CERULEAN

AS600 Air Sampler

USER MANUAL

Cerulean

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REVISION CONTROL

Revision	*Date*	*Changes made*	*Author*
V1.1	**Oct 2012**	**New manual**	**JC**
V1.2	**Dec 2012**	**Updated address**	**JC**
V1.3	**July 2013**	**Addition of new features**	**BSW**
V1.4	**Mar 2014**	**Rebranded**	**BSW**
V1.5	**July 2014**	**Addition of modified version**	**BSW**

Manual Scope

User Manuals are provided to give information on how to configure the instrument, calibrate, load and run samples, and obtain results from the instrument.

Further Assistance

Cerulean can provide training courses on more in-depth technical knowledge, fault finding, diagnostics, and maintenance and on the instrument. For these options, please contact your regional Cerulean Sales or Service Manager.

Cerulean also offer a comprehensive installation, spares, repairs, breakdown service, annual maintenance and contract service. For these options, please contact your regional Cerulean Sales or Service Manager.

For further technical support of the instrument contact technical.support@cerulean.com, or your regional Cerulean office.

Commissioning

It is recommended that the customer performs a risk assessment on the AS600 Air Sampler before first use.

Specification

For the specification of the AS600 Air Sampler please refer to the datasheet available from your regional Cerulean Sales Manager, Cerulean office, or via the Cerulean Web Site.
www.cerulean.com

CONTENTS

SAFETY

While every effort is made to ensure that this product can be operated safely, it is important that reasonable precautions are taken. In particular, only Cerulean trained personnel should operate this equipment.

Warnings — **avoid injury to personnel**

This device is not designed to be used in a combustible dust environment.

Use the handles to move the unit; do not use the chimney as the unit could topple.

Disconnect voltage supplies before performing any maintenance procedures.

Ensure that the cable is not a trip hazard.

Ensure that the wheel brakes are applied when the unit is stationary.

Cautions — **avoid damage to equipment**

It is recommended that when adjusting the airflow the unit is left for 5 minutes for the airflow to stabilise.

Do not remove or cover the fans or filters. They are essential for correct operation and accuracy of measurements.

European Community (EC) Directive Statement

When this equipment is installed in accordance with the instructions, it will conform to the protection requirements of the appropriate European regulations. At the time of manufacture the equipment complied with all the appropriate regulations. Cerulean is not responsible for any interference caused by other cables and connectors that are not specified, or by any changes or modifications to the equipment. This is not a declaration of conformity. A copy of the Declaration of Conformity is available from Cerulean on request.

When this product has reached the end of its life it must be disposed of in accordance with local regulations. Please contact your local agent for further information.

INTRODUCTION

The Newton Air Sampler, now known as the AS600 has been designed to monitor the enzyme risk in accordance with the current legislation that requires manufactures to control the exposure to air-borne particles by a combination of training, engineering and process control measures which limit, monitor and record the exposure in given periods of time in define work areas.

The proven technology for measuring enzyme levels is High Volume Air Sampling. The AS600 Air Sampler has become the industry standard sampler since it was developed over 40 years ago.

The AS600 Air Sampler is designed so that a dust sample is collected in the same way that an operator would inhale dust. The height of the filter is set at the average height of an operator (just over 1.5 meters) and the filter head is precisely manufactured so that the speed of air flowing into the filter is similar to the speed of air breathed in. The filter is also shielded from excess contamination by a hinged plate.

The AS600 model sampler has been further developed to make it user friendly and reduce the noise emitted by the sampler. Thus it incorporates instantaneous and batch flow electronic systems that automatically adjust their outputs for the vacuum in the sampler and are calibrated to a Standard Temperature of 20^{o}C. A timer is also included that stops the sampler after a predetermined sample duration.

If the power supply is disrupted during sampling, the sampler can be switched on again and an option will be given to continue the test without loss of settings and elapsed time.

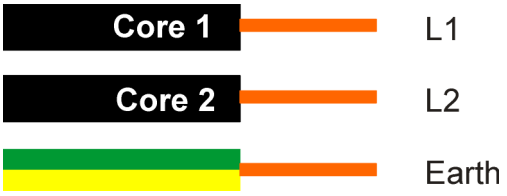
As the sampler is a solid-state device that requires no moving parts, regular calibration is not necessary. Cerulean can offer a calibration checking system that can be used annually at the customer's location to check the flowmeter's calibration is within tolerance. Additionally Cerulean recommends that the flow meter is returned for re-calibration to an internal standard at least every 5 years.

