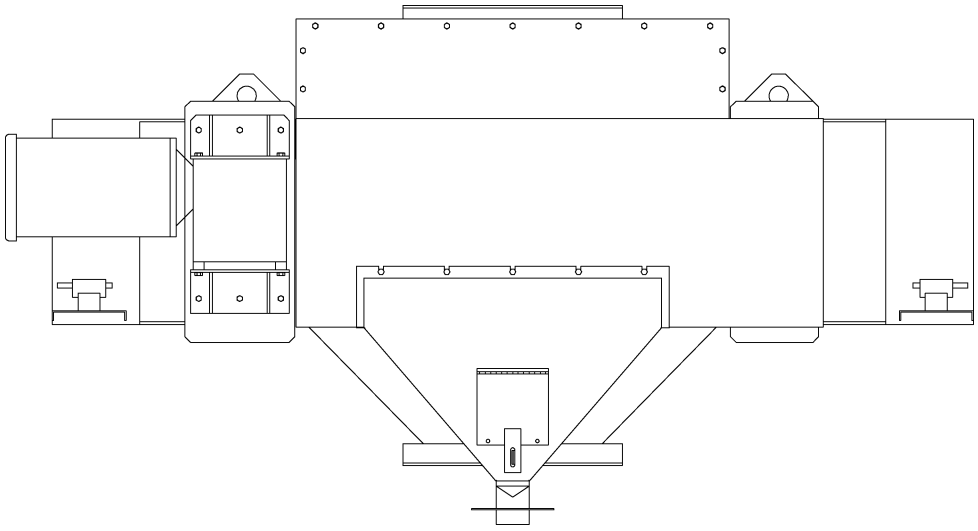


CE Compliant GCE Sampler

Model: GCE 45 and GCE 90

Installation and Operation Manual - Original Instructions

PNEG-2175CE

Version: 1.0

Date: 01-13-22

PNEG-2175CE

CE Declaration of Compliance
EC MACHINERY DIRECTIVE 2006/42/EC

1004 East Illinois Street, Assumption, IL, 62510, USA

+1 217 226 4429

The GSI Group declares that the machine, parts or equipment

GCE Cross Cut Samplers

Models: **45CE, 90CE**
Sizes: **All**

With Sentinel Controls

Model: **STL-400-3-***-GCE**

Meet the Essential Requirements of the **ATEX Directive 2014/34/EU and Machinery Directive 2006/42/EC**

- Combustible material Grain Dust
- Minimum ignition temperature 180°C (maximum design surface temperature 100°C)
- Ex II2/2D Ex h IIIB/- T100°C Db with GSI Sentinel Controls
- Ex II3/3D Ex h IIIB/- T100°C Dc without GSI Sentinel Controls

In accordance with the following standards:

IEC 60079-0:2017	Explosive atmospheres - Part 0: Equipment - General requirements
EN ISO 80079-36:2016	Explosive atmospheres. Part 36: Non-electrical equipment for explosive atmospheres - Basic method and requirements
EN ISO 80079-37:2016	Explosive atmospheres. Part 37: Non-electrical equipment for explosive atmospheres - non-electrical type of protection constructional safety ‘c’, control of ignition sources ‘b’, liquid immersion ‘k’
EN ISO 12100:2010	Safety of machinery - General principles for design - Risk assessment and risk reduction
EN60204-1:2018	Safety of machinery - Electrical equipment of machines

1. All installation shall be in accordance with manual PNEG-2175CE.
2. Sentinel controls shall not be installed inside the potentially explosive environment.

Signed:

Contents

This manual covers the installation and operation for the Sampler Model GCE 45 and 90. 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 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
1004 E. Illinois St.
Assumption, IL 62510-0020
Phone: 1-217-226-4421
Fax: 1-217-226-4420

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 InterSystems recommendation that a small supply of spare parts be kept on hand to cover any minor breakdowns. A separate priced spare parts list will be sent identifying the suggested spare parts. It is also necessary to check the certified drawings, which will list any special or custom components utilized on this equipment.

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
34769	Standard SAE 80W-90 EP Gear Lubricant Oil Quart (Pennzoil 4096)
529601	Optional Synthetic Gear Lubricant Oil Quart (Mobil SHC634)
35342	#50 Friction Facing (Ref #16 *on Page 36*.)
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. Read and save these instructions.

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-0001-4

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.**

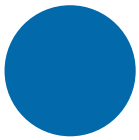
WARNING This symbol indicates a potentially hazardous situation which, if not avoided, **can result in serious injury or death.**

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

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
1004 E. Illinois St.
Assumption, IL 62510-0020
Phone: 1-217-226-4421
Fax: 1-217-226-4420

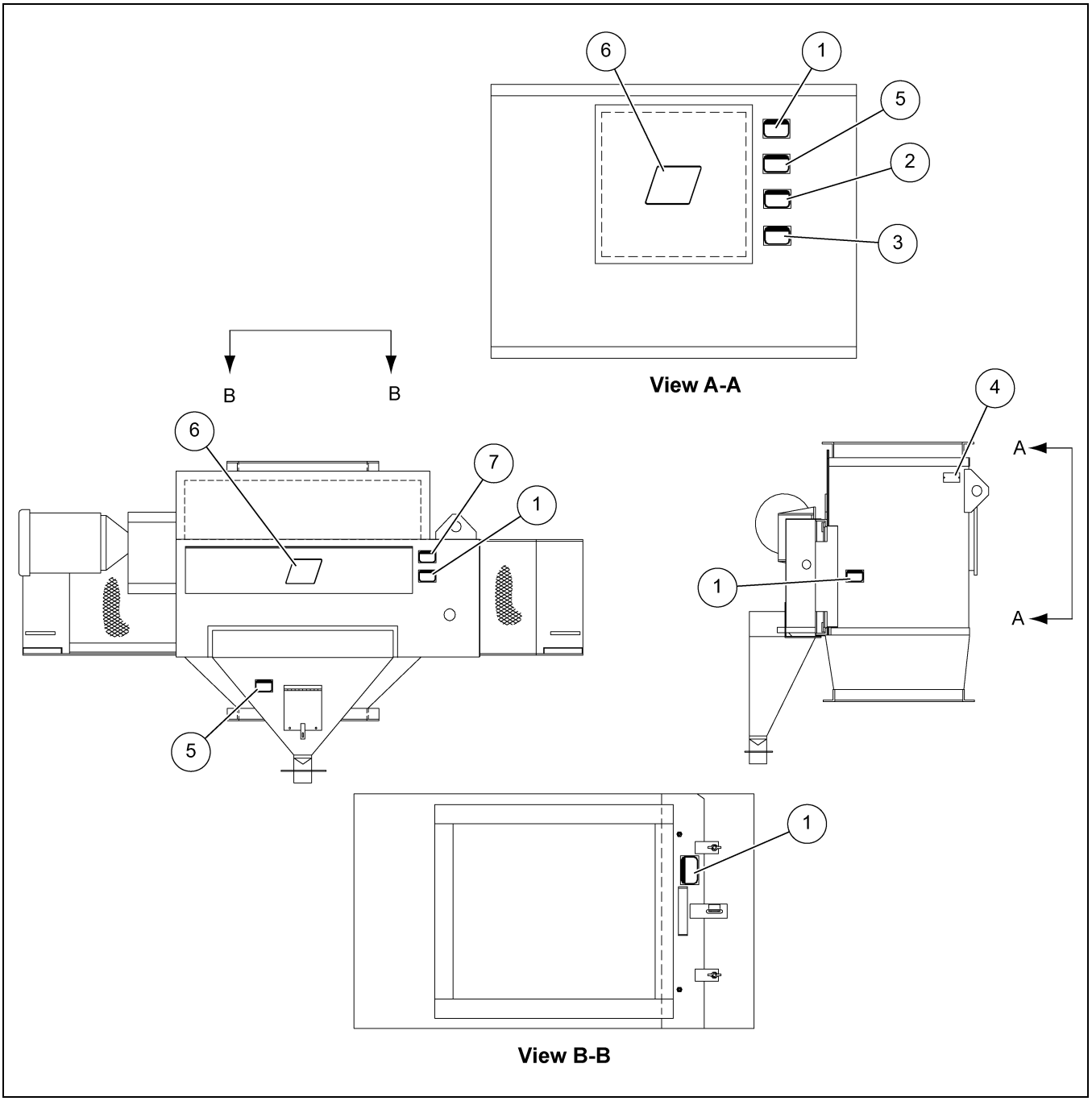
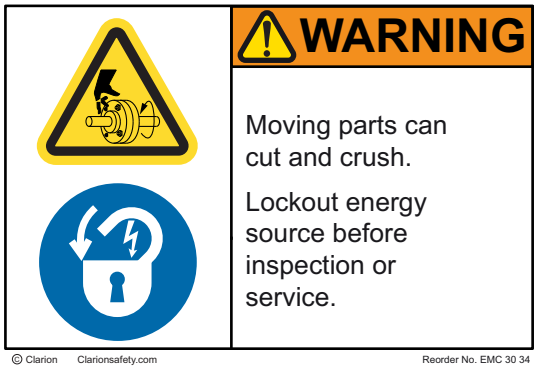
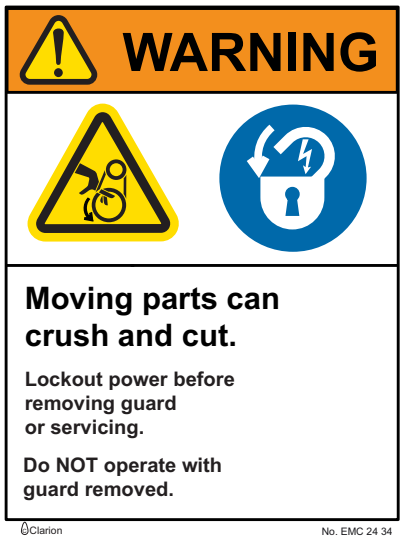


Figure 3A *GCE Sampler Safety Label Locations*

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 34		Moving Part
2	EMC 402 34		Lock Out Machine
3	EMC 403 34		Starts Without Warning
4	-	**InterSystems** 13217 IL Highway 133 Paris, IL, 61944-6701 USA **GCE SAMPLER** **MODEL** 90 **SIZE** 34 **SN** 1234567 **T** -10°C/+40°C T_{crit} 100°C t_{norm} 2.4 s t_{crit} 1.2 s 400 V AC: 3 ph: 50 hz: 7A FLC CE Ex II2/2D; Ex h IIIB T100°C Db	Rating Plate

Ref #	Decal #	Decals	Description
5	EMC 428 34		Eye Protection
6	DC-2553		InterSystems Logo
7	EMC 24 34		Exposed Belt

System Description

The GCE Sampler is designed to collect a representative sample of granular, flake, pellet or other materials in a gravity conveying line.

