SCC 1-Pump 4-Station Controller

Part Number: 882.00245.00
Bulletin Number: CV3-605.1
Effective: 8/23/07

Write Down Your Serial Numbers Here For Future Reference:

_____ _____

_____ _____

_____ _____

We are committed to a continuing program of product improvement.
Specifications, appearance, and dimensions described in this manual are subject to change without notice.

DCN No. _____

Shipping Information

Unpacking and Inspection

You should inspect your equipment for possible shipping damage. Thoroughly check the equipment for any damage that might have occurred in transit, such as broken or loose wiring and components, loose hardware and mounting screws, etc.

In the Event of Shipping Damage

According to the contract terms and conditions of the Carrier, the responsibility of the Shipper ends at the time and place of shipment.

Notify the transportation company's local agent if you discover damage

Hold the damaged goods and packing material for the examining agent's inspection. **Do not return any goods before the transportation company's inspection and authorization.**

File a claim with the transportation company. Substantiate the claim by referring to the agent's report. A certified copy of our invoice is available upon request. The original Bill of Lading is attached to our original invoice. If the shipment was prepaid, write us for a receipted transportation bill.

Advise customer service regarding your wish for assistance and to obtain an RMA (return material authorization) number.

If the Shipment is Not Complete

Check the packing list as back-ordered items are noted on the packing list. In addition to the equipment itself, you should have:

- ☑ Bill of lading
- ☑ Packing list
- ☑ Operating and Installation packet
- ☑ Electrical schematic and panel layout drawings
- ☑ Component instruction manuals (if applicable)

Re-inspect the container and packing material to see if you missed any smaller items during unpacking.

If the Shipment is Not Correct

If the shipment is not what you ordered, **contact the parts and service department immediately** at (262) 641-8610. Have the order number and item number available. *Hold the items until you receive shipping instructions.*

Returns

Do not return any damaged or incorrect items until you receive shipping instructions from the shipping department.

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Chapter 1: Safety

1-1 How to Use This Manual

Use this manual as a guide and reference for installing, operating, and maintaining your equipment. The purpose is to assist you in applying efficient, proven techniques that enhance equipment productivity.

This manual covers only light corrective maintenance. No other maintenance should be undertaken without first contacting a service engineer.

The Functional Description section outlines models covered, standard features, and optional features. Additional sections within the manual provide instructions for installation, pre-operational procedures, operation, preventive maintenance, and corrective maintenance.

The Installation chapter includes required data for receiving, unpacking, inspecting, and setup of the equipment. We can also provide the assistance of a factory-trained technician to help train your operator(s) for a nominal charge. This section includes instructions, checks, and adjustments that should be followed before commencing with operation of the equipment. These instructions are intended to supplement standard shop procedures performed at shift, daily, and weekly intervals.

The Operation chapter includes a description of electrical and mechanical controls, in addition to information for operating the equipment safely and efficiently.

The Maintenance chapter is intended to serve as a source of detailed assembly and disassembly instructions for those areas of the equipment requiring service. Preventive maintenance sections are included to ensure that your equipment provides excellent, long service.

The Troubleshooting chapter serves as a guide for identification of most common problems. Potential problems are listed, along with possible causes and related solutions.

The Appendix contains technical specifications, drawings, schematics, and parts lists. A spare parts list with part numbers specific to your machine is provided with your shipping paperwork package. Refer to this section for a listing of spare parts for purchase. Have your serial number and model number ready when ordering.

Safety Symbols Used in this Manual

The following safety alert symbols are used to alert you to potential personal injury hazards. Obey all safety messages that follow these symbols to avoid possible injury or death.

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

Warning! ***WARNING indicates a potentially hazardous situation or practice which, if not avoided, could result in death or serious injury.***

Caution! ***CAUTION indicates a potentially hazardous situation or practice which, if not avoided, may result in minor or moderate injury or in property damage.***

1-2 Warnings and Precautions

Our equipment is designed to provide safe and reliable operation when installed and operated within design specifications, following national and local safety codes. This may include, but is not limited to OSHA, NEC, CSA, SPI, and any other local, national and international regulations.

