



SCC 1-Pump 1-Station Controller

Part Number: 882.00244.00
Bulletin Number: CV3-600.1
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. _____

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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, 1-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, 1-Station Conveying Controller is an integrated system composed of a control panel that sends and receives signals to and from a vacuum pump and a material receiver.

2-2 General Description

Our material conveying systems create vacuum for the automatic conveying of most free-flowing, dry, pelletized, or granular materials in central material handling systems. 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, loading silos and bulk storage containers.

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. A0536580) for installation recommendations.

Note: Vacuum leaks occurring in your system reduce capacity.

2-3 Standard Features

Mechanical Features

Sensor-Driven Automatic Machine Bin Filling

- If the machine bin is full, the single-station system does not convey. The system automatically resumes conveying when the material level drops in the machine bin.

Efficient Design Conveying

- Adjustable timer-driven hopper filling.
- Single-station controller systems can be adapted for silo-fill and surge bin applications.
- Ideal for minimum inventory applications.

2-4 Optional Features

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

Rotary Switch for High Level Selection. A ten (10) – position single- or double-pole switch allows you to select from multiple material receivers.

115/1/60 or 24VDC Operation. Required to operate with a 115/1/60 or 24VDC supply voltage.

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, 1-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, 1-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

Connect the control panel to a grounded 115 VAC duplex outlet, as indicated on the serial tag. The control enclosure draws less than two (2) amps during operation at 115 VAC.

Connecting the Control Panel to Vacuum Receivers

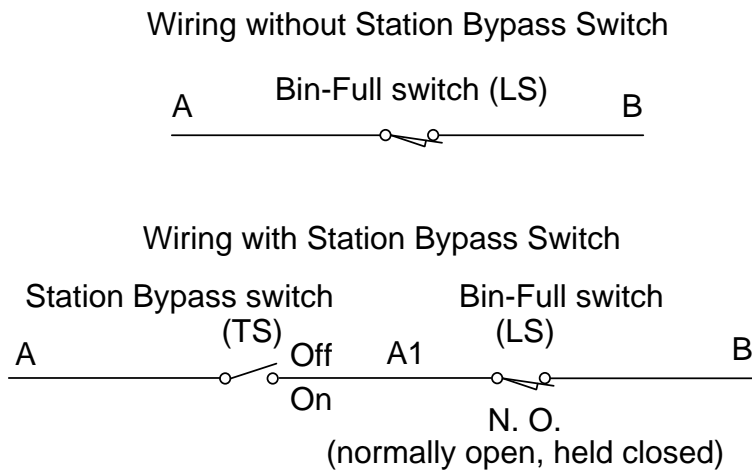
The receiver bin-full sensor is already wired into inputs on a terminal block in the control panel. Refer to the electrical schematic supplied in the information package.

A station bypass switch can be wired into the bin-full sensor circuit as shown in Figure 1 shown below. Mount the switch near the receiver and use it to simulate a bin-full condition. When the switch opens, the control finishes the current cycle then goes into AutoSutdown mode.

Close the switch to restart the conveying sequence.

Note: *This step is useful when servicing the receiver, clearing obstructions, or changing materials or machine bin/silo.*

Figure 1: Station Bypass Switch Diagram



Connecting the Control Panel to the Pump/Blower Package

Wire your single-station control panel to the motor starter coil, vacuum switch, and vent valve on the vacuum pump or blower package. Refer to the electrical schematic enclosed with the unit for more information.

If you purchased the optional rotary-selector switch, connect each receiver bin-full sensor to a terminal block in the control panel. Only one material receiver can be selected at a time. To select a receiver, turn the switch to the receiver number you want, and make the connection to the appropriate vacuum receiver. This method is useful when filling silos one at a time.

3-4 Setup

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

Configuration of your controller includes setting conveying times, . 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.

Setting Conveying Times

DANGER! Disconnect power *BEFORE* opening the control enclosure!

Electric current, capable of causing injury or death may be present in the control enclosure during these procedures. Make sure that all adjustments performed in this chapter are done only by qualified, safety-conscious personnel.

Adjust the vacuum conveying cycle duration by setting the DIP switches in the control enclosure.

Choose the best conveying time for your process by starting with a medium length time setting. Begin to convey material, and note how long it takes to fill the material receiver. The sound of the pump or blower changes and the conveying rate drops off as the receiver fills.

Select a conveying time that is slightly longer than the time it takes to fill the material receiver. The dump delay time is a function of the conveying time you selected and is not independently adjustable.

