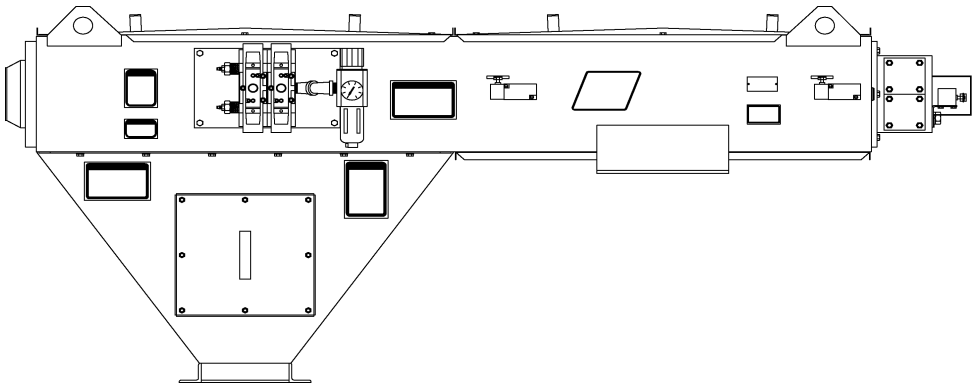


Sampler

Model: HD-PRT

Installation and Operation Manual

PNEG-2229

Version: 1.0

Date: 05-03-18

PNEG-2229

All information, illustrations, photos, and specifications in this manual are based on the latest information available at the time of publication. The right is reserved to make changes at any time without notice.

Contents

This manual covers the installation and operation for the Sampler Model HD-PP. This manual provides guidelines for installing the product. You must retain a qualified contractor to provide on-site expertise. INTERSYSTEMS IS NOT RESPONSIBLE FOR THE INSTALLATION OF THIS PRODUCT.

InterSystems reserves the right to improve its product whenever possible and practical to do so. We reserve the right to change, improve and modify products at any time without obligation to make changes, improvements and modifications on equipment sold previously.

General Safety Statements

1. The Sampler system is designed and manufactured with operator safety in mind. However, residual hazards remain due to the nature of material handling, and specific material hazards. Use extreme caution at all times.
2. Modifications to equipment may cause extremely dangerous situations that could result in damage to the equipment as well as serious injury or death. Never modify the equipment.
3. InterSystems recommends that you contact the local power company to have a representative survey the installation to ensure wiring is compatible with their system and adequate power is supplied to the unit.
4. Consult InterSystems 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.
5. 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.
6. 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 products to which this equipment is in contact to determine what PPE is required.

This equipment is to be operated only on the voltage designated on the certified electrical drawings. Fire or explosion may result, which can cause death, serious injury and extensive damage to equipment. Do not connect to voltages other than designated.

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.

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.

Ordering Parts

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

InterSystems, Inc.
9575 N. 109th Ave
Omaha, NE. 68137
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.

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 InterSystem's 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.

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.

Part #	Description
522319	Valve Repair Kit (Automatic Valve)
516551	Standard 110/120 VAC, 50/60 HZ Valve Coil (Automatic Valve)
529440	Optional 220/240 VAC, 50/60 HZ Valve Coil (Automatic Valve)
527133	Rod Seal Kit for 1" Rod Air Cylinder (Parker 2MA series)
527134	Rod Seal Kit for 1-3/8" Rod Air Cylinder (Parker 2MA series)
525512	Piston Seal Kit for 5" Bore Air Cylinder (Parker 2MA series)
527855	Piston Seal Kit for 6" Bore Air Cylinder (Parker 2MA series)
522320	Rotary Actuator Seal Repair Kit (Parker PTR322 series)
525425	Rotary Actuator Seal Repair Kit (Parker HP4.5 series)
513963	Gauge for Filter Regulator
524711	Filter Element Kit for Filter Regulator (SMC NAW4000 series)
35527	Limit Switch Contact Block 1 N.O. 1 N.C.

Safety Guidelines

Safety guidelines are general-to-specific safety rules that must be followed at all times. This manual is written to help you understand safe operating procedures and problems that can be encountered by the operator and other personnel when using this equipment. Save these safety guidelines for future reference.

As owner or operator, you are responsible for understanding the requirements, hazards, and precautions that exist and to inform others as required. Unqualified persons must stay out of the work area at all times.

Alterations must not be made to the equipment. Alterations can produce dangerous situations resulting in SERIOUS INJURY or DEATH.

This equipment must be installed in accordance with the current installation codes and applicable regulations, which must be carefully followed in all cases. Authorities having jurisdiction must be consulted before installations are made.

When necessary, you must consider the installation location relative to electrical, fuel and water utilities.

Personnel operating or working around equipment must read this manual. This manual must be delivered with equipment to its owner. Failure to read this manual and its safety instructions is a misuse of the equipment.

ST-0001-3

Cautionary Symbol Definitions

Cautionary symbols appear in this manual and on product decals. The symbols alert the user of potential safety hazards, prohibited activities and mandatory actions. To help you recognize this information, we use the symbols that are defined below.

DANGER — This symbol indicates an imminently hazardous situation which, if not avoided, **will result in serious injury or death.**

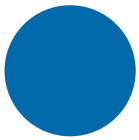
WARNING — This symbol indicates a potentially hazardous situation which, if not avoided, **can result in serious injury or death.**

CAUTION — This symbol indicates a potentially hazardous situation which, if not avoided, **can result in minor or moderate injury.**

NOTICE — This symbol is used to address practices not related to personal injury.

This symbol indicates a general hazard.

This symbol indicates a prohibited activity.



This symbol indicates a mandatory action.

ST-0005-2

Safety Cautions

Use Personal Protective Equipment

- Use appropriate personal protective equipment:

Eye Protection

Respiratory Protection

Foot Protection

Hearing Protection

Head Protection

Fall Protection

Hand Protection

- Wear clothing appropriate to the job.
- Remove all jewelry.
- Tie long hair up and back.

ST-0004-1

Follow Safety Instructions

- Carefully read all safety messages in this manual and safety signs on your machine. Keep signs in good condition. Replace missing or damaged safety signs. Be sure new equipment components and repair parts include the current safety signs. Replacement safety signs are available from the manufacturer.
- Learn how to operate the machine and how to use controls properly. Do not let anyone operate without instruction.
- If you do not understand any part of this manual or need assistance, contact your dealer.

ST-0002-1

Maintain Equipment and Work Area

- Understand service procedures before doing work. Keep area clean and dry.
- Never service equipment while it is operating. Keep hands, feet, and clothing away from moving parts.
- Keep your equipment in proper working condition. Replace worn or broken parts immediately.

ST-0003-1

Stay Clear of Hoisted Equipment

- Always use proper lifting or hoisting equipment when assembling or disassembling equipment.
- Do not walk or stand under hoisted equipment.
- Always use sturdy and stable supports when needed for installation. Not following these safety precautions creates the risk of falling equipment, which could crush personnel and cause serious injury or death.

ST-0047-1

Sharp Edge Hazard

- This product has sharp edges, which can cause serious injury.
- To avoid injury, handle sharp edges with caution and always use proper protective clothing and equipment.

ST-0036-2

Install and Operate Electrical Equipment Properly

- Electrical controls must be installed by a qualified electrician and must meet the standards set by applicable local codes (National Electrical Code for the US, Canadian Electric Code, or EN60204 along with applicable European Directives for Europe).
- Lock-out power source before making adjustments, cleaning, or maintaining equipment.
- Make sure all equipment and bins are properly grounded.

ST-0075-1

Stay Clear of Moving Parts

- Stay clear - machine can start without warning.
- Entanglement in gate will cause serious injury.
- Keep all shields and covers in place at all times.
- Lock-out power source before making adjustments, cleaning, or maintaining equipment.

ST-0070-1

Flying Material and High Pressure Air Hazard

- Flying material and/or high pressure air can cause severe eye injury or blindness.
- Wear safety glasses around operating equipment.

ST-0071-1

Toxic Fume and Dust Hazard

- Do all work outside or in a well-ventilated area. Dispose of paint and solvent properly.
- Remove paint before welding or heating:
  - — Avoid potentially toxic fumes and dust. Hazardous fumes can be generated when paint is heated by welding, soldering, or using a torch.
  - — If you sand or grind paint, avoid breathing the dust. Wear an approved respirator.
  - — If you use solvent or paint-stripper, remove stripper with soap and water before welding.
  - — Remove solvent or stripper containers and other flammable material from area. Allow fumes to disperse at least 15 minutes before welding or heating.

ST-0043-2

Safety Sign-Off Sheet

Below is a sign-off sheet that can be used to verify that all personnel have read and understood the safety instructions. This sign-off sheet is provided for your convenience and personal record keeping.

Date	*Employee Name*	*Supervisor Name*

ST-0007

3. Decals

The safety decals on your equipment are safety indicators which must be carefully read and understood by all personnel involved in the installation, operation, service and maintenance of the equipment.
To replace a damaged of missing decal, contact us to receive a free replacement.

InterSystems
9575 N. 109th Ave.
Omaha, Nebraska 68137
Phone: (402) 330-1500
FAX: (402) 330-3350

