

# Model L3P

Sonic Sifter Separator

Operation Manual



MODEL L3P  
MODEL L3P-15  
MODEL L3P-25  
MODEL L3P-26



Specifications for the ATM Model L3P  
Sonic Sifter Separator

Power Requirements

Model L3P.....	120 volts, 60 Cycles
Model L3P-15.....	120 volts, 50 Cycles
Model L3P-25.....	240 volts, 50 Cycles
Model L3P-26.....	240 volts, 60 Cycles

Materials of Construction

- Stainless Steel Test Table
- Steel Cabinet and Frame
- Baked Powder Finish Throughout
- Acrylic Sieve Frames, Spacers, and Top Cone
- Metal Column Lock
- Aluminum Fines Collector Holder

Physical Dimensions

Weight.....	43lb (20kg)
Cabinet Dimensions.....	23”h x 10”w x 12”d
.....	61 cm x 25 cm x 31 cm

Operating Conditions

This device will function properly at any non-condensing humidity level within the temperature limits of 0° to 120°F (-18° to 49°C). However, for test repeatability, it is recommended that the ambient temperature and humidity be controlled. The sieves and accessories used with this device should never be subjected to temperatures above +125°F (52°C) or below -45°F (-43°C).

External vibrations of a low energy level will have little effect upon the accuracy of the test results. For optimum results, the device should be operated on a stable, level surface. This practice will help ensure an even layer of particles on each sieve.

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# ATM Model L3P Sonic Sifter Separator Operating Instructions

## Installation

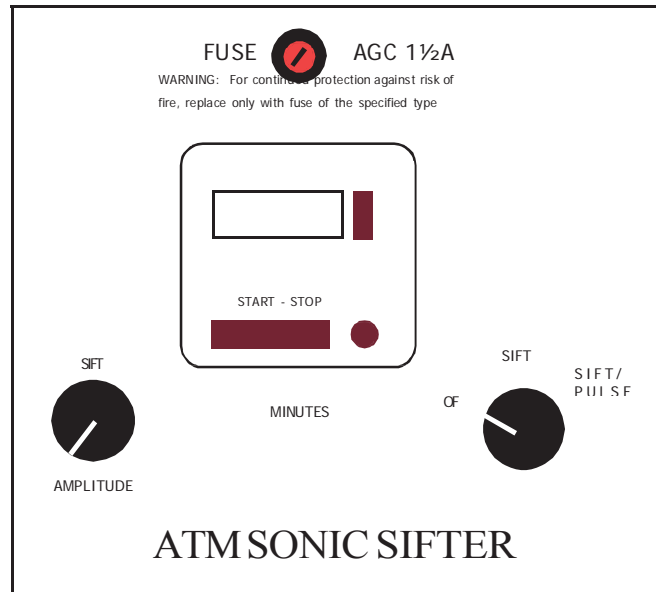
Place the Model L3P Sonic Sifter Separator on a level surface for operation. Observe the ambient temperature and humidity guidelines outlined in the Specifications section.

## Electrical Connection

Plug the power cord into the socket in the rear of the unit and then into the appropriate power source as outlined in the Specifications section.

## Control Panel Components

On the Control Panel diagram, locate the Sift/Pulse Switch, Amplitude Control and Timer. The components and their operation are described below.



Model L3P Sonic Sifter Separator Control Panel

## Precision Sieves

Precision sieves listed meet the current ASTM E 161 and ISO sieve specifications

Electroformed nickel mesh

Clear acrylic frame dimensions: 3-1/2"O.D., 3"ID. & 1-1/4" overall height

U.S. <u>Opening</u>	Catalog <u>Number</u>	U.S. <u>Opening</u>	Catalog <u>Number</u>
3µm	L3-M3	60µm	L3-M60
5µm	L3-M5	65µm	L3-M65
10µm	L3-M10	70µm	L3-M70
15µm	L3-M15	75µm	L3-M75
20µm	L3-M20	80µm	L3-M80
25µm	L3-M25	85µm	L3-M85
30µm	L3-M30	90µm	L3-M90
35µm	L3-M35	95µm	L3-M95
40µm	L3-M40	100µm	L3-M100
45µm	L3-M45	105µm	L3-M105
50µm	L3-M50	125µm	L3-M125
55µm	L3-M55	150µm	L3-M150