Note: Verify the program number on the EPROM before you refer to Figure 2 or 3!

Figure 2: DIP Switch Chart for Adjusting Vacuum Time, Program A0538928

Dump delay	20 seconds	25 seconds	30 seconds	35 seconds
7 seconds	1 2 3 4 <input type="checkbox"/> <input type="checkbox"/> <input type="checkbox"/> <input type="checkbox"/> OFF OFF OFF OFF OPEN	1 2 3 4 <input type="checkbox"/> ON <input type="checkbox"/> <input type="checkbox"/> <input type="checkbox"/> <input type="checkbox"/> OFF OFF OFF OPEN	1 2 3 4 <input type="checkbox"/> <input type="checkbox"/> ON <input type="checkbox"/> <input type="checkbox"/> OFF <input type="checkbox"/> OFF OFF OPEN	1 2 3 4 <input type="checkbox"/> ON <input type="checkbox"/> ON <input type="checkbox"/> <input type="checkbox"/> <input type="checkbox"/> <input type="checkbox"/> OFF OFF OPEN
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	1 2 3 4 <input type="checkbox"/> <input type="checkbox"/> <input type="checkbox"/> ON ON OFF OFF <input type="checkbox"/> <input type="checkbox"/> OPEN	1 2 3 4 <input type="checkbox"/> ON <input type="checkbox"/> <input type="checkbox"/> ON ON <input type="checkbox"/> OFF <input type="checkbox"/> <input type="checkbox"/> <input type="checkbox"/> OPEN	1 2 3 4 <input type="checkbox"/> <input type="checkbox"/> ON ON ON ON OFF <input type="checkbox"/> <input type="checkbox"/> <input type="checkbox"/> <input type="checkbox"/> OPEN	1 2 3 4 <input type="checkbox"/> ON ON ON ON <input type="checkbox"/> <input type="checkbox"/> <input type="checkbox"/> <input type="checkbox"/> OPEN

PROGRAM # A0538928

Note: Figure 2 contains two (2) different programs (7 and 10 second dump delay).

Figure 3: DIP Switch Chart for Adjusting Vacuum Time, Program A0541578

Dump delay	1.5 seconds	3.0 seconds	4.0 seconds	6.0 seconds
15 seconds	1 2 3 4 <input type="checkbox"/> <input type="checkbox"/> <input type="checkbox"/> <input type="checkbox"/> OFF OFF OFF OFF OPEN	1 2 3 4 <input type="checkbox"/> ON <input type="checkbox"/> <input type="checkbox"/> <input type="checkbox"/> <input type="checkbox"/> OFF OFF OFF OPEN	1 2 3 4 <input type="checkbox"/> <input type="checkbox"/> ON <input type="checkbox"/> <input type="checkbox"/> OFF <input type="checkbox"/> OFF OFF OPEN	1 2 3 4 ON ON <input type="checkbox"/> <input type="checkbox"/> <input type="checkbox"/> <input type="checkbox"/> OFF OFF OPEN
	9 seconds 1 2 3 4 <input type="checkbox"/> <input type="checkbox"/> ON <input type="checkbox"/> OFF OFF <input type="checkbox"/> OFF OPEN	12 seconds 1 2 3 4 ON <input type="checkbox"/> ON <input type="checkbox"/> <input type="checkbox"/> OFF <input type="checkbox"/> OFF OPEN	15 seconds 1 2 3 4 <input type="checkbox"/> ON ON <input type="checkbox"/> OFF <input type="checkbox"/> <input type="checkbox"/> OFF OPEN	18 seconds 1 2 3 4 ON ON ON <input type="checkbox"/> <input type="checkbox"/> <input type="checkbox"/> <input type="checkbox"/> OFF OPEN
18 seconds	20 seconds 1 2 3 4 <input type="checkbox"/> <input type="checkbox"/> <input type="checkbox"/> ON OFF OFF OFF <input type="checkbox"/> OPEN	25 seconds 1 2 3 4 ON <input type="checkbox"/> <input type="checkbox"/> ON <input type="checkbox"/> OFF OFF <input type="checkbox"/> OPEN	30 seconds 1 2 3 4 <input type="checkbox"/> ON <input type="checkbox"/> ON OFF <input type="checkbox"/> OFF <input type="checkbox"/> OPEN	35 seconds 1 2 3 4 ON ON <input type="checkbox"/> ON <input type="checkbox"/> <input type="checkbox"/> OFF <input type="checkbox"/> OPEN
	40 seconds 1 2 3 4 <input type="checkbox"/> <input type="checkbox"/> ON ON OFF OFF <input type="checkbox"/> <input type="checkbox"/> OPEN	45 seconds 1 2 3 4 ON <input type="checkbox"/> ON ON <input type="checkbox"/> OFF <input type="checkbox"/> <input type="checkbox"/> OPEN	50 seconds 1 2 3 4 <input type="checkbox"/> ON ON ON OFF <input type="checkbox"/> <input type="checkbox"/> <input type="checkbox"/> OPEN	55 seconds 1 2 3 4 ON ON ON ON <input type="checkbox"/> <input type="checkbox"/> <input type="checkbox"/> <input type="checkbox"/> OPEN