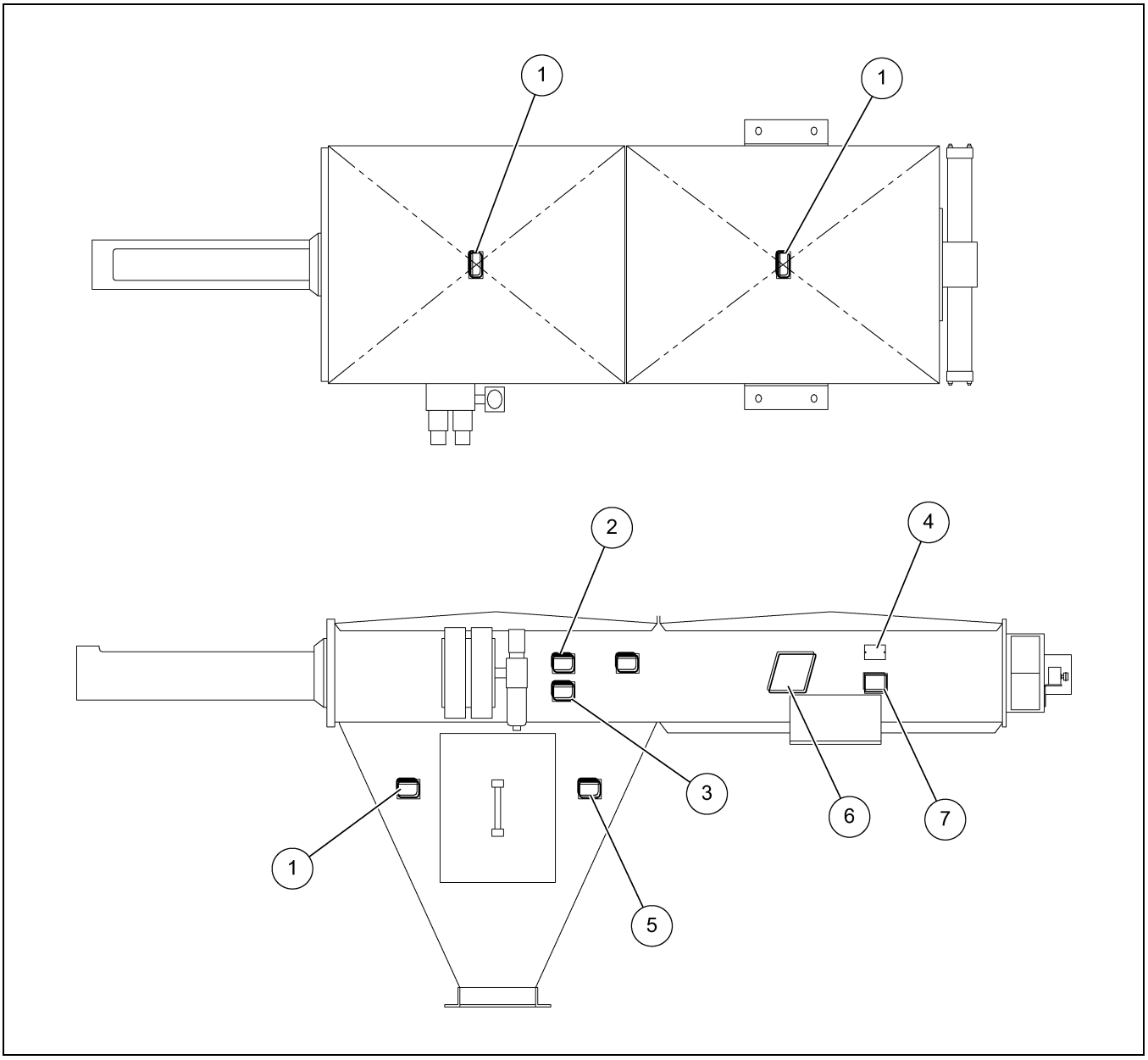
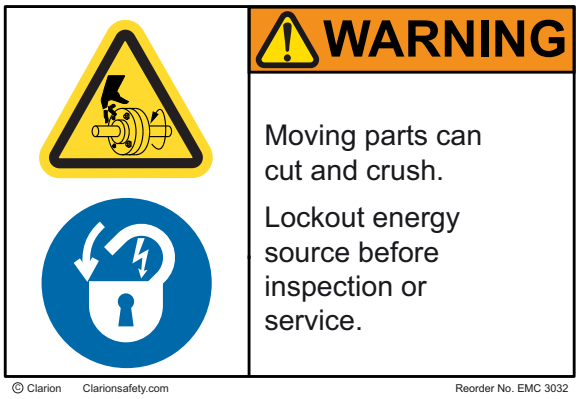
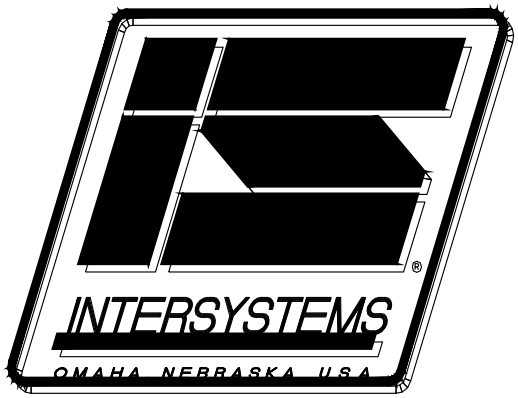
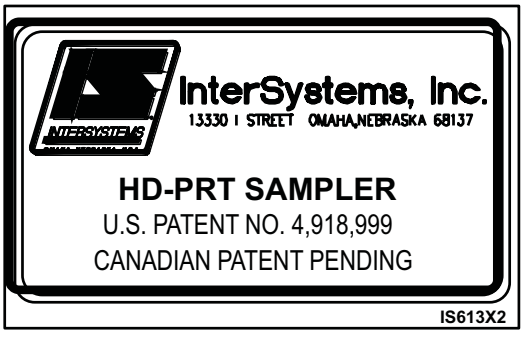


Figure 3A *Model HD-PRT Sampler Safety Label Locations*

NOTE: *These signs must never be removed, tampered with, painted over or obscured in anyway. If labels are damaged or become unreadable, replacement labels are available from InterSystems.*

Ref #	Decal #	Decals	Description
1	EMC 30 32		Moving Part (N.S., F.S)
2	EMC 40 232		Lock Out Machine
3	EMC 40 332		Starts Without Warning
4	IS Tag		IS Serial No Tag

3. Decals

Ref #	Decal #	Decals	Description
5	EMC 28 32		Eye Protection
6	IS526X4		IS Logo
7	IS613X2		HD-PRT Patent

System Description

The HD-PRT Sampler is designed to collect a representative sample of granular, pellet, chip, flake or other materials in a gravity chute or from a conveyor discharge. *Figure 4A* illustrates a typical HD-PRT Sampler application.

Sample collection is initiated in response to either an operator's manual command or a signal automatically generated by controller logic. A sample cycle begins when a pair of double-acting pneumatic cylinders extend the slotted sampling probe into the product stream. Then the rotary actuator rotates the sample probe clockwise (when viewed from the rotary actuator end of the sampler) through a 270° arc, exposing the sample probe cavity to the product stream to collect a sample of the material. Next, the cylinders retract the sample probe from the product stream, isolating the sample and sample probe cavity from the product stream. Subsequently, the rotary actuator rotates the sample probe counterclockwise through 270°, dumping the collected sample into the sampler's discharge chute. The sample then falls down and out of the discharge chute to the desired sample collection point, at which point an InterSystems SCS Sample Collection System (optional) may be installed.

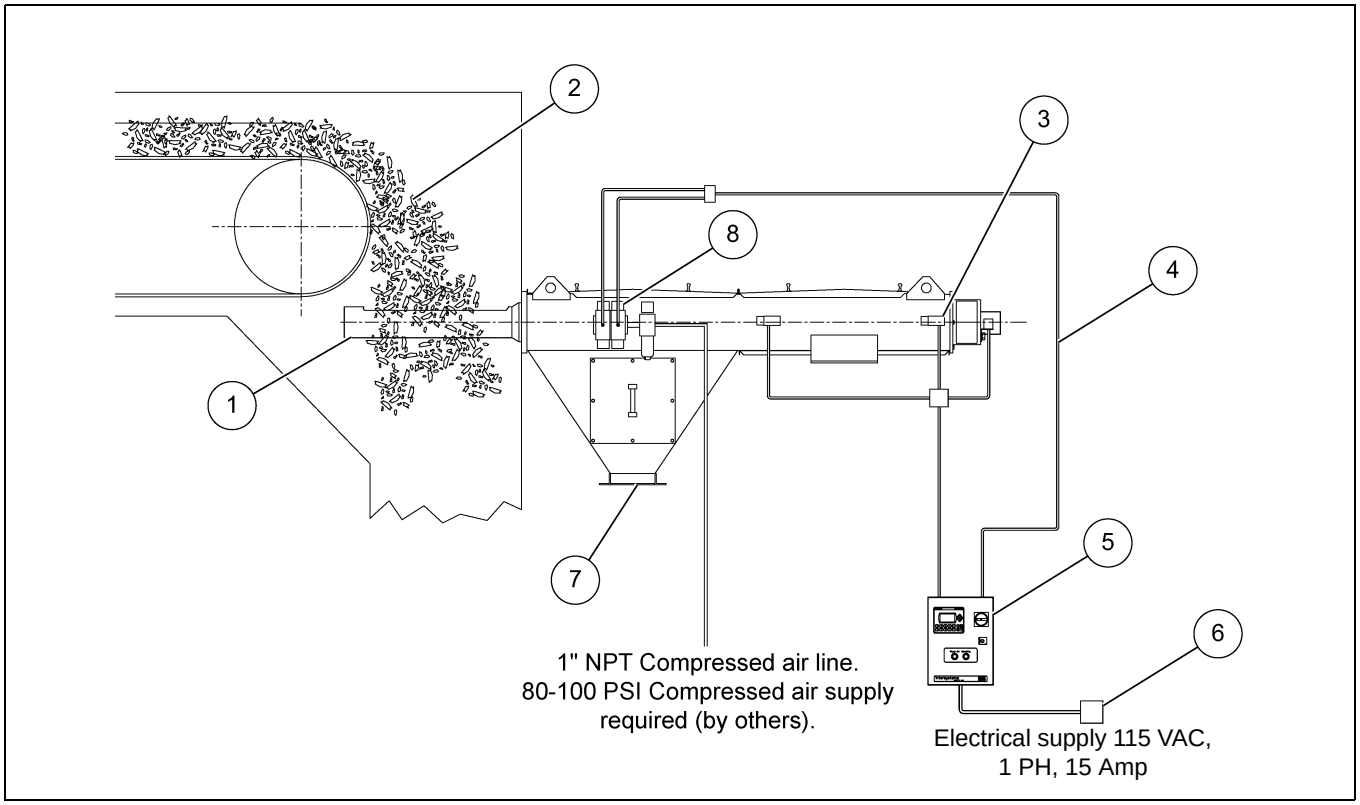


Figure 4A *Typical Installation, Model HD-PRT Sampling System*

Ref #	Description
1	Sample Probe
2	Material to be Sampled
3	Limit Switches (4)
4	Electrical Conduits

Ref #	Description
5	Sampler Control Panel
6	Circuit Breaker
7	Sample discharge extend to desired collection point.
8	Directional Control Valve Coils (4)

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.

1. Controller arranged to initiate a sampling cycle based on quantity or volume of material passing through conveying line rather than upon elapsed time periods.
2. 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.

    a. An explosion-proof solenoid on the directional control valve with the rating of:

        Class 1, Groups C and D, Division 1 and 2

        Class 2, Groups E, F and G, Division 1 and 2

    b. An explosion-proof limit switch with the rating of:

        Class 1, Groups C and D, Division 1 and 2

        Class 2, Groups E, F and G, Division 1 and 2

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

    a. The NEMA 9 control with the rating of:

        Class 2, Groups E, F and G, Division 1 and 2

    b. The NEMA 7 control with the rating of:

        Class 1, Groups C and D, Division 1 and 2

        Class 2, Groups E, F and G, Division 1 and 2

3. Components of special materials, such as 316 stainless steel, monel, inconel or nedox coatings.
4. Programmable controls to sequence the sampler and the sample collection equipment.

Material Sampled

Most materials from light to heavy density powders, granules, flakes and pellets.

Sampler Construction

Standard sampler housing construction is of painted carbon steel. This includes the frame, mount plate, sample hopper and guards. The sample probe is of Type 304 Stainless Steel. 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.

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.

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).*

Location

The HD-PRT sampler is typically mounted horizontally in the chute at the discharge end of a belt conveyor carrying the product to be sampled, as shown in *Figure 4A on Page 15*. If this is the arrangement to be used, maintain a minimum of 6" clearance between the end of the sample probe and the face of the head or drive pulley. If the conveyor belt has cleats, maintain a 6" minimum clearance between the end of the sample probe and the tips of the cleats. Reasons for maintaining the minimum clearance includes:

1. To prevent damage to the sample probe resulting from a drive pulley wobbling on its shaft or from a flap of loose or damaged belt.
2. To prevent conveyed product or material from jamming in the gap between the pulley and the sample probe.
3. To ensure that complete, representative samples are collected. The sample probe should extend under the drive pulley to ensure that all fines are collected.

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.

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 additional hanger rods or braces to rigidly support the sampler. Support should bear on the side support angles located toward the rear on each side of the sampler frame. Each angle has two 7/8" diameter holes for securing the angles to the support(s). Refer to the certified drawing(s) of the sampler for the dimensioned locations of these holes. The hangers or braces should be capable of fully supporting the sampler.

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.*

Sampler Without Optional Mounting Accessories

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 chute work.