To avoid possible personal injury or equipment damage when installing, operating, or maintaining this equipment, use good judgment and follow these safe practices:

- ☑ **Read and follow these operation and installation instructions when installing, operating, and maintaining this equipment. If these instructions become damaged or unreadable, additional copies are available from the manufacturer.**
- ☑ Follow all **SAFETY CODES**.
- ☑ Wear **SAFETY GLASSES** and **WORK GLOVES**.
- ☑ Work only with approved tools and devices.
- ☑ Disconnect and/or lock out power before servicing or maintaining the equipment.
- ☑ Use care when **LOADING**, **UNLOADING**, **RIGGING**, or **MOVING** this equipment.
- ☑ Operate this equipment within design specifications.
- ☑ **OPEN**, **TAG**, and **LOCK ALL DISCONNECTS** before working on equipment. You should remove the fuses and carry them with you.
- ☑ Make sure the equipment and components are properly **GROUNDED** before you switch on power.
- ☑ Use **EXTEREME CAUTION** when working with conveying system. **HIGH VACUUM** can be dangerous. Keep body parts, tools, clothing, and debris away from vacuum inlets.
- ☑ When welding or brazing in or around this equipment, make sure **VENTILATION** is **ADEQUATE**. **PROTECT** adjacent materials from flame or sparks by shielding with sheet metal. An approved **FIRE EXTINGUISHER** should be close at hand and ready for use if needed.
- ☑ Do not restore power until you remove all tools, test equipment, etc., and the equipment and related components are fully reassembled.
- ☑ Only **PROPERLY TRAINED** personnel familiar with the information in this manual should work on this equipment.

We have long recognized the importance of safety and have designed and manufactured our equipment with operator safety as a prime consideration. We expect you, as a user, to abide by the foregoing recommendations in order to make operator safety a reality.

1-3 Responsibility

These machines are constructed for maximum operator safety when used under standard operating conditions and when recommended instructions are followed in the maintenance and operation of the machine.

All personnel engaged in the use of the machine should become familiar with its operation as described in this manual.

Proper operation of the machine promotes safety for the operator and all workers in its vicinity.

Each individual must take responsibility for observing the prescribed safety rules as outlined. All warning and danger signs must be observed and obeyed. All actual or potential danger areas must be reported to your immediate supervisor.

General Responsibility

No matter who you are, safety is important. Owners, operators and maintenance personnel must realize that every day, safety is a vital part of their jobs.

If your main concern is loss of productivity, remember that production is always affected in a negative way following an accident. The following are some of the ways that accidents can affect your production:

- Loss of a skilled operator (temporarily or permanently)
- Breakdown of shop morale
- Costly damage to equipment
- Downtime

An effective safety program is responsible and economically sound.

Organize a safety committee or group, and hold regular meetings. Promote this group from the management level. Through this group, the safety program can be continually reviewed, maintained, and improved. Keep minutes or a record of the meetings.

Hold daily equipment inspections in addition to regular maintenance checks. You will keep your equipment safe for production and exhibit your commitment to safety.

Please read and use this manual as a guide to equipment safety. This manual contains safety warnings throughout, specific to each function and point of operation.

Operator Responsibility

The operator's responsibility does not end with efficient production. The operator usually has the most daily contact with the equipment and intimately knows its capabilities and limitations.

Plant and personnel safety is sometimes forgotten in the desire to meet incentive rates, or through a casual attitude toward machinery formed over a period of months or years. Your employer probably has established a set of safety rules in your workplace. Those rules, this manual, or any other safety information will not keep you from being injured while operating your equipment.

Learn and always use safe operation. Cooperate with co-workers to promote safe practices. Immediately report any potentially dangerous situation to your supervisor or appropriate person.

Maintenance Responsibility

Proper maintenance is essential to safety. If you are a maintenance worker, you must make safety a priority to effectively repair and maintain equipment.

Before removing, adjusting, or replacing parts on a machine, remember to turn off all electric supplies and all accessory equipment at the machine, and disconnect and lockout electrical power. Attach warning tags to the disconnect switch.

Be sure that all non-current carrying parts are correctly connected to earth ground with an electrical conductor that complies with current codes. Install in accordance with national and local codes.

When you have completed the repair or maintenance procedure, check your work and remove your tools, rigging, and handling equipment.

Reporting a Safety Defect

If you believe that your equipment has a defect that could cause injury, you should immediately discontinue its use and inform the manufacturer.

The principle factors that can result in injury are failure to follow proper operating procedures (i.e. lockout/tagout), or failure to maintain a clean and safe working environment.

Chapter 2: Functional Description

2-1 Models Covered in This Manual

This manual provides operation, installation, and maintenance instructions for 1-Pump, 4-Station Conveying Controllers. Model numbers are listed on the serial tag. Make sure you know the model and serial number of your equipment before contacting the manufacturer for parts or service.

The 1-Pump, 4-Station Conveying Controller is a programmable logic controller, with a 24 VDC control circuit, easy-to-use operator interface terminal and optional audible/visual alarm.

2-2 General Description

Our material conveying systems create vacuum for the automatic conveying of most free-flowing, dry, pelletized, or granular materials. Material characteristics determine the type of equipment needed to convey the material.

A typical use for our equipment is an in-plant distribution system for plastic processing plants.