PROGRAM # A0541578

Note: *Figure 3 contains two (2) different programs (15 second and 18 second dump delay).*

Setting the Material Receiver Selector Switch (Optional)

1. Connect all proper material and vacuum lines before switching material receivers.
2. Select the material receiver you want. The controller senses the bin-full sensor on the material receiver.

Caution! *Setting the selector to the wrong material receiver can cause a silo to over-fill!*

Do not turn on the pump/blower package until you make all connections and select the proper material receiver.

3. The selector switch allows material to convey only when the controller receives a bin full signal. You must make all other required connections manually.

An optional double pole rotary switch is also available. You can use the additional contact to control a solenoid coil output of the same voltage as the controller, and direct airflow to the material receiver. The primary contact monitors the material receiver bin-full sensor.

Using and Adjusting the Auto-Shutdown Timer (1TMR)

The Auto-Shutdown timer in the control enclosure is factory-set to shut down the vacuum pump package if no material demand is sensed within approximately thirty (30) seconds. A no-material-demand condition occurs if the bin-full sensor on the material receiver trips. The timer starts at the beginning of the dump-delay sequence. Automatic operation resumes when the material level drops in the machine bin or silo below the material receiver and creates a material demand condition.

You can adjust the Auto-Shutdown timer between 0 and 100 seconds. To change the timer setting, locate 1TMR in the control enclosure. Turn the knob clockwise (within the 270° range) to increase the time period that the pump package remains on after the controller senses a no-material-demand condition. Turn the knob counterclockwise to decrease this time.

Note: *The thirty-second (30 sec.) setting is ideal for most conditions.*

Vacuum Switch Operation (1VS)

The vacuum switch is mounted in the pump package junction box. It protects the motor and pump from damaging high vacuum conditions.

Note: *The vacuum switch is preset at the factory for the maximum capacity of the motor and pump, and must not be adjusted!*

Allowing the vacuum switch to be tampered with voids your warranty!

During operation, the power unit draws a vacuum of less than 5" Hg (169 millibars) when only air is pulled into the system; it draws a vacuum of 5" to 10" Hg (169 to 339 millibars) when material conveys. If the vacuum reaches 12" Hg (407 millibars), it indicates an obstruction in the system. The vacuum switch closes and a dump delay sequence starts. This sequence repeats until you clear the obstruction.

Note: *Vacuum draw depends on pump size.*

Mechanical High Vacuum Relief

The regulated vent valve provides a backup mechanical safety that protects the system from damaging high vacuum conditions if the vacuum switch fails. It prevents vacuum from exceeding 14" Hg (475 millibars) by regulating the supply air pressure to the vacuum air cylinder.

Caution! *Do not adjust the air regulator on the vent valve to trip at a point higher than 14" Hg (475 millibars).*

This point is the maximum safe vacuum that the pump package can operate.

Chapter 4: Operation

4-1 Overview

Your 1-pump, 1-station controller sends a control shift signal to a compressed air-operated valve. The valve directs airflow for material conveying, material dumping, and idle position. A vacuum switch and a mechanical vacuum relief valve can be used to protect the vacuum pump and motor from high amp draw damage.

The conveying cycle is determined by signals from a sensor mounted in the vacuum receivers and interpreted by the controller. The controller monitors current system status and sends the convey signal to the system until material levels send a signal to the controller to stop conveying.

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 Startup

Pre-Startup Checks

Before operating the single-station controller or any other part of your conveying system, check these items:

1. Verify that all components in the system are installed securely and ready to operate. Refer to the instructions supplied with auxiliary equipment for specific checks.
2. Make sure that couplers, fittings, attachments, and flexible lines are securely attached and are vacuum-tight.
3. Verify that all electrical and compressed air connections to the vacuum pump/blower package are complete, tight, and safe.
4. Fill the vacuum pump blower gearbox with oil, based on the manufacturer's instructions included in your Customer Information Packet.