VOLTAGE CONNECTION

Three versions of the AS600 are available:

- The 3 phase 230 V version
- The single phase 240 V version
- The single phase 110 V version

The voltage supply cables are as shown in the following diagrams.



3 Phase Connections (Only 2 phases are used)

Single Phase Connections

It is the customer's responsibility to fit a suitable connector to the cable.

START UP

The AS600 Air Sampler is designed to be mobile and can be moved to any location easily on the built-in wheels. It is necessary to ensure that the wheel brakes are applied to prevent the unit moving when sampling.

User Interface

The USA version contains a LED that will be lit when power is applied to the unit.
The AS600 Air Sampler is fitted with a control panel which includes a display (1), a green button (2), a red button (3) and a variable controller dial (4).

Control panel

The display is used to set the airflow, set the desired sample duration, and as a time counter.

NOTE: If when the Air Sampler is switched on, the display shows the option to continue or abort, the power to the unit must have been disrupted when the unit was last used. To continue the previous test, select Continue or to start a new test, select Abort and follow the on-screen prompts.

Status

During sampling the display shows a counter clock which indicated the sampling duration. The sampling period can be interrupted at any time by pressing the red button. If the sampling period is interrupted, it is recommended that a new filter be installed and a new sampling period initiated.

CONFIGURATION

There are a number of actions required before using the AS600 Air Sampler for the first time:

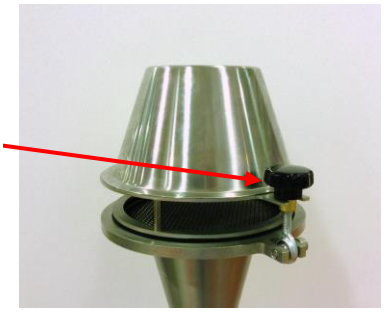
- Install a filter
- Set the flow rate
- Set the sampling duration

The following sections allow a user to set-up the unit for sampling.

Filter Installation

It is always necessary to have a filter installed into the AS600 Air Sampler to protect the vacuum device within. A filter pad is easily installed:

1. Loosen the retaining handle (1) by turning counter-clockwise.



2. Move the retaining handle forward freeing the filter retainer.
3. Lift the filter retainer (2).

4. Remove the old filter (if applicable) and fit a new filter (3). Ensure that it is central to the mesh grid.

5. Replace the filter retainer ensuring that the foam sealing ring (4) sits within the filter.
6. Lift the retaining handle to hold the filter retainer.
7. Turn the retaining handle clock-wise to secure the filter, finger-tight is sufficient.

Do not over-tighten the retaining handle.

Flow Rate Setting

The airflow can be adjusted depending on the required airflow required, typically the airflows are:

- 600 l/min – for powder enzymes
- 300 l/min – for soluble enzymes

When the unit has been connected to power and the warm-up routine has been carried out (approximately 20 seconds) the unit can be set according to the user's requirements.

1. Open the display cover.
2. Using the Flow Speed dial (1), adjust the flow speed (2) to the required value (l/min).
3. It is recommended that the unit is left to stabilise for 5 minutes before sampling begins.

Control panel

Sampling Duration

The sampling duration can be changed to the user's requirements (4 hours is typical):
If the unit is turned on, turn the unit off and wait 30 seconds.

1. Turn the unit on and when the display shows 'Warm Up' press the red and green buttons together. The unit will enter the Run Time setup screen.
2. To change the sample duration press the red button (shown as 'Inc' on the display) until the desired time period is displayed.
3. Press the green button (shown as 'OK' on the display). If the time period is less than 4 hours it will be necessary to keep pressing Inc until the desired value is displayed.

4. The sampling duration is now stored and will not need to be changed unless the sampling duration needs changing.
5. The screen will change to display the hours and flow since operations started.
6. Press the green button to continue to the operation screen.

OPERATION

Taking Samples

When positioning the Air Sampler ensure that the sampler is not directly beneath any overhead pipes etc., thus eliminating high dust figures due to falls of powder. Generally the position will be agreed with the Production Department so as to cause minimal obstruction, whilst being in an area of possible hazard.

This device is not designed to be used in a combustible dust environment.

