

Spencer® Jet-Clean™ Separator

Serial No:

Model No:

Filter Bags:

Installation, Operation and Maintenance Instructions



Important

Do not operate machine in unstable, low-flow range (surge).

Read and become familiar with this manual prior to uncrating and installing your Spencer Vacuum equipment. This precision equipment is capable of extended service and lifespan. Realization of this potential can best be achieved through proper handling and adherence to the instructions detailed here. Damage resulting from failure to follow correct procedures will void warranty.

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Warranty:

Spencer warrants that this product will be free from defects in material and workmanship for a period of 18 months from date of shipment or 12 months from date of start-up, whichever comes first. Within the warranty period, we shall repair or replace, F.O.B. our Factory or designated service center, such products that are determined by us to be defective.

Caution: The Spencer Turbine Company is not responsible for wear or corrosion caused by the material being handled or failure due to corrosion or abrasion.

This warranty will not apply to any product which has been subjected to misuse, negligence, or accident or misapplied or improperly installed, or for failure due to corrosion or abrasion. The warranty will not apply to any product which has been disassembled, repaired or otherwise altered by any persons not authorized by our Service Department.

The guarantee of the control manufacturer will govern the extent of our guarantee on such equipment. Warranty work on the controls must be authorized by Spencer and must be performed in an authorized shop as designated by the control manufacturer.

See Form 706 for complete Terms and Conditions.

I. General Information

The Jet-Clean™ Separator is supplied with an electronic sequencer in various NEMA enclosures, (NEMA 12 is standard). This unit utilizes "shop air" to clean the filter bags.

This design is reliable under severe climate conditions and capable of continuous operation. The unit is easy to install. Only one connection to high pressure air is necessary to ready the unit for operation.

Removable Dirt Can Design

Available on all Jet-Clean Separators. Depending on the size of the separator, dirt cans will be supplied in 3 cu. ft. or 7½ cu. ft. capacities. Each dirt can is provided with ball bearing casters and two lifting handles to facilitate removal from the separator and dumping. The dirt can is held in place by a can arrangement and is removed by lifting the handle. When the can is replaced and the handle lowered the can is locked in place.

Hopper Bottom Design

The Hopper Bottom design uses a 60° cone section that terminates in a flange. Generally, more storage capacity can be realized than in the removable dirt can design. For continuous dumping of material, the hopper bottom style can be utilized along with one of several types of automatic dumping devices.

Plastic Dirt Can Liner and Equalizing Line

Separators with removable dirt cans can be equipped with an equalizing line which allows use of a plastic dirt can liner. This

option is recommended when hazardous or extremely dusty materials are being handled. The equalizing line uses system vacuum to hold the plastic bag (liner) in place in the dirt can while the system is in operation. When the system is shut down and the dirt can is removed from the separator, the collected material can be easily and cleanly disposed of by tying off the top of the plastic bag and removing it from the dirt can. A new bag is then placed in the dirt can and the can replaced and its equalizing line reconnected to prepare the system for continued operation.

Bag Cleaning Control

The Jet-Clean Separator has an ASME code welded air tank with pressure gage and pressure-relief valve. The bag cleaning control is time-based and is designed to cycle each of the air operated diaphragm valves at a preprogrammed rate. This program is determined by the field conditions including type of material collected and customer requirements regarding the system.

Material Level Indicator (Optional)

The material level indicator senses high material level and can be wired to: shut down the system, empty the separator, sound an alarm, activate a light or start a rotary valve.

II. Separator Operation

The Spencer Jet-Clean Separator is designed to separate air-borne material from the air stream of cleaning or conveying system and to collect it for use or disposal. Large particles of material are separated from the air stream by the cyclonic action induced by the separator casing design. Fine particles which still remain in the reduced velocity air are collected on the outside surface of the bags. Eventually, this material begins to build up on the bags to form what is known as "bag cake." As bag cake continues to build up on the bags, the resistance to air flow through the bags increases. This is indicated by an increase in differential pressure across the bags and is measured by the manometer supplied with each separator.

For any given material, there is an optimum amount of bag cake which should be allowed to form since it actually enhances the filtering efficiency of the bags. Less than the optimum amount will result in less than ideal (although in most cases adequate) filtration. Too much cake will cut down on the air flow and may actually adversely affect conveying velocity in the system. In general, an average pressure drop of 4" H₂O across the filter bags will provide good results although exceptions to this will be found. A certain amount of trial-and-error work with any new system will usually be necessary to determine the best pressure drop across the bags for that system.