Our central vacuum systems are as varied as the applications they service. The tubing and equipment furnished in our system is designed to convey the material(s) specified at the time of purchase at specific rates and distances.

We can advise you on your system capabilities based on system makeup, distance, material, and conveying rates you want.

System capacity is directly affected by the pressure drop in the overall system, such as number of material line bends, pipe length, Y-tubes, T-tubes, etc.

Use the minimum effective amount of vinyl flex hose to maximize material line efficiency. Keep material lines as straight as possible. Refer to Vacuum Pump Product manual (Part No. A0571050) for installation recommendations.

2-3 Standard Features

Mechanical Features

Time-fill Capability. The length of time allowed for material to drain from the station to its receiver. During this time, the controller does not attempt to deliver any more material to the station.

Volume-fill Capability. The length of time a station's vacuum valve remains open to allow material to be drawn in. The vacuum valve will close when material covers the station's volume-fill proximity sensor or this time elapses, whichever comes first.

Vent Valve Output. The vent valve protects the pump motor from damage during high vacuum conditions if an undetected failure of the vacuum switch should occur. The vent valve limits system vacuum by allowing a plunger in the valve to shift and vent the pump.

Closed-Loop Conveying (Dry or Ambient Air). This feature allows material to be conveyed and processed without being contaminated by outside influences (such as dust, other materials, etc.).

Common Purge Valve Output Control for Each Pump. This feature allows any remaining material to be cleaned out of the vacuum pump or station.

Pump filter cleaning outputs.
Compressed air filter cleaning – when this option is enabled the controller periodically sends compressed air backwards through the pump's air filter to dislodge accumulated dust and debris.

Vacuum pulse filter cleaning - when this option is enabled the controller periodically sends a vacuum pulse backwards through the pump's air filter to dislodge accumulated dust and debris.

Electrical Features

- 115/1/60 supply voltage
- 24 VDC control voltage
- Single-point power and ground connection
- Non-fused disconnect switch, lockable
- Branch circuit fusing
- Fully accessible NEMA 12-style electrical control enclosure

Controller Features

- Mitsubishi programmable control with LED display and keypad interface
- Monitors Station status and Pump status

2-4 Optional Features

Options marked with "*" indicate options that can be factory installed or retrofitted in the field.

230/1/60 Operation. Required to operate with a 230/1/60 supply voltage.

CE Package for 220/1/50 Operation. Required in Europe and other areas that need 220/1/50 supply voltage.

Remote audible/visual alarm. Alarm light and horn assembly that can be remote mounted and wired into the controller to indicate an alarm condition.

2-5 Safety Devices and Interlocks

This section includes information on safety devices and procedures that are inherent to the Controller. This manual is not intended to supersede or alter safety standards established by the user of this equipment. Instead, the material contained in this section is recommended to supplement these procedures in order to provide a safer working environment.

At the completion of this section, the operator and maintenance personnel will be able to do the following:

- Identify and locate specific safety devices.
- Understand the proper use of the safety devices provided.
- Describe the function of the safety device.

Safety Circuit Standards

Safety circuits used in industrial systems protect the operator and maintenance personnel from dangerous energy. They also provide a means of locking out or isolating the energy for servicing equipment.

Various agencies have contributed to the establishment of safety standards that apply to the design and manufacture of automated equipment. The Occupational Safety and Health Administration (OSHA) and the Joint Industrial council (JIC) are just a few of the organizations that have joined with the plastics industry to develop safety standards.

Every effort has been made to incorporate these standards into the design of the conveying system; however, it is the responsibility of the personnel operating and maintaining the equipment to familiarize themselves with the safety procedures and the proper use of any safety devices.

Fail Safe Operation

If a safety device or circuit should fail, the design must be such that the failure causes a "Safe" condition. As an example, a safety switch must be a normally open switch. The switch must be held closed with the device it is to protect. If the switch fails, it will go to the open condition, tripping out the safety circuit.

At no time should the safety device fail and allow the operation to continue for example, if a safety switch is guarding a motor, and the safety switch fails, the motor should not be able to run.

Safety Device Lock-Outs

Some safety devices disconnect electrical energy from a circuit. The safety devices that are used in this Controller are primarily concerned with electrical power disconnection.

WARNING! ***Always disconnect and lockout all electrical power and pneumatic (i.e. compressed air) sources prior to servicing the 1-Pump, 4-Station Controller. Failure to do so may result in serious injury. No one but the person who installed the lockout may remove it.***

Chapter 3: Installation

3-1 Uncrating

1-Pump, 4-Station Controllers are shipped mounted on a skid, enclosed in a plastic wrapper, and contained in a cardboard box.