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 drives the slotted sample cutter through the product flow to collect a sample of the material. The sample flows through the sample cutter and out the discharge as it travels through the material flow. The sample cutter, when at rest, is situated under one of two dust seals that seal the sample cutter. The sample from the sample cutter flows into to the sample hopper and out the 3.00" (76 mm) O.D. discharge tube. The sample, flowing via gravity from the hopper discharge, will then be routed to a sample divider or directly to the desired sample collection point.

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. ATEX compliant sampler for use in dusty atmospheres and with internal zone designated up to ATEX zone 21D.

   NOTE: *ATEX compliant sampler does not include electrical controllers, which must be installed outside the ATEX zone.*
3. Components of special materials, such as stainless steel or nedox coatings.
4. Programmable controls to sequence the sampler and the sample collection equipment.
5. Abrasion resistant linings of urethane, AR carbon steel plate, 304 stainless steel or ceramic tile.

Correct Use of the GCE Sampler

The sampler is designed to be used for automatic, intermittent sampling of free-flowing, granular, flake or pelleted materials in a gravity conveying line.

Any other form of use is a misuse of the sampler and may result in damage or serious/fatal injury.

In particular the sampler is not designed to be used as follows:

1. Continuous sampling.
2. Sampling liquids, sludges or slurries.
3. Sampling rock, stone, sand, gravel or other highly abrasive materials.
4. Sampling materials prone to sparking on impact.
5. Sampling corrosive materials.
6. Sampling materials with maximum aggregate size greater than 1-3/8" (35 mm).

7. Sampling volatile, explosive or highly flammable materials.
8. Use other than when connected directly to a material handling system.
9. Use with either the inlet or outlet exposed such that moving parts can be reached.
10. Use with manual filling of emptying.
11. Use when modified in any way.
12. Use in environmental conditions contrary to those marked on the rating plate.
13. Use underground or in mining processes.
14. Sampling of clean, dust free material is inherent to reducing the risk of a potentiality explosive dust air mixture forming inside the sampler.
15. Where high levels of dust are anticipated inside the sampler, ventilation and extraction should be used to reduce concentrations.
16. Operators should be aware of health risks from dusts, mould and other biological agents from the materials being sampled. Overall design of the facility in which the sampler operates shall minimize this exposure and personal protective equipment (PPE) shall be used to further reduce risks if required.

NOTE: *The sampler may be installed or used in a potentially explosive environment ONLY when specified as such by GSI and when carrying the relevant ATEX rating. Refer to the ATEX Compliance that follows.*

Electrical Safety

Equipment shall include:

1. Fuse protected main power supply.
    a. The electrical supply should include earth leakage protection, ex: residual current device (RCD) or residual current circuit breaker (RCCB), to provide automatic disconnection in the event of a fault.
2. Lockable main safety disconnect.

    a. Disconnects all electrical power.
3. Lockable motor service disconnect.

    a. Adjacent to each motor (or group of motors).
    b. Disconnects all power to the motors.

4. Emergency stops.

   a. Stops all equipment immediately when pressed.

   b. Must remain engaged until manually disengaged.

   c. Equipment shall not immediately restart when the emergency stop is reset.

5. Door safety interlocks - where doors provide access to dangerous machinery.

   a. Immediately stops and prevents restart of all equipment when the door is open.

   b. Equipment shall not immediately restart when the door in closed.

   c. Design of the safety related parts of the control system (SRPCS) shall be carried out following risk assessment and in accordance with EN ISO 13849.

6. The electrical supply shall include a properly designed protective earth system (PE), with connection to all exposed conductive parts.

7. All motors shall be connected to protective earth at the terminal provided.

8. The control system shall include,

   a. Short circuit protection.

   b. Start/stop controls (labelled 1 and 0 respectively).

9. Equipment shall not immediately restart following re-establishment of power.

10. Motor circuits shall include over current protection set according to the full load current, stated on the motor rating plate.

11. Motor thermal protection may also be required.

12. All electrical design, installation and testing must be carried out by a qualified electrical engineer, in accordance with EU Directives and Standards, local laws and codes. Specific reference should be made to EN 60204 for electrical equipment and controls.

Safe Access

The GCE sampler may be installed at heights and as part of a larger material handling system. To ensure correct and safe maintenance, servicing and repair can be carried out, safe access to the sampler is required.

1. Suitable fixed ladders or stairs in accordance with EN ISO 14122-3 or EN ISO 14122-4.
2. Suitable working platform, in accordance with EN ISO 14122-2, providing access to all parts of the sampler.

ATEX Compliance

GCE samplers may be specified for use in or containing a potentially explosive environment.

1. Classification of the ATEX zone on site is the end users responsibility, but shall be limited to zones 21 or 22 (dusts). Use in all other zones is prohibited.
2. Samplers must be ordered, specified and marked according to the designated zone.
3. Compliance and use in an ATEX zone requires use of a safety control system (control of ignition sources). Refer to *CE Control Electrical Layout on Page 28* for more details.

ATEX Control Requirements (Zones 22 and 21)

1. To prevent excessive motor temperatures, the motors are provided with internal thermal switches. These must be installed into the control system in the locations provided or, for non-GSI controls, in the location identified by the control manufacturer.
2. Where user designed controls are used, the controls shall be designed to provide a minimum level of ignition protection b1 or be designed to meet the requirements of control of ignition sources to explosion protection level (EPL) Db, in accordance with EN80079-37.
3. User supplied controls, in addition to the requirements given above, shall include:
    a. Motor over temperature control and/or monitoring. Motor temperature shall not exceed 100°C.
    b. Sampler over speed detection. Sampler speed shall not exceed 1m/s.
    c. Sampler motor maximum run time shut off. The sampler motor shall not run for longer than 20s. This feature is required to ensure that the clutch fitted to the sampler is not slipping, resulting in potential high surface temperatures and potential sources of ignition. Maximum surface temperature shall not exceed 100°C.
4. Where any of the limits stated above are exceeded, the control shall bring the sampler to a stop and shall not allow restart without direct intervention from the operator. This shall only be permitted once the cause of the fault has been identified and rectified.
5. These functions shall be testable. (See testing ATEX controls *on Page 32.*)

Ignition Hazard Assessment - GCE Samplers

Possible Ignition Sources	Equipment related Yes/No	Reason	Controls
Hot Surfaces	Yes	Sliding friction of moving parts on static parts Surface temperature of gearbox and motor Slipping torque tamer clutch Bearing temperatures	Constructional safety Control of ignition sources Surface temperature control Overrun timers
Mechanical Sparks	Yes	Single impact of mal-adjusted moving part. Chain/sprocket failure Sampling incorrect materials, prone to impact sparks	Constructional safety Operator's manual instruction on correct use
Flames, Hot Gases	No	None present	
Electric Sparks	Yes	Potential arcs at electrical connections, in motors and switches. Static electricity sparks from non-conductive surfaces.	Constructional safety Control of ignition sources Electrical controls design and installation to EN 60204
Stray Electric Current and Cathodic Corrosion Protection	No	None present	
Static Electricity	Yes	None present	
Lightning	No	To be addressed on specific installation location	To be addressed on site
Electromagnetic Waves	No	None present	
Ionising Radiation	No	None present	
High Frequency Radiation	No	None present	
Ultrasonics	No	None present	
Adiabatic Compression	No	None present	
Chemical Reaction	No	None present	

Guarding of Moving Parts

GCE samplers have hazardous moving parts which present a risk of serious injury when unguarded. The samplers operate under automatic control and may start unexpectedly and without warning.

1. Guards are provided to enclose all moving parts except those involved in the sampling process.
2. Moving parts involved in the sampling process shall be made inaccessible at installation by enclosing both the inlet and outlet of the sampler such that the moving parts cannot be reached by any part of the human body.
3. Generally this is achieved by close coupling the sampler inlet and outlet to the upstream and downstream conveying system.
4. Where this is not suitable (ex: open hopper inlet), the installer must ensure access to the moving parts is restricted in accordance with EN ISO 13857 or through other methods (ex: interlocking controls).
5. Under certain circumstances it may be necessary to remove guards. Only do this when the sampler and other associated equipment is isolated and locked out from the power supply.
6. Never operate the sampler with the guards removed.