To prevent too much cake from accumulating, the Spencer Jet-Clean Separator's control initiates a backwash of clean, high pressure air through the bags.

Special nozzles direct the high pressure air into the bags so as to induce additional backflow of the air from the clean air plenum through the bags. The blast of high pressure air in combination with induced backflow causes the filter bags to puff out, thus loosening the collected cake. Reverse airflow through the bags helps blow this loosened dust away from the bags so it can drop to the bottom of the separator where it is collected.

The Separator is designed so that only a few of the bags are being pulsed at the same time. Under this arrangement, the bags that are not being cleaned provide uninterrupted filtering service.

Start Up

On start up, the manometer should read approximately 1/2" H₂O differential pressure and gradually climb to approximately 4.0" H₂O before the first cleaning cycle is initiated. After the cleaning cycle, the manometer reading should have dropped, indicating that proper cleaning is occurring. If the differential pressure across the bags continues to climb, the cleaning cycle should be set to operate more frequently. If this does not improve performance, check the trouble shooting guide. If trouble persists, consult factory.

III. Installation

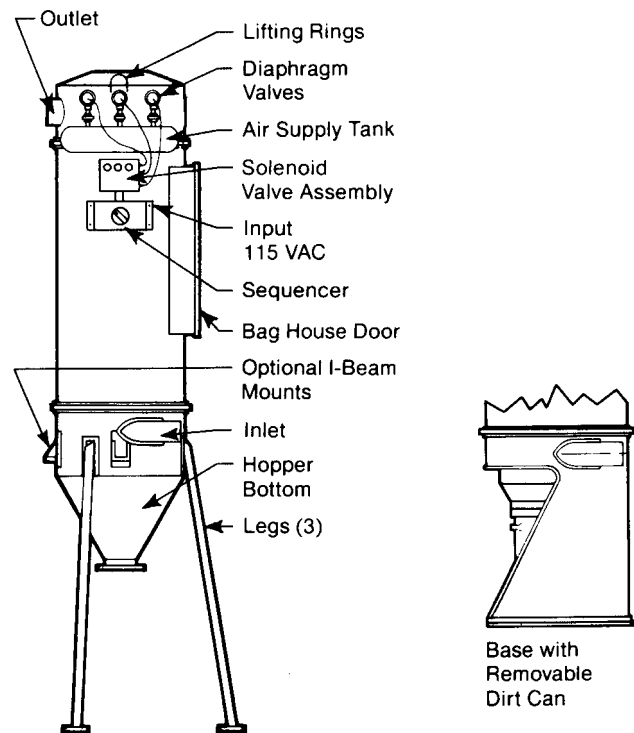
Receipt, Handling, and Storage

Each Jet-Clean Separator and its components and accessories are carefully crated and packaged to assure arrival at the site of installation in safe condition. Any damage suffered in transit should be reported to the carrier immediately. Product damage should also be reported to The Spencer Turbine Company so that we may anticipate any need for repairs.

Handling of the Spencer Jet-Clean Separator is simplified by leaving the unit on its shipping skid until it is located in its installation area. If the unit is to be slung or hoisted, the lifting rings (see Figure 1) provided should be employed.

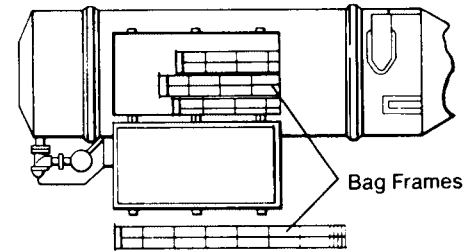
Whenever possible, delivery of the Jet-Clean Separator should be scheduled to keep storage time at a minimum. When storage is necessary, the unit should be kept in a cool, dry place and should not have other items stored on top of it.

Figure 1
Electronic Sequencer

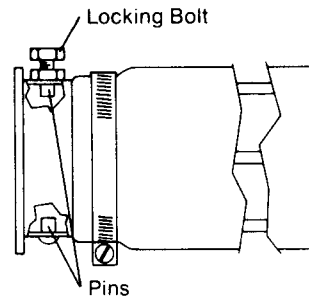


Step One: Install the filter bags and bag frames according to the following procedure.