1. Pry the crating away from the skid.

   Note: ***Remove the nails holding the box to the skid and lift the box off carefully; avoiding staples in the 1' x 4' wood supports. Cut the steel banding.***

2. Use a pry bar to remove the blocks securing the unit to the skid.
3. Lift unit from sides. Use a pry bar if necessary to carefully remove the skid from the unit.
4. Lower slowly.

3-2 Mounting the Control Panel

Note: ***Before you mount the panel, consider how you run wiring to the vacuum hoppers, the filter chamber atmospheric valve (if so equipped) and the pump motor starter(s), vacuum switch(es), and vent valve(s).***

Mount the panel on a flat, vertical area. It should be a visible area that gives your operator access to the control. The panel requires a low voltage power drop as listed on the serial tag.

3-3 Electrical Connections

Refer to local electrical codes, the schematic and connection diagrams supplied with this unit and the serial tag for wiring considerations. Run all wiring in conduit if codes require it.

Making Control Panel Power Drop Wiring Connections

Hardwire the input power at 110/1/50-60 VAC or 230V/1/50-60 VAC, depending on the specifications, which are located on the Control Panel Serial Tag. The main power switch is located on the front of the enclosure.

Caution! ***We recommend that you protect PLC memory by providing the control panel with a dedicated circuit, a true earth ground, and a spike/surge protector.***

Connecting the Control Panel to Vacuum Hoppers

Note: *Wire size depends on control voltage, distance, number of vacuum hoppers, and the number of wires in each raceway. Consult a qualified electrician.*

1. On 24 VDC control voltage systems, run a common +24 VDC wire and a common 0 (zero) VDC wire from the controller to each vacuum hopper in the system.
2. On all systems, run two wires to each vacuum hopper: one each from the controller to the Bin-Full switch (LS) and to the Atmospheric/Sequence-T solenoid (SOL) valve.
3. Make sure that the solenoid and the proximity switch (if supplied) on vacuum hoppers are the same voltage (24 VDC) as the control panel voltage. Consult the control panel serial tag and the solenoid valve nameplates.
4. Properly ground each hopper to reduce static build up generated by material conveying.

Connecting the Control Panel to the Pump Package

1. Wire the pump package motor starter coil to the terminal provided in the control panel enclosure.
2. Wire the pump package vacuum relief valve solenoid to the terminal provided in the control panel enclosure.
3. Wire the pump package vacuum switch to the terminal located in the control panel enclosure (If provided).
4. Wire the pump package motor overload to the terminal provided in the control panel enclosure.
5. On 24 VDC control voltage systems, run a common +24 VDC wire and a common 0 (zero) VDC wire from the controller to each pump package in the conveying system.

Connecting the Control Panel to the Pump Filter Assembly

1. For SFCA models, wire the clearing valve solenoid to the terminals provided in the control panel enclosure.
2. Wire the sealing valve solenoid to the terminals provided in the control panel enclosure.
3. Wire the filter drawer limit switch to the terminals provided in the control panel enclosure.
4. For SFCK models, wire the pump package blowback solenoid to the terminal located in the control panel enclosure. Connect +24VDC to the relay input 15 to enable blowback.

Special Timed Convey

Connect +24VDC to control inputs 11-14 corresponding to Stations 1-4 to enable the Special Convey Feature. This feature will keep a specific hopper loading material regardless of whether the hopper demand signal stays on or not. Sight glass loaders without a bottom flapper will need this feature enabled.

3-4 Setup

This section provides the procedures for configuring your 1-pump, 4-station controller.

Configuration of your controller includes setting the number of stations and pumps, setting variables such as convey time and blow-back interval, and setting up passwords. We recommend that you carry out these procedures in the order given here.

Note: *Before carrying out these procedures, install all equipment as described in this section and in the Conveying Systems manual.*

Basic Menus and Setup of Controller

Once power has been applied to a properly installed system, turn the disconnect switch to the **ON** position. The alpha controller will display the screen for receiver 1 **(Hopper 1)**.

This screen allows the operator to adjust the convey time **(CONVEY)**, dump delay **(DUMP)**, purge time **(PURGE)** and the number of tries before the no convey alarm activates **(NO CONVEY)**.

To disable a station, set the convey time to **0** (zero). To disable purge, set purge to **0** (zero).

Caution! ***DO NOT set the DUMP delay or No Convey to 0 (zero).***

To set the parameters for each receiver, use the left (◄) or right (►) arrow keys to scroll through the settings for the next (►) or previous (◄) receiver.

Setting Pump Parameters

To access the pump screen, press the right arrow key (►) when in the station 5 screen or press the left arrow key (◄) when in the blowback screen.

This screen allows the operator to adjust the pump motor ramp up/ramp down time **(RAMP)** and the amount of time the pump runs unloaded before shutting off **(IDLE)**.