## L3P Sonic Sifter Separator and Accessories

<u>Part Number</u>	<u>Description</u>
L3P	Sonic Sifter, 120VAC / 60Hz
L3P-15	Sonic Sifter, 120VAC / 50Hz
L3P-25	Sonic Sifter, 240VAC / 50Hz
L3P-26	Sonic Sifter, 240VAC / 60Hz
L3-N1	Column Lock
L3-N2	Diaphragm
L3-N3	Top Cone
L3-N4	Standard Spacer
L3-N5	Fines Collector
L3-N6	Fines Collector Holder
L3-N7	Complete Stack Assembly*
L3-N8	Horizontal Pulse Accessory

\* Includes column lock, diaphragm, top cone, six (6) spacers, fines collector & fines collector holder.

## U.S. Standard Sieves available for the Model L3P Sonic Sifter Separator

U.S. Standard sieves listed meet current ASTM E 11 and ISO sieve specifications

Supplied with Certificate of Compliance to U.S. and International Standards

Clear acrylic frame dimensions: 3-1/2"O.D., 3"ID. & 5/8"overall height

U.S. Opening	Number	Catalog Number No.	Catalog Sieve Size
Stainless Steel	Brass		
3.5	5.60mm	L3-S3.5	-
4	4.75mm	L3-S4	-
5	4.00mm	L3-S5	-
6	3.35mm	L3-S6	-
7	2.80mm	L3-S7	-
8	2.36mm	L3-S8	L3-B8
10	2.00mm	L3-S10	L3-B10
12	1.70mm	L3-S12	L3-B12
14	1.40mm	L3-S14	L3-B14
16	1.18mm	L3-S16	L3-B16
18	1.00mm	L3-S18	L3-B18
20	850µm	L3-S20	L3-B20
25	710µm	L3-S25	L3-B25
30	600µm	L3-S30	L3-B30
35	500µm	L3-S35	L3-B35
40	425µm	L3-S40	L3-B40
45	355µm	L3-S45	L3-B45
50	300µm	L3-S50	L3-B50
60	250µm	L3-S60	L3-B60
70	212µm	L3-S70	L3-B70
80	180µm	L3-S80	L3-B80
100	150µm	L3-S100	L3-B100
120	125µm	L3-S120	L3-B120
140	106µm	L3-S140	L3-B140
170	90µm	L3-S170	L3-B170
200	75µm	L3-S200	L3-B200
230	63µm	L3-S230	L3-B230
270	53µm	L3-S270	L3-B270
325	45µm	L3-S325	L3-B325
400	38µm	L3-S400	L3-B400
450	32µm	L3-S450	-
500	25µm	L3-S500	-
635	20µm	L3-S635	-

## Sift/Pulse Switch

The Sift/Pulse Switch consists of three possible settings (Off, Sift, and Sift/Pulse) and serves two main functions. First, it is the main power switch to the unit itself. When rotated counterclockwise to the OFF position, all power is shut off to the L3P circuitry. Rotating the switch clockwise to the SIFT position enables only the sifting portion of the unit to operate. Rotating the switch clockwise to the SIFT/PULSE position energizes not only the sifting portion of the unit, but also the pulse portion. The pulse is supplied by a vertical-firing electromagnetic solenoid located beneath the table in the test chamber. Every four seconds, a vertical pulse or shock wave is imparted to the sieve stack to reorient the particles in the stack and break down softly clinging or agglomerated particles. Virtually every test procedure benefits from the use of the pulse circuitry.

