



Powder Hopper Loaders

Part Number: 882.00238.00
Bulletin Number: CV1-605.2
Effective: 4/15/08

Write down your Powder _____

Hopper Loader(s) serial _____

numbers here for _____

future reference _____

Performance figures stated in this manual are based on a standard atmosphere of 59°F (15°C) at 29.92" Hg (1,014 millibars) at sea level, using 60 Hz power. Altitude is an important consideration when specifying hopper loaders. ACS can advise you on proper selection and sizing of systems for your operating environment.

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

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Safety Considerations

Powder hopper loaders are designed to provide safe and reliable operation when installed and operated within design specifications, following national and local safety codes.

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

- ☑ Follow all **SAFETY CODES**.
- ☑ Wear **SAFETY GLASSES** and **WORK GLOVES**.
- ☑ Disconnect and/or lock out power before servicing or maintaining the powder hopper loader.
- ☑ 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 hopper loader and components are properly **GROUNDING** before you switch on power.
- ☑ Do not jump or bypass any electrical safety control.
- ☑ Do not restore power until you remove all tools, test equipment, etc., and the powder hopper loader and related equipment are fully reassembled.
- ☑ Only **PROPERLY TRAINED** personnel familiar with the information in this manual should work on this equipment.

Annex B Information

The following design information is provided for your reference:

1. No modifications are allowed to this equipment that could alter the CE compliance
2. Ambient temperature: 40 degrees Celsius – Maximum (104 degrees Fahrenheit)
3. Humidity range: 50% relative humidity
4. Altitude: Sea level
5. Environment: Clean, dust-free and non-explosive
6. Radiation: None
7. Vibration: Minimal, i.e. machine mounting
8. Special installation requirements: Clean, dry compressed air 1 cfm @ 60 psi
(1.7 m³/hr @ 4.14 bar)
9. Allowable voltage fluctuation: +/- 10%
10. Allowable frequency fluctuation: Continuous +/- 1%
Intermittent +/- 2%
11. N/A
12. Nominal supply voltage: 120/1/60 or 220/1/50/60 (Verify on serial number tag)
13. Earth ground type: TN (system has one point directly earthed through a protective conductor)
14. Power supply should include a neutral power connection.
15. Over-current protection is supplied in the loader, but additional protection should be supplied by the user.
16. The plug on the power cord serves as the electrical disconnect device.
17. Unit is not equipped with three-phase motors.
18. N/A
19. Loader is not equipped with local lighting.
20. Functional identification
21. Loader is equipped with a CE mark
22. Loader is supplied with an operating manual in the language of the destination country.
23. Cable support may be required for power cord, depending on final installation.
24. No one is required to be in the interior of the electrical enclosure during the normal operation of the unit. Only skilled electricians should be inside the enclosure for maintenance.
25. Doors can be opened with a screwdriver, but no keys are required.
26. Two-hand control is not required or provided.
27. All loaders should be moved around and set in a place with a lift truck or equivalent.
28. There are no frequent repetitive cycles that require manual control—repetitive functions are automatic while the loader is operating.
29. An inspection report detailing the functional test is included with the loader.
30. The machine is not equipped with cableless controls.
31. Color-coded (harmonized) power cord is sufficient for proper installation.

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1-1 Introduction

Powder hopper loaders economically and efficiently load free-flowing pellets or granular materials from supply containers into machine bins or other receivers. They are a modular, stainless steel component design using significant operational advantages. They're engineered construction permits easier cleaning and maintenance, and they can be quickly and easily reconfigured to accommodate future production requirements. Simple electrical and compressed air connections are all that's needed for operation; central vacuum systems are not necessary.

Powder hopper loaders use an integral-mount three-stage centrifugal motor with a quick-disconnect power cord. The receiver-mounted junction box is pre-wired to the field-mounted control box. The powder hopper loader features a high-flow blowback valve to enhance cleaning its acrylic/mesh flat filter, providing excellent filtration of conveying air. Powder hopper loaders also feature a counter-weighted flapper assembly.

1-2 Equipment Function

Powder hopper loaders are efficient conveyers of free-flowing powder, pelletized or granular materials. They are typically used to convey material from supply containers into machine bins or other receivers. You can customize operation by adjusting operating parameters accessible through a menu system built into the control. Simple electrical and compressed air connections are all that's needed for operation; a central vacuum system is not necessary.

1-3 Accessories

ACS offers a variety of standard options for the powder loaders. All accessories are designed and manufactured by ACS, Inc. to ensure proper results for your application.

1-4 Customer Service

The intent of this manual is to familiarize the operator and maintenance personnel with this equipment and help your organization get the maximum service from your equipment. If you have any questions regarding installation, service, repair, custom equipment, or applications, please do not hesitate to contact us for the information required. Prices for additional equipment, accessories, or repair parts will be furnished promptly upon request.

NOTICE: If you desire to use a loader for an application other than that for which it was purchased, please contact your sales representative or our factory to verify compatibility of the equipment with the new process. Misapplication of the equipment could result in injury to the operator or damage to the equipment.

