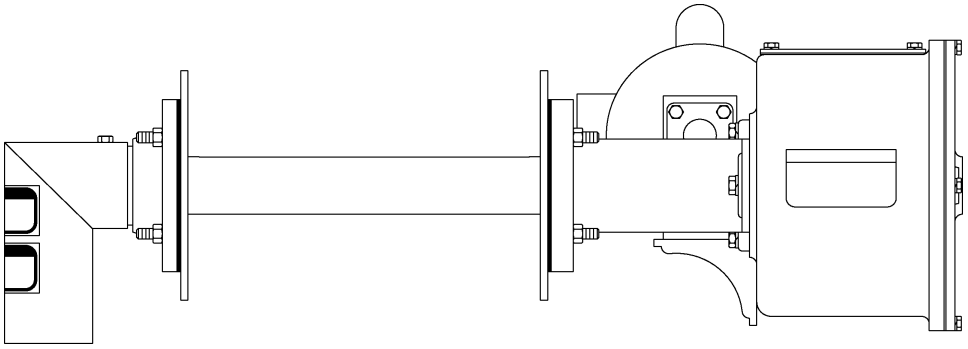


Sampler

Model: GSS and GSS-XP

Installation and Operation Manual

PNEG-2190

Version: 1.0

Date: 02-13-18

PNEG-2190

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 GSS and GSS-XP. 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.

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.

Product Code	Description
512133	Clutch Spring (Warner PSI-6)
527854	Replacement XP Solenoid Coil (ASCO Red Hat II Series)

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.**

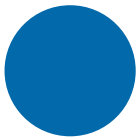
WARNING — This symbol indicates a potentially hazardous situation which, if not avoided, **can result in serious injury or death.**

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

Rotating Auger Hazard

- Keep clear of rotating augers and moving parts.
- Do not remove or modify guards or covers.
- Lock-out power source before making adjustments, cleaning, or maintaining equipment.
- Failure to follow these precautions will result in serious injury or death.

ST-0037-1

Flying Material Hazard

- Flying material can cause severe eye injury or blindness.
- Wear safety glasses around operating equipment.

ST-0074-1

Stay Clear of Rotating Parts

- Do not service equipment while it is in operation.
- Entanglement in rotating parts or exposed belts will cause serious injury or death.
- Keep all shields and covers in place at all times.
- Lock-out power source before making adjustments, cleaning, or maintaining equipment.

ST-0072-1

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

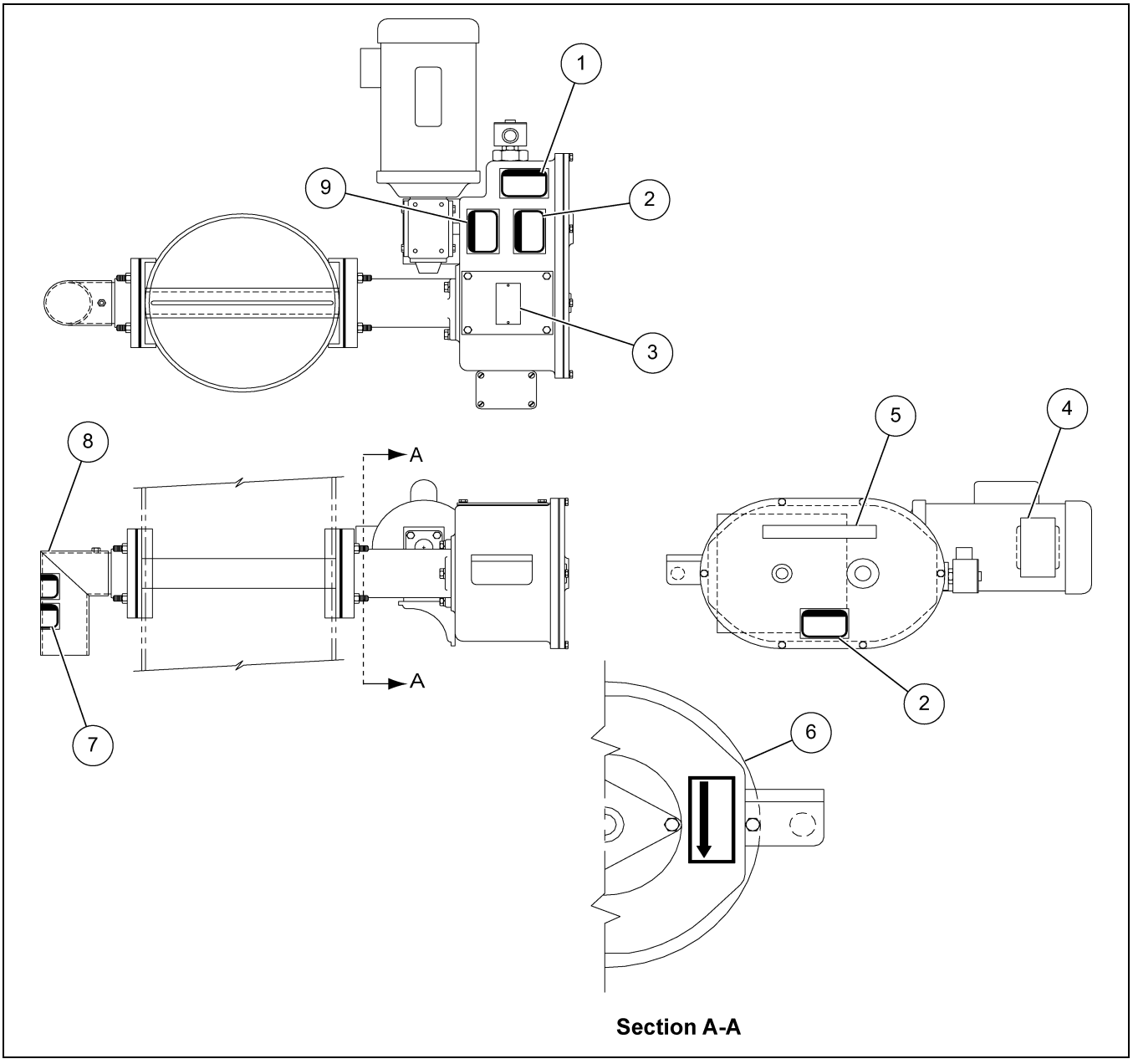
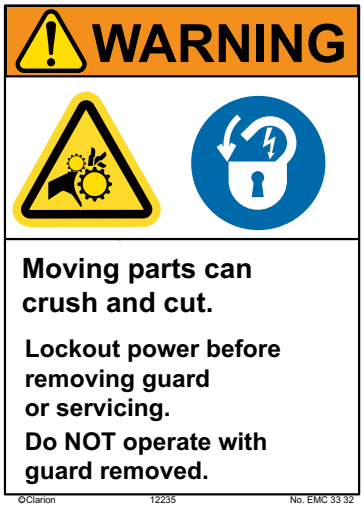
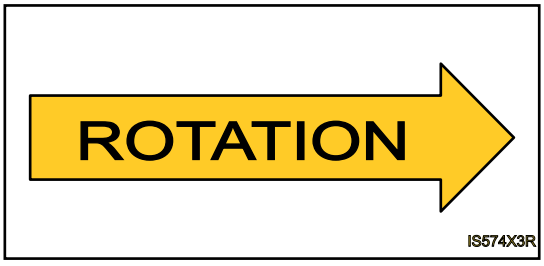
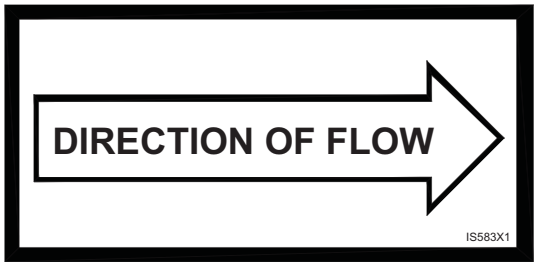
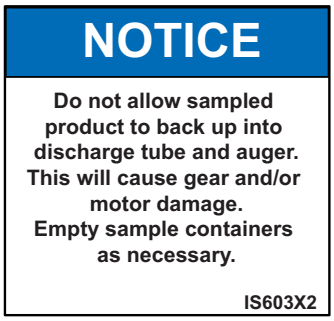