## Amplitude Control

The Amplitude Control adjusts the amount of 'lift' applied to the powder in the sieve stack. The density of the particles, the presence of electrostatic or other physical bonds, and the percentage of fine material in the sample determine the amount of lift required.

## Digital Timer/Clock

The Timer controls the cycle time of the sieving operation, as well as functioning as a 24-hour clock.

## Setting the Clock

Rotate the timer knob on the lower right hand corner one stop (felt as the knob is rotated) clockwise. The digital display will become illuminated. Press and hold the rectangular button to the right of the display while turning the timer knob clockwise to the desired time. Once the clock has been set to the time of day, it may be changed by the same procedure.

The clock display will switch to the timer mode whenever the start/stop bar is pressed. This activates the timer and displays the preset time used during the previous session. To return to the clock display, rotate the timer knob counterclockwise until

the display darkens, then press the button to the right of the digital display.

Setting and using the timer

Rotate the timer knob one stop clockwise to turn on the digital display. Continue to turn the timer knob until the desired sift time is shown in the digital display. The timer can be set between 1 second and 99 minutes in the following increments:

- 1 second to 1.0 minute .....in 1-second increments
- 1.0 minute to 10 minutes .....in 10-second increments
- 10.0 to 99.0 minutes .....in 1 minute increments

Starting and stopping the timer

Press the start-stop bar below the digital display. The unit will begin to operate and the timer will count down to '0'. When the '0' point is reached, the sifting/pulse action will cease, the digital display will darken and six tones (beeps) will be heard. Pressing the start-stop bar once will disable the sound.

The timer can be restarted for the exact same time interval as the previous run by pressing the start-stop bar once to illuminate the digital display and once to restart the unit. This procedure can be repeated as often as necessary.

Pausing and resetting the timer

If desired, the sifter can be paused at any time during the cycle by pressing the start-stop bar. It can be restarted to finish the remaining portion of the cycle by pressing the start-stop bar, or the remainder of the cycle can be canceled without losing the preset time. To cancel the cycle, press the start-stop bar and then rotate the timer knob counterclockwise until the display darkens.

To change the preset program time, rotate the timer knob clockwise to the desired time and press the start-stop button. The new time will stay in the memory of the timer until the machine is reset or unplugged.

Using the SIFT/PULSE Switch

Rotate the Sift/Pulse Switch to either the SIFT or SIFT/PULSE positions. The light at the rear of the test chamber will become

stack assembly parts should be wiped off periodically with a soft damp cloth.

Servicing the L3P Sonic Sifter Separator Unit

Only personnel qualified by AdvanTech Mfg. should service the Sonic Sifter Separator. If any performance or operational problems arise, please contact AdvanTech Mfg. directly.

ATM Model L3P Sonic Sifter Separator Limited Warranty

AdvanTech Mfg. guarantees all its apparatus against defective material and workmanship for a period of one year from the date of delivery. This guarantee is limited to repair or replacement of the defective apparatus in our factory in New Berlin, Wisconsin. AdvanTech Mfg. does not assume responsibility or accept invoices for unauthorized repairs to its apparatus. Under no circumstances shall the AdvanTech Mfg. be liable for loss of profits or other damages.

AdvanTech Mfg. is not responsible for damage to apparatus due to improper installation or operation beyond its rated capacity (intentional or otherwise). It is distinctly understood that the above covers all conditions under which AdvanTech Mfg. apparatus are sold.

For warranty claims or other service requests, please obtain return authorization prior to shipment by contacting:

DO NOT use compressed air to clean the sieves or dislodge trapped particles.

**Precision Electroformed Sieve Series:** Store the Precision Electroformed sieves in the protective plastic storage box provided. DO NOT remove particles clogging sieve openings with a needle or other sharp object.

DO NOT brush the electroformed media

DO NOT touch the electroformed media with your fingers. The natural acids and oils in the skin will attack and discolor the fragile electroformed mesh and cause premature failure.

