FLUKE®
Biomedical

# Installation, Operation, and Maintenance

## Controller
## Model 859A-1-72

## Instruction Manual

**July 2006**
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**Fluke Biomedical**
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# *Table of Contents*



**List of Figures:**

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# *Section 1*
# *Introduction*

## 1.1 General Description

The Victoreen Model 859A-1-72 Controller is designed to be used in a process flow, radiation-monitoring channel. Refer to figure 1-1 for a general view of the controller, or to Appendix A for all applicable drawings.

The 859A-1-72 controller drives the stepping motor in an 859-1-50 Continuous Filter Air Sampler, which determines the filter speed. Two methods are used by the controller to set filter speed. In the first method, a rotary switch in the controller energizes the controller's internal circuitry and sets the filter speed at 0.5, 1, 2, or 10 inches per hour. The second method involves removing a jumper wire in the controller, and allowing an external pulse to determine the filter speed.

The controller contains a power supply, motor driver circuit board, filter speed circuitry, and fast advance circuitry.

The controller is built into a NEMA 12 enclosure and has four mounting brackets in a rectangular configuration.

## 1.2 Specifications

General specifications are shown below.

| | |
|---|---|
| **Dimensions (H x W x D)** | 16 in. x 12 in. x 6 in.<br>(40.64cm x 30.48cm x 15.24cm) |
| **Weight** | 25 lb. (11.3kg) |
| **Enclosure** | NEMA 12 |
| **Operating Temp.** | 32°F to 130°F (0°C to 50°C) |
| **Relative Humidity** | 0 to 95% non-condensing |
| **Power Requirements** | 110 to 130 VAC, 50/60 Hz |