1-5 Necessary Documents

The items listed here are required for installation, operation, and maintenance of powder hopper loaders. Additional copies are available from the manufacturer.

- This product manual.
- Product manuals for accessories and options selected by the customer, where installed.

1-6 System Capabilities

Loading systems are as varied as the applications that they service. This equipment is intended to load the materials(s) specified at the time of purchase at specific rates.

1-7 Models Covered in this Manual

Models are designated by capacity. Powder hopper loaders are available in 1.6 cu. ft. (45.3 liters) capacities and hold approximately 50 lbs. of material.

Powder Hopper Loaders models	Capacity			
	cu. ft.	liters	lbs.	kg
50(E)	1.6	45	50	22

Note: (E) Denotes “CE” models, including 220/1/50 operation and CE mark.



1-8 Standard Features

Powder Hopper Loaders

- Stainless steel vacuum receiver
 - Tangential 1½” (38mm) OD material inlet
- High flow blowback valve with electrical quick disconnect and accumulator
- Twin bag filter assembly with glazed polyester filter bags
- Receiver-mounted junction box with 8 feet (2.6 m) of cable to a field-mounted control box
- Material demand/level sensor
- High-performance centrifugal motor with electrical quick disconnect
- Sound enclosure
- 9-foot (2.7 m) power cord
- Dual tube aluminum pickup wand with ten (10) feet (3 m) of grounded flexible vinyl hose and two (2) hose clamps
- Counter-weighted flapper assembly.

2-1 Work Rules

Install, operate, and maintain this equipment according to applicable work and safety codes for your location. This includes OSHA, CE, NEC, CSA, SPI, and many other local, national, and international regulations. Obey these specific work rules:

- ☐ Read and follow the instructions in this manual before installing, operating, or maintaining any equipment. Additional copies are available from the manufacturer.
- ☐ Only qualified persons should work on, or with, this equipment.
- ☐ Work only with approved tools and devices.
- ☐ Disconnect and lock out power while working on this equipment.

2-2 Tools and Equipment Needed

You'll need the following:

- Hand tools
- Fork lift or overhead lift
- Wire, conduit, and fittings for wiring runs (if receptacle is not already in place)
- Mounting bolts with lock nuts and washers, or pop rivets
- Compressed air tubing and fittings

2-3 Mechanical Installation

Loaders are typically mounted on the machine supply hopper. Be sure it is securely attached and additional bracing is used if necessary. The sections on the following pages explain general installation rules.



Read manual thoroughly before installing loader.



Use approved safety straps or chains to lift the loader at the marked lifting points.

2-4 Safety Considerations

The terms **NOTICE**, **CAUTION**, **WARNING**, and **DANGER** have specific meanings in this manual. *See Section 11 for a complete list of specific safety warning information.*

A **NOTICE** is used to indicate a statement of company policy directly or indirectly related to the safety of personnel or protection of property.

A **CAUTION** indicates a potentially hazardous situation which, if not avoided, may result in minor or moderate injury.



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

A **DANGER** indicates an imminently hazardous situation which, if not avoided, will result in death or serious injury. This word will be limited to the most serious situation(s).



The term **IMPORTANT** emphasizes areas where equipment damage could result, or provides additional information to make a step or procedure easier to understand. Disregarding information marked **IMPORTANT** would not be likely to cause personal injury.

REPORTING A SAFETY DEFECT

NOTE: If you believe that your equipment has a defect which could cause injury, you should immediately discontinue its use and inform the manufacturer at our address listed in this manual.

The principle factors which can result in injury are:

- Failure to follow proper operating and clean-out procedures, i.e. lockout/tagout.
- Failure to maintain a clean and safe working environment.

2-5 General Responsibility

NO MATTER WHO YOU ARE...

Safety is important. Owners, operators, and maintenance personnel must realize that every day, safety is a vital aspect of their jobs.

If your main concern is loss of productivity, remember this: **Production is always affected in a negative way following an accident.** The following are some of the reasons, which can affect your production:

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

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.

2-6 Operator Responsibility

The operator's responsibility does not end with efficient production. The operator usually has the most daily contact with the loader 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.

ONLY YOU can make safety work for you by constantly thinking about what is safe and what is not. It is often the "just once" that an operator reaches into a loader to remove material and it results in serious injury.

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.