1. Locate and mark the desired mounting location on the discharge chute, spout, or conveying line.
2. Cut and deburr a clearance hole in the chute where the sample probe is to enter the chute. This hole will need to be 8" diameter for the 5-1/2" diameter HD-PRT probe or 11" diameter for the 8-1/2" diameter HD-PRT probe. Refer to the certified drawing(s).
3. The mounting flange on the end of the sampler drive housing has six 0.88" (7/8") clearance holes for 3/4" mounting screws or studs. Using the sampler mounting face as a pattern, layout or transfer punch the hole locations onto the conveying line.
4. Drill and tap the holes for the mounting screws, or weld studs to the conveying line for fastening the sampler.
5. Position the sampler on the conveying line and loosely install the mounting fasteners. Verify that the sample probe will extend and retract without interference. The probe should be centered in the clearance hole. Tighten the mounting fasteners.
6. Finally, attach the sample discharge hopper to the sampler.
7. The user or installer must provide hanger rods or braces to rigidly support the sampler. Support should bear on the side support angles located toward the rear on each side of the sampler frame. Each angle has two 7/8" diameter holes for securing the angles to the support(s). Refer to the certified drawing(s) of the sampler for the dimensioned locations of these holes. The hangers or braces should be capable of fully supporting the sampler.

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 chute work.

1. Locate and mark the desired mounting location on the conveying line.
2. Cut and deburr a clearance hole in the chute where the sample probe is to enter the conveying line. This hole will need to be 8" diameter for the 5-1/2" diameter HD-PRT probe or 11" diameter for the 8-1/2" diameter HD-PRT probe. Refer to the certified drawing(s).
3. Position the sampler mounting plate by aligning the sample probe clearance holes.
4. Tack weld the sides of the mounting plate to the product line surface and double check alignment.
5. 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.*
6. Position the sampler on the conveying line and loosely install the mounting fasteners. Verify that the sample probe will extend and retract without interference. The probe should be centered in the clearance hole. Tighten the mounting fasteners.
7. Finally, attach the sample discharge hopper to the sampler.

8. The user or installer must provide hanger rods or braces to rigidly support the sampler. Support should bear on the side support angles located toward the rear on each side of the sampler frame. Each angle has two 7/8" diameter holes for securing the angles to the support(s). Refer to the certified drawing(s) of the sampler for the dimensioned locations of these holes. The hangers or braces should be capable of fully supporting the sampler.

Material Sample Transport Lines

The tubing used to transport material samples must be adequately sized and compatible with the operating environment and the material sampled. Tubing size is usually determined by the size of the flanged discharge chute outlet as shown on the certified drawing(s) furnished with the sampler.
All sample lines must be installed either vertically or at a maximum slope to ensure the sampled material flows freely. Use rigid tubing having a smooth interior surface. The sample line is routed to allow material to flow via gravity to a convenient collection point. At that point it may be connected to a collection jar bracket or a Sample Collection System cabinet.

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. Escaping sample material can contaminate surrounding atmosphere and equipment.

Controller Location

1. Use vibration isolation pads when mounting the control enclosure or mount the controller in a vibration-free location.
2. Unless ordered for severe duty, locate controller so it is protected from water and dust.
3. Unless an explosion-proof rated controller was specifically ordered, DO NOT locate the controller in a hazardous area.
4. Most applications require that the sampler be in easy view of the controller.

System Wiring

Refer to the certified electrical drawing(s) for specific wiring requirements. As explained in Manual Sampling *on Page 24*, the terminal strip 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.

Electrical Power Requirements, System

110/120 VAC 50/60 Hz, Single Phase, 10 Amp Service

Optional - 220/240 VAC 50/60 Hz, Single Phase, 5 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.

Controller

110/120 VAC, 50/60 Hz, Single Phase, 4 Amp Max. (Includes motor power requirements.)

Optional - 220/240 VAC, 50/60 Hz, Single Phase, 2 Amp Max. (Includes motor power requirements.)

Solenoid Valve Coil

110/120 VAC, 50/60 Hz, Single Phase, 5 Watts

Optional - 220/240 VAC, 50/60 Hz, Single Phase, 5 Watts

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.*

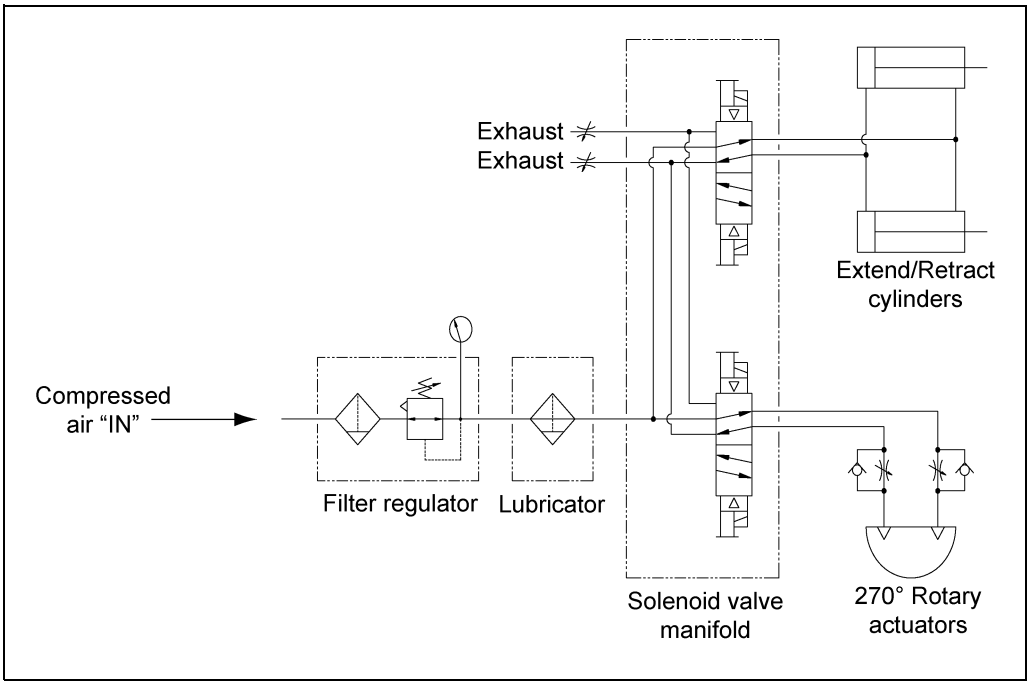


Figure 5A *Pneumatic Schematic*

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" NPT, reduced to 3/4" NPT at sampler. Larger piping to the sampler, and/or a 30 gallon surge tank located at the sampler, will be required on installations where the compressed air source is further than 200' from the sampler to prevent excessive drop in air pressure.

InterSystems recommends installing a lockable shut off valve upstream of the filter/regulator. The shut off 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.

Compressed Air Consumption

A complete sampling cycle requires that the cylinder retract and extend and that the rotary actuator rotates the sample probe twice through a 270° arc during each cycle. 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	
	5-1/2" Diameter Probe	8-1/2" Diameter Probe
HD-PRT - 12	6.2 SCF	8.8 SCF
HD-PRT - 18	8.1 SCF	11.5 SCF
HD-PRT - 24	10.0 SCF	14.3 SCF
HD-PRT - 30	11.9 SCF	17.0 SCF
HD-PRT - 36	13.8 SCF	19.7 SCF
HD-PRT - 42	15.7 SCF	22.4 SCF
HD-PRT - 48	17.6 SCF	25.2 SCF
HD-PRT - 54	19.5 SCF	27.9 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.

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. Lock out power before performing any maintenance.

Control Components and their Functions

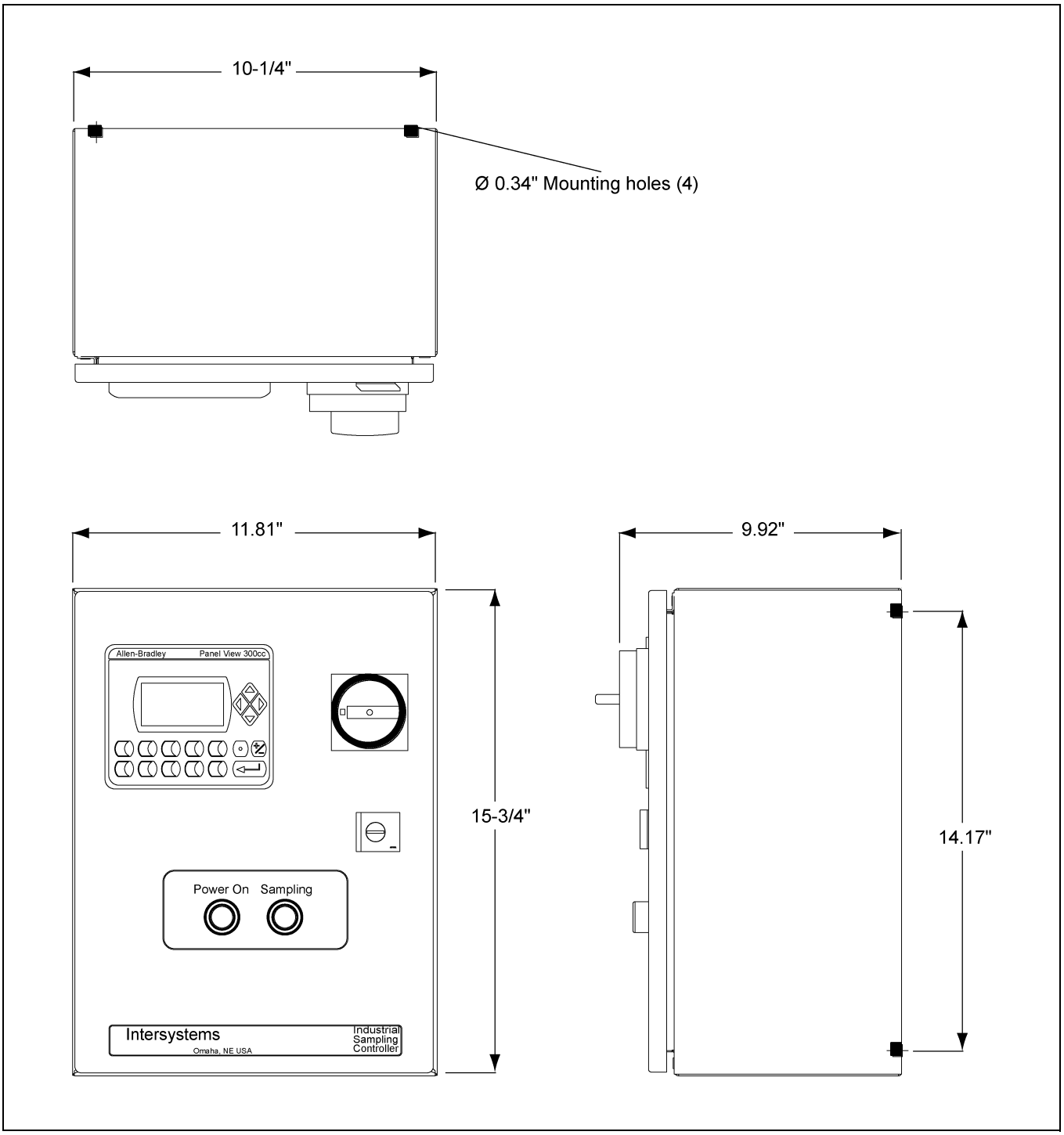


Figure 6A *Standard NEMA 4 Control Panel Detail*

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

Power OFF/ON Switch (S1)

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

This machine starts without warning. Moving parts can cause severe injury. Clear area prior to controller start-up.

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.