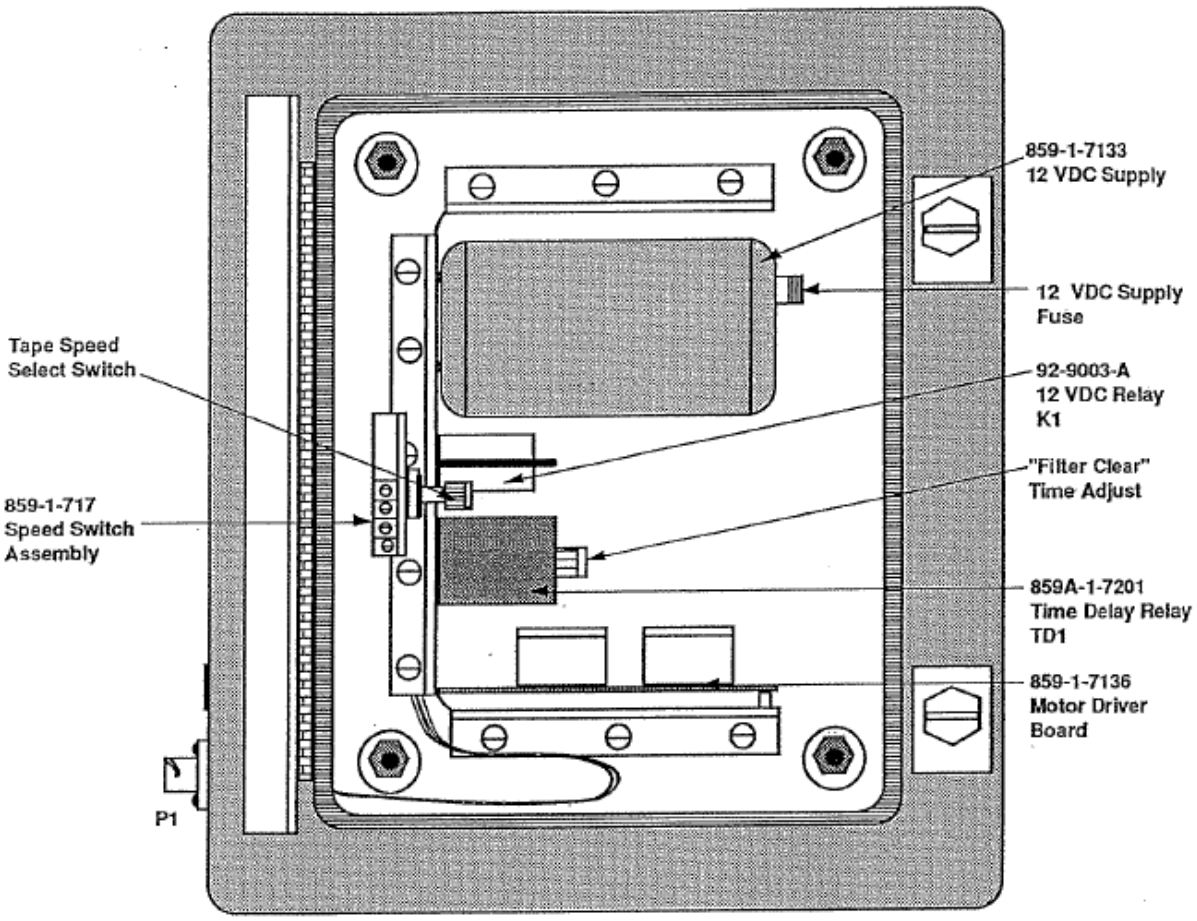


Figure 1-1. Model 859A-1-72 General View

# *Section 2*
# *Receiving Inspection*

## 2.1 Receiving Inspection

Upon receipt of the unit:

1. Inspect the carton(s) and contents for damage. If damage is evident, file a claim with the carrier and notify the Fluke Biomedical RMS Customer Service Department.

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2. Remove the contents from the packing material.

3. Verify that all items listed on the packing list have been received and are in good condition.

**NOTE**

**If any of the listed items are missing or damaged, notify the Fluke Biomedical RMS Customer Service Department.**

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# *Section 3*
# *Storage and Installation*

## 3.1 Storage

Storage of the Victoreen instruments must comply with Level B storage requirements as outlined in ANSI N45.2.2 (1972) Section 6.1.2(.2). The storage area shall comply with ANSI N45.2.2 (1972) Section 6.2 Storage Area, Paragraphs 6.2.1 through 6.2.5. Housekeeping shall conform to ANSI N45.2.3 (1972).

Level B components shall be stored within a fire resistant, tear resistant, weather tight enclosure, in a well-ventilated building or equivalent.

Storage of Victoreen instruments must comply with the following:

1. Inspection and examination of items in storage must be in accordance with ANSI N45.2.2 (1972) Section 6.4.1.

2. Requirements for proper storage must be documented and written procedures or instructions must be established.

3. In the event of fire, post-fire evaluation must be in accordance with ANSI N45.2.2 (1972), Section 6.4.3.

4. Removal of items from storage must be in accordance with ANSI N45.2.2 (1972), Sections 6.5 and 6.6.

## 3.1 Installation

**WARNING**

**Ensure that all power is removed, prior to connecting the controller.**

**CAUTION**

**Personnel performing the following procedure must be familiar with the operation of the monitoring system and the location of each piece of equipment used in the system.**

**CAUTION**

**Failure to install the equipment in accordance with the information presented in the assembly drawings could result in damage to the equipment.**

**NOTE**

**Refer to the applicable drawings in Appendix A of this manual or in the "Applicable Drawings" appendix of the pertinent system level manual.**

The Model 859A-1-72 Controller is mounted close to the 859-1-50 Continuous Filter Air Sampler, and all required wiring is connected through one connector. Electrical connections are made to a mating connector, which runs to the P1 connector on the controller. For wiring information, refer to drawing 859A-1-3 and 859A-1-5 in Appendix A.

**WARNING**

**Ensure that all power is removed, prior to installing the controller.**

**CAUTION**

**Prior to power up, ensure the controller cable is properly connected.**

1. Apply power to the system.

# *Section 4*
# *Operation*

## 4.1 Operation

Once installation is complete and the field wiring is connected, operation is fully automatic.