REMEMBER:

- **NEVER** place your hands or any part of your body in any dangerous location.
- **NEVER** operate, service, or adjust the loader without appropriate training and first reading and understanding this manual.
- **NEVER** try to pull material out of the loader with your hands while it is running!
- Before you start the loader check the following:
 - Remove all tools from the blender;
 - Be sure no objects (tools, nuts, bolts, clamps, bars) are laying in the metering or mixing area;

- If your blender has been inoperative or unattended, check all settings before starting the unit.
- At the beginning of your shift and after breaks, verify that the controls and other auxiliary equipment are functioning properly.
- Keep all safety guards in place and in good repair. **NEVER** attempt to bypass, modify, or remove safety guards. Such alteration is not only unsafe, but will void the warranty on your equipment.
- When changing control settings to perform a different mode of operation, be sure selector switches are correctly positioned. Locking selector switches should only be adjusted by authorized personnel and the keys removed after setting.
- Report the following occurrences **IMMEDIATELY**:
 - unsafe operation or condition
 - unusual blender action
 - leakage
 - improper maintenance
- **NEVER** stand or sit where you could slip or stumble into the loader while working on it.
- **DO NOT** wear loose clothing or jewelry, which can be caught while working on a loader. Also cover or tie back long hair.
- Clean the loader and surrounding area **DAILY**, and inspect the machine for loose, missing or broken parts.
- Shut off power to the loader when it is not in use. Turn the switch to the **OFF** position, or unplug it from the power source.

2-7 Maintenance Responsibility

Safety is essential to the good health of both operator and machine. If you are a maintenance worker, you must make safety a priority in order to effectively repair and maintain equipment.

BEFORE REMOVING, ADJUSTING, OR REPLACING PARTS ON A MACHINE, REMEMBER TO DO THE FOLLOWING:

- **BLEED** all air pressure from system components (refer to the Maintenance Section of this manual.)
- **TURN OFF** all air and electric supplies and all accessory equipment at the machine.
- **DISCONNECT AND LOCK OUT** electrical and pneumatic power, and attach warning tags to the disconnect switch and air shutoff valve.

When you need to perform maintenance or repair work on a loader above floor level, use a solid platform or a hydraulic elevator. If there is a permanently installed catwalk on your loader, use it. The work platform should have secure footing and a place for tools and parts. **DO NOT** climb on loaders, machines, or work from ladders.

If you need to repair a large component, use appropriate handling equipment. Before you use handling equipment (portable “A” frames, electric boom trucks, fork trucks, overhead cranes) be sure the load does not exceed the capacity of the handling equipment or cause it to become unstable.

Carefully test the condition of lifting cables, chains, ropes, slings, and hooks before using them to lift a load.

Be sure that all non-current carrying parts of electrical apparatus, electrical component enclosures, and the loader frame are correctly connected to earth ground with an electrical conductor that complies with current codes. Install in accordance with national and local codes, which apply.

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

Do not restore power to the loader until all persons are clear of the area. Start and run the loader until you are sure all parts are functioning correctly.

BEFORE you turn the loader over to the operator for production, verify all guards and safety devices are in place and functioning properly.

2-8 Safety

2-8-1 Description and Objectives

This section includes information on safety devices and procedures that are inherent to the Powder Hopper Loading system. 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:

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

2-8-2 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 the 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 Powder Hopper Loading 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.

2-8-3 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.

2-8-4 Safety Device Lock-Outs

Some safety devices disconnect electrical energy from a circuit. The safety devices that are utilized on powder hopper loader models are primarily concerned with the pneumatics and electrical power disconnection, and the disabling of moving parts that may need to be accessed during the normal operation of the machine.

Some of the safety devices utilize a manual activator. This is the method of initiating the safety lock out. This may be in the form of a plug, disconnect plug, lever or a handle. Within this lockable handle, there may be a location for a padlock. Personnel servicing the equipment should place a padlock in the lockout handle.

WARNING! Always disconnect and lockout all electrical power and pneumatic (i.e. compressed air) sources prior to servicing or cleaning any loader, including all units. Failure to do so may result in serious injury.



At no time must *anyone* remove the lockout or reconnect the twist plug, other than the person who installed the lockout or who unplugged the twist plug.

2-8-5 Lock-Outs, Plugs, and Other Safety Devices

The Powder Hopper Loading system utilizes several types of safety devices.

The Line Cord Plug

This line cord plug allows the operator or maintenance personnel to unplug the loading system from its power source and tag it out. This plug may be tagged with any number of approved electrical lockout tags. These tags are available at most electrical supply stores.

WARNING!



Disconnect both of these items to ensure optimum maintenance personnel safety when cleaning or servicing this equipment.

Figure 1
Typical Powder Hopper Loader



Figure 2
Powder Hopper Loader Dimensions, Specifications, and Maximum Machine-Side Throughput

Specifications

Model	Hopper capacity				Full-load amps (FLA)	Inlet size range		Shipping weight	
	cu. ft.	Liters	lbs.	Kg		inches	mm	lbs.	Kg
Powder Hopper Loader	1.6	45	50	22	11	1½"	38 mm	120	55

Maximum Machine-Side Throughput

Model	lbs./hr.	Kg/hr.
Powder Hopper Loader	1000	454

Note: Twelve (12) -foot (3.66 m) vertical 1½" OD (approx. 38 mm) flex hose; free-flowing powder @ 35 lbs./cu. ft. (560 Kg/cu. m)

ACS, Inc. is committed to a continuing program of product improvement. Specifications, appearances, and dimensions are subject to change without notice.

3-1 Unpacking and Inspection

You should inspect your powder hopper loader for possible shipping damage. If the container and packing materials are in reusable condition, save them for reshipment if necessary.