Safety in Maintenance and Servicing

Only suitably competent/qualified persons should carry out servicing or maintenance on the GCE sampler. The following recommendations should be considered:

1. Safe Access: Samplers may be installed in remote locations and at height. Ideally safe, permanent access should be provided. However in the event that this is not the case, the service technician should use safe methods, such as a powered work platform or tower scaffold. It is not recommended to work solely off a ladder.
2. Safe Isolation: Service and maintenance should be carried out only when the sampler has been disconnected and locked off from all power/energy supplies and the key remains solely in the possession of the service technician. The sampler operates under automatic control and will start without warning. Working in or on a sampler that has not been disconnected and locked out can result in very serious injury. It may also be necessary to isolate other equipment associated with or attached to the sampler.
3. Safe Troubleshooting: In extreme circumstances, when troubleshooting a malfunctioning sampler it may become necessary to observe the sampler operating with guards removed. This should only be carried out in MANUAL mode and, if the sample control is remote from the sampler, with a second person manning the controls. Refer to *Sampler Controls on Page 23* for information on how to operate the sampler in manual mode.

   NOTE: *This only applies where the GSI Sample Sentinel controls are being used. For other control types, refer to the control manufacturer.*
4. NEVER attempt to intervene or work on the sampler when powered up, even when in manual mode.

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 GCE 90 sampler is typically mounted vertically into a gravity flowing conveying line carrying the product to be sampled. The GCE 45 sampler is typically mounted into a sloping gravity flowing conveying line. The sampler axis must be installed parallel 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

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.

1. Locate and mark the desired mounting location of the sampler on the product conveying line.
2. Cut out the section of conveying line 1/16"-1/8" (2-3 mm) longer than the length of the sampler.
3. Slip a companion flange over each end of the conveying line.
4. Locate the sampler in the desired position and adequately brace. Braces are to be permanent.
5. Bolt the companion flanges to the sampler and weld companion flanges to the chute.

Material Sample Transport Lines

The tubing used to transport material samples must be compatible with the operating environment and the material sampled. Typically a 3.00" (75 mm) 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, a sample divider 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. Locate controller so it is protected from water and dust.
3. DO NOT locate the controller in explosion risk area.
4. Most applications require that the sampler be in easy view of the controller.
5. Ideally controllers should be installed at ground level, inside or on a suitable work platform, making controls readily accessible to the operator.

Field Wiring

The installer is responsible for the design, selection, protection and erection of field electrical wiring between the sampler and its controls.

1. Conductor sizes shall be selected in accordance with IEC 60364-5-52.
2. Cable types and insulation shall be suitable for the anticipated installation environment.
3. The supply type shall be suitable for the installation:
    a. Additional protective measures (ex: residual current device, residual current circuit breaker, arc detection circuit breaker, over current and short circuit protection) shall be selected and installed where the supply system requires or where the maximum fault loop impedance cannot be guaranteed to provide automatic disconnection in the required time, in the event of an electrical fault.
    b. The prospective short circuit current shall not exceed that stated on the control rating plate.

Sampler Controls

It is recommended the sample be controlled via the GSI Sample Sentinel control system, which can be supplied as full stand-alone control (SA) or safety interface (SI) versions. These are pre-programmed and configured for safe, efficient use of the sampler. Where the sampler is part of a larger facility and is to be controlled by third party controls, the SI version is recommended. This permits inputs for control mode, auto sampling intervals and manual sampling from a third party control.

Main Isolator

Closing the main isolator (1) powers the control. Power light (2) will illuminate indicating the DC power supply is active.

The safety controller will check all safety inputs and if satisfied, the status indicator (4) will emit a 1 Hz flash continuously.

NOTE: *If the control was shut down in automatic mode, this will resume on restarting until reset. Refer to the Automatic Mode below for more information.*

A 3 pole service disconnect should also be installed, adjacent to the sampler, to provide safe isolation of the sampler and control. Terminals for this are provided in the control.

Following power loss or shut down via the isolator or service disconnect, the sampler control must be reset before sampling can proceed.

Reset Button

Pressing the reset button (3) following normal power-up will reset the sampler to ‘home’ position (fully to the right) and leave the control in stand-by. The status indicator (4) will remain steady ON.

Stand-By/Sample Switch

The stand-by/sample switch (5) when turned to sample will permit the execution of the pre-programmed timed sample procedure or, if the control is in manual mode, permit manual sampling. When returned to stand-by mode, the sampler will complete the sample if it is in progress. This switch (5) shall not be used as an alternative to the emergency stop.

Automatic Mode

Automatic sampling mode is selected by pressing and holding the mode button (7) until the status indicator emits a fast continuous flash. Once in automatic mode, return to manual mode can only be achieved by pressing and holding the mode button (7) until the status indicator stops flashing (approximately 5 seconds).

Sample Button

Pressing and holding the sample button (6) for 3 seconds will permit a manual sample at any time when the sampler is ON, regardless of operation mode. If however the sampler is in manual mode, this is the only method a sample can be taken.

Sample Timer

The sample timer (8) provides automatic sampling on a timed basis when the control is in auto mode.

Emergency Stop

When pressed the emergency stop (9) will stop all sample functions.

NOTE: *It may be necessary to interlink this function with other equipment installed with the sampler.*

IMPORTANT: *An additional, external, emergency stop should be installed, which will produce the same outcome. Terminals for this are provided for within the control.*

Position Indicators

The position indicators (10 and 11) shows the current position of the sampler. If both position indicators (10 and 11) are ON, the sampler is mid-position.

Left and Right Indicators

The left and right indicators (12 and 13) indicates the direction of movement of the sampler.

Status/Fault Indicator

This status/fault indicator (4) has several modes, depending on the status of the sampler:

Mode	Description
Steady ON	Control is reset and in manual mode.
Continuous flash 1 Hz	Safeties satisfied, awaiting reset.
Continuous flash 4 Hz	Control in automatic mode.
Sequence of 2 flashes	Limit switch fault (Incorrectly wired or stuck).
Sequence of 3 flashes	Panel E-stop is open.
Sequence of 4 flashes	Sampler motor thermal fault. **NOTE:** *This fault requires manual reset to be cleared once the motor has cooled.*
Sequence of 5 flashes	Divider motor thermal fault. **NOTE:** *This fault requires manual reset to be cleared once the motor has cooled.*
Sequence of 6 flashes	External E-stop is open.
Sequence of 7 flashes	Sampler failed to complete and was timed out. Possible sampler blockage.
Sequence of 8 flashes	Sampler motor overcurrent trip.
Sequence of 9 flashes	Divider motor overcurrent trip.

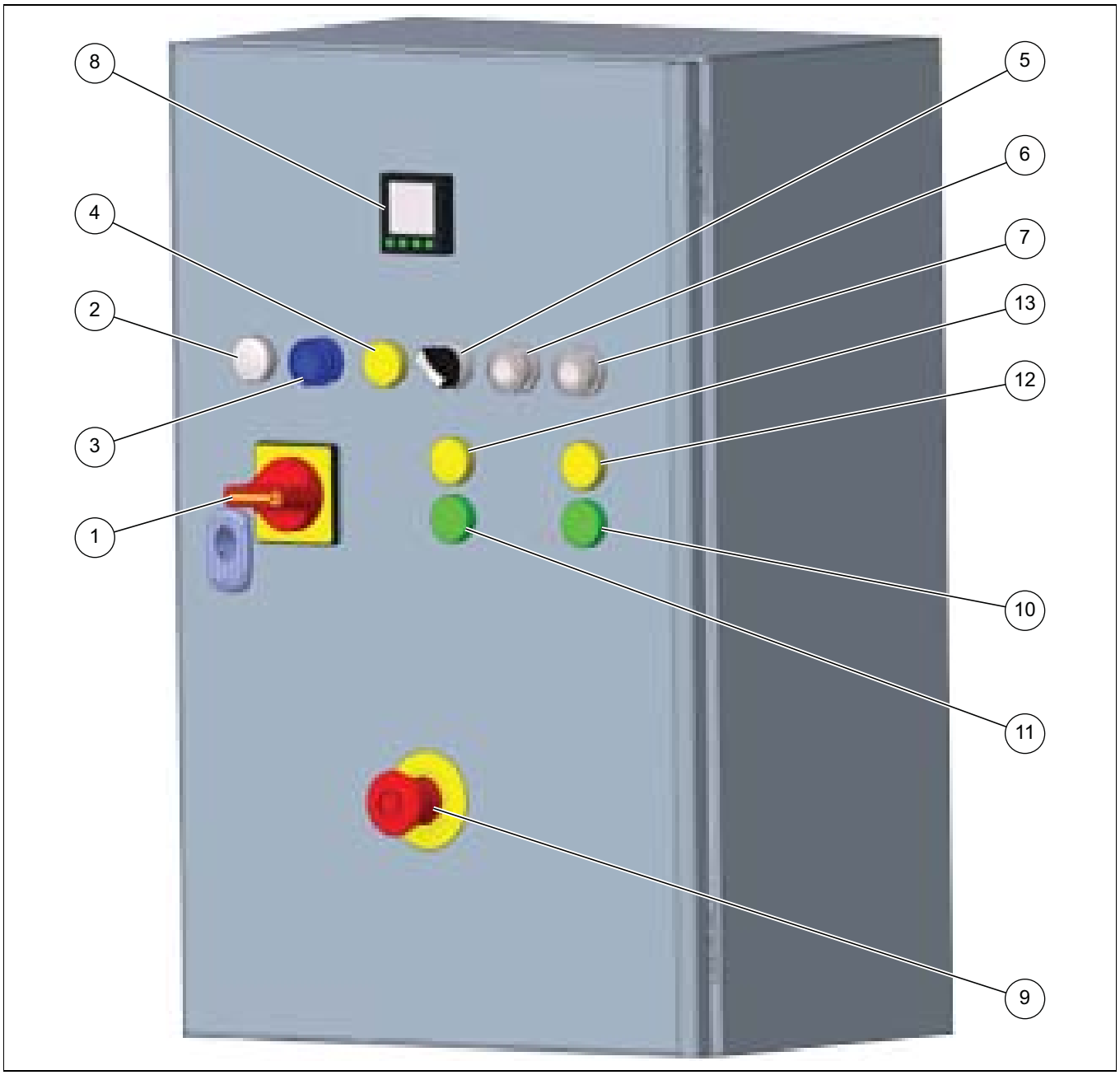


Figure 6A *Sample Sentinel Control*

Ref #	Description
1	Main Isolator
2	Power Light
3	Reset Button
4	Status/Fault Indicator
5	Stand-By/Sample Switch
6	Sample Button
7	Mode Button

Ref #	Description
8	Sample Timer
9	Emergency Stop
10	Position Indicator
11	Position Indicator
12	Right Indicator
13	Left Indicator

Configuring the Controls

The Sample Sentinel controls can be configured in 2 ways:

1. Setting the sample period
2. Setting the auto-reverse time

Setting the Sample Period

The sample period is set at the programmer located on the panel door. (See Ref #8 *on Page 25*.) The precise method of setting will depend on the type of timer used and specific instructions will be provided with the controller.