Sampling Pilot Light

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

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 PNEG-2170 for further information on the sampler control.

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, 1 PH operation, use ONLY a BUSS Type FNM 2 Amp, 250 VAC Slo-Blo fuse or equivalent.

For 220//240 VAC, 1 PH operation, use ONLY a Buss Type FNM, 1 Amp, 250 VAC Slo-Blo fuse of equivalent.

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).

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).

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).

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.

Manual Sampling

The operator may choose to run the sampler in Manual Mode by selecting manual mode in the PanelView menu. (Refer to manual PNEG-2170.) After selecting manual mode, each time F1 is pressed on the PanelView, a manual sample is initiated.

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 PNEG-2170.) **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 PNEG-2170 for sampling automatic sampling options.

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.

Sampler Mounted Electrical Components

Sample Probe Extended Limit Switch, LS-1

This switch is actuated when the sample probe is fully extended into the product stream. Closing of the N.O. contacts energizes the "A" coil of the rotation control valve, V-2. The rotary actuator causes the sample probe to rotate clockwise (when viewed from the rotary actuator end of the sampler) from the six o'clock to the three o'clock position to collect a sample. The switch is restored when the cylinders retract the sample probe from the product stream.

Sample Probe Retracted Limit Switch, LS-2 (Actuated at Rest)

This switch is actuated when the sample probe is fully retracted from the product stream. Closing of the N.O. contacts energizes the "B" coil of the rotation control valve, V-2, which rotates the sample probe counterclockwise (when viewed from the rotary actuator end of the sampler) from the three o'clock position to the six o'clock position to dump the sample into the discharge chute. The switch is actuated at rest and restores when the cylinders extend at the beginning of a cycle.

Sample Probe @ Six o'Clock Limit Switch, LS-3 (Actuated at Rest)

This switch is actuated when the rotary actuator has rotated fully counterclockwise to the six o'clock position. Closing of the N.O. contacts signals a sample cycle is complete and allows the digital display timer to run (in the automatic mode). An automatic or manual sample cycle may be initiated if, and only if, this switch is actuated. The switch is actuated at rest and restores when the rotary actuator begins to rotate to sample.

Sample Probe @ Three o'Clock Limit Switch, LS-4

This switch is actuated when the rotary actuator has rotated fully clockwise to the three o'clock position. Closing of the N.O. contacts energizes the “B” coil of the EXTEND/RETRACT control valve, V-1. The switch restores later in the cycle when the sample probe rotates to dump the sample.

Pneumatic Components

Solenoid Valves V-1 And V-2

These valves are 4-way, 2-position, double-solenoid operated, maintained-position directional control valves.

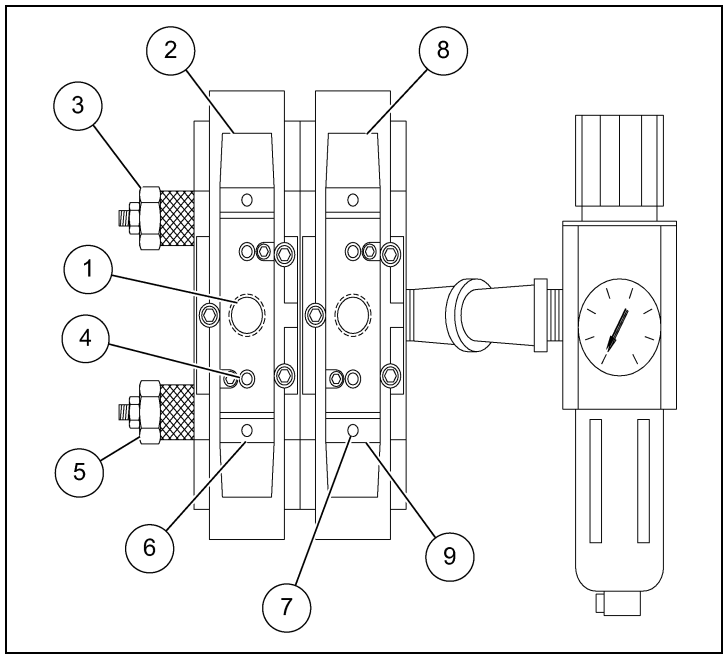


Figure 6B *Solenoid Valve*

Ref #	Description
1	1/2" NPT Conduit Connections (2)
2	Probe Extend Solenoid Coil V-1 “A”
3	Probe Extend Speed Control
4	LED Indicator (4)
5	Probe Retract Speed Control

Ref #	Description
6	Probe Extend Solenoid Coil V-1 “B”
7	Manual Overide Button Typical 4 Places
8	Probe rotate to collect sample solenoid coil V-2 “A”
9	Probe rotate to empty sample solenoid coil V-2 “B”

Sample Probe Extend/Retract Valve V-1

This solenoid operated directional control valve alternately pressurizes the piston end and rod end of two doubleacting cylinders to extend and retract the sample probe. When the valve's “A” solenoid is energized, the valve spool shifts, pressurizing the rod ends of the cylinders. The cylinders extend, extending the sample probe into the product stream. When the “B” solenoid is energized, the valve spool shifts, pressurizing the piston ends of the cylinders. The cylinders retract, retracting the sample probe from the product stream.

Sample Probe Rotate Valve V-2

This solenoid operated directional control valve alternately pressurizes opposing ports of the rotary actuator to rotate the sample clockwise (CW) to collect samples and counterclockwise (CCW) to dump samples. (When viewed from the rotary actuator end of the sampler.) When the valve’s “A” solenoid is energized, the valve spool shifts, pressurizing the CW port of the actuator. The sample probe rotates, collecting a sample of the material from the product stream. When the “B” solenoid is energized, the valve spool shifts, pressurizing the CCW port of the actuator. The sample probe rotates, dumping the collected sample.

Rotation Speed Controls

Needle valves are supplied in the airlines leading from the ports of the rotary actuator. Each needle valve can be adjusted to restrict the flow of air FROM the actuator port to which it is connected and control the rotational speed at which the actuator rotates the sample probe in one direction. The arrow on the valve body indicating the direction of controlled air flow should point AWAY from the valve port.

Probe Extend/Retract Speed Control Valve Adjustment

A speed control valve is threaded into each exhaust port of Valve V-1. *(See Figure 6B on Page 25.)* Each speed control valve controls the rate at which air exhausts from one end of the cylinder and as a result, controls cylinder operating speed in only one direction. The speed controls were factory set but may need minor adjustment due to differences in air supplies. Use the following guidelines when adjusting the speed controls.

CAUTION

Escape of pressurized air, fluids, and contaminants at high velocity can cause injury to unprotected eyes. Always wear eye protection when servicing air valves and components.

1. Turn the nut locking the one speed control valve’s metering screw clockwise to loosen it. (**NOTE**: *left hand threads.*) Do not allow metering screw to turn.
2. Change control switch to manual mode and initiate a manual sample. While operating the sampler, turn the metering screw to vary the speed of cylinder operation. Turn the screw clockwise to decrease speed, or turn the screw counterclockwise to increase speed.
3. When the desired cylinder operating speed in one direction has been achieved, tighten the nut to lock the adjustment and repeat procedure to adjust the other speed control valve.

Air Filter/Pressure Regulator

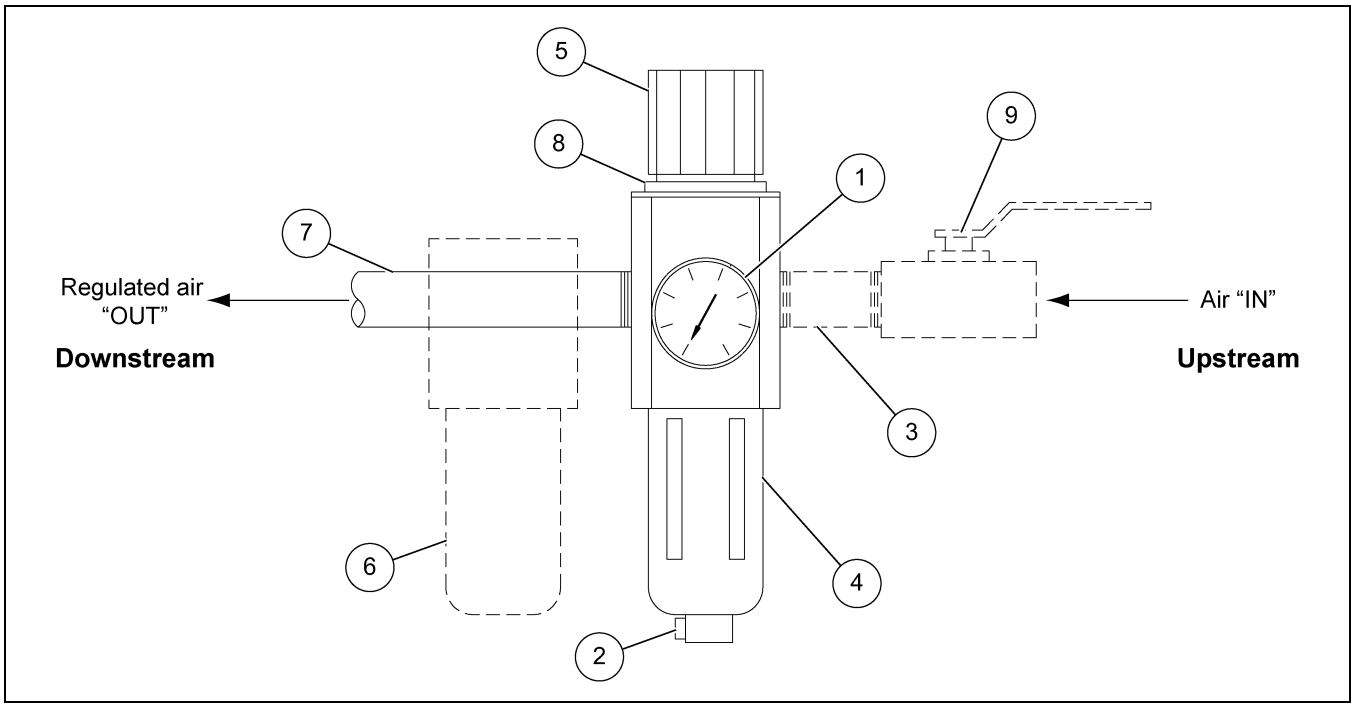


Figure 6C *Filter/Regulator*

Ref #	Description
1	Air Pressure Gauge
2	Filter Drain Valve
3	3/4" Pipe (Minimum)
4	Air Filter and Bowl Guard
5	Adjustment Knob

Ref #	Description
6	Lubricator (Optional by others field installed)
7	3/4" NPT Airline to Control Valves
8	Pressure Regulator
9	Lockable, vented shut off valve required (by others field installed)

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 type drain for draining the filter bowl.

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

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.

Pneumatic Cylinder

These double-acting, non-cushioned rod cylinders extend and retract the sample probe. Stroke length varies with the sample probe stroke. Cylinder rods are attached to the sample probe assembly using an alignment coupler. Solenoid valve V-1 controls extension and retraction of the cylinders.

Rotary Actuator

The actuator is essentially two double acting air cylinders that drive a rack and pinion unit, thus converting linear motion into rotary motion. The actuator is coupled directly to the sample probe, alternately rotating the sample probe clockwise to collect samples and counterclockwise to dump samples. Solenoid valve V-2 controls rotary actuator motions.