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 case of breakage, damage, shortage, or incorrect shipment, refer to the following sections.

3-2 In the Event of Shipping Damages

Important!



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 to the manufacturer before the transportation company inspection and authorization.**
- ☑ File a claim against 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 the manufacturer regarding your wish for assistance and to obtain an RMA (return material authorization) number.

Parcel Post Shipment

- ☑ Notify the manufacturer at once in writing, giving details of the loss or damage. This information is required for filing a claim with our insurance company.
- ☑ Hold the damaged goods with the container and packing materials for possible inspection by postal authorities.

United Parcel Service Shipment

- ☑ Contact your local UPS office regarding damage and insurance claims.
- ☑ Retain the container and packing.
- ☑ Notify the manufacturer at once.

3-3 If the Shipment is Not Complete

Check the packing list. The apparent shortage may be intentional. Back-ordered items are noted on the packing list. You should have:

- ☑ Powder hopper loader(s) with controller(s)
- ☑ Bill of lading
- ☑ Packing list
- ☑ Operating and Installation packet
- ☑ Electrical schematic and panel layout drawings
- ☑ Component instruction manuals

Re-inspect the container and packing material to see if you missed any smaller items during unpacking. Determine that the item was not inadvertently taken from the area before you checked in the shipment. Notify the manufacturer immediately of the shortage.

3-4 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.*

3-5 Returns

Important!



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

4-1 Safety Considerations

- ☑ Connect the hopper loader to a grounded three-prong power receptacle. If this is not possible, ground the hopper loader motor for electrical isolation and protection from electric shock.
- ☑ Do not use hopper loaders in explosive atmospheres.
- ☑ Do not use outdoors or in wet environments. Moisture damages the motor and can create an electric shock hazard.
- ☑ Operate hopper loaders at the rated voltage. Operation at other than design voltage can result in, at best, poor performance, and can cause damage to the vacuum motor, control, and personnel.

4-2 Necessary Tools

- ☑ Hand drill
- ☑ Pop-rivet gun
- ☑ $\frac{3}{16}$ " (about 4.8 mm) -diameter rivets

4-3 Mounting Powder Hopper Loaders

Important!



You can mount your powder hopper loader directly to the processing machine by cutting a hole in the machine bin lid and fastening the hopper loader to it. The hopper loader mounting flange mates with ACS equipment and uses the same mounting holes as previous ACS models.

For new installations or mounting on other manufacturer's equipment, a hole location template is included in the information packet.

Important!



The manufacturer is not responsible for equipment damage from excessive processing machine movement or vibration.

4-5 Mounting Tips

- Run a bead of silicone sealant around the mounting flange before seating the hopper loader. This provides an additional seal.
- Use **rivets** to mount the hopper loader. Bolts, nuts, and washers can loosen, fall into, and damage process equipment.
- Check across the mounting flange with a bubble level. Level installation ensures proper material discharge valve operation.
- Install controller boxes to a non-moving solid structure to avoid loosening any wiring from vibration.
- Remove all rubber banding and any other packaging materials from around the flapper dump valve **before** installation for proper operation.

4-6 Attaching the Pickup Wand

Slide the flex hose onto the material inlet and pickup wand. Strip material away from the ground wire in the hose and secure the bare wire under the hose so it is in contact with the metal tube. Use the hose clamps supplied to secure the flex hose.

The pickup wand can be adjusted for maximum performance. Insert it into the material to be conveyed. Adjust the tube by loosening the wing nut at the top and sliding the wand assembly to maintain performance.

The material should flow freely and not surge through the hose.

4-7 Making Compressed Air Connections

Your powder hopper loader requires a clean, dry, 80 to 120 psi (551.6 to 827.4 kPa/5.52 to 8.27 bars) compressed air supply. A

filter, regulator, and shutoff valve are recommended components of your in-plant compressed air supply.

You may need to install an accumulator in your air supply system to enhance blowback effectiveness if your system cannot consistently meet these requirements. Make sure you use full-sized 1/2" diameter pipe or tubing when making connections.

4-8 Making Electrical Connections

The controller you selected is shipped pre-wired to the hopper loader. Units are supplied with a power cord with plug wired to the control unit, ready to plug into an appropriately grounded three-prong receptacle.

Make sure that the material demand sensor is installed with the proper amount of clearance, and that it is free of obstructions.