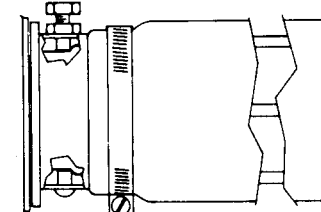
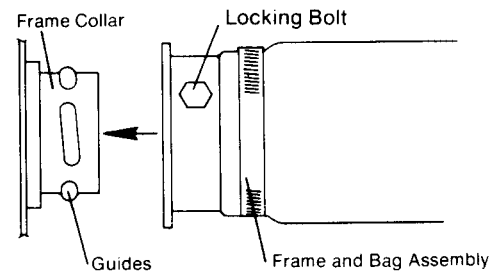
- A. Before the separator is placed in an upright position, open the bag house door and remove the bag frames and box of filter bags which are shipped loose inside.



- B. Pull a filter bag over the bag frame until the bag end is immediately next to the locking bolt as shown below. Position and tighten the bag clamp.



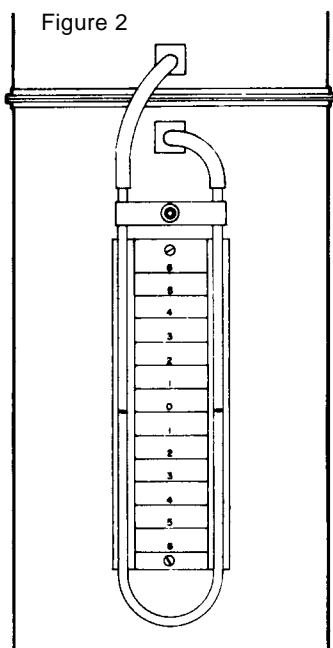
- C. The bag frame assembly can now be installed in the Jet-Clean Separator bag head. Place the bag frame assembly into the separator and, beginning with the bag furthest from the separator door, make contact with the frame collar. Turn in a clockwise direction to engage the frame pins into the holder guides. Note that when the bag frame assembly is secure on the frame collar, the locking bolt must be visible in order for it to be tightened. If, after installation of the bag frame assembly, the locking bolt is not visible, remove the frame, reposition and reinstall. When properly installed, tighten the locking bolt.



- D. Continue to install the bag frame assemblies in the same manner working from the back of the separator toward the access door. Place the remaining three or four bag frame assemblies into the separator before attaching each of them to their respective collars.
- E. When all of the bag frame assemblies are installed the separator is ready for installation or reuse.

Step Two: Using the lifting rings provided, stand the separator in an upright position and locate the separator in its installation area either on its legs or by using the I-beam mounting lugs, if you have ordered your separator with this mounting option. (see Figure 1)

Step Three: A manometer, which indicates pressure drop across the filter bags, is supplied with each Jet-Clean Separator to assist in selecting the optimum bag cleaning frequency for each individual installation. With most materials, bags should be cleaned with a frequency that maintains a maximum pressure drop across the bags for approximately 4" of water.



Two pressure taps, one on either side of the bag head, are located near the top of the separator opposite the air supply tank. After pouring the liquid (supplied with the manometer) into the manometer tube, connect the two manometer tube ends, one to each tap, and mount the manometer on the side of the separator by means of its magnetic mount. (see Figure 2) *Install the manometer while the system is not in operation to prevent the manometer liquid from being pulled into the Separator.*

Caution: When the unit is installed outdoors and temperatures below 32°F (0°C) are expected, be sure to use the supplied liquid which will not freeze.

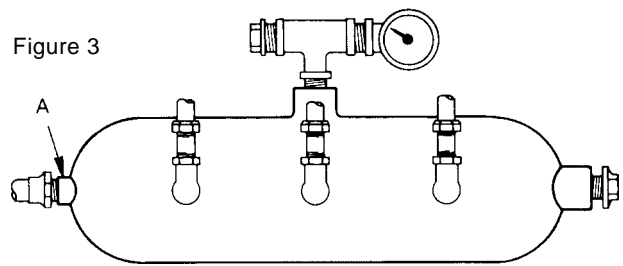
This manometer has been calibrated to use only the oil supplied (0.826 sp. gr.). For replacement oil, contact the factory.

Step Four; Installation of Bag Pulse Sequencer:

Air Supply Connection

Remove the threaded plug from the 1" N.P.T. female pipe fitting located at "A" which is the end of the air supply tank and connect

a supply of 100 psi to 125 psi air to the separator's tank at this point. All other connections have been made at the factory. (see Figure 3)



Electronic Sequencer Connection (Standard)

A 120 VAC 60 cycle input must be wired to the control unit. The hot line must be connected to the door mounted selector switch and the neutral line must be connected to terminal 12 on the printed circuit board.

Important: The 100 psi to 125 psi air supplied to the separator must be oil-free, clean and dry (suitable for use with air-operated valves and controls) and must be available at a rate of at least 15 cfm in order to properly operate the unit and provide clean, dry air for bag cleaning.