Caution! ***DO NOT set the Idle Time or Ramp Time to 0 (zero).***

Setting Filter Cleaning Blowback Parameters

Once the pump parameters have been set, the filter cleaning blowback parameters will need to be configured. This screen can be accessed for each station, by pressing the right arrow key (►) when in the pump parameters screen (**RAMP** and **IDLE** times are displayed). Press the left arrow key (◄) when in the closed loop convey screen to activate this feature.

This screen allows the operator to adjust all those settings related to cleaning the filter chamber: the number of conveys before blowback **(CNV>FC)**, the duration between blowback pules **(FC OFF)**, the duration of the pulse **(FC ON)**, and the number of cleaning pulses **(FC CYC)**.

Caution! *Setting either the **CNV>FC or FC CYC** parameters to **"0" will disable** the filter cleaning blowback feature.* ***DO NOT set other filter cleaning blowback parameters to "0."***

Closed Loop Convey

To access this screen, press the right arrow key (►) from the filter clean page or the left arrow key (◄) from the status page.

Set the parameter to 1 to enable the closed loop convey for each station. Set to **0** (zero) to disable this feature.

Status Page

To access this screen, press the right arrow key (►) from the closed loop convey screen or the left arrow key (◄) from the I/O screen.

The status page displays whether the convey system is ON or OFF.

Input and Output Screen Features

To access the I/O screen, press the right arrow key (►) when the Blowback Status Parameter screen is displayed or the left arrow key (◄) when the Convey/Dump/No Convey screen is displayed.

The I/O screen allows a service technician to view the status of the controller's inputs and outputs during operation.

Changing Parameters

To change the settings in the Conveying, Pump Parameters, or Blowback screens (To access the required screen, press the right (►) or the left arrow key (◄)), the following operations will need to be performed:

1. When the controller is in the menu screen of the feature you wish to configure, press the up (▲) and down (▼) arrow keys to select the value you wish to change. (The parameter value will flash when selected.)
2. Use the Plus (+) key to increase the value or the Minus (-) key to decrease the value.
3. Press the **OK** key to update and accept the new value entered.
4. Press the **ESC** key to cancel the parameters you entered and return the values to the previous settings.

Chapter 4: Operation

4-1 Overview

Your 1-pump, 4-station controller electrically controls valves and solenoids to convey material from a central location to individual stations as needed. The controller senses demands for material at the stations and responds to the demands in a timely fashion.

This section provides the procedures necessary for using your controller.

Note: *Before you carry out any of the procedures in this chapter, the system must be set up as described in Chapter 3.*

4-2 Starting and Stopping the System

1. Press the green **START** pushbutton in. The controller will display "CONVEY ON" in the status screen.

   Once the system has been started, each active station is polled in sequence for a demand signal. The convey sequence upon initiation, will continue until the set convey time has elapsed or the demand signal stops, whichever happens first. If the Special Timed Convey feature is enabled, conveying will continue until the convey time has elapsed. (Once station dump delay has been initiated during the convey sequence, a new demand signal will be ignored.) If the blowback sequence begins immediately following the convey sequence, the sequence valve will remain open throughout the blowback sequence.

2. To stop conveying, depress the green **START** pushbutton. The controller will display "CONVEY OFF" in the status screen.

4-3 Alarms

If during operation, a station conveys the specified number of consecutive times without clearing the demand signal, the **NO CONVEY alarm** will activate. Press the **ALARM SILENCE** pushbutton and hold it in to clear the alarm. The no convey alarm will sound in **LONG TONES**.

Should the high vacuum pressure switch activate, the **HIGH VACUUM alarm** will sound. Press the **ALARM SILENCE** pushbutton and hold it in to clear the alarm. The high vaccum alarm will sound in **SHORT TONES.**

If the pump motor contactor fails or the pump motor overload trips, the **PUMP FAULT alarm** will be activated. Press the **ALARM SILENCE** pushbutton and hold it in to clear the alarm. The pump fault alarm will sound in a **CONTINUOUS TONE.**

Chapter 5: Maintenance

No Periodic maintenance is required on this unit.

Chapter 6: Configurable Settings

This section describes the proper setup of the 1-pump, 4-station control system parameters. These parameters are operator changeable; however, these items should require setup only during the initial installation. Only authorized personnel should change them.

Many of the variables and setup parameters have been preset at the factory and do not need to be changed. However, this section of the manual will address all of the setup parameters that were available at the time of printing. The purpose of this is to familiarize the reader with all the setup parameters and their usage.