If the installation has the hopper loader wired directly to a power main, you must install a fused disconnect with lockout to allow safe operation and maintenance. **Make sure all connections are *tight*.**

5-1 Pre-Startup Checklist

- Are all electrical connections correct, secure, and to code?
- Is the compressed air connection secure and safe?
- Is the receiver level and mounted securely?
- Are the flex hose and pick-up wand secure?
- Is the flexible hose properly grounded?
- Can the material level switch activate without obstruction?**
- Can the material discharge valve swing without obstruction?**

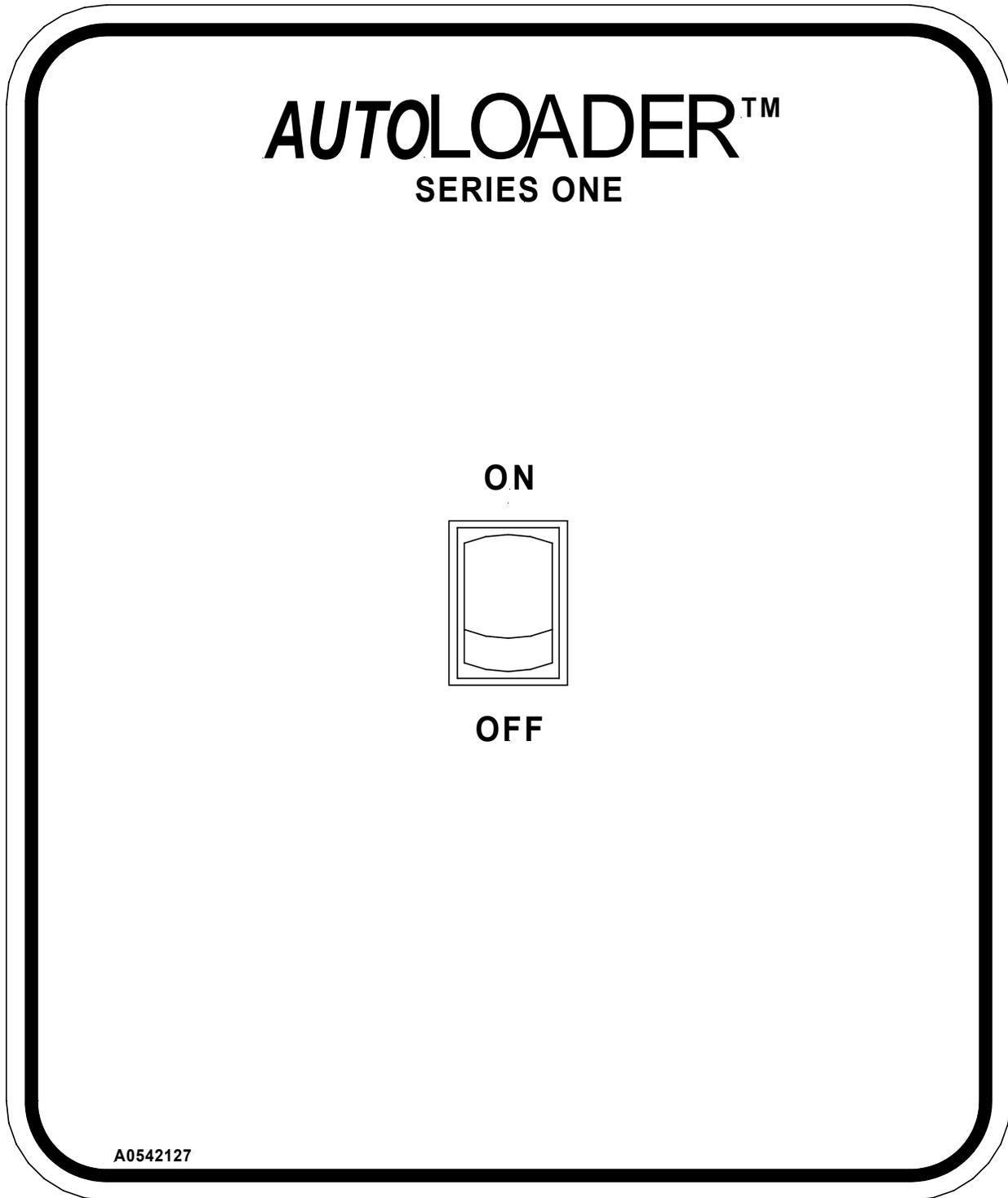
5-2 Operating Sequence

1. Blowback sequence.
2. Motor starts.
3. Flapper discharge valve seals under vacuum.
4. Material conveys.
5. Vacuum receiver fills.
6. Vacuum timer times out.
7. Motor stops.
8. Blowback sequence begins, the flapper discharge valve opens under the weight, and material dumps.

Steps 1 through 8 repeat automatically.

If the level switch remains open, the receiver loader remains idle until the material level in the bin drops and frees the counterbalanced dump valve. Steps 1 through 8 in the loading sequence as listed above then resume automatically.

Figure 4
Series One Control Panel



5-3 Starting the Loader

1. Insert the pickup probe into the material supply.
2. Turn on compressed air to the unit.
3. Plug in power to the control enclosure.
4. Move the power switch on the Series One graphic panel to the **ON** position.

5-4 Changing the Conveying Sequence

DANGER!



DISCONNECT POWER *BEFORE* OPENING THE CONTROL BOX.

Electric current, *CAPABLE OF CAUSING INJURY OR DEATH*, MAY BE PRESENT in the controller enclosure during these procedures.

The adjustments listed in this section must be performed *ONLY* by a qualified, safety-conscious technician.