IMPORTANT: *Do not set the sample frequency (cycle time) lower than 1 minute (60 per hour). This can cause short cycling of the sampler motor and result in potential damage.*

IMPORTANT: *Do not set the ON time any less than 0.5 seconds. This can result in the start signal not being recognized by the controller.*

Setting the Auto-Reverse Time

Auto-reverse is a safety feature built into the control to detect potential blockage or damage to the sampler, resulting in it not being able to complete the traverse from left to right (or vice-versa). In this situation the sampler will stop and reverse back to the starting position. The auto-reverse time is dictated by the size of the sampler, and should be in accordance with table below:

Model Size	Stroke	Recommended Delay Time Setting
10	14	1.2 Seconds
14	18	1.4 Seconds
18	22	1.6 Seconds
22	26	1.8 Seconds
26	30	2.0 Seconds
30	34	2.2 Seconds
34	38	2.4 Seconds
38	42	2.6 Seconds
42	46	2.8 Seconds
46	50	3.0 Seconds

Configuring the Controls (Continued)

The reverse time is changed by opening or closing knife jumpers A, B, C and D, located inside the control enclosure, according to the table below:

Reverse Time (s)	Switch Status (1 = CLOSED, 0 = OPEN)			
	A	B	C	D
1.2	0	0	0	0
1.4	1	0	0	0
1.6	0	1	0	0
1.8	1	1	0	0
2.0	0	0	1	0
2.2	1	0	1	0
2.4	0	1	1	0
2.6	1	1	1	0
2.8	0	0	0	1
3.0	1	0	0	1
3.2	0	1	0	1
3.4	1	1	0	1
3.6	0	0	1	1
3.8	1	0	1	1
4.0	0	1	1	1
4.2	1	1	1	1

CE Control Electrical Layout

This section refers, primarily to installation of the sampler with the GSI Sample Sentinel control.

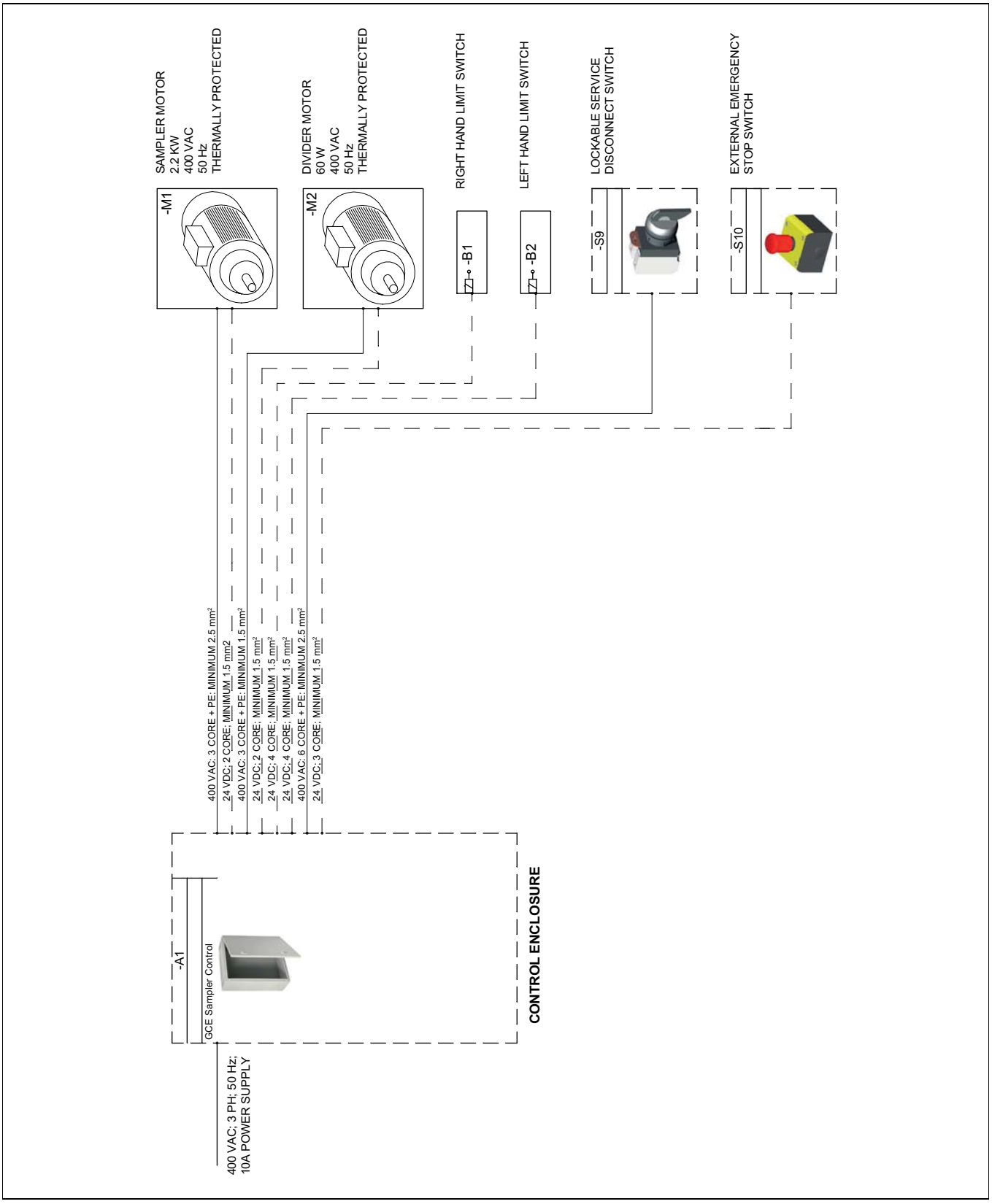


Figure 7A *Electrical layout*

CE Control Electrical Layout (Continued)

1. The control requires a 400 Volt, 3 PH and neutral supply (TPN) with minimum current capacity of 10 Amp.

2. Run suitable type cables to the components on the Sampler and Divider as indicated in the *Figure 7A on Page 28*.

   NOTE: *The conductor cross section areas stated above the minimum and should be increased if required, according to local regulations, length of cable and voltage drop.*

3. When making connections to the sampler and divider components, refer to the certified drawing provided with your controls (See *Figure 7B on Page 30*, *Figure 7C on Page 31* and *Table below*).

Electrical Connections

Item	Voltage	Maximum Current	Terminal (Block) Numbers
Power Supply (TPN)	400 VAC	10 Amp	(X1) 1, 2, 3, N, PE
Service Disconnect Switch	400 VAC	10 Amp	(X1) 4, 5, 6, 7, 8, 9, PE
Sampler Motor	400 VAC	7 Amp	(X2) 1, 2, 3, PE
Divider Motor	400 VAC	1 Amp	(X2) 4, 5, 6, PE
Sampler Motor Thermal Protection	24 VDC	1 Amp	(X3) 1, 2
Divider Motor Thermal Protection	24 VDC	1 Amp	(X3) 3, 4
Right Limit Switch	24 VDC	1 Amp	(X3) 5 (COM), 6 (N.C.), 11 (N.O.), PE
Left Limit Switch	24 VDC	1 Amp	(X3) 7 (COM), 8 (N.C.), 12 (N.O.), PE
External Emergency Stop	24 VDC	1 Amp	(X3) 9, 10, PE