Shock Absorbers

These devices prevent impact damage to the sampler in the occasional instance when sampled material prevents the smooth, immediate, and complete retraction of the sample probe. This can happen when a fragment of the sample material protrudes from the slot in the sample probe and the probe is prevented from retracting completely. Once the air cylinders build pressure the fragment is sheared. The shock absorbers prevent the sudden freeing of the sample probe would allow the cylinders and sample probe to violently impact against the frame.

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. Lock out power before performing any maintenance.

General Maintenance

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

Periodic Inspection

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

1. Loose or missing hardware
2. Functioning and properly adjusted shock absorbers.
3. Structural damage
4. Rust or corrosion
5. Structural damage
6. Damaged wiring, including exposed conductors and connections
7. Damaged airlines or pneumatic components
8. Keep the areas around the limit switches clear of accumulations of dirt and debris which might prevent the switches from functioning as intended.
9. Make sure that all guards are in place and that all warning labels are in place and legible. *See Page 7*, 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.

Lubrication

Guide Bushings and Drive Bearings

All shafts and bearings have been coated with a liberal amount of multi-purpose grease. Bearings and shafts should be thoroughly cleaned and re-greased once a year. It is essential that all covers remain fastened in place to prevent the entrance of dust and dirt, which would contaminate the grease.

Airline Lubricator

An airline lubricator is not required. The cylinders and the rotary actuator are of a non-lube design requiring NO lubrication. If the use of a lubricator is desired, it must be field mounted between the filter/regulator 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 lubricator 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 valves on the sampler.

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.

1. Shut off and lock out the air supply.
2. Operate a valve or loosen an airline connection to relieve all pressure downstream from the filter/regulator.
3. 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.*
4. Clean or replace the filter element.
5. 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.
6. Re-install the bowl. Turn ON pressure and make sure the bowl is seated and sealed.

Rotation Reversal

Depending on the installation, it may be desirable to reverse the rotation of the sampler probe to prevent material from flowing into the sample slot when the probe is in the 3 o'clock position. This is typically encountered in an installation where the sampler is probing from a sideways moving pile of material as in a drag conveyor or truck pit. The sampler is re-configured as follows.

1. Shut off and lock out all power (electrical and pneumatic).
2. Shut down the conveying line or conveyor when empty and lock out.
3. Remove the top cover(s) of the sampler and the access cover on the sample hopper.
4. Remove the 1/4"-20 UNC hex head bolts attaching the shear nose, bearing and locator.
5. Rotate the serrated shear nose 180°.
6. Re-install the 1/4"-20 UNC hex head bolts and tighten.
7. Remove the four 1/2"-13 UNC hex head nuts and washers attaching the drive bearing to the probe, and slide the drive bearings off the probe.
8. Without moving the square drive tube rotate the probe 90° clockwise (as viewed from the actuator end).
9. Re-install the drive bearing, washers and nuts and tighten.
10. Re-install the top covers and the sample hopper access cover.
11. Reverse the electrical wiring from the control to the two rotation solenoids.
12. Reverse the electrical wiring from the control to the two rotation limit switches.
13. Make notations in this manual and on the electrical drawings that the limit switches and the solenoids are reversed and re-designate.
14. Restore power to the sampler and operate it through several collection cycles. It may be necessary to re-adjust the rotation speed control valves. Refer to Rotation Speed Controls section *on Page 26*.

General HD-PRT Sampler Troubleshooting

Careless or accidental restoration of power can result in death or serious injury. Make certain area is clear before removing lock outs.

Problem	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.	Replace fuse. Refer to Main Fuse (FU1) section *on Page 23*.
	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.
	Limit switch malfunction.	Inspect. Refer to *Pages 24-25*.
	No or low air pressure.	Turn ON air supply and set regulator to 80-100 PSI.
	Defective control valve.	Refer to Directional Solenoid Valve Troubleshooting section *on Page 32*.
	Defective control relay.	Replace Relay.
Sampler cycles in Manual mode, but not in Automatic mode.	Automatic initiate jumper not installed.	Install jumper across terminals 1 and 2.
Sample size too small or large.	Rotational speed of the sample probe too fast or too slow.	Adjust needle valve V-3. Refer to Rotation Speed Controls section *on Page 26*. See location as noted in *Figure 8B on Page 34*.
Sampler sluggish. (Operates too slowly).	Inadequate air supply.	Increase line size or add surge tank.
	Regulator set too low.	Reset. Refer to Air Filter/Pressure Regulator Section *on Page 27*.
	Filter clogged.	Clean as outlined in Draining and Servicing the Filter section *on Page 30*.
	Airline from filter regulator blocked or damaged.	Inspect and correct.
	Cylinder seal leakage.	Refer to Cylinder Leaking section *on Page 33*.
Sampler stops with probe extended.	Limit switch LS-1 and/or LS-4 not properly set.	Inspect and adjust if limit switch arm bent or loose.
	Limit switch LS-1 and/or LS-4 defective.	Replace if contacts not opening and closing by manually tripping.
	Sample probe jammed.	Inspect and correct.
	Excessive gap between probe and shear nose.	Replace shear nose.

Directional Solenoid Valve Troubleshooting

Problem	Possible Cause	Corrective Action
Valve does not shift but 120 VAC signal is present at the terminal strip inside the control.	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 and clean. Or replace.
Valve leaks air continuously out an exhaust port.	Defective valve seals.	Refer to Valve vs. Cylinder Leak Test Section *on Page 34*.
	Defective cylinder seals.	Refer to Valve vs. Cylinder Leak Test Section *on Page 34*.

There must be at least 60 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.

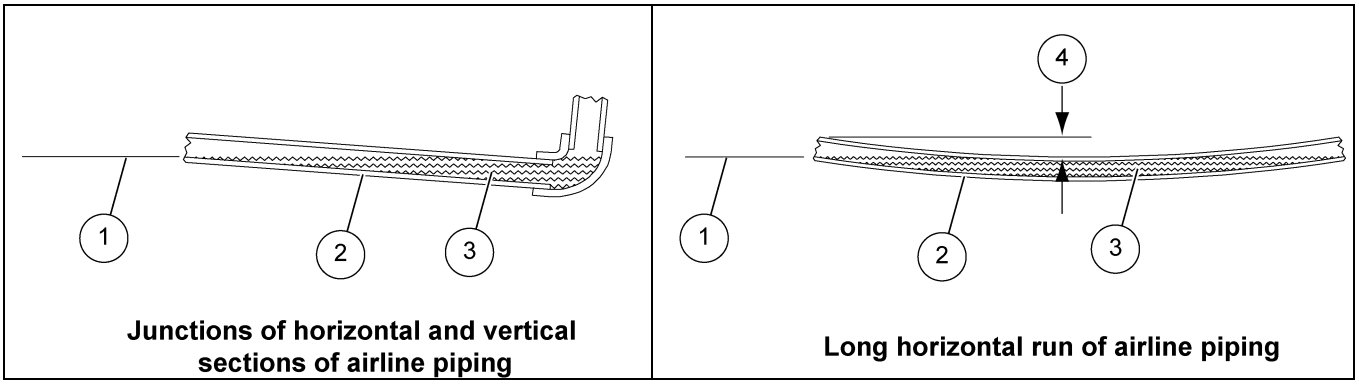


Figure 8A *Condensed Moisture Blocking Airline*

Ref #	Description
1	Water Level
2	Airline
3	Condensed Moisture
4	Sag of Pipe Greater than Internal Diameter

One often overlooked cause of insufficient air flow is moisture condensing and collecting in a low spot in the supply line. *Figure 8A on Page 32* 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 airline.

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.*

Air Components Troubleshooting

Cylinder Leaking

1. **External Leakage**

   a. 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 the rod's surface is rough or worn out-of-round.

   b. 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.

2. **Internal Leakage**

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

   b. 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.

   c. 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 cylinder is bypassing. The cylinder will need to be repaired or replaced.

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.

1. Cylinder retracted as shown *Detail 1* in *Figure 8B*.
    a. If there is continuous leakage out of Port “5”, the valve seals are defective and must be replaced.
    b. 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:
        i. Disconnect the line between Valve Cylinder Port “2” and the cylinder per *Detail 2* in *Figure 8B*.
        ii. If leakage continues out of Port “3” and/or Cylinder Port “2”, the valve seals are defective and must be replaced.
        iii. If there is a leakage out of the line from the cylinder, the cylinder seals are defective and must be replaced.
2. Cylinder extended as shown *Detail 3* in *Figure 8B*.
    a. If there is continuous leakage out of Port “3”, the valve seals are defective and must be replaced.
    b. If there is continuous leakage out of Port “5”, the problem can be either the valve seals or the cylinderb seals. To determine which proceed as follows:
        i. Disconnect the line between Valve Cylinder Port “4”, and the cylinder per *Detail 4* in *Figure 8B*.
        ii. If leakage continues out of Port “5” and/or Cylinder Port “4”, the valve seals are defective and must be replaced.
        iii. If there is a leakage out of the line from the cylinder, the cylinder seals are defective and must be replaced.