The Series One controller is a time-fill mode controller, and has sixteen (16) loading sequences to select. **Make sure you avoid over-filling the receiver!** Figure 2 lists loading times and number of blowback pulses in each sequence. **Use the chart as your model;** select a sequence that suits your needs.

To select a sequence:

1. Turn off and disconnect power to the unit.
2. Remove the controller box cover.
3. Move the DIP switches on the DIP switch array labeled **SW1** to one of the sixteen (16) available configurations as shown in Figure 8.
4. Replace the controller box cover.
5. Reconnect power to the Series 1 controller and prepare the unit for operation.

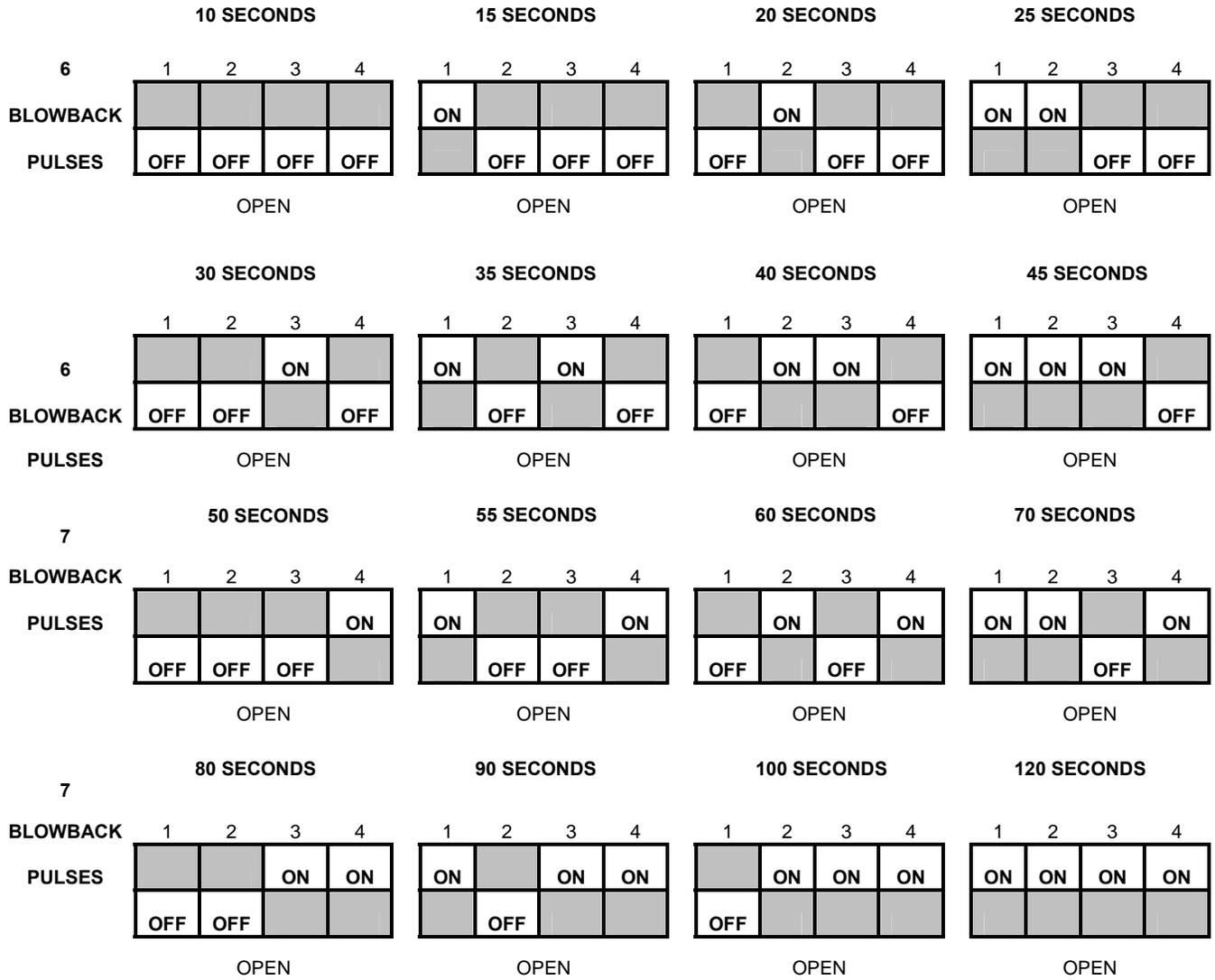
Note: Figure 7 contains two (2) different programs (12 and 14 blowback pulses).

5-5 Selecting the Most Efficient Loading Sequence

By selecting the best sequence, you can reduce vacuum motor wear, save energy, and reduce your need to maintain filters.

1. Begin with a sequence time longer than what is required for your process.
2. Start up the hopper loader with the Series One controller.
3. Observe the flex hose and the material in which you buried the pickup probe. Listen to the vacuum motor and the sound that the material makes as it enters the hopper loader.
4. When the hopper loader is full, the conveying rate drops off sharply. You can observe this condition in the clear flex hose and the material container in which you buried the pickup probe. When the hopper loader is full, the vacuum motor and material sounds also change.
5. Make a note of the elapsed time from the start of conveying to the time the hopper loader is full.
6. See Figures 7 and 8; pick the next-shorter sequence. For example, if the hopper is full by the 90-second point of the conveying sequence, select the 80-second conveying sequence.