Make sure that the voltage supply cable is not positioned in a way that will cause a trip hazard.

Make sure that the wheel brakes are applied before sampling is started.

Control panel

1. Accurately weigh the new filter and record the value.
2. Install the filter as per the procedure on page 8 Filter Installation.
3. Check the Sampling Duration is set to the correct duration (see page 9 for the procedure).
4. Press the green button (1) to start the sampling duration.
5. Check the sampling flow rate (3) is close to the desired flow.

   NOTE: The flow rate may exceed the target value initially but will settle after 5 minutes. It is important not to adjust the flow half-way through the sampling duration.

6. Check that before the end of the sample duration that the flow rate (3) has not dropped to below 80% of the target flow rate. If the flow is below 80% of the target flow this could indicate that the environment has high levels of dust. If the flow rate is higher than the target flow, check that the filter is correctly aligned, not damaged and retained correctly.
7. The AS600 Air Sampler will stop sampling when the sampling duration has completed.

   NOTE: If the power to the sampler is disrupted during sampling, a message will be displayed when the Air Sampler is switched on again. This message gives the option to either continue or abort the test. Select the required option.

8. From the Batch Flow Display (2), record the total flow during the sample. The sampler automatically adjusts the flow for pressure.
9. Remove and weigh the dust-laden filter to determine the weight of the dust.
10. Analyse the dust-laden filter for enzymes.

Power Disruption During a Test

If there is a disruption to the power supply during a test the test can either be continued or aborted.

Continuing the test

When the power has been restored, the count-down timer will start.
After the count-down timer has finished, the following screen will be displayed.

1. Press the Green (Continue) button to continue the test.
   The display will show:
   Running From XX (Where XX = the elapsed time).

   The test will then continue.

Aborting the test

When the power has been restored, the count-down timer will start.
After the count-down timer has finished, the following screen will be displayed.

1. Press the Red (Abort) button.
   The display will show the amount of time that has elapsed.

2. Press the Red Button (OK).
   The display will show “Are you Sure”

3. Press the Green button (Yes) to continue the abort or press the Red button (No) to cancel the abort.

4. Press the Red button (Abort) to abort the test.

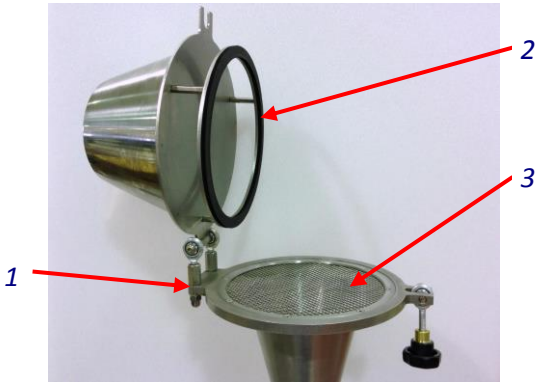
USER MAINTENANCE – REQUIREMENTS

Warning: Disconnect the AS600 from the voltage supply before performing any of the following maintenance procedures.

Warning: Do not disconnect any pipes from the blower in the AS600 and switch on the voltage supply. Particles of dust etc. that are in the blower may be ejected at a high velocity.

Maintenance should only be performed by Cerulean trained engineers.

The AS600 Air Sampler is a robust machine designed to run up to 24 hours a day with minimum maintenance, it is, however, recommended the following actions are carried out to ensure years of trouble-free operation:



Filter head

Before Sampling Maintenance

When a filter pad is changed,

- Clean the unit with a soft damp cloth to remove any dust and dirt. Do not use abrasives as this will damaged the casing.
- Avoid accumulations of dust around the filter head (1).
- Check that the foam sealing ring (2) is in good condition; is not damaged and is 'eve' throughout the whole ring.
- Check that the filter mesh (3) and surrounding area is clean and free of obstruction.

Weekly Maintenance

- Carry out the 'Before Sampling Maintenance' tasks.

- Check the flexible hose that connects the vacuum unit for holes, cracks and leaks.
- Check the vacuum unit mounting bolts are secure and tight.
- Check the mains cable for damage.

Annual Maintenance

- Carry out the 'Weekly Maintenance' tasks.
- Cerulean recommend the flowmeter is checked using the calibration confirmation system annually.

Cerulean can offer a calibration service for checking the flowmeter. See the Contacting Cerulean page for more details on how to arrange this service requirement.

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