#### Cleaning the Fines Collector and Diaphragm

The fines collector and diaphragm are made of a durable latex material. With regular care, these parts can withstand a considerable number of duty cycles. Both parts can be cleaned in a mild detergent and water solution and rinsed with water. The parts should be allowed to air dry, avoiding heat and sunlight.

After drying, both parts should be dusted lightly with talcum powder (NYTAL 200 or any commercial unscented talcum powder). The excess talcum powder can be blown off with low-pressure compressed air. Return the parts to their protective foil envelopes for storage, as light and some chemicals in the air can be harmful to the latex, causing holes and cracks to appear prematurely.

**Users' Tip** – For longer life of the fines collectors, rotate the use of several collectors over time. For example, use fines collector #1 on Monday, wash and store the collector at the end of the day and use collector #2 on Tuesday, etc. Set up a regimen to rotate 3-5 collectors over the course of a week, or whatever your usage requires. Allowing the latex to 'rest' before it is put back into regular service can significantly extend the life of the individual collector.

#### Cleaning and Care of the L3P Sonic Sifter Separator Unit

The Sonic Sifter Separator cabinet, test chamber and aluminum

illuminated.

#### Removing the Stack Assembly

The stack assembly can be removed from the test chamber by grasping the locking arms on the column lock assembly and pulling straight down. The stack assembly will lock and the stack can be slid straight out of the test chamber.

#### Disassembling the Stack Assembly

Sliding thumb and forefinger into the openings between the lowest sieve or spacer and the column locking arms can disassemble the stack assembly. While steadying the stack with one hand, spread the column locking arms with the other hand. The spring-loaded column lock will release. It can then be carefully removed and access gained to the rest of the stack components.

#### Selecting the Sieves for Analysis

Select the sieves required for analysis. The height of the testing stack used within the L3P is a fixed height.

#### U.S. Standard Sieve Series - 5/8" overall height

A maximum of six U.S. Standard Series sieves (sieve sizes #3.5 through #635) may be used at one time. Any combination of sieves, accessories or spacers making up the standard stack height of six Standard Sieve units may be used.

**Precision Electroformed Sieve Series - 1-1/4" overall height** A maximum of three Precision Electroformed Sieves may be used at one time. Any combination of sieves, accessories or spacer(s) making up the standard stack height equivalent to three Precision Electroformed Sieves may be used.

#### Accessory Usage

When sifting powders 45µm and finer, or with powders of any distribution showing high electrostatic charges, the use of the ATM L3-N8 Horizontal Pulse Accessory is recommended. It takes the place of one Standard Series Sieve (5/8" height). The operating principle is the introduction of a high-speed shock wave sent across the sieving medium. The net result is a

further reorientation of particles, a shearing action on agglomerated particles, and a reduction of screen blinding (plugged openings).

For more information on specific applications, contact your AdvanTech Mfg. representative.

#### Preparation for the Analysis

To prepare for the analysis of a powder sample for the first time, it will be necessary to perform a few simple tasks.

#### Gather the ancillary equipment needed

Weighing device (balance or scale with resolution in grams suitable for your application-generally, 0.1g or 0.01g are sufficient) 100g capacity is suitable.

Camel hair paint brush for brushing fine particles from the standard sieves or precision mesh frames. (NOTE: Brush sieves from the underside ONLY! Never force material through a sieve opening.)

Means of recording and calculating tare weights, sample weights, percentages, etc.

Note: In addition, prior to performing the first test, all sieves, standard spacers, and the top cone should be washed according to the care section which follows. This step will reduce the chance of sample contamination from any residues left over from the manufacturing process.

#### Performing the Analysis

The following steps constitute a typical analysis with the L3P Sonic Sifter Separator:

##### 1. Weighing the parts

Weigh and record the tare weights of the diaphragm, top cone, spacers, sieves, and fines collector.