Figure 5
Conveying Sequence DIP Switch Chart, Program A0536814



Note: Figure 4 contains two (2) different programs (6 and 7 blowback pulses).

5-6 Shutting Down the Hopper Loader Using the Series One Controller

- Move the power switch on the Series One graphic panel to the **OFF** position.

For maintenance or for a long-term shutdown, **unplug the unit from the power source** and shut off the compressed air supply.

6-1 Routine Maintenance

Cleaning Filters

Check the condition of the filter assembly frequently until you can determine a filter-cleaning interval. Units conveying dusty or fine materials need more frequent cleaning. Note that a clogged filter can reduce the overall capacity of the loader.

Replace the filter bags if they show any signs of wear. You can obtain replacements from the manufacturer.

To gain access to the filter, release the cover latches and lift the hopper/lid assembly off, grasping the lip of the filter assembly and remove.

CAUTION!



Do not lift the cover assembly by the motor, piping, or accumulator.

These components are not designed to support the assembly.

Checking Flex Hose for Wear

Worn hoses can cause leaks and reduce conveying rates. Check the hose regularly.

Inspect Material Discharge Valves

Look for signs of wear, improper operation, or material obstruction. Make sure that the flapper discharge valve is secure and free from all obstructions.

Note: Powder hopper loaders that convey very abrasive and/or very dusty materials may require more frequent maintenance.

6-2 Replacing Motor Brushes

Note: Make sure that you replace motor brushes **before** the brush shunt touches the commutator. Replacements and spares are available from the manufacturer.

Powder hopper loader vacuum motor brushes require periodic replacement. Maintain a supply of motor brushes, and establish a preventive maintenance program to reduce downtime.

Make sure that you **properly seat replacement brushes** to achieve maximum service life. Unseated brushes may fail prematurely and increase your maintenance workload.



WARNING!

HAZARDOUS ELECTRICAL CURRENT PRESENT.
Secure the machine *BEFORE* servicing!

WEAR SAFETY GLASSES *BEFORE* performing this procedure!

Use a stable platform if working above floor level.

Removing Old Motor Brushes

1. If you haven't already done so, disconnect the hopper loader from the electrical supply!
2. Disconnect motor and blowback connection receptacles at the control enclosure.
3. Release the latches that secure the cover assembly. Lift off the cover assembly by the edges.

Remove the motor from the cover assembly by carefully releasing the springs. Springs are under tension, so be very careful!

5. Remove the brush end cap, then the two brush clips from the brush holder.
6. Remove the two brushes from the brush holder, and replace with new brushes.

Replacement and Reassembly

1. Re-attach the brush clips and the end cap after you make sure that the brush assembly is properly seated.

Following steps 5 and 6 above, perform the same procedure for the opposite side.

2. Remove the armature assembly at the top portion of the hopper loader to properly seat the replacement brushes.
3. Insert a strip of 600-grit sandpaper with the rough side facing the brush.
4. Release the brush and rotate the commutator back and forth by hand (See the alternative seating procedure on the facing page) so that the brush is sanded to match the arc of the commutator.
5. In older motors, the wear of the brushes creates a shallow trough in the commutator. Sand the brush to conform to the contour.
6. Remove the sandpaper, and repeat steps 5 and 6, as needed until all brushes are replaced.
7. Reinstall the armature assembly.

Seating Motor Brushes

You have two (2) options for seating motor brushes (Steps 5 to 11):

Option 1

- Run the powder hopper loader at 50% to 75% voltage for about 30 minutes.
- Apply power from a variable transformer at the motor disconnect, not at the control box.

Option 2

- Connect two (2) hopper loader motors in series and run them for about 30 minutes.

WARNING!



On motors using white AMP disconnects, make sure power is not applied to the green ground wire; otherwise, the motor housing becomes electrically “hot.”
Reducing line voltage may be accomplished by using a variable transformer or by connecting two identical motors in series.

Powder Hopper Loaders

Problem	Possible cause	Solution
Hopper loader does not work.	No power to control box.	Plug in power cord. Check main disconnect.
	Power switch is off.	Turn ON control box.
	Fuse is blown.	Replace the MDL 10 fuse.
	The bin below the hopper loader is filled to capacity.	Unit resumes operation when the material level drops; <i>this is normal.</i>
	Fouled flapper discharge valve.	Remove obstruction; check for free movement of flapper assembly.
	Build-up on flapper.	Clean and readjust for material flow characteristics.
	Loose control wiring.	Secure all terminal connections.
	Blowback and motor connections are not secure.	Reattach blowback and/or motor connections.
	Power switch has failed.	Replace switch.
	Reed switch has failed.	Replace reed switch, adjust magnet.
	Circuit board has failed.	Replace circuit board.
Vacuum motor does not work.	The bin below the hopper loader is filled to capacity.	Unit resumes operation when the material level drops; <i>this is normal.</i>
	Motor assembly is not properly connected to the controller.	Plug motor assembly into the controller enclosure.
	Fuse is blown.	Replace fuse with an MDL 10 fuse.
	Motor requires servicing.	Repair or replace motor as needed.