CE Control Motor Connections

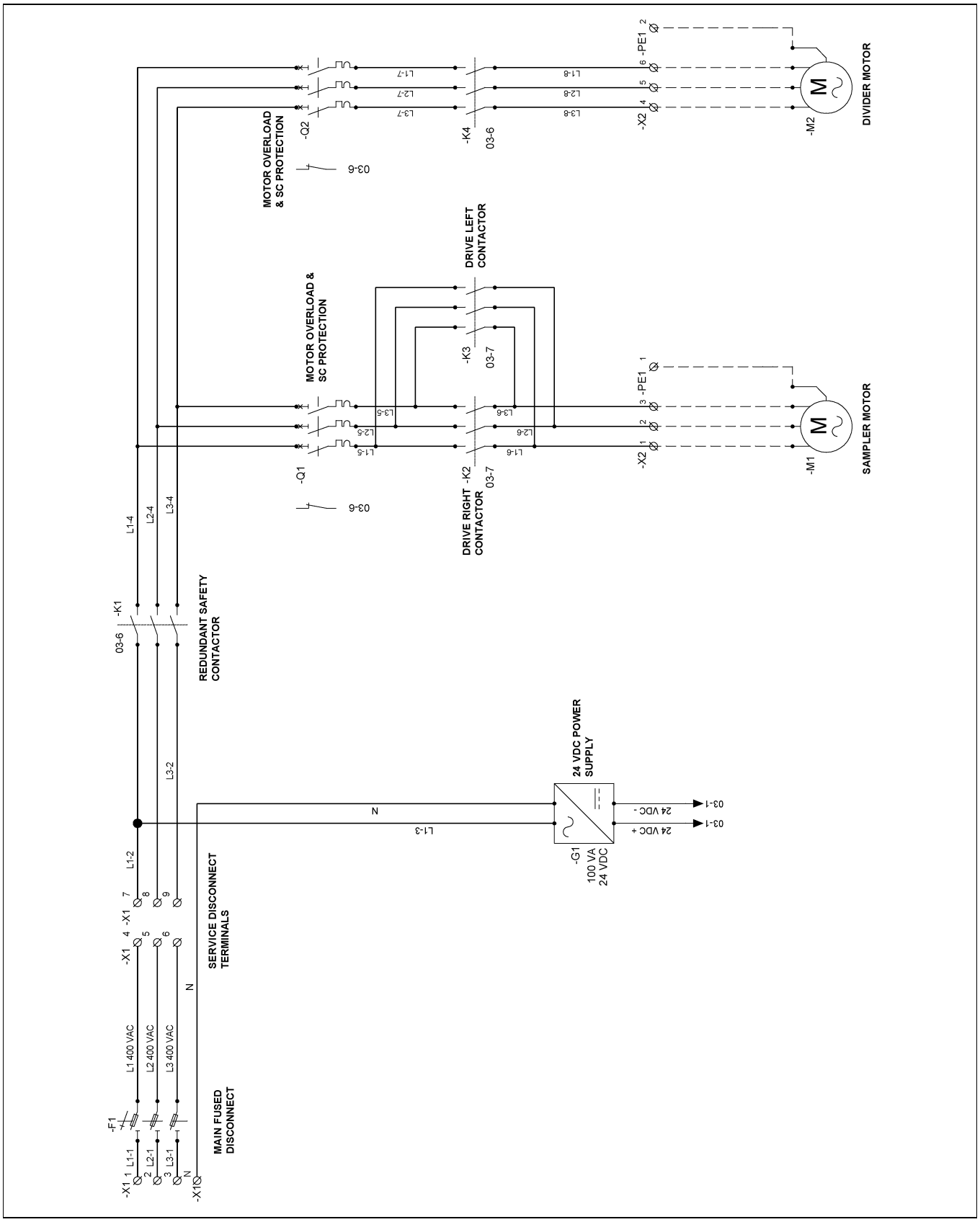


Figure 7B *Motor Connections*

CE Control Connections

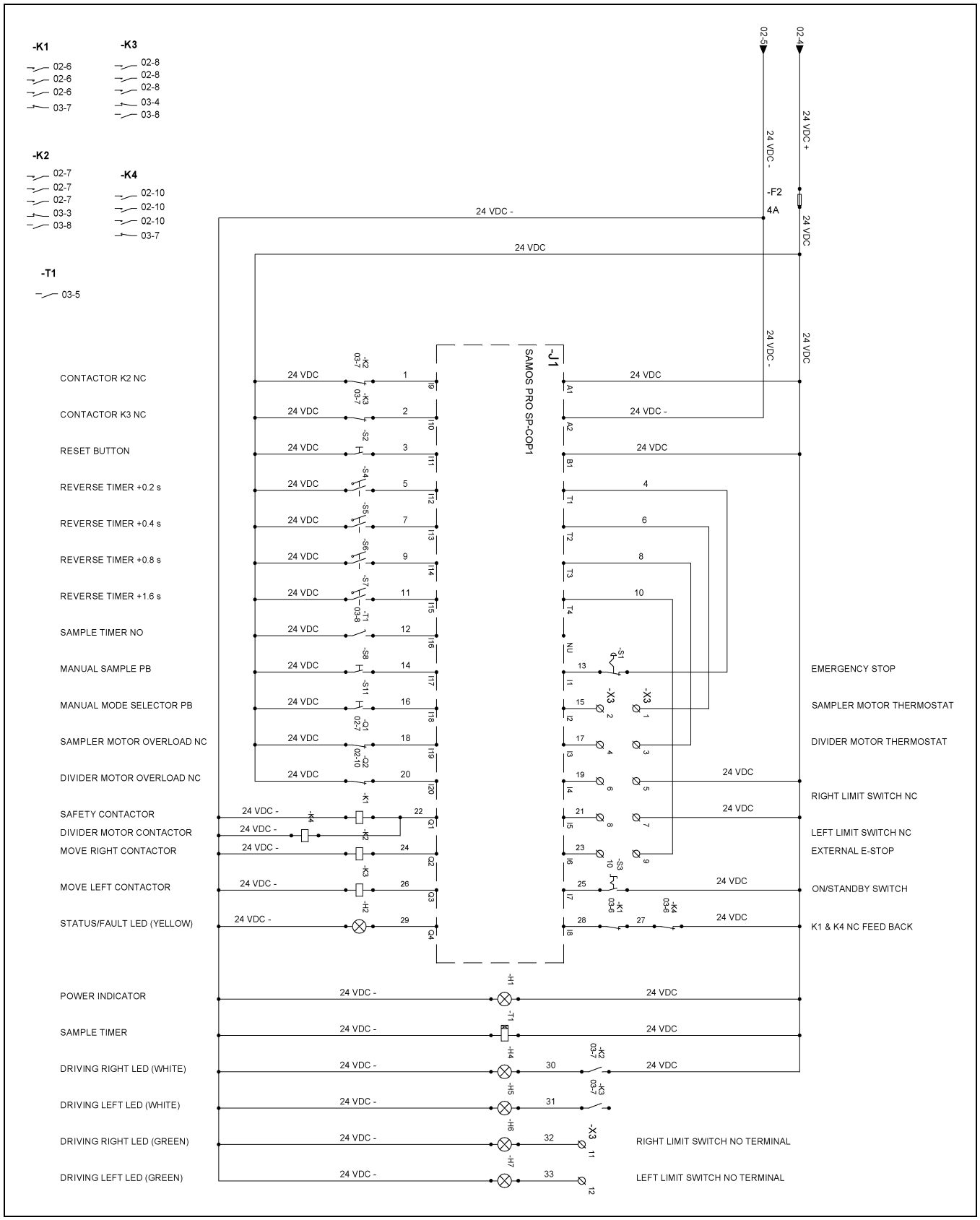


Figure 7C *Control Connections*

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.

General Maintenance

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

Testing ATEX Controls

All controls intended to provide prevention of ignition shall be capable of being tested to ensure they remain functional. These tests should be carried out every 6 months.

1. Motor temperature controls shall be tested by opening the thermostat circuit and seeing the sampler control go into a non-volatile lock out condition. Restart shall not be possible without manual reset of the control system. On the GSI Sample Sentinel controls, these tests are carried out as follows:

    a. Start the control

    b. Locate terminal X3-2 and open the knife switch on that terminal

    c. The control should go into a non-volatile lock out

    d. Close terminal X3-2

    e. Reset the control

    f. Locate terminal X3-4 and open the knife switch on that terminal

    g. The control should go into a non-volatile lock out

    h. Close terminal X3-4

2. Sampler over speed testing shall be carried out by simulating a higher sample pelican speed (>1 m/s), resulting in a non-volatile lock out. On the GSI Sample Sentinel controls, this is carried out by:

    a. Set all time DIP switches to OFF

    b. Set the control in manual mode

    c. Turn the stand-by/sample switch (5) to sample

    d. Press and hold the reset button (3)

    e. Press and hold the manual sample button (6) to run a sample cycle

    f. Observe that the control goes into a non-volatile lock out

    g. Return timer DIP switches to original setting

3. Sampler run time testing shall check that the control locks out in the event that the sampler motor, running in both directions, exceeds 20 seconds running time. On the GSI Sample Sentinel controls, that is achieved by:
   a. Set the control in manual mode
   b. Turn the stand-by/sample switch (5) to stand-by
   c. Locate terminal X3-13 and open the knife switch installed on it
   d. After 20 seconds the control should go into a non-volatile lock out
   e. Close terminal X3-13 and reset the control
   f. Repeat the test, this time using terminal X3-14
   g. Reconnect terminal X3-14
4. In the event that any fault is detected in these tests, the sampler shall not be used until the fault has been identified and rectified. Failure to do so could result in a serious incident endangering life and property.

Periodic Inspection

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

1. Check motor and gear reducer cooling surfaces and fans for damage and/or build-up of dust and debris which might result in over heating. Clean and repair as required.
2. Loose or missing hardware
3. Noisy motor or motor/reducer bearings
4. Overheated motor or reducer
5. Adequate lubricant in gear reducer
6. Loose drive chain
7. Structural damage
8. Rust or corrosion
9. Damaged wiring, including exposed conductors and connections
10. 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

Drive Chain, Sprockets and Idler Shaft

The drive chain, sprockets and idler shaft have been greased at the factory. The chain should be thoroughly cleaned and re-greased once a year using a multi-purpose grease. The idler shaft should also be greased at the same time.

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 a gear lubricant with an AGMA #8 rating for normal operating conditions. Use a synthetic gear lubricant such as “Mobil SHC 634” for extreme operating conditions.