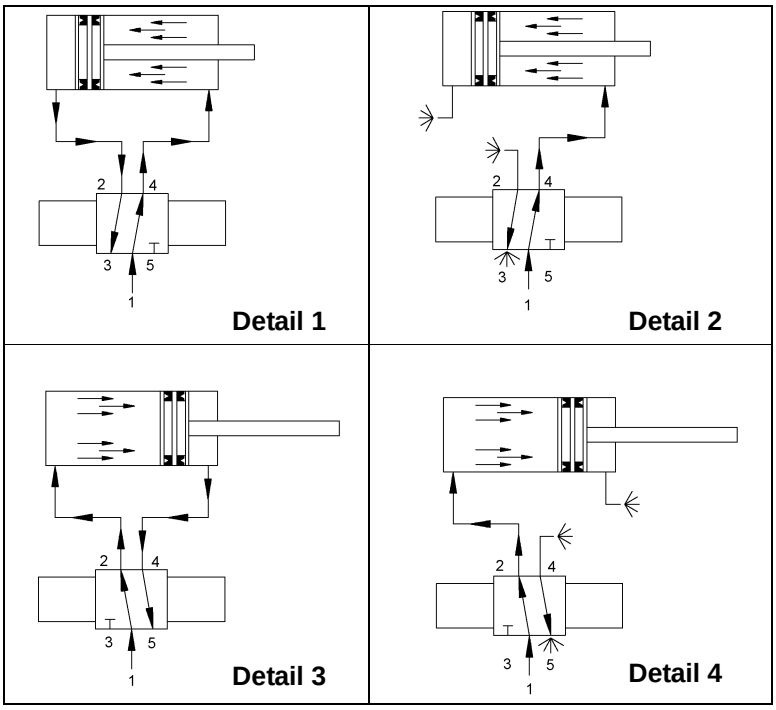
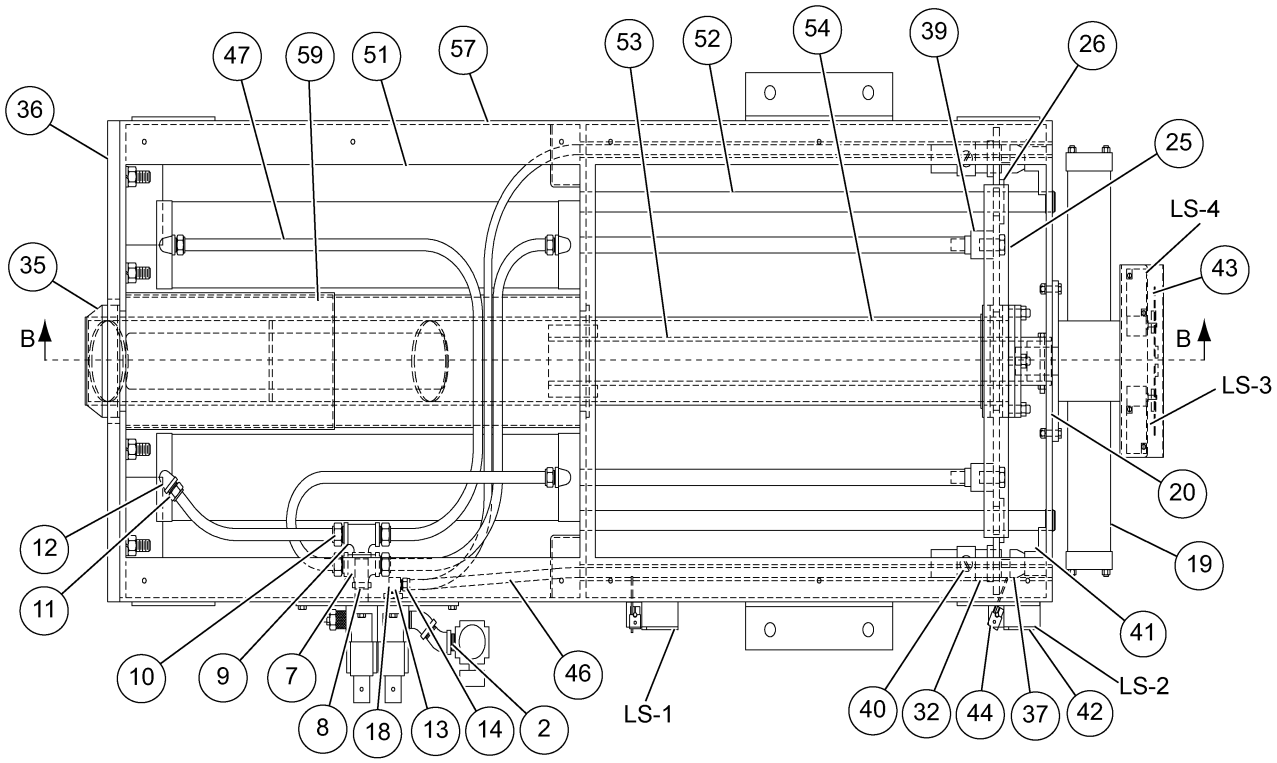
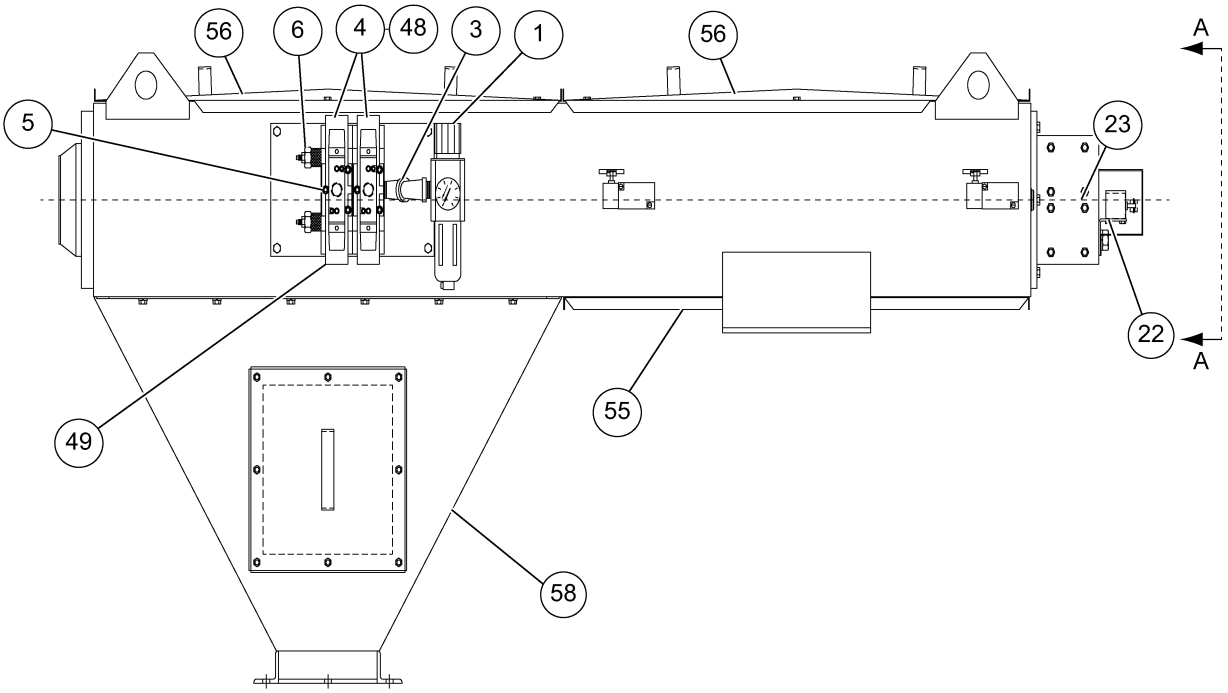


Figure 8B *Valve Vs. Cylinder Leak Test Diagram*

HD-PRT Sampler With 5-1/2" O.D. Probe



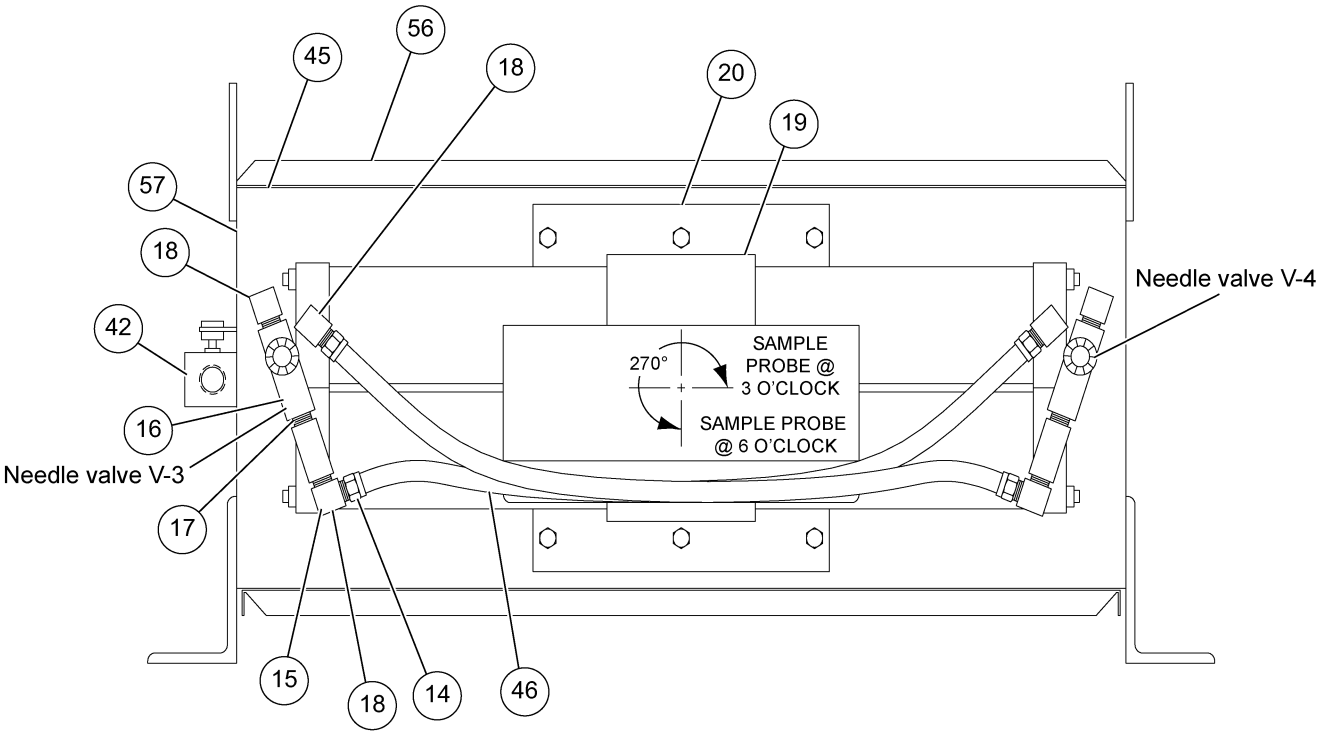
Plan view
(with top covers removed)



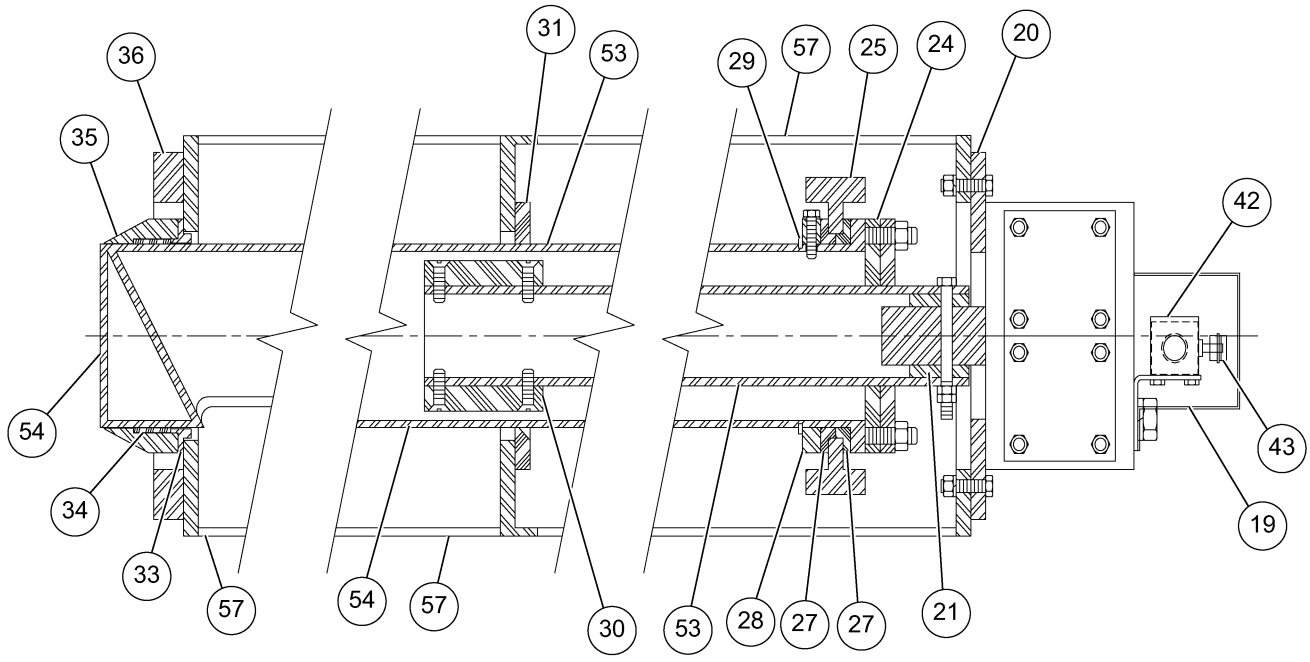
Elevation view

NOTE: *The parts pointed out on this page are listed on Pages 37-38.*

HD-PRT Sampler With 5-1/2" O.D. Probe (Continued)