Controller operation is centered at an 859-1-7136 Motor Control. The motor control receives – 12 VDC unregulated power and then outputs pulses for the necessary stepping sequence at the sampler. The unregulated – 12 VDC is supplied by an 859-1-7133 Power Supply. Output pulses are supplied to the stepping motor in one of two ways. The internal timing circuit can be used to generate pulses, or an external source can be used to generate the required pulses.

Internal pulses are generated through a 555 integrated timing circuit in the motor control. A rotary switch is provided to connect the appropriate resistor-capacitor circuit to the 555 timer, which sends pulses to the stepping motor. The operator has the option of choosing filter speed. The choices are: 0.5, 1, 2, or 10 inches per hour. The operator can also choose the FILTER CLEAR function. FILTER CLEAR is accomplished using a pair of relays, which override the selected resistor-capacitor circuit. This generates a fast input pulse to the motor controller and will advance a predetermined length of filter paper from the 859-1-50 Continuous Filter Air Sampler. The relays are initiated through a push button switch inside the 859-1-50 Continuous Filter Air Sampler. The filter advance time is determined by the adjustable timer relay.

External pulses can be used to drive the stepping motor. Remember that proper operation of the moving filter depends on the shape and timing of the input pulse. To use externally generated pulses, remove the jumper wire connecting S and V on the motor control. This will disable the 555 timer.

Externally generated pulses are received by the controller at connector P1, pin K. Pulses must meet the requirements shown in figure 4-1. To move the filter one inch per hour, the controller requires an input pulse at 14-second intervals. All other filter speeds are shown in the Controller Adjustments section of section 4.