Caution! *Do not overfill the gearbox. Too much oil can damage the blower.*

5. If you haven't already done so, remove the plastic plug from the air inlet.

WARNING! *KEEP HANDS AWAY FROM THE OPEN AIR INLET TO AVOID INJURY!*

6. Verify that no loose parts, tools, or foreign materials are in or near the unit or other system components.
7. Turn off the compressed air supply, switch on the power at the external fuse box or disconnect, and move the main power on the control enclosure to the ON position.
8. Using the ON/OFF switch, turn on the pump just long enough to verify that the motor is rotating in the proper direction.

Changing Motor Rotation Direction

If the motor is rotating in the wrong direction, do the following:

1. Disconnect the power at the external disconnect.
2. Switch any two incoming power leads on the main power supply.

Caution! *Do not change wiring at the motor starter!*

Starting the System

After you completely install the conveying system and make all pre-startup checks, perform the following procedure to operate the system.

1. Turn on compressed air to the power unit solenoid valve and set the supply regulator at 80 psi (551.6 kPa/5.52 bars).
2. Close the disconnect switch on the electric supply circuit and on the vacuum pump package.
3. Move the ON/OFF switch in the ON position.

Note: *The pump does not turn on until the first dump delay is complete. Conveying then begins.*

4-3 Control Panel Components

Once the controller has been configured according to the instructions listed in Section 3-4, The only procedure necessary to begin conveying, is to turn on the controller using the Power toggle switch described below. If the controller is equipped with the Optional Material Receiver Selector Switch, then the operator will need to select the material receiver to convey to before turning on the Power toggle switch on the controller.

Material Receiver Selector Switch (Optional)

The MATERIAL RECEIVER SELECTOR switch (Shown in Figure 4 on Page 19) allows you to select the material receiver from multiple material receivers for time-filling. It is typically used in railcar unloading processes.

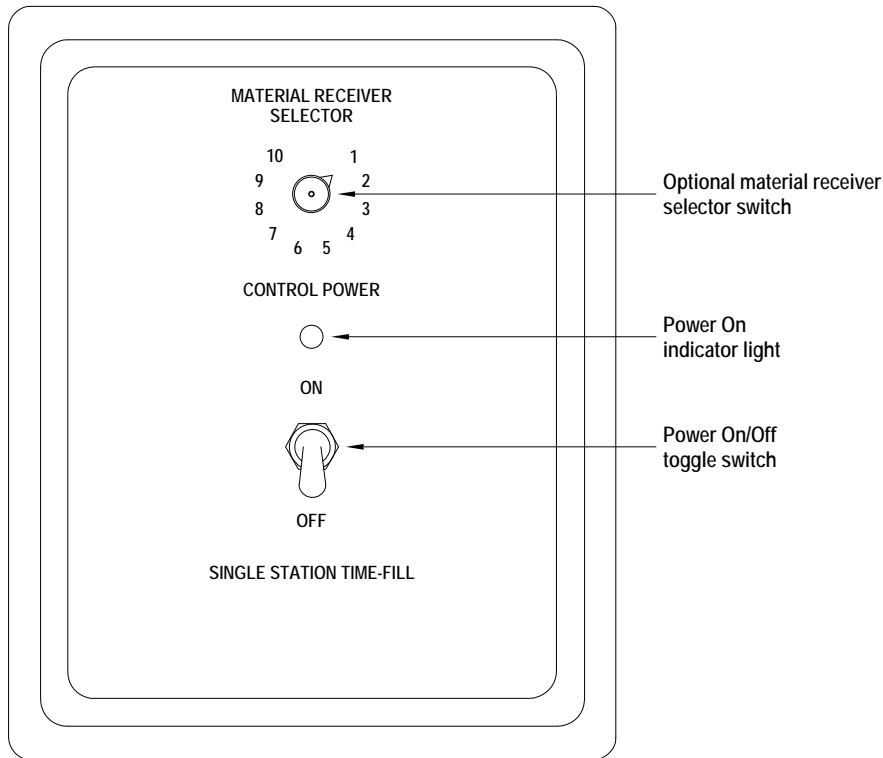
Control Power Indicator Light

The CONTROL POWER indicator light illuminates when the control panel energizes.

Control Power Toggle Switch

The CONTROL POWER switch starts or stops the conveying cycle. If you selected a material receiver with a material demand condition, the cycle begins. This switch also lets you turn the vacuum pump or blower on and off.