Figure 3A *Model GSS Sampler Safety Label Locations*

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 40 332		Starts without Warning
2	EMC 33 32		Exposed Gears
3	IS Tag		Serial Number Tag
4	IS574x3R		Rotation

Ref #	Decal #	Decals	Description
5	IS517X1		IS Samplers
6	IS583X1		Direction of Flow
7	EMC 29 32		Exposed Screw Hand
8	IS603X2		Empty Sample Containers
9	EMC 40 232		Lock Out Machine

System Description

The GSS Sampler is designed to collect a representative sample of granular, flake, powder, or other materials in a non-pressurized gravity conveying line or from a hopper tank. *Figure 4A* illustrates a typical GSS 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 an electric motor operating through a right angle gear reducer rotates the drive housing input shaft. The clutch solenoid, which energizes at the same time the motor starts, allows the slotted sampling tube (auger tube) in the product line to rotate through one revolution to collect a sample of the material. As the auger tube rotates the sample auger also is turning and continues to auger material out of the auger tube for a period of time after the auger tube stops rotating. The sample then falls down and out the 2.00" (51 mm) O.D. discharge tube to the desired sample collection point, at which point an InterSystems SCS Sample Collection System (optional) may be installed.

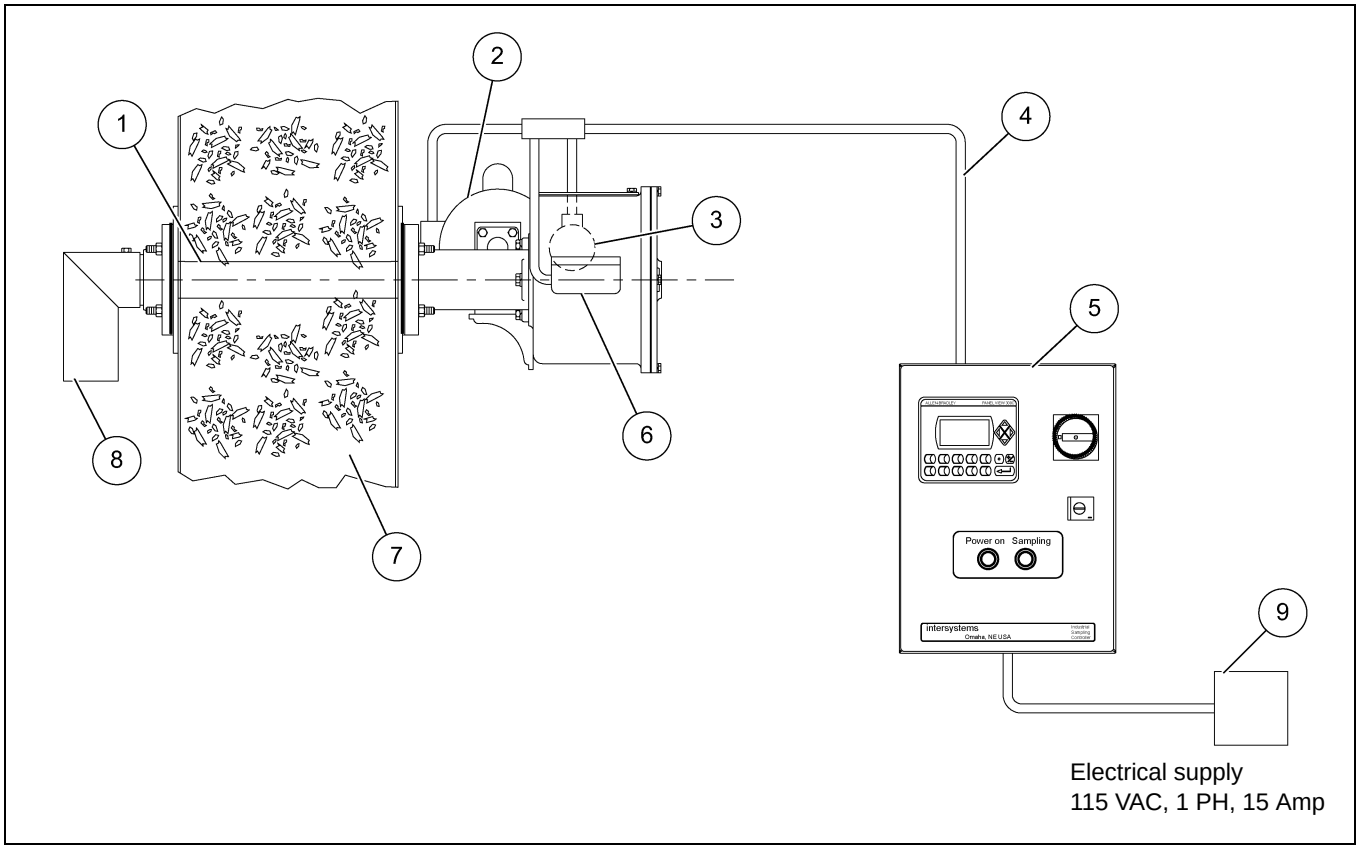


Figure 4A *Typical Installation, Model GSS Sampling System*

Ref #	Description
1	Sample Probe
2	Motor
3	Clutch Solenoid
4	Electrical Conduit
5	Sample Control Panel

Ref #	Description
6	Limit Switch
7	Material to be Sampled
8	Sample Discharge
9	Circuit Breaker

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 clutch solenoid with the rating of: (Standard, furnished on all GSS samplers)

        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: (Standard, furnished on all GSS samplers)

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

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

    c. An explosion-proof limit switch with the rating of: (Optional)

        Class 1, Groups 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 cast aluminum. The sample auger and auger tube are of type 304 Stainless Steel. The standard auger is 1-15/32" O.D. with welded flights. An optional auger, machined from a solid bar (no welds on flights) and hand polished, is also available. 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 GSS sampler is typically mounted horizontally onto a vertical gravity flow conveying line carrying the product to be sampled as shown in *Figure 4A on Page 15*. The sampler axis must be installed perpendicular (at a 90° 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.

General Mounting Guidelines

The sampler assembly is designed to support ONLY its own weight.

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*.

NOTE: *Over tightening the mounting fasteners will warp or crack the seal housing flange. Improper sampling will result.*

Sampler without Optional Mounting Accessories

1. Locate and mark the desired mounting location on the product line.
2. Cut and de-burr two 2-1/2" diameter holes (opposite each other) in the product line through which the sample tube will pass to collect material samples