No adjustments should be made to the internals of the sequencer of the Jet-Clean Separator except for cycle time. Each unit is completely tested prior to shipment and is preset for proper operation at the factory. Any malfunction of the control should be reported to your Spencer Representative or to The Spencer Turbine Company Service Department in Windsor, Connecticut.

IV. Operation and Maintenance

Caution: The Spencer Turbine Company is not responsible for wear or corrosion caused by the material being handled or failure due to corrosion or abrasion.

Removal and installation of twist-off Jet-Clean Separator Bag Frames

The Spencer twist-off bag frame assembly is unique because a simple turn allows for easy removal or reinstallation. A locking bolt prevents inadvertent loosening of the unit. To change the filter bag, proceed as follows:

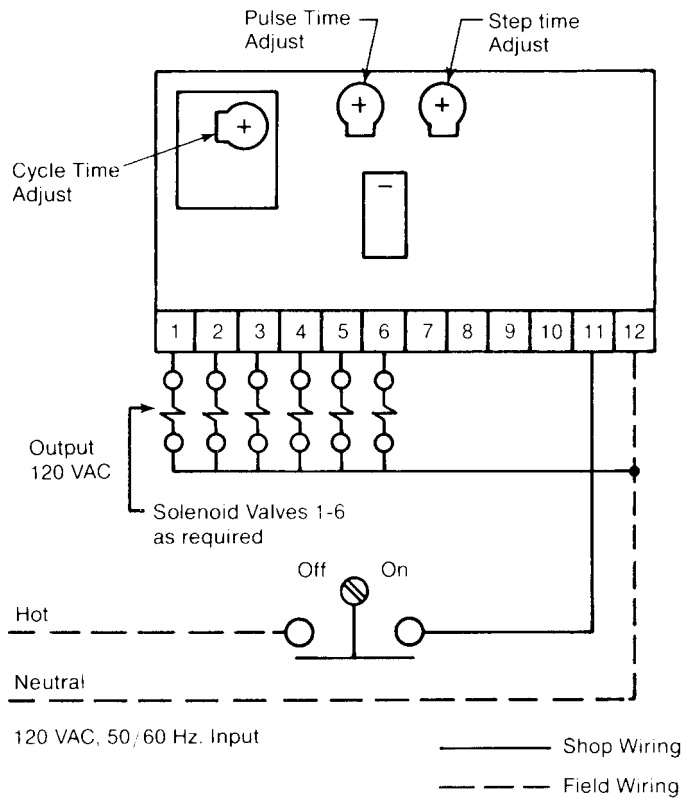
1. Locate and loosen the locking bolt.
2. Twist the bag frame in a counter-clockwise direction and allow the male pins on the bag frame to ride down the guides located on the frame collar.
3. Remove the bag frame assembly from the separator.
4. Loosen the bag clamp and remove the filter bag.
5. Install a new filter bag and re-tighten bag clamp.
6. Re-insert bag frame assembly into the separator. Note here that when the bag frame is secure on the bag collar the locking bolt must be visible in order to be tightened.
7. With this in mind, raise the bag frame assembly into contact with the bag collar and turn in a clockwise direction to re-engage the frame pins into the holder guides.
8. When the bag frame assembly is fully hand-tightened, tighten the locking bolt.

Description and adjustments for the Electronic Sequencer

The Electronic Sequencer furnished by Spencer contains the following standard design features: Solid state controls, solenoid pilot valves, 120 VAC 60 Hz input and NEMA 12 enclosure. NEMA 4 and NEMA 7 & 9 enclosures are optional.

There are three adjustments that can be made on the Electronic Sequencer. The first, Pulse Time, which is the actual length of time that the air blast lasts, is adjustable from 0.1 second to 1.0 second. The second, Step Time, which is the length of time between pulses, can be adjusted from 1.0 second to 1.0 minute. The third, Cycle Time, the time between cycles, can be adjusted from 1.0 minute to 1.0 hour.

These adjustments are made by using a pocket size screwdriver to turn the required potentiometer clockwise to increase; counter-clockwise to decrease.

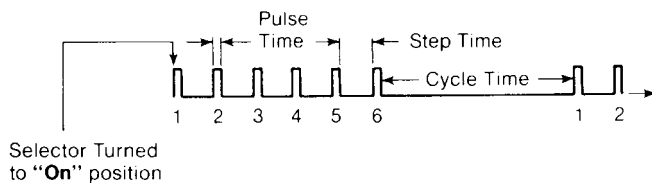


Cycle Time – 1 minute to 1 hour (preset at 10 min.)