Figure 4: Control Panel Components



4-4 Operation Sequence

Once the controller has been energized, the following will occur:

1. The dump delay/blowback sequence occurs.
2. The vacuum pump/blower motor starts and the pump vent valve directs vacuum through the material receiver.
3. The material discharge valve seals under the vacuum.
4. The material receiver fills until the DIP switch-set vacuum timer times out.
5. The vent valve shifts, breaking vacuum.
6. The dump delay blowback sequence begins. The material discharge valve opens and the material leaves the receiver.

If the switch on the material discharge valve senses a full machine bin, the vacuum pump motor shuts down, based on an adjustable auto-shutdown time. When the controller senses a need for material, it restarts the cycle after Step 1.

4-5 Shutting Down the System

1. Move the power switch on the control box to the OFF position.
2. Disconnect main power to the pump package at the disconnect switch in the junction box.
3. For maintenance or long-term shut-down, unplug the control panel from the power source, disconnect main power to the vacuum pump motor, and turn off compressed air.

Chapter 5: Maintenance

Our conveying systems require periodic maintenance to provide long, dependable service. For maintaining mechanical components in your conveying system, see the Conveying System Mechanical Components manual (Part No. A0536580) for more information.

Caution! *Keep the electrical panel closed securely to prevent contaminating the components with material and to prevent electrical shock.*

Don't defeat the disconnect!

Chapter 6: Troubleshooting

6-1 General Troubleshooting

Note: For more information on troubleshooting your conveying system, see the Conveying System Mechanical Components manual (Part No. A0536580).

Problem	Possible cause	Solution
A pump/blower package doesn't run.	No power to the control box.	Plug in the power cord. Check the main disconnect.
	Power switch is off.	Turn ON the control box.
	Power switch has failed.	Replace the switch.
	Fuse is blown.	Replace the fuse.
	The machine bin is full.	The hopper operates after the material level drops.
	The high level switch has failed.	Replace the switch.
	The discharge valve is blocked.	Remove the obstruction and check for free movement of the flapper assembly.
	Loose control wiring.	Secure all terminal connections.
	Motor connections are loose.	Reattach blowback and motor connections.
	The motor overload has tripped.	Reset the overload and check the motor for the proper amp draw on tag.
	The circuit board has failed.	Replace the circuit board.
	Main fuse in power drop or optional fused disconnect has blown.	Replace the fuse.
	The relay has failed.	Replace the relay.
	The Auto-Shutdown timer has failed.	Replace the timer.
The noise suppressor has failed.	Replace the suppressor.	
A material receiver is being by-passed in the loading cycle.	The bin below it is full if its amber indicator light is off.	Normal operation. When the level drops, the hopper is conveyed to.
	The hopper is off line.	Using the controller, place the hopper on line.
	The convey time for the hopper is set to zero.	Using the controller, enter a reasonable convey time.
	The field-installed station bypass switch is simulating a Bin Full condition.	Normal operation. Set the switch so the hopper is back in the loading sequence.
	The field-installed station bypass switch is bad or mis-wired.	Repair, replace, or rewire.

Problem	Possible cause	Solution
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The material receiver does not completely fill.	Vacuum time is too short.	Lengthen vacuum time.
	Material supply is too low.	Refill material supply.
	Material probe is not positioned correctly in material supply.	Adjust the material probe at the pickup point.
	Material probe is not adjusted to the characteristics of the material.	Adjust the material probe to compensate for flow characteristics.
	Obstructions in the supply line.	Clear all obstructions in the line.
	The filter is dirty.	Clean or replace the filter.
The POWER light does not illuminate.	A terminal connection is loose.	Secure terminal connections on the terminal board.
	The light is burned out.	Replace the light (1LT).
The power light doesn't light when the ON/OFF switch is in the ON position and the unit won't run.	The disconnect switch on the unit or in the power drop is open.	Close the switch.
	The fuse(s) in the power drop disconnect switch is (are) open.	Replace the fuse(s).
	Fuse(s) 1FU has/have opened.	Replace the fuse(s).
Hopper over-fills repeatedly.	Vacuum time is too long.	Decrease vacuum time.
High vacuum condition.	Material line obstruction.	Clear the material line.
	Material probe obstruction.	Reposition or clear the probe.
	Railcar air intake is blocked.	Clean or clear the filter.
	Vacuum switch failed.	Replace the vacuum switch.
	Wiring fault in the vacuum switch.	Check connections.
POWER light on, but pump/ blower motor doesn't run.	Machine bin is filled with an adequate material supply.	Normal operation. The unit resumes operation when the bin level drops.
	The motor overload (10L) has tripped and taken the motor off line.	Reset the overload and check the motor for the proper amp draw as listed on the nameplate.
	The motor starter (10L) has failed.	Repair or replace the motor starter as needed.
Pressure present at the vacuum unit.	Improper blower rotation.	Switch any two wires at the incoming power mains on the disconnect.
Unit shifts into blowback cycle repeatedly.	Vacuum switch (1VS) detects a high vacuum condition.	A material line is plugged.
		Filter chamber needs cleaning.
		Switch may be mis-wired (initial startup).