3. The mounting flange on the end of the sampler drive housing has four 0.406"(13/32") clearance holes for 3/8" mounting screws or studs. Using the sampler discharge hub mounting face as a pattern, layout or transfer punch the hole locations onto the conveying line only on the side the drive housing is to be mounted.
4. Drill and tap the holes for the mounting screws, or weld studs to the conveying line for fastening the sampler.

5. Ensure that the mounting gasket is in place on the sampler drive housing mounting flange and verify that the auger tube rotates without interference.
6. Install the sampler drive housing on the mount face and tighten the mounting fasteners.
7. Locate the discharge hub by slipping it over the end of the auger tube. Using the mounting holes as a guide transfer punch the hole locations onto the conveying line.
8. Drill and tap the holes for the mounting screws, or weld studs to the conveying line for fastening the sampler.
9. Ensure that the mounting gasket is in place and install the sampler discharge hub on the mount surface. Tighten the mounting fasteners to ensure proper sealing between the sampler mounting faces and the product line.

Factory Pre-Mounted Sampler

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

1. Remove a section of pipe or chute work where the sampler is to be installed.
2. Remove the sampler from the sampler pre-mount.
3. Locate the sampler pre-mount in the desired position.
4. Attach the sampler pre-mount using one of the following methods.
    a. Weld the sampler pre-mount ends directly to the existing pipe or chute work.
    b. Clamp the sampler pre-mount ends to the existing pipe utilizing compression couplings.
    c. Weld matching flanges to the existing pipe or chute work and sampler pre-mount.
5. Ensure that the mounting gasket is in place on the sampler drive housing mounting flange and verify that the auger tube rotates without interference.
6. Install the sampler drive housing on the mount face and tighten the mounting fasteners.

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.

1. Locate and mark the desired mounting location on the conveying line.
2. Cut and de-burr two 2-1/2" diameter holes (opposite each other) in the product line through which the sample tube will pass to collect material samples.
3. Position the sampler drive housing mounting plate by aligning the 2-1/2" diameter auger tube 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. Ensure that the mounting gasket is in place on the sampler drive housing mounting flange and verify that the auger tube rotates without interference.

7. Install the sampler drive housing on the mount face and tighten the mounting fasteners.
8. Locate the discharge hub and mounting plate assembly by slipping it over the end of the auger tube.
9. Tack weld the sides of the mounting plate to the product line surface and double check alignment.
10. Remove discharge hub and gasket from the mounting plate and weld a continuous bead around all sides of the mounting plate.
11. Ensure that the mounting gasket is in place and install the sampler discharge hub on the mount surface and tighten the mounting fasteners to ensure proper sealing between the sampler mounting faces and the product line.