Pulse Time – 30 milliseconds to 1.2 seconds (preset at 450 m.s.)

Step Time – 1 second to 60 seconds (preset at 7.5 sec.)

1. Output starts at No. 1, then No. 2 and so on to the last selected output, then back to No. 1 after Cycle Time is completed.
2. Turning selector switch on "OFF" then back to "ON" resets the above.



V. Trouble Shooting Guide-Separators

Trouble	Probable Cause	Corrective Action
High differential pressure across bags Note: although a differential pressure of 1" to 6" H₂O can be considered normal, most installations are designed for a differential of 4 inches.	Overloaded by too much air. Improper compressed air supply.	System design or leaks in system. 100 to 125 psi is required. Air should be clean and dry.
	System length shorter than design length.	Reduce vacuum with blast gate located on vacuum producer discharge.
	Filter bag loading caused by too much vacuum for system. Sequencer will not pulse	Is air on? Check air line installation at separator.
	Leaky air lock or dust discharge valve causing filter overload. Moisture-laden bags.	Check for moisture in compressor air lines. Check operation of air dryer. (moisture in line) Repair or replace defective parts or entire unit. Speed-up airlock rotation. Run the cleaning mechanism without moving air through the filter unit and eliminate moisture. Check compressed air dryer.
	Excessive dust in the clean air plenum (from a previously leaky bag) often impregnates the bags in the reverse direction.	Check filter bags clean or replace defective bags and clean out plenum. Remove and dry clean bags.
	Static electricity.	Grounded bags. (Special order only.)
Seepage – Visible Discharge	Bags improperly installed.	Check bag installation and re-install, if necessary.
	Loose bag clamps.	Tighten clamps.
	Torn bags or holes in bags.	Repair or replace bags.
Insufficient Suction	Vacuum producer. High differential pressure.	Check direction of vacuum producer rotation. See above instructions for high differential pressure.
	Blockage in system. Leaking duct work, access doors, discharge valve or airlock.	Remove blocking material. Repair or replace seals.
	Improper duct size or run size. Poor system design.	Replace with original design specification. Check against original design specifications.
Unable to Maintain Compressed Air Pressure	Faulty or too small compressor or too small service pipe. Pipe leaks.	Replace defective parts or use larger compressor or install larger pipe line. Repair and reseal connections.
Poor Filter Bag Life	Material build-up in hopper.	Check build-up of material in hopper. Check airlock operation – it may leak.
	Incorrect bag cage installation allowing friction between outside elements and housing.	Make sure filter bag cages are installed vertically and not touching other bags or housing.
	Abrasion caused by impingement of high velocity particles. Bag cleaning too frequent.	Reduce air flow-through filter. Separator too small, need larger. Slow down backwash cycle. NOTE: Contact Service or Engineering Departments for Special Problems.
No Air Released Thru Injection Holes.	Defective diaphragm valve. Defective Sequencer. Faulty wiring or improper air line connection.	Check and replace valve. Consult Factory. Check installation and start-up instructions.

Filter Bag Maintenance Record

Date	Filter Bag Part No.	Filter Bag Material	Date Changed

Vacuum Accessories Record (Hoses, Tools, Valves)

Part No.	Description



Products & Services

Industrially rated products offering effective solutions for air and gas moving problems:

- Modular central vacuum systems
- Mobile or stationary integrated vacuum units
- Dust collectors and separators
- Multi-stage centrifugal blowers
- Single stage centrifugal blowers
- Regenerative blowers and packages
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- Gas boosters
- Custom-engineered products with special materials for extreme temperatures and pressure

Complementary accessories with single source convenience and compatibility:

- Standard and custom electrical control panels - UL, CUL and CE Listed available
- Comprehensive selection of tubing, fittings, vacuum hoses, valves and tools
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Comprehensive engineering and other customer support services:

- The industry's largest complement of technical specialists in air and gas moving technology
- Worldwide parts and service organization
- Application research and testing facility
- Product selection process aided by internal computer program

Worldwide organization of sales representatives and distributors offering:

- Product selection, installation and operation assistance
- Comprehensive system design services
- Follow-up services and troubleshooting

***For the name and telephone number of your local
Spencer Representative, call 1-800-232-4321.***



Since 1892 moving air and gas for a cleaner environment

The Spencer Turbine Company, 600 Day Hill Road, Windsor, CT 06095-4706

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