6-1 Options for Station Setup

Name	Description	Default
Conveying Components		
Convey time **(CONVEY)**	Length of time the station's vacuum valve remains open to allow material to be drawn in. (For a volume-fill station, the valve closes when material covers the station's volume-fill proximity sensor or this time elapses, whichever comes first.) Adjust this value to match the actual time needed to fill the station. **To disable a station, set the convey time to Ø (zero).**	15 sec.
Dump delay **(DUMP)**	Length of time allowed for material to drain from the station into the receiver. The controller will not attempt to deliver more material to the station until this time has elapsed. Adjust this value to match the actual time needed to drain the station. If it is set too short, the controller may attempt to refill the station before it is empty, causing material to back up and/or underusing the station's capacity. If it is set too long, the system may be unable to keep up with your equipment's demand for material. **DO NOT SET TO "Ø".**	10 sec.
No convey **(NO CONVEY)**	The controller issues a "no convey" alarm if it has repeatedly attempted to convey material to the station but the flapper never opened during the dump delay. (The number of attempts is controlled by this setting.) The setting for this option depends on (a) how much material your injection mold uses to make each part compared with the capacity of the receiver and (b) how important it is to keep your injection mold from running out of material and shutting down. A higher setting will give you fewer alarms, at the risk of emptying the receiver without warning. A lower setting will give more frequent alarms, at the risk of disrupting operations unnecessarily. **DO NOT SET TO "Ø".**	3
Purge	The length of time to allow material to clear vacuum lines. Set to **0** (zero) to disable purge feature.	Ø (Disabled)
Closed Loop Convey	This feature is used for dry air conveying of dried material. Set to 1 to enable closed loop convey. Set to **0** (zero) to disable.	Ø

6-2 Options for Pump Setup

The ramp time represents the amount of time it takes for the vacuum blower to come up to full speed once it has been turned on. The ramp down time represents the amount of time it takes the blower to stop once it has been turned off.

The ramp up time lets the blower reach full speed unloaded. When the ramp up time is reached, the vent valve will open and allow the pump to draw a vacuum on the main vacuum line. This in turn will open the receiver sequence valve connected to the main vacuum line and allow material to be drawn into the vacuum receiver.

The ramp down time allows the vacuum blower to come to a full stop before it can be started again. This prevents the blower motor from becoming a generator and blowing fuses.

Name	Description	Default
Pump Settings		
Idle **(IDLE)**	Length of time the pump continues to run unloaded without demand from any station. After this time has elapsed, the pump shuts down to save power and to prevent wear on the pump. Adjust this setting to fit the needs of your facility in trading off the savings against the costs associated with waiting for a pump to start up when there is a demand for material.	45 sec.
Ramp Up	This feature specifies the time (in seconds) allowed for the pump motor to reach operating speed.	5 sec.
Ramp Down **(Ramp Dn)**	This feature specifies the time (in seconds) allowed for the pump motor to come to a complete stop.	5 sec.
Conveys Before Blowback **(CNV>FC)**	When this option is enabled, the controller periodically sends compressed air backward through the pump's air filter to dislodge accumulated dust and debris. Enable this option if and only if the pump has the equipment for compressed-air filter cleaning. **Set to Ø to Disable Blowback.**	enabled
	Number of conveying cycles to stations between filter cleanings. Adjust this setting based on experience. The more dust and debris in your material line, the smaller this number needs to be.	5
Pulse On Time **(FC ON)**	Tenths of seconds that the air pulse remains on for each cleaning pulse during filter cleaning. If blow-back is not working as desired, the Sterling service may ask you to change this setting.	1.6 sec.
Pulse Off time **(FC OFF)**	Tenths of seconds between air pulses during filter cleaning. If blow-back is not working as desired, the Sterling service may ask you to change this setting.	0.8 sec.
Numbler of cleaning pulses (No. Pulses) **(FC CYC)**	Number of pulses of compressed air sent through the pump's filter during cleaning. If blow-back is not working as desired, the Sterling service may ask you to change this setting. **Set to Ø to Disable Blowback.**	1
Input 15 not jumpered	Normal filter cleaning.	
Input 15 jumpered	Blowback filter cleaning.	

Chapter 7: Troubleshooting

7-1 General Troubleshooting

Problem	Possible Cause	Solution
The control panel doesn't light up at all	The control panel is not turned on.	Turn on the control panel.
	The external disconnect (recommended) in the dedicated circuit is open (off).	Close the switch (on).
	Fuse/circuit breaker in the power drop is blown/tripped.	Replace/reset.
	Control power switch is broken.	Replace.
A pump package doesn't run, even though it is on-line and its indicator is lit.	The motor overload has tripped.	Reset the overload and check the motor for the proper amp draw on tag.
	Main fuse in power drop or optional fused disconnect has blown.	Replace the fuse.
	Motor contact is faulty.	Repair or replace as required.
A vacuum receiver is being by-passed in the loading cycle.	The vacuum receiver is off-line.	Use the controller to put the vacuum receiver on-line.
	The convey time for the vacuum receiver is set to zero.	Use the controller to enter a longer convey time.
	The field-installed station bypass switch is simulating a Bin Full condition.	Normal operation. Set the switch so the vacuum receiver is back in the loading sequence.
	The field-installed station bypass switch is bad or mis-wired.	Repair, replace, or re-wire.
	The vacuum receiver was assigned to the wrong pump during setup.	Repeat the setup procedure.
Vacuum receivers are overfilling.	Conveying times are too long (Time Fill Mode only).	Time the vacuum receiver (s) during loading, and set the conveying times to a few seconds less.
	Maximum conveying times are too long, and the PLC does not recognize the Vacuum Receiver Full Proximity Switch(es).	Check proximity sensors for proper operation and proper wiring to the PLC. Repair as needed. Reset the conveying times to a reasonable value, and adjust as needed.