Field Mounted Sampler Using Clamp-Type Mounting Brackets

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

1. Locate and mark the desired mounting location on the conveying line.
2. Cut and de-burr two 2-1/2" diameter holes (opposite each other) in the product line through which the sample tube will pass to collect material samples.
3. Remove the discharge hub from the clamp.
4. Make sure the 1/8" thick Neoprene gasket is in place inside the clamp adapter.
5. Position the clamp bracket by aligning the auger tube 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.*
6. Ensure that the mounting gasket is in place and install the sampler discharge hub on the mount surface and tighten the mounting fasteners to ensure proper sealing between the sampler mounting faces and the product line.

Material Sample Transport Lines

The tubing used to transport material samples must be compatible with the operating environment and the material sampled. Typically a 2.00" I.D. 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.

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 Terminal Strip *on Page 22*, the 19-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.

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.

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)

Clutch Solenoid Coil

110/120 VAC, 50/60 Hz, Single Phase, 17.1 Watts

Optional - 220/240 VAC, 50/60 Hz, Single Phase, 17.1 Watts

Drive Motor

Standard 110/120 VAC, 220/240 VAC, 50/60 Hz, Single Phase, 6.6/3.3 Full Load Amps

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. Lock out power before performing any maintenance.***

Control Components and their Functions

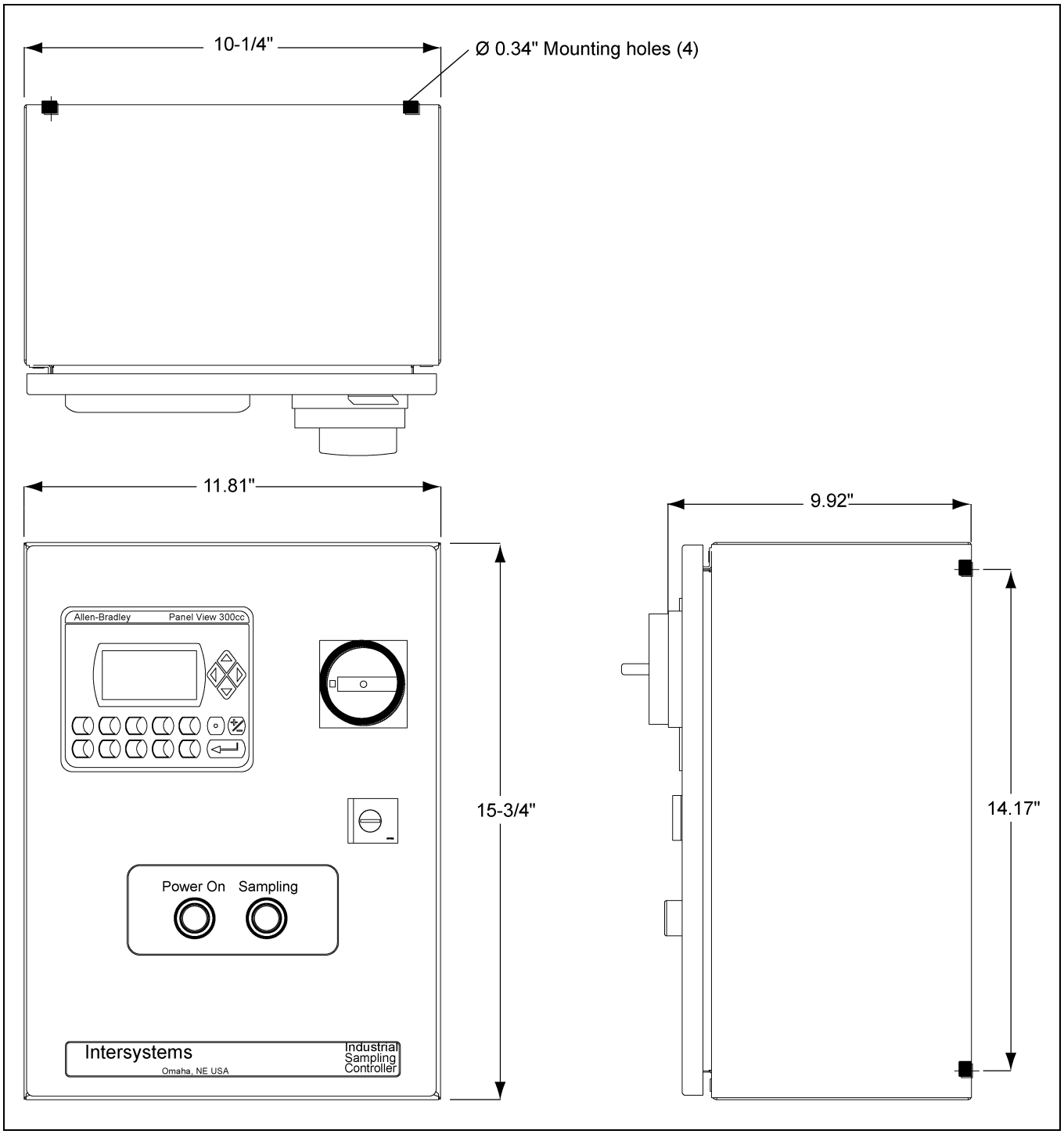


Figure 6A *Standard NEMA 4 Control Panel Detail*

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.

Refer to 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).

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. Refer to 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

Limit Switch

This switch is actuated when the auger tube is in its home position. Upon initiation of a sample cycle the auger tube rotates the cam tripping the limit switch. The normally closed contacts on the limit switch close and power is supplied directly to the clutch solenoid. When the limit switch is actuated the opening of the normally closed contacts removes power to the clutch solenoid thus stopping the auger tube rotation.

Correct wiring termination is essential to proper sampler operation. Refer to *Figure 6B*, it shows the limit switch utilized on the GSS sampler and the physical orientation of the proper wiring connections.