Problem	Possible cause	Solution
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Vacuum conveying rates decline.	Vacuum leak in the system.	Find the leak and repair it.
	Filter in filter chamber is plugged.	Clean thoroughly; replace if worn.
	Material receiver filter is plugged.	Clean thoroughly; replace if worn.
	Blower is dead-headed.	Check the blower inlet for obstructions.
	Valve(s) not seating properly.	Service valve(s).
	Low air pressure.	Verify minimum of 80 psi (551.6 kPa/5.52 bars) supply air pressure.

Chapter 7: Appendix

7-1 Optional Components

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

Rotary Switch for High Level Selection. A ten (10) – position single- or double-pole switch allows you to select from multiple material receivers.

115/1/60 or 24VDC Operation. Required to operate with a 115/1/60 or 24VDC supply voltage.

7-2 Drawings and Diagrams

Figure 5: Receiver Wiring Details

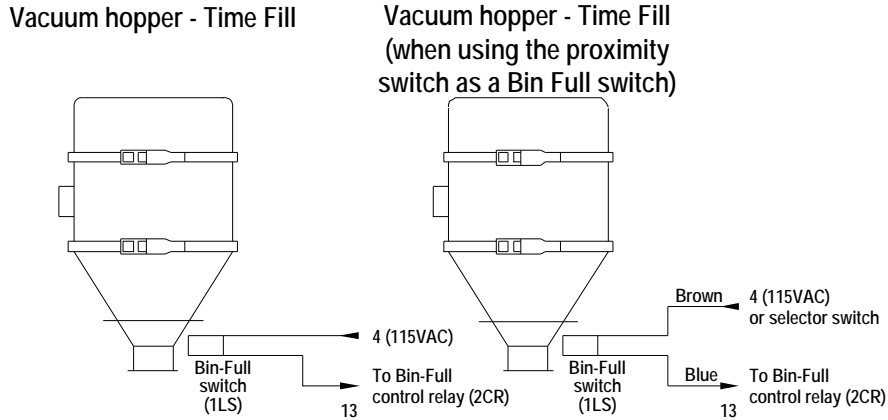


Figure 6: Typical Single-Station Electrical Schematic without Optional Material Receiver Selector Switch Circuit