7-2 Alarms

The format for all station alarms is "Station *n* [alarm text]," for example, "Station 12 receiver low level." The format for all pump alarms is "Pump *n* [alarm text]." Any alarm that does *not* start with "Station" or "Pump" is a system alarm.

The following tables list all alarms alphabetically, together with possible causes. A "critical" alarm is one that causes the affected device to stop.

Note: *You can also see a list of alarms and their causes in the controller's online help. To display this information, touch the color key of statuses in the upper right-hand corner of either the "Station Status" or the "Pump Status" screen, or touch* ***Help*** *at any other screen. When you are finished reviewing the help, touch* ***Return****.*

Station Alarms

Alarm message	Possible cause
High vacuum	Material line is blocked.
	Vacuum line is blocked.
	Convey time is too long (time-fill station only).
	Sequence valve has malfunctioned.
	Vacuum switch has malfunctioned.
	Note: After you have corrected the cause of this alarm, the alarm will be cleared when the controller has conveyed a full load to this station.
No convey	Material container is empty.
	Material line is disconnected from material source.
	Vacuum line is disconnected from station.
	Take-off compartment is not adjusted properly.
	Convey time is too short.
	Note: As a stopgap measure, you can disable the "no convey" alarm for this station until the problem can be remedied.

Pump Alarms

Alarm message	Possible cause
Pump failure *(Critical)*	Circuit breaker or overload protector has tripped.
	Contactor has malfunctioned.

Chapter 8: Appendix

8-1 Optional Components

The following is a list of options that your controller may be equipped with:

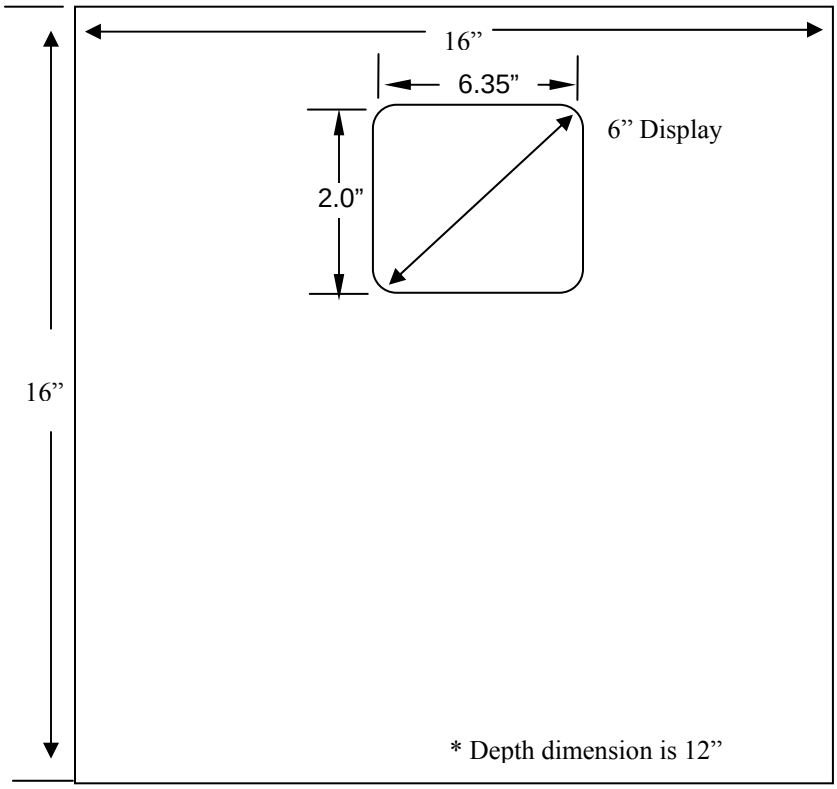
230/1/60 Operation. Required to operate with a 230/1/60 supply voltage.

CE Package for 220/1/50 Operation. Required in Europe and other areas that need 220/1/50 supply voltage.