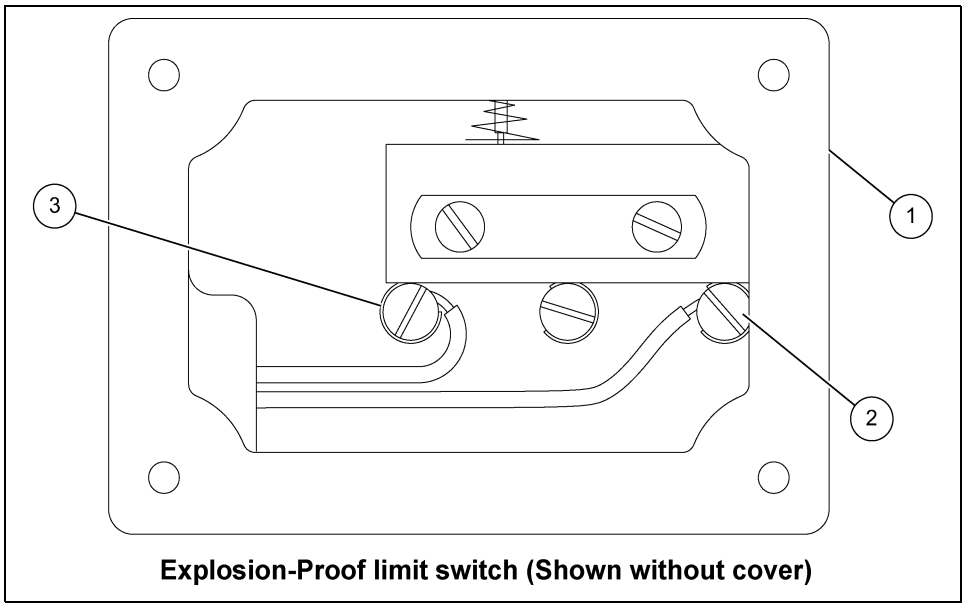


Figure 6B *Limit Switch Connections*

Ref #	Description
1	1/2" NPT Conduit Connection
2	N.C.Contact Connection
3	Common Connection

Drive Motor

This motor drives the sample auger and auger tube rotation through a right angle gear reducer and two independent sets of spur gears inside the drive housing. A label is located on the motor designating the correct direction of rotation. *(See Figure 3A on Page 12.)* Verify that the motor is turning the proper direction of rotation when wiring the system. On initial setup, disconnect the motor from the gear reducer and test run the motor. This will prevent damage to the clutch if the motor is run backwards.

NOTE: *Do not run the motor the in wrong direction. Extensive damage to the sampler will result.*

Clutch Solenoid

This solenoid, when energized, pulls the clutch actuator from the catch on the clutch and allows the clutch to engage. The output shaft on the gear reducer rotates the clutch and clutch gear which in turn rotates the auger tube.

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. Noisy motor or motor/reducer bearings
3. Overheated motor or reducer
4. Adequate lubricant in gear reducer
5. Structural damage
6. Rust or corrosion
7. Damaged wiring and conduit, including exposed conductors and connections.
8. 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

Auger and Auger Tube Spur Gears

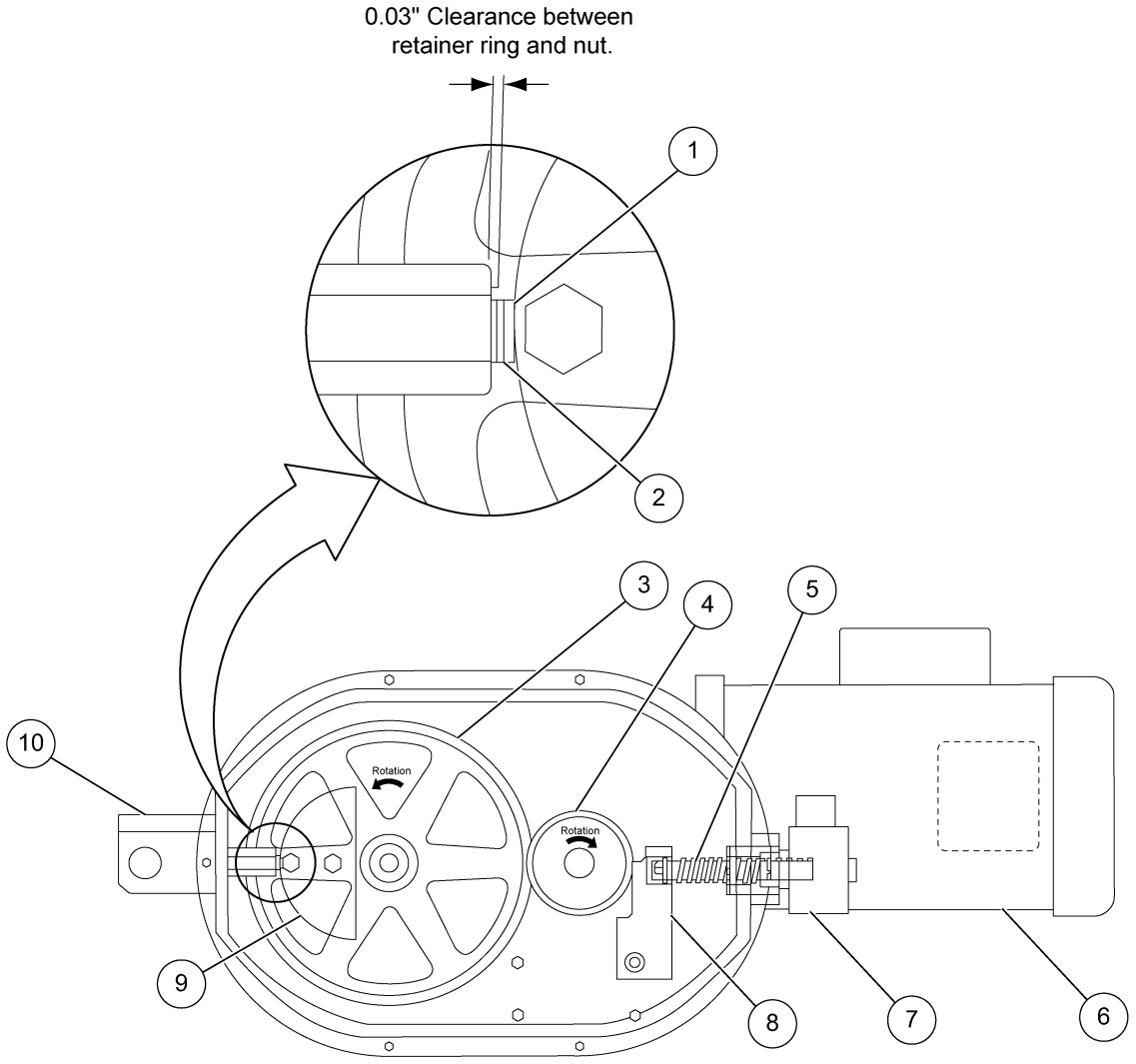
The auger and auger tube spur gears are designed to run dry. If grease is applied to the gears, extra care must be taken to ensure that the grease remains free from contaminates.