##### 2. Installing the Fines Collector

Install the fines collector in the fines collector holder. Fasten the round metal plate at the bottom of the fines collector to the fines collector holder by sliding the keyhole slot in the fines collector over the fastener mounted in the fines collector holder base.

##### 3. Assembling the Sieve Stack

## ATM MODEL L3P SONIC SIFTER SEPARATOR and ACCESSORY CARE

The ATM Model L3P Sonic Sifter Separator and Accessories will perform satisfactorily for many years if the following basic care instructions are observed:

#### Cleaning the Sieves and Stack Assembly Parts

For best results, stack assembly components and sieves should be cleaned in an ultrasonic cleaner of 150 watts or less. General cleaning is best accomplished in a mild solution of dishwashing detergent and water maintained at 75°-80° F (24°-27°C). Ultrasonic cleaning has proven to be the most effective method of removing particles plugging sieve openings. Regular ultrasonic cleaning will help prevent particle buildup in the sieve openings, thus reducing the amount of time each sieve must be exposed to the ultrasonic vibrations. Care must be taken in how long the sieves are exposed to the ultrasonic vibrations, as damage can result from overexposure.

After washing, rinse the parts with tap water, and allow to air dry. DO NOT expose the sieves, spacers or top cone to heat sources of any kind. Heat sources will cause warping and/or cracking of the parts which will compromise the airtight seal between the stack assembly parts during use. If an ultrasonic cleaner is not available, immerse items to be cleaned in the same mild detergent solution, rinse and allow to air dry as directed.

#### CAUTIONS

U.S. Standard Sieve Series: Improper handling can cause serious damage to the sieve openings and accelerate sieve failure.

DO NOT remove particles clogging sieve openings with a needle or other sharp object.



Precision Electroformed Series sieves; excessive amplitude, especially over extended periods of time can cause immediate or premature sieve failure.

After starting the timer, increase the amplitude SLOWLY until the largest of the particles begins rolling on the top sieve. The entire operation can be viewed through the sidewalls of the sieves. The finer material should begin flowing through the sieves within seconds. Each particle is being lifted off of the screening surface and set back down on the sieve openings 60 times per second when using 60 Hz current (50 times per second with 50 Hz current).

## 12. Completing the test

For an initial test run: When no more material can be seen falling through the sieves, note the time elapsed. This value should be used for subsequent testing of the same material to assure repeatable results.

For a routine test run: When the timer counts down to '0', open the door and follow the procedures listed for 'Removing the Stack Assembly' (page 7). Caution should be exercised when dismantling the stack assembly to avoid any loss of sample retained on the sieves or in the fines collector.

The parts can be weighed directly on the weighing device, removing the need to transfer the powder to a weighing dish (thus reducing potential sample loss). Don't forget to weigh the fines collector as well. Record the weights on the worksheet used to record the tare weights. Subtracting the tare weight from the post-test weight yields the mass of the sample retained on the part. The percentage retained at each sieve size can be calculated simply by comparing the weight on each part with the starting sample weight.

Assemble the sieve stack with the coarsest sieve on the top of the stack and finest sieve at the bottom. If fewer than six (6) Standard Series or three (3) Precision Electroformed Series sieves are used, add spacers as necessary to fill out the proper stack height as described in the Selecting the Sieves for Analysis section above. If spacers are necessary for operation, they should be placed at the top of the stack.

## 4. Introducing the powder sample

Discussion of the proper methods of extracting gross samples and preparing test samples for analysis is far too complex to be dealt with here. For more information on sample extraction and preparation, contact your AdvanTech Mfg. representative for the publication Test Sieving: Principles and Procedures.

A good rule of thumb is to use the smallest sample size possible which is still representative of the lot from which it was extracted. Sample sizes of 1 gram are a good starting point for Sonic Sifter Separator determinations. The sample size can be increased until the optimal combination of sample size, time, and sift amplitude are determined. Our Customer Service Laboratory can be consulted at no charge for suggestions on test parameters for powder samples.