Remote audible/visual alarm. Alarm light and horn assembly that can be remote mounted and wired into the controller to indicate an alarm condition.

8-2 Drawings and Diagrams

Figure 1: 1-Pump 4 Station Controller



Also, review electrical drawings supplied in the packet with the manual.

8-3 Spare Parts List

Quantity	Part Number	Vendor Part Number	Description
1	A0538007	FNM-6	Fuse
1	A0536896	FNM-2	Fuse

8-4 Returned Material Policy

Credit Returns

Prior to the return of any material, **authorization** must be given by **the manufacturer.** A RMS number will be assigned for the equipment to be returned.

Reason for requesting the return must be given.

All returned material purchased from **the manufacturer** is subject to 15% ($75.00 minimum) restocking charge.

All returns are to be shipped prepaid.

The invoice number and date or purchase order number and date must be supplied.

No credit will be issued for material that is not within the manufacturer's warranty period and/or in new and unused condition, suitable for resale.

Warranty Returns

Prior to the return of any material, **authorization** must be given by **the manufacturer.** A RMS number will be assigned for the equipment to be returned.

Reason for requesting the return must be given.

All returns are to be shipped prepaid.

The invoice number and date or purchase order number and date must be supplied.

After inspecting the material, a replacement or credit will be given, at **the manufacturer's** discretion, if the item is found to be defective in materials or workmanship**.** Purchased components are covered under their specific warranty terms.

8-5 Safety Tag Information

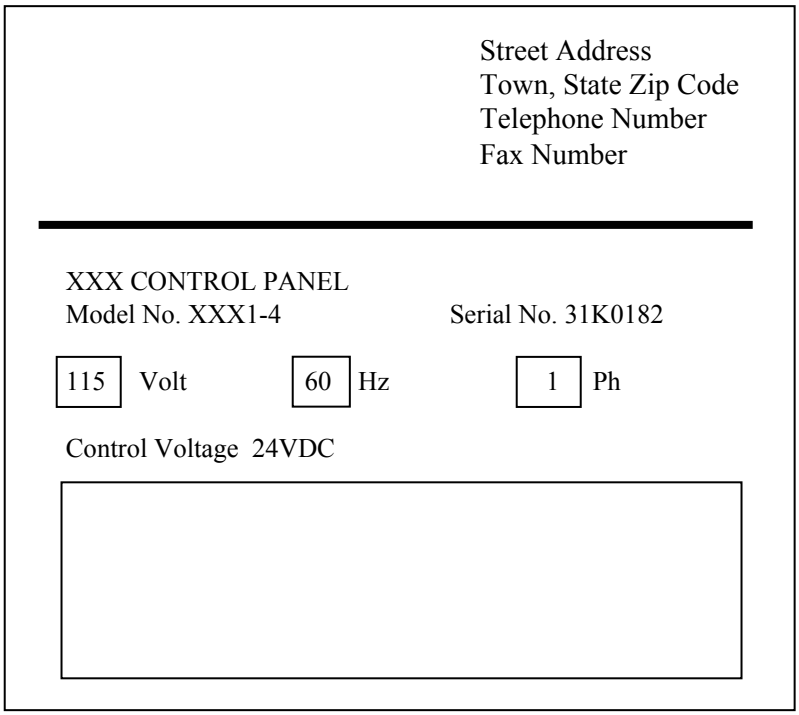
Controller Safety Tags

High Voltage
Inside Enclosure

Read Operation and
Installation Manual

8-6 Controller Identification (Serial Number) Tag

(Located on the side of the controller box)



8-7 Technical Assistance (Contact Information)

Parts Department

Call toll-free 7am–5pm CST [800] 423-3183 or call [262] 641-8610, Fax [262] 641-8653
The ACS Customer Service Group will provide your company with genuine OEM quality parts manufactured to engineering design specifications, which will maximize your equipment's performance and efficiency. To assist in expediting your phone or fax order, please have the model and serial number of your unit when you contact us. A customer replacement parts list is included in this manual for your convenience. ACS welcomes inquiries on all your parts needs and is dedicated to providing excellent customer service.

Service Department

Call toll-free 8am–5pm CST [800] 423-3183 or call [262] 641-8600
Emergencies after 5pm CST, call [847] 439-5655
We have a qualified service department ready to help. Service contracts are available for most products.

Sales Department

Call [262] 641-8610 Monday–Friday, 8am–5pm CST
Our products are sold by a world-wide network of independent sales representatives. Contact our Sales Department for the name of the sales representative nearest you.

Contract Department

Call [262] 641-8610 Monday–Friday, 8am–5pm CST
Let us install your system. The Contract Department offers any or all of these services: project planning; system packages including drawings; equipment, labor, and construction materials; and union or non-union installations.