Mechanical Repair Procedures

Drive Chain Adjustment

The drive chain will need adjustment periodically to maintain proper tension. The chain is attached to the sample pelican drive nose by means of two eye bolts. Loosen, adjust and re-tighten the eye bolt nuts to increase or decrease chain tension. The chain only needs to be tight enough to prevent any sag or slack. As the chain wears it will stretch to a point where the adjustment of the eye bolts will no longer permit further tightening. Shorten the chain by removing a link if necessary.

Limit Switch Adjustment

Loosen and adjust the limit switch arm if required. The limit switches trip on the ends of the slide plate of the sampler and signal the control to remove power from the motor. They should trip before the sample pelican completes its traverse. When a limit switch trips the sample pelican should gently coast to a stop under the dust seal and up against the bumper.

Sample Cutter Blade Replacement

When following the instructions below, refer to the applicable drawing of the sampler. Reference the drawings of the samplers *on Pages 38 and 41* and the certified drawing(s).

1. Shut off and lock out all power (electrical, pneumatic and hydraulic).
2. Shut down conveying line.
3. Open the large inspection door on the sampler housing and the seal door over the sample cutter.
4. Remove the 1/4"-20 UNC hex head bolts fastening the sample cutter to the sample pelican.
5. Using a utility knife, cut the caulking seal around the bottom of the cutter blade and remove.
6. Install the new cutter blade on the sample pelican.
7. Re-install the 1/4"-20 UNC hex head bolts fastening the sample cutter to the sample pelican.
8. Re-caulk the joint between the cutter blade and the sample pelican to ensure a tight seal.
9. Re-install the inspection cover on the housing.
10. Restore power to the sampler and operate it through several collection cycles.

Sample Cutter Seals Replacement

When following the instructions below, refer to the applicable drawing of the sampler. Reference the drawings of the samplers *on Pages 38 and 41* and the certified drawing(s).

1. Shut off and lock out all power (electrical, pneumatic and hydraulic).
2. Shut down conveying line.
3. Open the large inspection door on the sampler housing and the seal door over the sample cutter.
4. Remove the 5/16"-18 UNC wing nuts fastening the sample cutter seal brackets to the doors. Avoid dropping the assemblies inside the sampler.
5. Wrap the new seals around the seal brackets and re-install.
6. Check to see that the cutter fits snugly under the pelican seals.
7. Restore power to the sampler and operate it through several collection cycles.

Drive Clutch Adjustment

The drive clutch may need adjustment if it starts to slip. When following the instructions below, refer to the clutch drawing *on Page 36*. Also reference the drawings of the samplers *on Pages 38 and 41* and the certified drawing(s).

1. Shut off and lock out all power (electrical, pneumatic and hydraulic). Make sure sampler pelican is on the side opposite the drive motor.
2. Open the clutch access door in the rail guard and remove the clutch guard.
3. Fully loosen the three tension screws (19).
4. Loosen the adjusting nut (17) set screw (18) at least nine turns.
5. Turn the adjusting nut (17) clockwise to finger tightness. Tighten an additional 1/8" turn.
6. Turn the adjusting nut (17) to position the adjusting nut (17) set screw (18) in the nearest spline on the clutch hub (14) and tighten the set screw (18). Do not tighten the set screw (18) on the threads of the hub.
7. Tighten the three tension screws (19) firmly against the adjusting nut (17).
8. Close the clutch access door in the rail guard and replace the clutch guard.
9. Restore power to the sampler and operate it through several collection cycles.

Drive Clutch, Facings, Bushing and Sprocket Replacement

The drive clutch may need to be replaced if adjustment fails to prevent slippage. When following the instructions below, refer to the clutch detail *on Page 36*. Also reference the drawings of the samplers *on Pages 38 and 41* and the certified drawing(s).

1. Shut off and lock out all power (electrical, pneumatic and hydraulic). Make sure sampler pelican is on the side opposite the drive motor.
2. Open the clutch access door in the rail guard and remove the clutch guard.
3. Fully loosen the three tension screws (19).
4. Loosen the adjusting nut (17) set screw (18) at least nine turns.
5. Remove the adjusting nut (17), splined plate (15), friction facing (16), sprocket (21) and bushing (20).
6. Re-assemble the clutch using the new facings (16), sprocket (21) and bushing (20).
7. Turn the adjusting nut (17) clockwise to finger tightness. Tighten an additional 1/8" turn.
8. Turn the adjusting nut (17) to position the adjusting nut (17) set screw (18) in the nearest spline on the clutch hub (14) and tighten the set screw (18). Do not tighten the set screw (18) on the threads of the hub.
9. Tighten the three tension screws (19) firmly against the adjusting nut (17).
10. Close the clutch access door in the rail guard and replace the clutch guard.
11. Restore power to the sampler and operate it through several collection cycles.