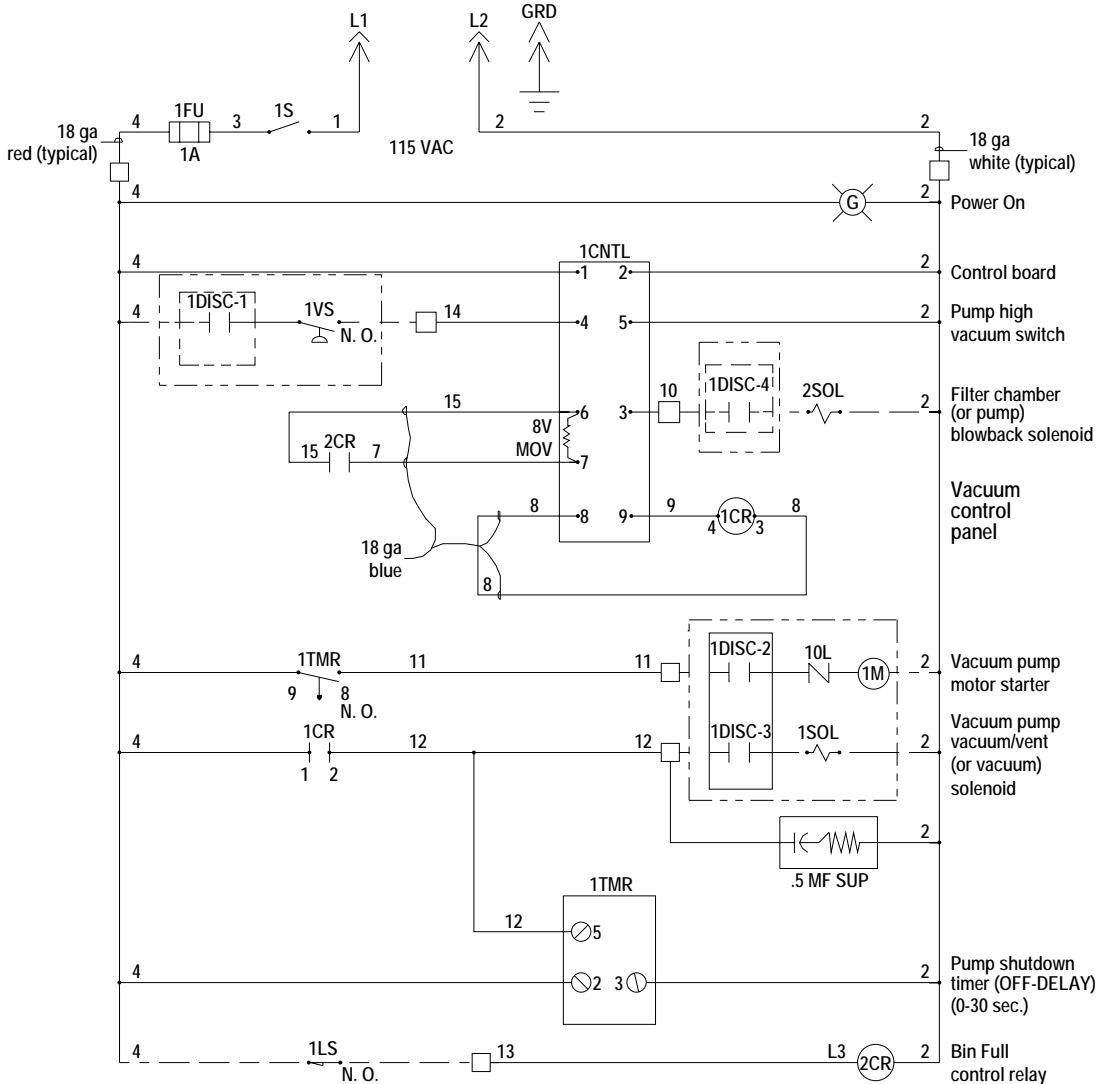
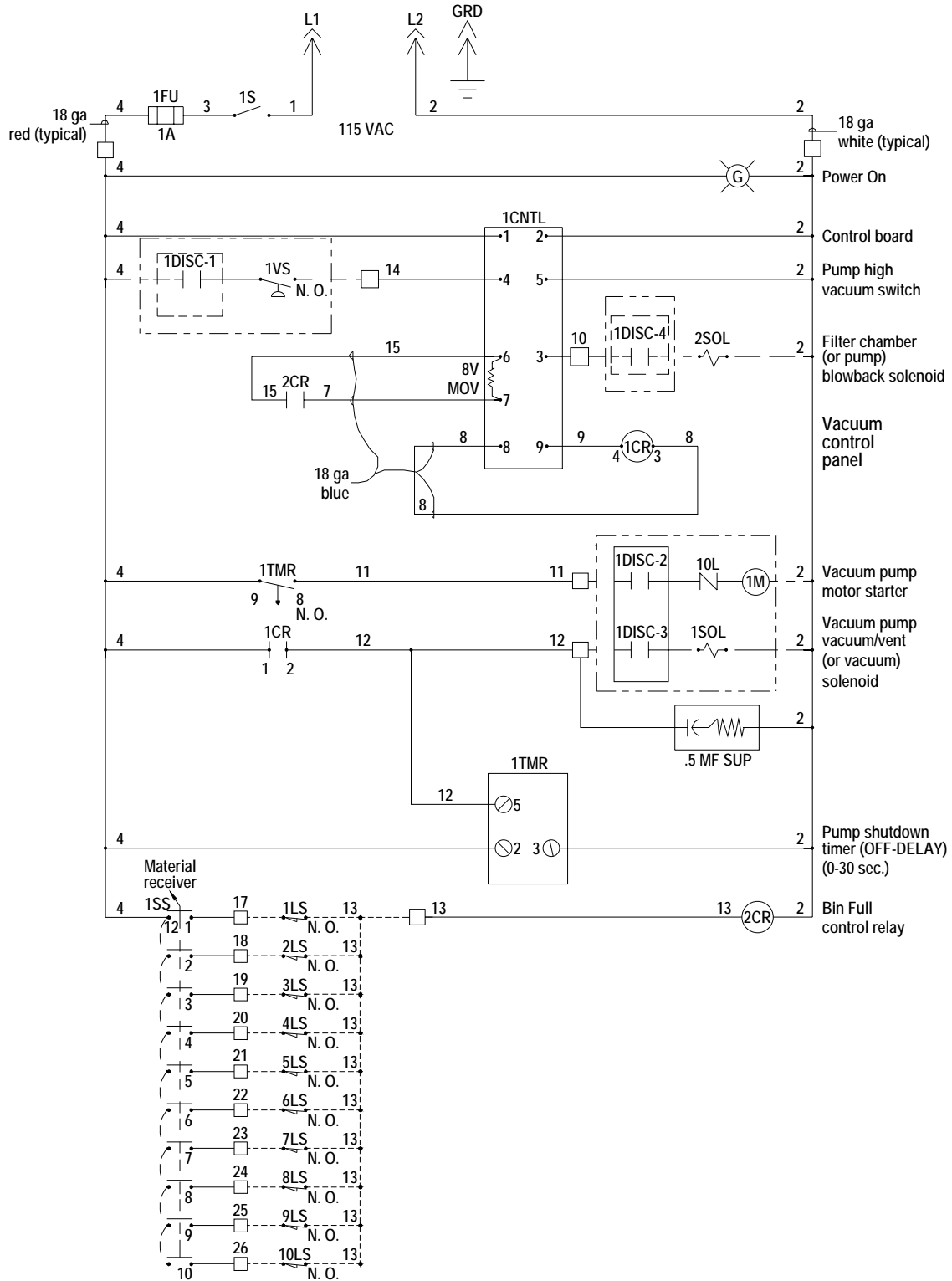
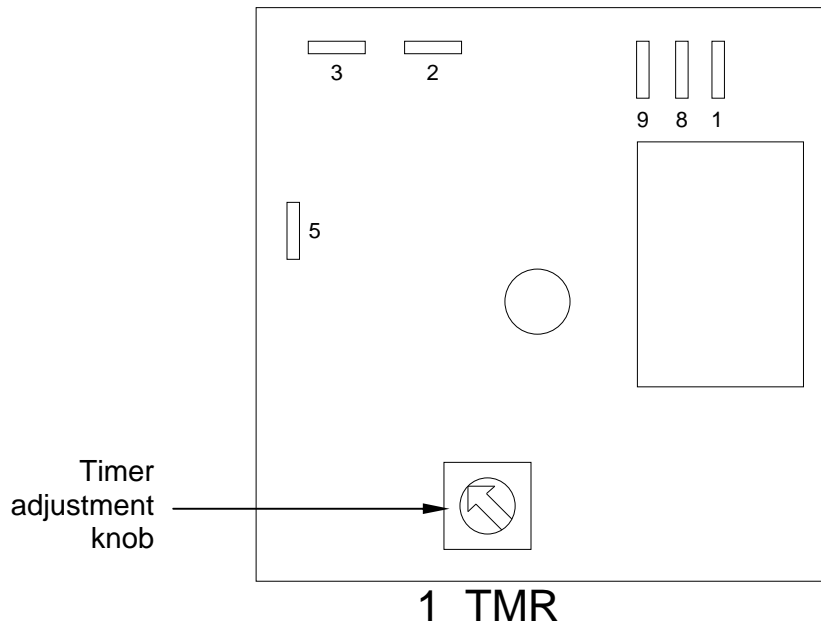


Figure 7: Typical Single-Station Electrical Schematic with Optional Material Receiver Selector Switch Circuit



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

Figure 8: Auto Shutdown Timer



7-3 Spare Parts List

Part No.	Description
A0536932	Auto Shutdown Timer
A0536546	Solid State Relay
A0539361	Control Board
A0503765	Relay
A0536646	Neon Light
W00014987	Sequence Valve Solenoid (24V)
W00014988	Sequence Valve Solenoid (115V)

7-4 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.

7-5 Safety Tag Information

Controller Safety Tags



High Voltage
Inside Enclosure



Read Operation and
Installation Manual

7-6 Controller Identification (Serial Number) Tag

(Located on the side of the controller box)

Street Address		
Town, State Zip Code		
Telephone Number		
Fax Number		
<hr/>		
XXX CONTROL PANEL		
Model No. XXX1-1		Serial No. 31K0182
115	Volt	60
		Hz
		1
		Ph
Control Voltage 24VDC		
<div style="border: 1px solid black; height: 40px; width: 100%;"></div>		

7-7 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] 641-8610

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.