End view A-A



Section view B-B

NOTE: *The parts pointed out on this page are listed on Pages 37-38.*

Sampler Parts Listing HD-PRT With 5-1/2" Diameter Probe

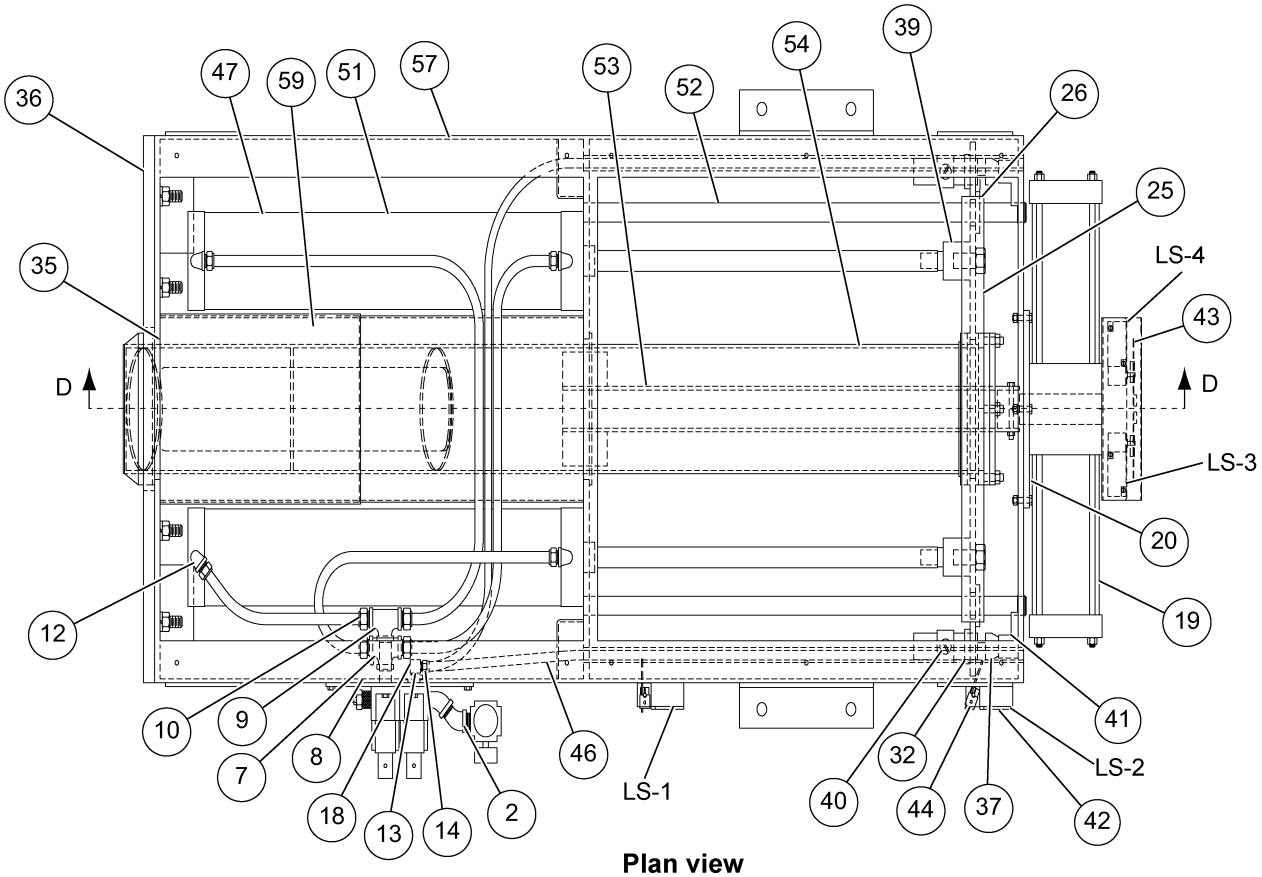
Ref #	Part #	Description	Qty
1	519457	3/4" NPT Filter Regulator	1
2	512825	Brass Pipe Close Nipple 3/4" NPT	1
3	35681	Black 45° Street Elbow 3/4" NPT	2
4	513757	4-Way NPT Solenoid Valve 110/120 VAC 50/60 Hz	2
5	34517	Black Pipe Plug 3/4"	7
6	36433	Speed Control 3/4" NPT	2
7	36441	Black Pipe Nipple 3/4" x 3"	1
8	512437	Black Pipe Nipple 3/4" x 2"	1
9	36442	Black Pipe Tee 3/4" NPT	2
10	513288	1/2" Push-Loc to 3/4" MPT STR Adaptor	4
11	24558	1/2" Push-Loc to 1/2" MPT STR Adaptor	4
12	513290	Brass 90° Street Elbow 1/2" NPT	4
13	36445	Pipe Bushing 3/4" x 3/8"	2
14	24553	3/8" Push-Loc to 3/8" STR Adaptor	8
15	34423	Brass Pipe Tee 3/8" NPT	2
16	516550	Flow Control Valve 3/8"	2
17	512823	Brass Pipe Close Nipple 3/8" NPT	4
18	34451	Brass 90° Street Elbow 3/8" NPT	8
19	515432	270° Rotary Actuator 2 Rack	1
20	512616	HD-PRT Actuator Mount Plate (5-1/2" Probe)	1
21	512475	HD-PRT Probe Actuator Coupler	1
22	519458	Limit Switch Bracket	1
23	519459	Limit Switch Guard	1
24	512471	HD-PRT Drive Bearing (5-1/2" Probe)	2
25	519460	HD-PRT Drive Plate (5-1/2" Probe)	1
26	519461	HD-PRT Guide Rod Bushing 1-1/4" Diameter	2
27	516548	HD-PRT Drive PL Flange Bearing (5-1/2" Probe)	2
28	516768	HD-PRT Lock Collar (5-1/2" Probe)	1
29	516549	5-1/2" Shaft Retaining Ring (5-1/2" Probe)	1
30	512470	HD-PRT Drive Tube Support Bearing	2
31	523112	HD-PRT Drive Seal (5-1/2" Probe)	1
32	522352	Shock Absorber Square Flange Mounting	2
33	518979	HD-PRT Shear Nose Locator (5-1/2" Probe)	1
34	518980	HD-PRT Shear Nose Bearing (5-1/2" Probe)	1
35A	518875	HD-PRT Shear Nose (Wood Chips) (5-1/2" Probe)	A/R
35B	522449	Chisel Nose (Hard Materials) (5-1/2" Probe)	A/R
36	519462	HD-PRT Mount Plate (5-1/2" Probe)	1
37	522353	Shock Absorber Striker Cap	2
38	519463	1-1/4" Shaft Retaining Ring	4
39	28149	Rod Coupler 3/4"-16 UNF (5-1/2" Probe)	2
40	512607	Shock Absorber	2
41	514487	Rubber Bumper	2
42	26402	Limit Switch NEMA 4, 12	4
43	35341	Limit Switch Roller Arm	2
44	35355	Limit Switch Arm 13" Rod Lever	2
45	34185	Doortite Seal 3/16" x 3/4"	A/R
46	24550	3/8" I.D. Air Hose	A/R
47	36636	1/2" I.D. Air Hose	A/R
48	528064	3/4" NPT Manifold for Valve	2
49	535963	HD-PRT Air Valve Mount	1

Sampler Parts Listing HD-PRT With 5-1/2" Diameter Probe (Continued)

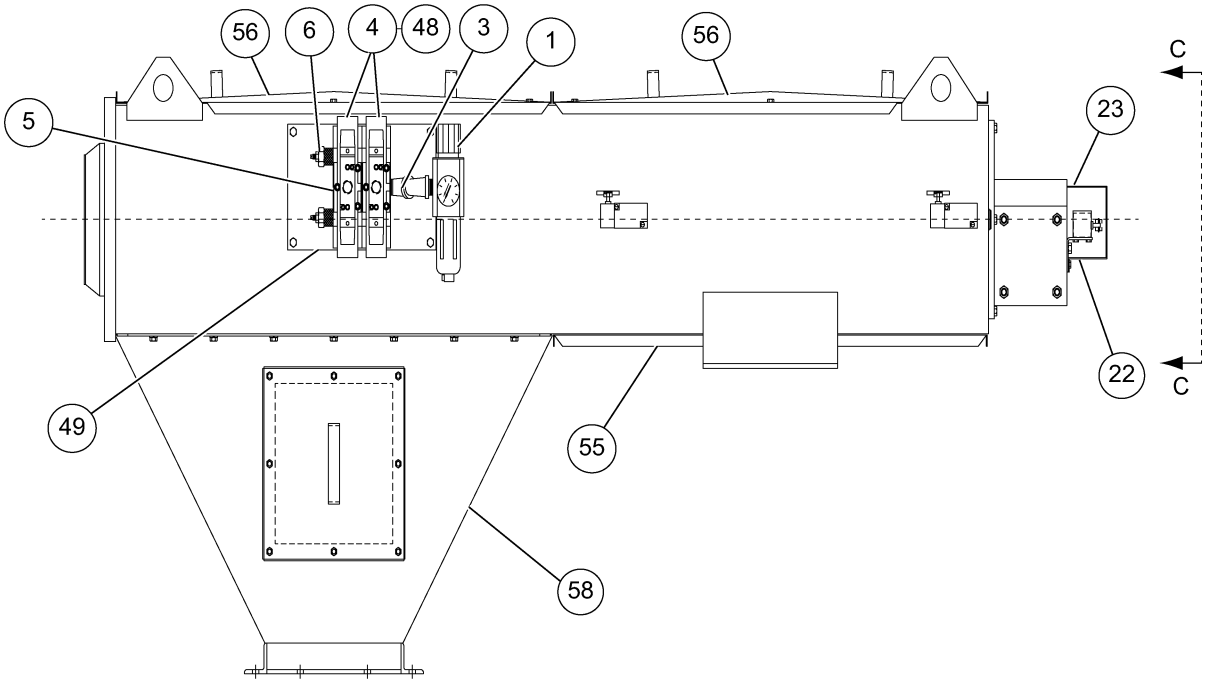
Ref #	Part #				Description	Qty
	HD-PRT-12	HD-PRT-18	HD-PRT-24	HD-PRT-30		
	12" Stroke	18" Stroke	24" Stroke	30" Stroke		
51	526241	526242	526243	526244	5" Bore Air Cylinder	2
52	519509	519510	519511	519512	HD-PRT SS Guide Rod	2
53	519517	519518	519519	519520	HD-PRT Drive Tube	1
54	519525	519526	519527	519528	HD-PRT Probe	1
55	519533	519534	519535	519536	HD-PRT Cover Bottom	1
56	519541	519542	519543	519544	HD-PRT Cover Top	2
57	535941	535942	535943	535944	HD-PRT Housing	1
58	519464	519465	519466	519467	HD-PRT Hopper	1
59	535965	535966	535967	535968	HD-PRT Probe Cover	1

Ref #	Part #				Description	Qty
	HD-PRT-36	HD-PRT-42	HD-PRT-48	HD-PRT-54		
	36" Stroke	42" Stroke	48" Stroke	54" Stroke		
51	526245	526246	526247	526248	5" Bore Air Cylinder	2
52	519513	519514	519515	519516	HD-PRT SS Guide Rod	2
53	519521	519522	519523	519524	HD-PRT Drive Tube	1
54	519529	519530	519531	519532	HD-PRT Probe	1
55	519537	519538	519539	519540	HD-PRT Cover Bottom	1
56	519545	519546	519547	519548	HD-PRT Cover Top	2
57	535945	535946	535947	535948	HD-PRT Housing	1
58	519468	519469	519470	519471	HD-PRT Hopper	1
59	535969	535970	535971	535972	HD-PRT Probe Cover	1