Select a proper mass of powder to be tested. When sieving materials larger than 38 $\mu$ m, do not exceed 20g. When sieving materials smaller than 38 $\mu$ m, do not exceed 10g. Weigh and record the mass of the powder sample. Place the powder sample on the top sieve in the stack.

## 5. Installing the Diaphragm

The diaphragm is placed on top of the top cone with the metal ring protruding downward. The proper orientation of the diaphragm can be determined by the word 'TOP' stamped on the latex material.

## 6. Replacing the Column Lock

Place the column lock onto the sieve stack and press straight down until the locking arms snap onto the fines collector holder.

## 7. Check the Control Panel

As a safeguard, make sure the amplitude control is set at '0' and the timer is in the 'clock' mode or the display is blank before placing the stack assembly into the test chamber. This is necessary to prevent damage to the sieves and the integrity of the test sample in the chamber. If the amplitude had been inadvertently set to the maximum setting or the timer interrupted in mid-cycle, for example, the sudden impact of the signal from the loudspeaker could damage the sieves or compromise your test sample.

## 8. Inserting the Stack Assembly

Slide the stack assembly into the test chamber with the column arms locked. The stack assembly is stopped at the top by two tabs on the driver support plate. On the test chamber table, you will notice two rivets which will limit how far the stack can be placed inside the chamber. Also on the floor of the test chamber is the table switch, a safety interlock device which prevents the unit from operating if the stack moves forward out of position. This switch will be properly deployed and the circuit activated if the stack is inserted correctly.

Once the stack assembly is in position the column lock can be released by sliding a thumb and forefinger into the openings between the lowest sieve or spacer and the column locking arms. Spread the column locking arms. The spring-loaded column lock will release and expand to lock the column into the test chamber, forming an airtight seal. Close the sliding door to the test chamber.

## 9. Beginning the Test

Rotate the SIFT/PULSE switch to the PULSE setting. While virtually all test procedures benefit from the use of the PULSE circuitry, some may not. Use the setting appropriate to your samples.

## 10. Setting and using the timer

Rotate the timer knob one stop clockwise to turn on the digital display. Continue to turn the timer knob until the desired sift time is shown in the digital display. The timer can be set between 1 second and 99 minutes in the following increments:

1 second to 1.0 minute .....in 1-second increments  
1.0 minute to 10 minutes .....in 10-second increments  
10.0 to 99.0 minutes .....in 1 minute increments

## Starting and stopping the timer

Press the start-stop bar below the digital display. The unit will begin to operate and the timer will count down to '0'. When the '0' point is reached, the sifting/pulse action will cease, the digital display will darken and six tones (beeps) will be heard. Pressing the start-stop bar once will disable the sound.

The timer can be restarted for the exact same time interval as the previous run by pressing the start-stop bar once to illuminate the digital display and once more to restart the unit. This procedure can be repeated as often as necessary.

## Pausing and resetting the timer

If desired, the sifter can be paused at any time during the cycle by pressing the start-stop bar. It can be restarted to finish the remaining portion of the cycle by pressing the start-stop bar, or the remainder of the cycle can be canceled without losing the preset time. To cancel the cycle, press the start-stop bar and then rotate the timer knob counterclockwise until the display darkens.

To change the preset program time, rotate the timer knob clockwise to the desired time and press the start button. The new time will stay in the memory of the timer until the machine is reset or unplugged.

## 11. Setting the amplitude

Note: The amplitude is the 'lift' particles see as the oscillating air column is set in motion. The higher the amplitude setting, the more lift on the particles. Moving the particles more vigorously than necessary DOES NOT increase the speed or precision of the separation. In fact, excessive amplitude settings may increase electrostatic problems, sample loss, and equipment wear.

WARNING: Due to the extremely fragile nature of the