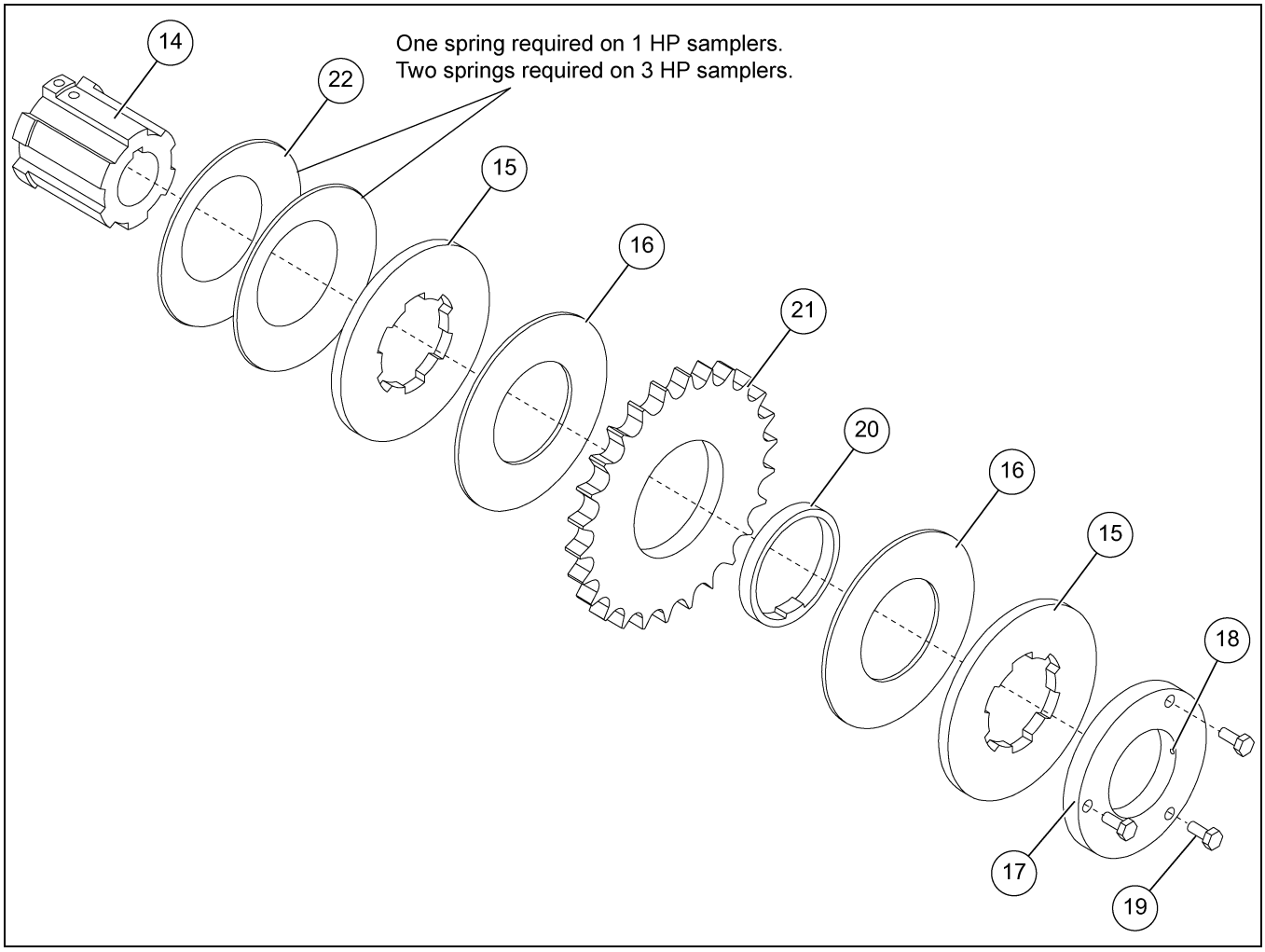


Figure 8A *Drive Clutch Detail*

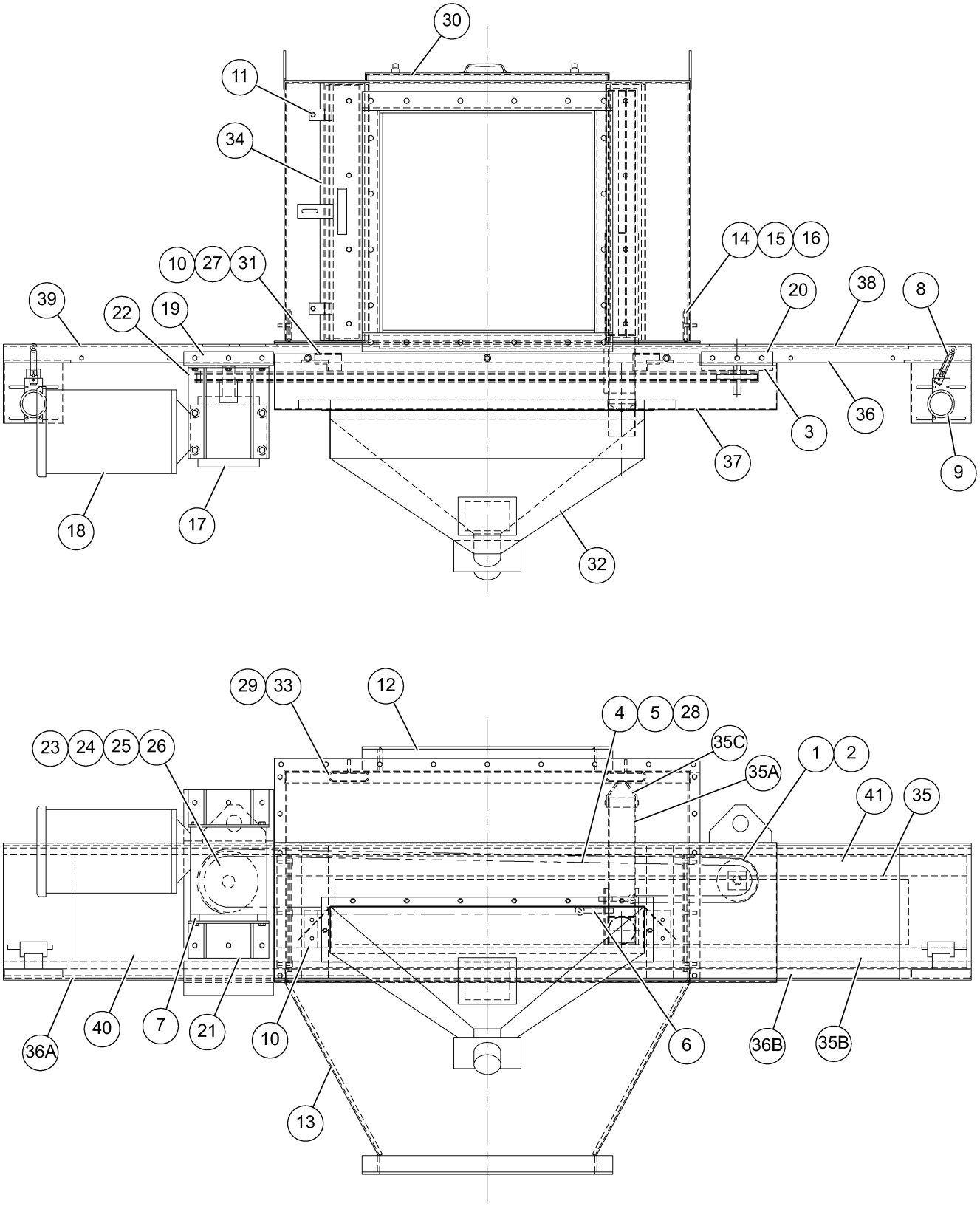
Ref #	Description
14	Clutch Hub
15	Splined Plate
16	Friction Facing
17	Adjusting Nut
18	Set Screw
19	Tension Screws
20	Bushing
21	Sprocket
22	Extra Clutch Spring

General GCE Sampler Troubleshooting

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

Symptom	Possible Cause	Corrective Action
Sampler does not cycle (Power light OFF).	Power switch OFF.	Turn power switch ON.
	Circuit breaker is open.	Reset breaker.
	Main fuse is blown.	Replace.
	Faulty supply wiring.	Correct. Refer to certified electrical schematic.
	Defective power switch.	Replace switch.
Sampler does not cycle (Power light ON).	Faulty system wiring.	Correct. Refer to certified electrical schematic.
	Motor power OFF.	Turn ON.
	Motor starter heaters tripped.	Reset.
	Motor burnt out.	Replace.
	Motor thermal overload tripped.	Allow motor to cool and reset.
	Defective timer T-1.	Replace timer if line voltage is present across #1 and #2 on timer T-1.
Sampler leaks air or material continuously out the sample discharge.	Sample cutter not stopping under the seals.	Adjust limit switch. (See Limit Switch Adjustment *on Page 34*.)
	Sampler installed in a pressurized conveying line.	Eliminate pressure or relocate sampler.
	Sample cutter worn.	Inspect and replace. (See Sample Cutter Blade Replacement *on Page 34*.)
	Sample cutter seals deteriorated.	Inspect and replace. (See Sample Cutter Seals Replacement *on Page 34*.)
Sampler makes loud banging noises.	Limit switches not set properly.	Adjust limit switch. (See Sample Cutter Blade Replacement *on Page 34*.)

Sampler Model GCE 45 Parts



NOTE: *The parts pointed out on this page are listed on Pages 39 and 40.*

Sampler Model GCE 45 Parts List

Ref #	Part #	Description	Qty
1	34007	Idler Sprocket	1
2	34008	Idler Shaft	1
3	34672	Idler Mount Base	1
4	34033	#60H Offset Link	2
5	34758	#60H Connector Link	A/R
6	510811	Eye Bolt with Offset Link	2
7	34661	Gearbox Spacer	4
8	35341	Adjusting Limit Switch Roller Arm	2
9	35354	Limit Switch	2
10	514487	Rubber Bumper	2
11	524678	Pelican Inspection Cover Hold-Down Bar	2

Spout Size	Part #	
	Ref #12 (Top)	Ref #13 (Bottom)
10" x 10"	512034	BL10-10x10
12" x 12"	512849	BL14-12x12
14" x 14"	512035	BL14-14x14
16" x 16"	512850	BL18-16x16
18" x 18"	512036	BL18-18x18
20" x 20"	512851	BL22-20x20
22" x 22"	512037	BL22-22x22
24" x 24"	512221	BL26-24x24
26" x 26"	512038	BL26-26x26
28" x 28"	512852	BL30-28x28
30" x 30"	512039	BL30-30x30

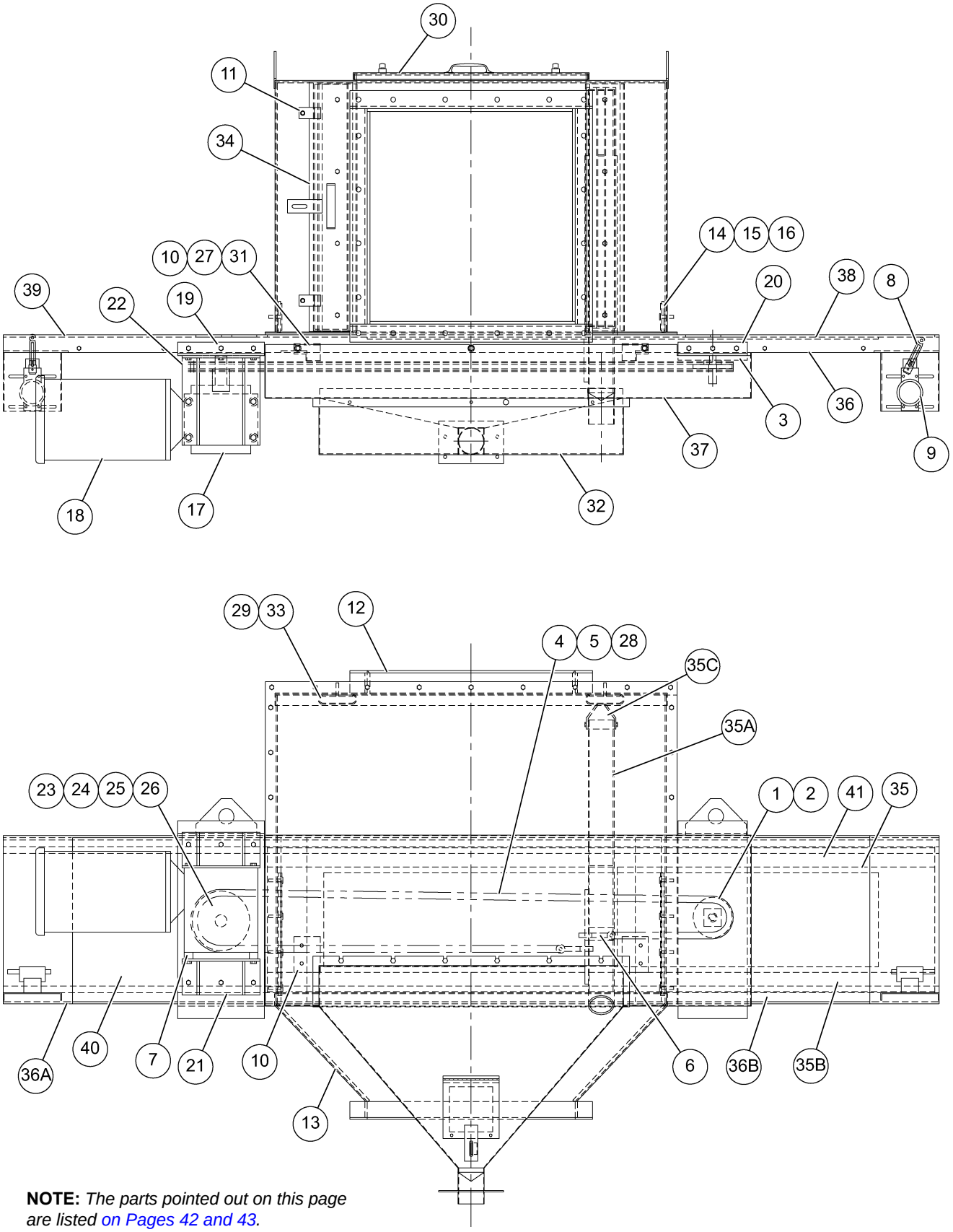
Ref #	Part #		Description	Qty
	10"-14"	18"-30"		
14	SPS-8	SPS-12	Slide Plate Seal	2
15	SPSBB-8	SPSBB-12	Slide Plate Seal Backup Bracket	2
16	SPSRB-8	SPSRB-12	Slide Plate Seal Retainer Bracket	2
17	34378	34376	Gear Reducer	1
18	34380	34379	Electric Motor	1
19	34665	34669	Motor Mount Bracket	1
20	34666	34671	Idler Mount Bracket	1
21	34667	34660	Gear Reducer Mount Bracket	2
22	516814	516815	Clutch Guard	1
23	35462	34370	Clutch	1
24	35464	34371	Clutch Bushing	1
25	35465	34374	Clutch Sprocket	1
26	None	34760	Extra Clutch Spring	1
27	None	523824	Bumper Retainer Plate	2