HD-PRT Sampler With 8-1/2" O.D. Probe



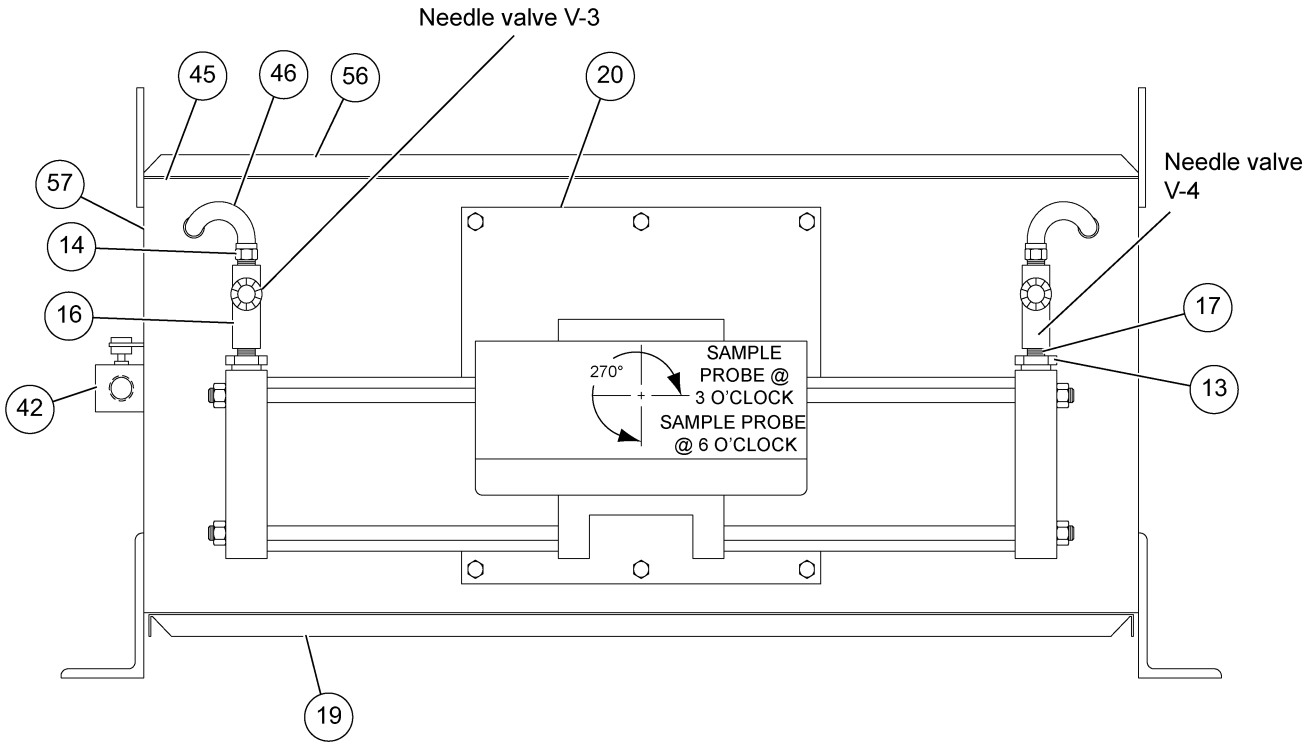
Plan view
(with top covers removed)



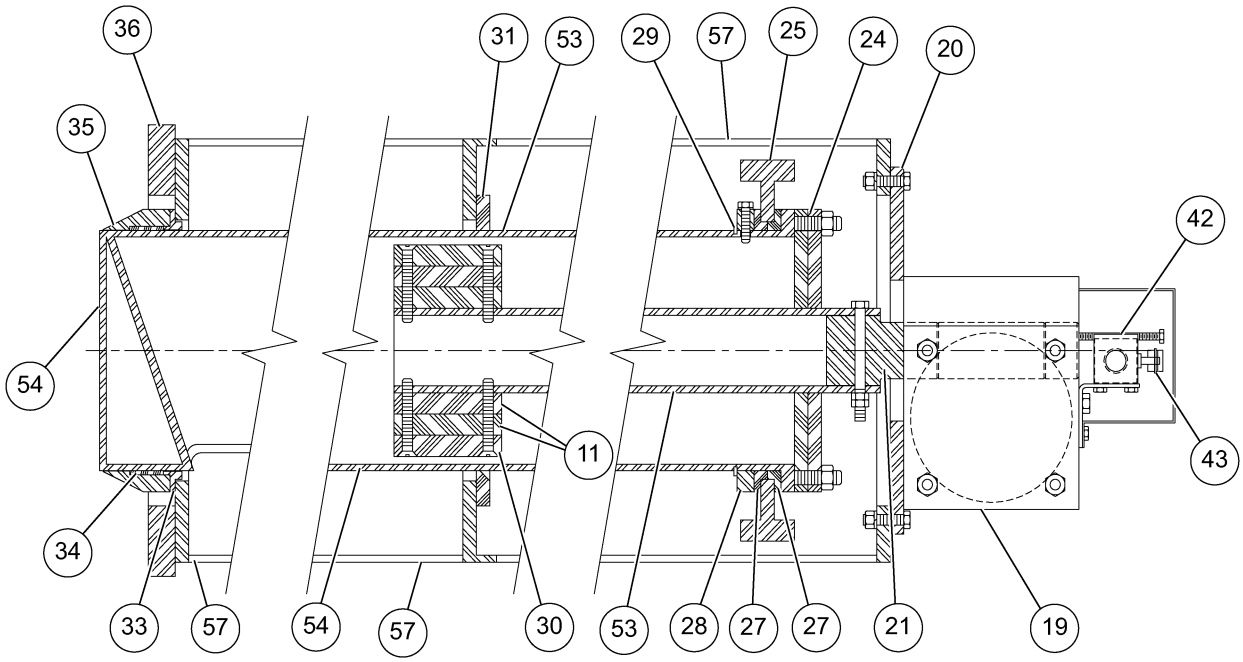
Elevation view

NOTE: *The parts pointed out on this page are listed on Pages 41-42.*

HD-PRT Sampler With 8-1/2" O.D. Probe (Continued)



End view C-C



Section view D-D

NOTE: *The parts pointed out on this page are listed on Pages 41-42.*

Sampler Parts Listing HD-PRT with 8-1/2" Diameter Probe

Ref #	Part #	Description	Qty
1	519457	3/4" NPT Filter Regulator	1
2	512825	Brass Pipe Close Nipple 3/4" NPT	1
3	35681	Black 45° Street Elbow 3/4" NPT	2
4	513757	4-Way NPT Solenoid Valve 110/120 VAC 50/60 Hz	2
5	34517	Black Pipe Plug 3/4"	7
6	36433	Speed Control 3/4" NPT	2
7	513801	Black Pipe Nipple 3/4" x 4"	1
8	36441	Black Pipe Nipple 3/4" x 3"	1
9	36442	Black Pipe Tee 3/4" NPT	2
10	24567	3/4" Push-Loc To 3/4" MPT STR Adaptor	8
11	524594	HD-PRT Support Bearing Spacer	4
12	35943	Black 90° Street Elbow 3/4" NPT	4
13	25871	Pipe Bushing 3/4" x 1/2"	4
14	24558	1/2" Push-Loc to 1/2" STR Adaptor	4
15	23852	2.00" Shaft Retaining Ring	2
16	525434	Flow Control Valve 1/2"	2
17	512824	Brass Pipe Close Nipple 1/2" NPT	2
18	513290	Brass 90° Street Elbow 1/2" NPT	4
19	525384	270° Rotary Actuator	1
20	525417	HD-PRT Actuator Mount Plate (8-1/2" Probe)	1
21	525385	HD-PRT Probe Actuator Coupler (8-1/2" Probe)	1
22	525386	Limit Switch Bracket (8-1/2" Probe)	1
23	525387	Limit Switch Guard (8-1/2" Probe)	1
24	524590	HD-PRT Drive Bearing (8-1/2" Probe)	2
25	524591	HD-PRT Drive Plate (8-1/2" Probe)	1
26	519461	HD-PRT Guide Rod Bushing 1-1/4" Diameter	2
27	524592	HD-PRT Drive PL Flange Bearing (8-1/2" Probe)	2
28	524593	HD-PRT Lock Collar (8-1/2" Probe)	1
29	522412	8-1/2" Shaft Retaining Ring	1
30	512470	HD-PRT Drive Tube Support Bearing	2
31	524595	HD-PRT Drive Seal (8-1/2" Probe)	1
32	522352	Shock Absorber Square Flange Mounting	2
33	524596	HD-PRT Shear Nose Locator (8-1/2" Probe)	1
34	524597	HD-PRT Shear Nose Bearing (8-1/2" Probe)	1
35A	524598	HD-PRT Shear Nose(Wood Chips) (8-1/2" Probe)	A/R
35B	524599	Chisel Nose (Hard Materials) (8-1/2" Probe)	A/R
36	524600	HD-PRT Mount Plate (8-1/2" Probe)	1
37	522353	Shock Absorber Striker Cap	2
38	519463	1-1/4" Shaft Retaining Ring	4
39	524589	Rod Coupler 1-16 UNF (8-1/2" Probe)	2
40	512607	Shock Absorber	2
41	514487	Rubber Bumper	2
42	26402	Limit Switch NEMA 4, 12	4
43	35341	Limit Switch Roller Arm	2
44	35355	Limit Switch Arm 13" Rod Lever	2
45	34185	Doortite Seal 3/16" x 3/4"	A/R
46	36636	1/2" I.D. Air Hose	A/R
47	36452	3/4" I.D. Air Hose	A/R
48	528064	3/4" NPT Manifold for Valve	2
49	535963	HD-PRT Air Valve Mount	1

Sampler Parts Listing HD-PRT with 8-1/2" Diameter Probe (Continued)

Ref #	Part #				Description	Qty
	HD-PRT-12	HD-PRT-18	HD-PRT-24	HD-PRT-30		
	12" Stroke	18" Stroke	24" Stroke	30" Stroke		
51	527822	527823	527824	527825	6" Bore Air Cylinder	2
52	524665	524666	524667	524668	HD-PRT SS Guide Rod	2
53	519517	519518	519519	519520	HD-PRT Drive Tube	1
54	524609	524610	524611	524612	HD-PRT Probe	1
55	524633	524634	524635	524636	HD-PRT Cover Bottom	1
56	524625	524626	524627	524628	HD-PRT Cover Top	2
57	535949	535950	535951	535952	HD-PRT Housing	1
58	524641	524642	524643	524644	HD-PRT Hopper	1
59	535973	535974	535975	535976	HD-PRT Probe Cover	1

Ref #	Part #				Description	Qty
	HD-PRT-36	HD-PRT-42	HD-PRT-48	HD-PRT-54		
	36" Stroke	42" Stroke	48" Stroke	54" Stroke		
51	527826	527827	527828	527829	6" Bore Air Cylinder	2
52	524669	524670	524671	524672	HD-PRT SS Guide Rod	2
53	519521	519522	519523	519524	HD-PRT Drive Tube	1
54	524613	524614	524615	524616	HD-PRT Probe	1
55	524637	524638	524639	524640	HD-PRT Cover Bottom	1
56	524629	524630	524631	524632	HD-PRT Cover Top	2
57	535953	535954	535955	535956	HD-PRT Housing	1
58	524645	524646	524647	524648	HD-PRT Hopper	1
59	535977	535978	535979	535980	HD-PRT Probe Cover	1

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