Powder Hopper Loaders *Cont'd.*

Problem	Possible cause	Solution
Blowback does not work properly.	Air pressure is too low.	Increase air pressure to at least 80 psi (551.6 kPa/5.52 bars).
	Air supply to blowback is restricted.	Make sure piping is full size.
		Remove all restrictions in air supply.
	Blowback valve assembly is not connected to controller.	Connect blowback assembly to controller at the proper receptacle.
	Control wiring connections are loose on the circuit board.	Secure terminal connections of the controller wiring on the circuit board.
Solenoid valve or valve coil has failed.	Repair or replace solenoid valve as needed.	
Hopper does not completely fill.	Material supply is low.	Refill material supply.
	Selected conveying sequence is too short.	Select a more suitable sequence from the 16 selections; see Section 4-4 on Pages 29 to 30 for more information.
	Material probe not properly positioned in material supply.	Adjust material probe at material pickup point.
	Material probe not adjusted for flow characteristics of material.	Adjust material probe to compensate for flow characteristics; see Section 3-8 for more information.
	Obstructions in supply line.	Clear all obstructions in the line.
	Filter is dirty.	Clean or replace filter as needed.
	Filter is clogged, holding open the flapper discharge valve.	Replace filter as needed.
Power light does not work.	Terminal connection is loose.	Secure terminal connections on the terminal board.
	Light is burned out.	Replace light.
	Wire has been cut.	Replace wire; replace light.
Hopper over-fills repeatedly.	The loading sequence is too long.	Select a more suitable sequence from the 16 selections; see Section 4-4 for more information.

Your loader may have been equipped with the following options:

Special Voltages

Models are also available in 230/1/50 and 230/1/60 supply voltages.

9-1 Powder Hopper Loader System Component Description

This section describes the various components of the loading system. The loading system is made up of the following components:

- Stainless steel vacuum receiver
 - Tangential 1½” OD (about 38.1 mm OD) material inlet
- High flow blowback valve with electrical quick disconnect and accumulator
- Twin bag filter assembly with glazed polyester filter bags
- Receiver-mounted junction box with 8 feet (2.6 m) of cable to a field-mounted control box
- Material demand/level sensor
- High-performance centrifugal motor with electrical quick disconnect
- Sound enclosure
- 9-foot (2.7 m) power cord
- Dual tube aluminum pickup wand with ten (10) feet (3 m) of grounded flexible vinyl hose and two (2) hose clamps
- Counter-weighted flapper assembly.

9-2-1 Overview

Component Identification and Location

This section will familiarize the reader with the components of the powder loading system. After reading this section, the reader will be able to identify the individual common components of the loading system.

10-1 Contact Information for Technical Assistance

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 of our products. www.acscustomerservice.com

Sales Department

Call [262] 641-8610 Monday–Friday, 8am–5pm CST

Our products are sold by a worldwide 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.

10-2 Returned Material Policy

10-2-1 Credit Returns

1. Prior to the return of any material **authorization** must be given by the manufacturer. A RMA number will be assigned for the equipment to be returned.
2. Reason for requesting the return must be given.

3. ALL returned material purchased from the manufacturer returned is subject to 15% (\$75.00 minimum) restocking charge.
4. ALL returns are to be shipped prepaid.
5. The invoice number and date or purchase order number and date must be supplied.
6. 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.

10-2-2 Warranty Returns

1. Prior to the return of any material, authorization must be given by the manufacturer. A RMA number will be assigned for the equipment to be returned.
2. Reason for requesting the return must be given.
3. All returns are to be shipped prepaid.
4. The invoice number and date or purchase order number and date must be supplied.
5. 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, and it was manufactured by ACS, purchased components are covered under their specific warranty terms.

11-1 Powder Hopper Loader Safety Tags



**Pinch Point
Slide Gate**



**Read Operation
and Installation
Manual**



**High Voltage
Inside Enclosure**



Earth Ground



**Protected Earth
Ground**



Lifting Point

11-2 Pushbutton and Keypad Tags

Button Position



ON



OFF

Function

Turns power on to the loader.

Turns power off to the loader.

11-3 Loader Identification (Serial Number) Tag

(Located on back of mixing chamber)

	
Series Powder Hopper Loader Model Number 50E Max Capacity 227 KG/HR	
220V	Serial Number 060701
1Ø	Date of Manufacture 06/2002
A	
Over-current Protection Device (s) A Total	
Frequency 50/60Hz	
Compressed air supply 4.14 bar (60 psi)	
Mass 110 lbs/(50 KG)	
Electrical Diagrams	_____
Pneumatic Diagram	_____
2900 S. 160th Street New Berlin, Wisconsin USA (262) 641-8600	