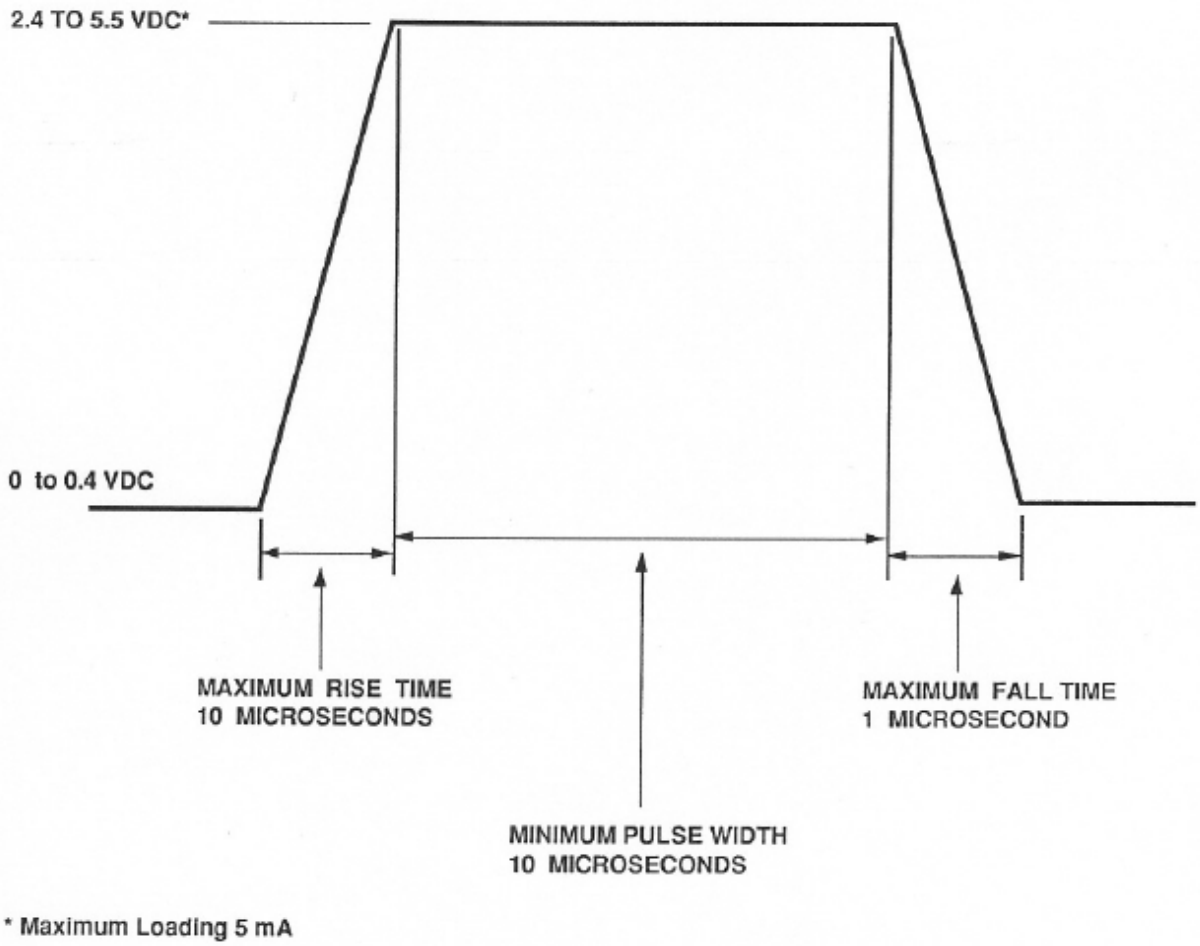


Figure 4-1. Input Pulse Specifications

## 4.2 Controller Adjustments

The following procedures address filter speed adjustments for internally set filter speeds on the controller. If an external pulse is used to set filter speed, the external equipment producing the pulse must be checked independently of this procedure.

Refer to the applicable systems manual to perform system start-up.

**Controller Timer Adjustments:**

**WARNING**

**Use extreme care when performing adjustments with power applied**

**NOTE**

**Refer to Appendix A, drawing 859-1-717 for resistor locations.**

1. Turn the speed control switch to 10 in./hr. Adjust R14, (1 meg-ohm) to give one step every 1.5 seconds.

2. Turn the speed control switch to 2 in./hr. Adjust R13, (1 meg-ohm) to give one step every 7.5 seconds.

3. Turn the speed control switch to 1 in./hr. Adjust R12, (1 meg-ohm) to give one step every 15.0 seconds.

4. Turn the speed control switch to 0.5 in./hr. Adjust R11, (1 meg-ohm) to give one step every 30.0 seconds.

5. Push the FILTER CLEAR pushbutton on the 859-1-50 Continuous Filter Air Sampler and adjust the timed relay to stop the fast advance after 5.5 seconds.

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# *Section 5*
# *Maintenance*

## 5.1 Maintenance

The Model 859-1-72 Controller requires no periodic maintenance.

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# *Section 6*
# *Troubleshooting*

## 6.1 Troubleshooting

1. If a problem develops, verify the voltages at connection point inputs and outputs.
2. Refer to the applicable instruction manuals to troubleshoot other components of the system.

**NOTE**

If a problem cannot be resolved by applying the troubleshooting and maintenance Procedures provided in the applicable instruction manuals, please contact the Fluke Biomedical Customer Service Department at (440) 498-2560 for assistance.

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# *Appendix A*
# *Applicable Drawings*

| | |
|---|---|
| 859-1-3 | Wiring Diagram |
| 859A-1-3 | Wiring Diagram |
| 859A-1-5 | Moving Air Filter |
| 859A-1-72 | Controller, Main Assembly |
| 859A-1-720 | Controller, Frame Assembly |
| 859-1-717 | Speed Switch Assembly |

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# *Appendix B*
# *Bills of Material*

| | |
|---|---|
| 859A-1-5 | Moving Air Monitor |
| 859A-1-72 | Controller, Main Assembly |
| 859A-1-720 | Controller, Frame Assembly |
| 859-1-717 | Speed Switch Assembly |

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