Gear Reducer

The gear reducer is shipped filled with oil. Check the oil level every six months and add oil if required. Under normal sampler operating conditions the oil should be changed once every two years.

Use “Hub City #GL-460” gear lubricant, AGMA number 7 Comp., or equal. Lubricant must be compatible with bronze gear materials and nitrile rubber seals.

Mechanical Repair Procedures



GSS Driving house
(Shown without cover and auger drive gears removed.)

Figure 7A *Limit Switch Cam Adjustment*

Ref #	Description
1	Limit Switch Plunger
2	Retainer Ring
3	120 Tooth Spur Gear
4	Clutch
5	Clutch Puller and Spring

Ref #	Description
6	Drive Motor
7	Clutch Solenoid
8	Clutch Activator
9	Limit Switch Cam
10	Limit Switch

Limit Switch Cam Adjustment

The limit switch cam actuates the limit switch by pushing the switch plunger inward. The correct cam position is shown in *Figure 7A on Page 26*. Follow the instructions below.

1. Shut off and lock out all power.
2. Remove the six 1/4"-20 UNC hex head screws attaching the cover to the sampler drive housing.
3. Loosen the two 1/4"-20 UNC hex head screws attaching the limit switch cam to the 120 tooth spur gear.
4. Slide the limit switch cam to the position as shown in *Figure 7A on Page 26*. Hold the 0.03" clearance dimension and re-tighten the two 1/4"-20 UNC hex head screws.
5. Make sure the thrust washers are in place on the auger shaft. Re-install the cover and gasket to the sampler drive housing.
6. Re-install the cover fasteners and tighten.

Clutch Solenoid Replacement and Adjustment

When following the instructions below, refer to the applicable drawing of the sampler. Refer to the drawings *on Pages 30-32* and the certified drawing(s).

1. Shut off and lock out all power.
2. Remove the six 1/4"-20 UNC hex head screws attaching the cover to the sampler drive housing.
3. Disconnect the solenoid electrical connection and conduit.
4. Remove the old solenoid from the solenoid bushing.
5. Install the new solenoid (use care to avoid cross threading).
6. Solenoid adjustment may be required. When solenoid is powered it should just clear the stop cog on the clutch. The solenoid will chatter and not release the clutch if positioned to far away. If positioned to close the clutch will not release.
7. Make sure the thrust washers are in place on the auger shaft. Re-install the cover and gasket to the sampler drive housing.
8. Re-install the cover fasteners and tighten.

Clutch Replacement and Timing

When following the instructions below, refer to the applicable drawing of the sampler. Refer to the section drawings of the sampler *on Pages 30-32*, and the certified drawing(s).

1. Shut off and lock out all power.
2. Remove the six 1/4"-20 UNC hex head screws attaching the cover to the sampler drive housing.
3. Loosen the #10-24 UNC set screws attaching the 112 tooth spur gear to the reducer shaft and remove it, to permit access to the clutch.
4. Loosen the 1/4"-20 UNC clutch set screw. Remove the clutch and 40 tooth spur gear from the reducer shaft.
5. Remove the 40 tooth spur gear from the clutch and install it on the new clutch.

6. Make sure the key is in place on reducer shaft and re-install the clutch so that the clutch and limit switch cam are positioned as shown in *Figure 7A on Page 26*.
7. Turn the motor fan shaft by hand in the direction labeled on the motor and in *Figure 3A on Page 12*. The clutch will rotate until the stop cog engages on the clutch actuator and stops further rotation of the auger tube. The limit switch cam should be the position as shown in *Figure 7A on Page 26*.
8. Re-time the gears if needed. Once the clutch and limit switch cam are in the correct position tighten the clutch set screw.
9. Re-install the 112 tooth spur gear and tighten the set screws. The auger drive gears do not require any timing.
10. Make sure the thrust washers are in place on the auger shaft. Re-install the cover and gasket to the sampler drive housing.
11. Re-install the cover fasteners and tighten.

Auger Tube Re-Alignment (4 o'clock or 6 o'clock)

When following the instructions below, refer to the applicable drawing of the sampler. Refer to the section drawings of the sampler *on Pages 30-32*, and the certified drawing(s).

1. Shut off and lock out all power.
2. Remove the discharge elbow and note the orientation of the notch in the exposed end of the auger tube. This indicates the position of the sample slot in the auger tube.
3. Remove the six 1/4"-20 UNC hex head screws attaching the cover to the sampler drive housing.
4. Remove the four 1/4"-20 UNC hex head screws attaching the small access cover to the sampler drive housing.
5. Loosen the two 1/4"-20 UNC hex head screws attaching 120 tooth spur gear to the auger tube.
6. Turn the auger tube to its new stopped location while holding the 120 tooth spur gear. Do not allow the 120 tooth spur gear or clutch to rotate when turning the auger tube.
7. Tighten the two 1/4"-20 UNC hex head screws attaching 120 tooth spur gear to the auger tube.
8. Re-install the small access cover and fasteners.
9. Make sure the thrust washers are in place on the auger shaft. Re-install the cover and gasket to the sampler drive housing.
10. Re-install the cover fasteners and tighten.