Ref #	Part #	Description	Machine Size					
			Qty (In Feet)					
			10	14	18	22	26	30
28	34029	#60H Roller Chain	7.00	9.00	9.50	11.00	12.00	13.00
29	34073	3" I.D. Gum Rubber Tube	2.00	2.60	3.50	4.00	4.60	5.40

Ref #	Part #			Description	Qty
	10"	14"	18"		
30	512022	512023	512024	GCE 45 Housing	1
31	515575	515450	523812	Bumper Bracket	2
32	HOP-10-45	HOP-14-45	HOP-18-45	GCE 45 Discharge Hopper	1
33	PDSB-10	PDSB-14	PDSB-18	Pelican Dust Seal Bracket	2
34	525240	525241	525242	Pelican Inspection Cover	1
35	515396	515397	515398	GCE 45 Lined Pelican with Cutter	1
35A	P-10-45	P-14-45	P-18-45	GCE 45 Pelican and Slide Plate	1
35B	511820	511821	511822	GCE 45 Pelican Lining	1
35C	RCB-10	RCB-14	RCB-18	Cutter Blade 3/4" Wide	1
36	515372	515373	515374	GCE 45 Lined Guide Rail	1
36A	512010	512011	512012	GCE 45 Guide Rail	1
36B	511808	511809	511810	GCE 45 Guide Rail Lining	1
37	DG-10-45	DG-14-45	DG-18-45	GCE 45 Drive Guard	1
38	SG-10-P	SG-14-P	SG-18-45P	GCE 45 Solid Guard Plain	1
39	SG-10-D	SG-14-D	SG-18-45D	GCE 45 Solid Guard with Door	1
40	None	None	512048	Expand Metal Guard (Motor)	1
41	None	None	512042	Expand Metal Guard (Idler)	1

Ref #	Part #			Description	Qty
	22"	26"	30"		
30	512025	512026	512027	GCE 45 Housing	1
31	523812	523812	523812	Bumper Bracket	2
32	HOP-22-45	HOP-26-45	HOP-30-45	GCE 45 Discharge Hopper	1
33	PDSB-22	PDSB-26	PDSB-30	Pelican Dust Seal Bracket	2
34	525243	525244	525245	Pelican Inspection Cover	1
35	515399	515400	515401	GCE 45 Lined Pelican with Cutter	1
35A	P-22-45	P-26-45	P-30-45	GCE 45 Pelican and Slide Plate	1
35B	511824	511826	511828	GCE 45 Pelican Lining	1
35C	RCB-22	RCB-26	RCB-30	Cutter Blade 3/4" Wide	1
36	515375	515376	515377	GCE 45 Lined Guide Rail	1
36A	512013	512014	512015	GCE 45 Guide Rail	1
36B	511811	511812	511813	GCE 45 Guide Rail Lining	1
37	DG-22-45	DG-26-45	DG-30-45	GCE 45 Drive Guard	1
38	SG-22-45P	SG-26-45P	SG-30-45P	GCE 45 Solid Guard Plain	1
39	SG-22-45D	SG-26-45D	SG-30-45D	GCE 45 Solid Guard with Door	1
40	512049	512050	512051	Expand Metal Guard (Motor)	1
41	512043	512044	512045	Expand Metal Guard (Idler)	1

Sampler Model GCE 90 Parts



NOTE: *The parts pointed out on this page are listed on Pages 42 and 43.*

Sampler Model GCE 90 Parts List

Ref #	Part #	Description	Qty
1	34007	Idler Sprocket	1
2	34008	Idler Shaft	1
3	34672	Idler Mount Base	1
4	34033	#60H Offset Link	2
5	34758	#60H Connector Link	A/R
6	510811	Eye Bolt with Offset Link	2
7	34661	Gearbox Spacer	4
8	35341	Adjusting Limit Switch Roller Arm	2
9	35354	Limit Switch	2
10	514487	Rubber Bumper	2
11	524678	Pelican Inspection Cover Hold-DN Bar	2

Spout Size	Part #	
	Ref #12 (Top)	Ref #13 (Bottom)
10" x 10"	512034	BS10-10x10
12" x 12"	512849	BS14-12x12
14" x 14"	512035	BS14-14x14
16" x 16"	512850	BS18-16x16
18" x 18"	512036	BS18-18x18
20" x 20"	512851	BS22-20x20
22" x 22"	512037	BS22-22x22
24" x 24"	512221	BS26-24x24
26" x 26"	512038	BS26-26x26
28" x 28"	512852	BS30-28x28
30" x 30"	512039	BS30-30x30

Ref #	Part #		Description	Qty
	10"-14"	18"-30"		
14	SPS-8	SPS-16	Slide Plate Seal	2
15	SPSBB-8	SPSBB-16	Slide Plate Seal Backup Bracket	2
16	SPSRB-8	SPSRB-16	Slide Plate Seal Retainer Bracket	2
17	34378	34376	Gear Reducer	1
18	34380	34379	Electric Motor	1
19	34665	34658	Motor Mount Bracket	1
20	34666	34659	Idler Mount Bracket	1
21	34667	34660	Gear Reducer Mount Bracket	2
22	516814	516815	Clutch Guard	1
23	35462	34370	Clutch	1
24	35464	34371	Clutch Bushing	1
25	35465	34374	Clutch Sprocket	1
26	None	34760	Extra Clutch Spring	1
27	None	523824	Bumper Retainer Plate	2

Ref #	Part #	Description	Machine Size					
			Qty (In Feet)					
			10	14	18	22	26	30
28	34029	#60H Roller Chain	7.00	9.00	9.50	11.00	12.00	13.00
29	34073	3" I.D. Gum Rubber Tube	2.00	2.60	3.50	4.00	4.60	5.40

Ref #	Part #			Description	Qty
	10"	14"	18"		
30	512028	512029	512030	GCE 90 Housing	1
31	515575	515450	523812	Bumper Bracket	2
32	HOP-10-90	HOP-14-90	HOP-18-90	GCE 90 Discharge Hopper	1
33	PDSB-10	PDSB-14	PDSB-18	Pelican Dust Seal Bracket	2
34	525240	525241	525242	Pelican Inspection Cover	1
35	515402	515403	515404	GCE 90 Lined Pelican with Cutter	1
35A	P-10-90	P-14-90	P-18-90	GCE 90 Pelican and Slide Plate	1
35B	511820	511821	511823	GCE 90 Pelican Lining	1
35C	RCB-10	RCB-14	RCB-18	Cutter Blade 3/4" Wide	1
36	515378	515379	515380	GCE 90 Lined Guide Rail	1
36A	512016	512017	512018	GCE 90 Guide Rail	1
36B	511814	511815	511816	GCE 90 Guide Rail Lining	1
37	DG-10-90	DG-14-90	DG-18-90	GCE 90 Drive Guard	1
38	SG-10-P	SG-14-P	SG-18-90P	GCE 90 Solid Guard Plain	1
39	SG-10-D	SG-14-D	SG-18-90D	GCE 90 Solid Guard with Door	1
40	None	None	512804	Expand Metal Guard (Motor)	1
41	None	None	512799	Expand Metal Guard (Idler)	1

Ref #	Part #			Description	Qty
	22"	26"	30"		
30	512031	512032	512033	GCE 90 Housing	1
31	523812	523812	523812	Bumper Bracket	2
32	HOP-22-90	HOP-26-90	HOP-30-90	GCE 90 Discharge Hopper	1
33	PDSB-22	PDSB-26	PDSB-30	Pelican Dust Seal Bracket	2
34	525243	525244	525245	Pelican Inspection Cover	1
35	515405	515406	515407	GCE 90 Lined Pelican with Cutter	1
35A	P-22-90	P-26-90	P-30-90	GCE 90 Pelican and Slide Plate	1
35B	511825	511827	511829	GCE 90 Pelican Lining	1
35C	RCB-22	RCB-26	RCB-30	Cutter Blade 3/4" Wide	1
36	515381	515382	515383	GCE 90 Lined Guide Rail	1
36A	512019	512020	512021	GCE 90 Guide Rail	1
36B	511817	511818	511819	GCE 90 Guide Rail Lining	1
37	DG-22-90	DG-26-90	DG-30-90	GCE 90 Drive Guard	1
38	SG-22-90P	SG-26-90P	SG-30-90P	GCE 90 Solid Guard Plain	1
39	SG-22-90D	SG-26-90D	SG-30-90D	GCE 90 Solid Guard with Door	1
40	512805	512806	512807	Expand Metal Guard (Motor)	1
41	512800	512801	512802	Expand Metal Guard (Idler)	1

NOTES

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

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