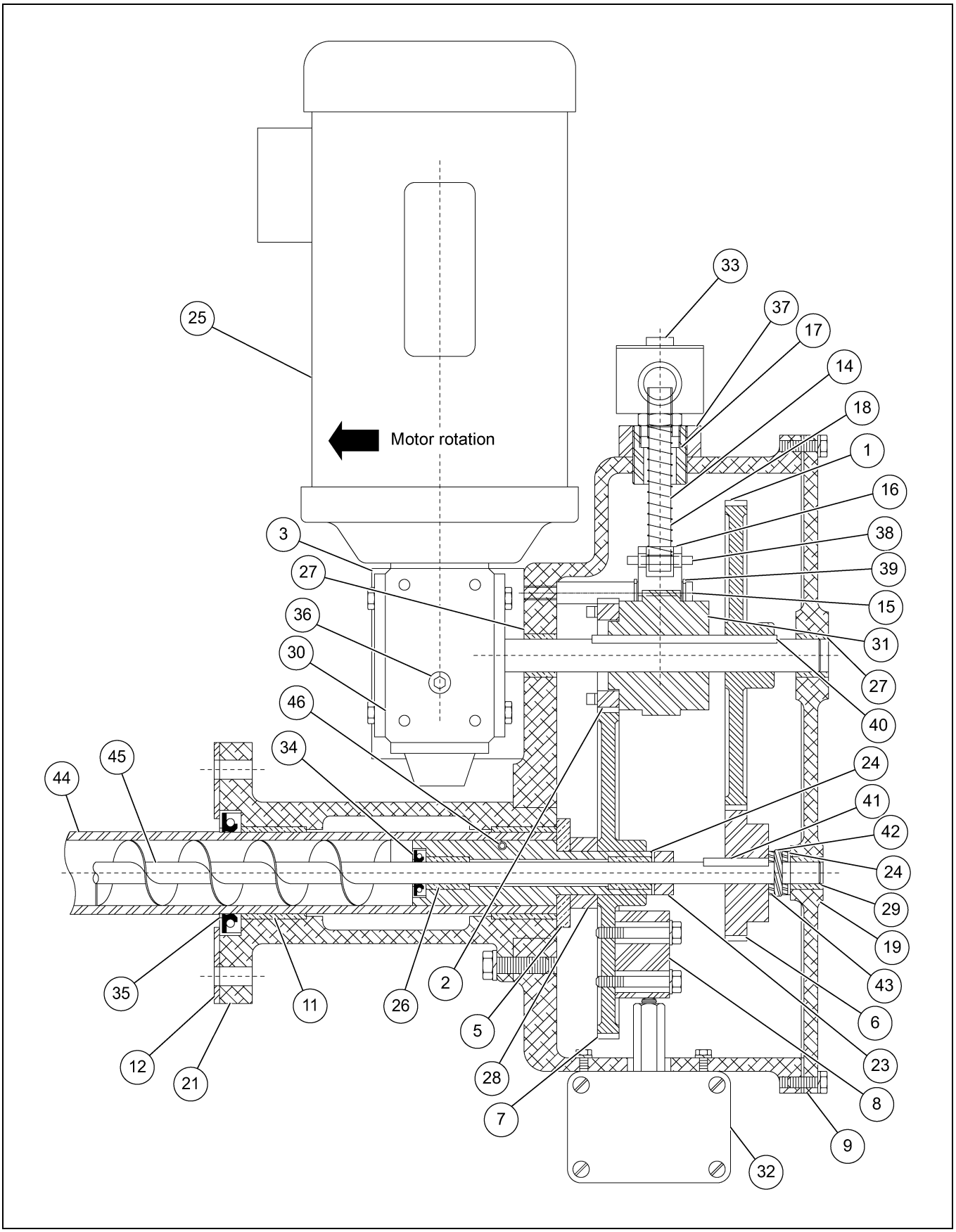
General GSS and GSS-XP Sampler Troubleshooting

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	Solution
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. Refer to Main Fuse *on Page 22*.
	Faulty supply wiring.	Correct. Refer to certified electrical schematic.
	Defective power switch.	Replace switch.
Sampler does not cycle in eiher Auto or Manual modes (power light ON).	Faulty system wiring.	Correct. Refer to certified electrical schematic.
	Defective clutch solenoid.	Replace. Refer to Clutch Solenoid Replacement and Adjustment *on Page 27*.
Sampler cycles in Manual, but not Automatic.	Jumper between controller terminals 1 and 2 not installed.	Install jumper or switch between controller terminals 1 and 2.
Sample size too small or large.	Solenoid time on setting too low or high.	Adjust timer setting.
Auger tube does not stop at its home position.	Solenoid wired improperly.	Correct. Refer to the certified electrical schematic.
Sampler leaks air or material continuously out the sample discharge.	Sampler installed on a positive pressure line.	Relocate to a non pressurized line.

NOTE: *GSS and GSS-XP samplers require the mode switch to be positioned on setting “2” (two). Refer to controller manual PNEG-2170.*

GSS and GSS-XP Drive Housing Section View (524676)

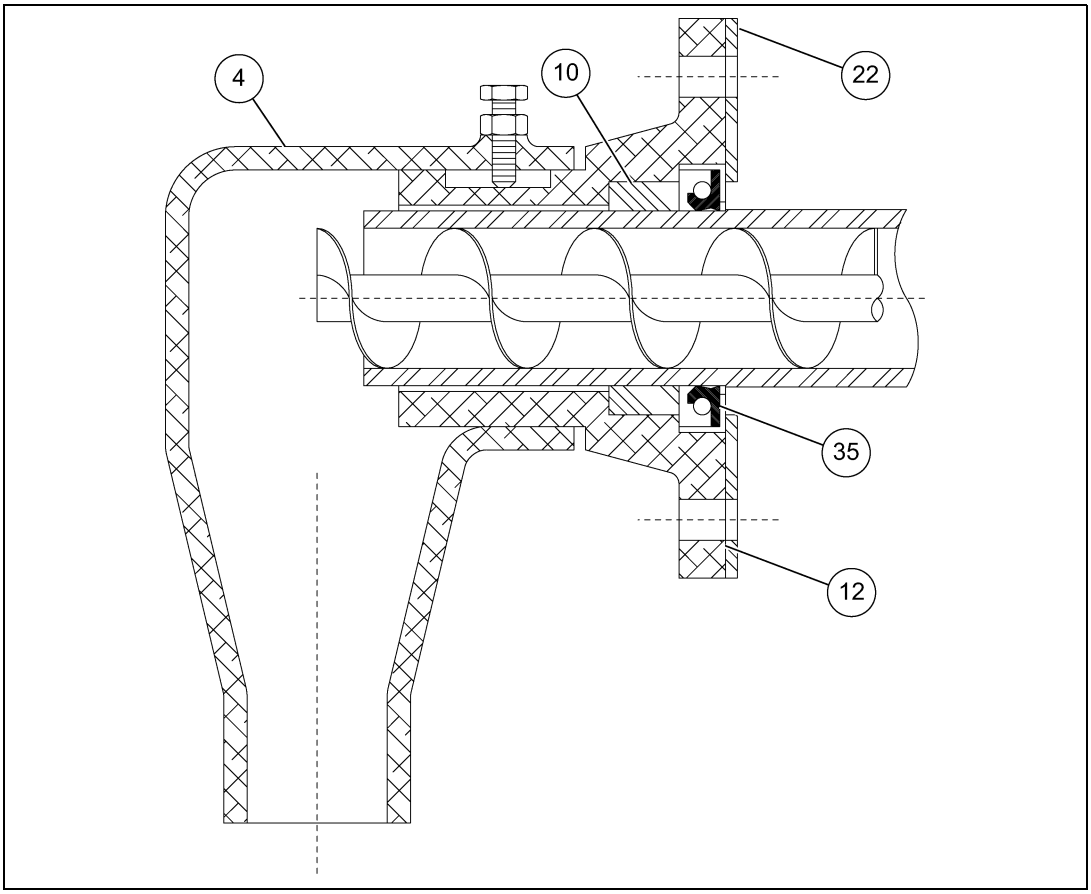


GSS and GSS-XP Drive Housing Section View Part List

Ref #	Part #	Description	Qty
1	20205-21	Gear Spur 112T 16 DP 14.5° PA	1
2	20205-23	Gear Spur 40T 16 DP 14.5° PA	1
3	20207-08	Mount Bracket Reducer Mach GSS	1
4	20207-13	Discharge GSS 2 O.D. Alum 90°	1
	20207-37	Discharge GSS 3 O.D. Alum 90°	1
5	20207-16	Bearing Thrust 1 I.D. Bronze	1
6	20207-18	Gear Spur 48T 16 DP 14.5° PA	1
7	20207-19	Gear Spur 120T 16 DP 14.5° PA	1
8	20207-20	Limit Switch Actuator GSS	1
9	20207-22	Gasket GSS Housing 0.13 WH Neoprene	1
10	20207-28	Bushing Discharge Hub GSS	1
11	20207-29	Bushing Bronze 1-7/8" I.D.	2
12	20207-30	Gasket 6.0" O.D. x 2.0" I.D. x 0.13" Neoprene	2
13	20207-32	Cover Plate GSS Access Hole	1
14	20207-64	Spring Comp 3 LG SS	1
15	20207-65	Pin GSS Pivot Clutch Actuator	1
16	20207-66	Actuator Pivot Mount GSS	1
17	20207-67	Bushing Solenoid Mount	1
18	20207-68	Puller GSS Clutch Actuator	1
19	20207-70	Housing Cover GSS with Bearings	1
20	20207-71	Housing GSS Main with Bearings	1
21	20207-72	Housing GSS Auger Tube Bearings and Seals	1
22	20207-73	Discharge GSS Hub Bearings and Seal	1
23	24001	Shaft Collar SSC50 1/2" I.D.	1
24	24010	Bearing Thrust 1/2" I.D. Bronze	2
25	26221	Motor, 3/4 HP TEFC DC 56C	1
	26201	Motor, 1/3 HP 1 PH TEFC 56C	1
26	24034	Bushing Bronze 1/2" I.D. x 1" LG	1
27	24036	Bushing Bronze 3/4" I.D. x 3/4" LG	2
28	24037	Shaft Collar SSC100 1" I.D.	1
29	525663	Bushing Bronze 1/2" I.D. x 3/4" LG	1
30	24208	Reducer Gear 60:1 Ratio B Shaft	1
31	24404	Clutch CCW Machined GSS	1

Ref #	Part #	Description	Qty
32	26408	Switch Limit NEMA 9 EX-Q	1
33	522510	Solenoid NEMA 9 120V	1
34	27218	Lip Seal 1/2" I.D. x 1.13" O.D.	2
35	27223	Oil Seal 1.88" I.D. x 2.88" O.D. x 0.312"	2
36		Pipe Plug 1/8" NPT Black	1
37		Jam Nut 1-1/4" - 12 UNF	1
38		Roll Pin 3/16" Diameter x 1-1/2" LG	1
39		Retaining Ring 1/2" Shaft	2
40		Retaining Ring 1/2" Shaft	1
41		Key, 3/16" Square x 1-1/4" LG	1
42		Roll Pin 3/16" Diameter x 1.0" LG	1
43		1/2" Shaft Collar With Pin Hole	1
44		Auger Tube with Adaptor, Bearings and Seal	1
45		Auger with Shaft Collar and Roll Pin	1
46		Roll Pin 3/16" Diameter x 1-1/2" LG	1

GSS and GSS-XP Drive Discharge Section View (524677)



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