



GAM 8 Workstation Continuous Monitor Operation, Installation and Maintenance

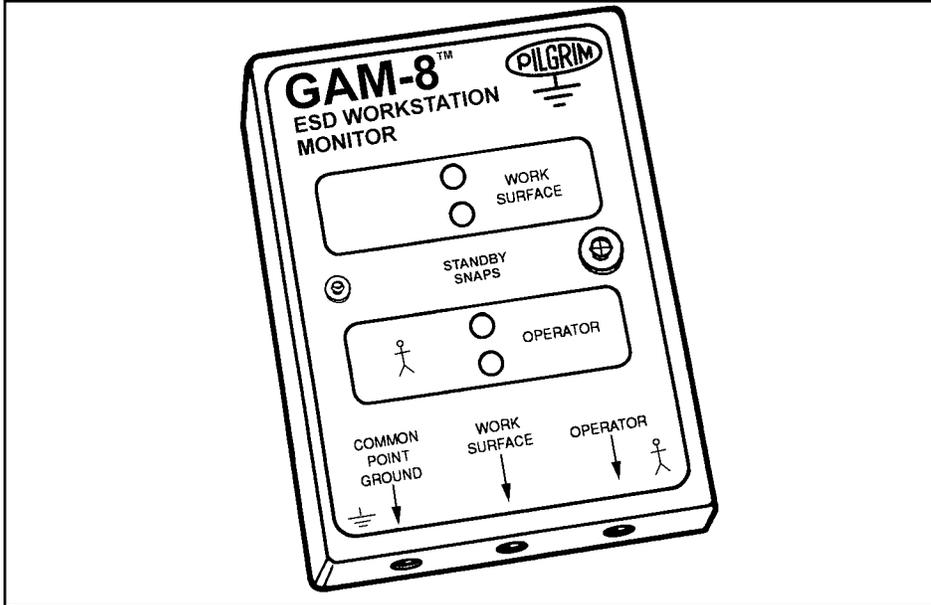


Figure 1. ESD Systems.com Pilgrim 41114 Workstation Continuous Monitor

Description

ESD Systems.com Workstation Continuous Monitor, Item 41114, continuously monitors both the operator and the work surface. This unit provides continuous monitoring of one user wearing a wrist strap and also functions to ensure the grounding integrity of ESD safe work surfaces. This device will continuously monitor the user until the wrist strap or the cord fails, at which point the monitor will issue an audible signal notifying the user of a problem. The monitor also verifies whether an outlet ground is good. When plugged in, the unit automatically runs a self-test. If the outlet is wired incorrectly, both red LEDs turn on and the alarm sounds. The unit will also ground a second user or supervisor.

The model 41114 operates on 220 VAC, 50/60 Hz.

ADVANTAGES OF WORKSTATION CONTINUOUS MONITORING OVER PERIODIC TESTING

Many customers are eliminating periodic testing and are utilizing workstation continuous monitoring to better ensure that their products were manufactured in an ESD controlled environment. Full time workstation continuous monitoring is superior to pulsed monitoring as well as periodic testing, and can save a significant amount of money in testing costs and rejected product. Periodic testing detects failures after ESD sensitive products have been manufactured. The costs of dealing with the resulting catastrophic or latent defects can be considerable. Workstation Continuous Monitors eliminate the need for users to test wrist straps and log the results; by their function, these monitors satisfy the ISO 9000 test logging requirement.

WAVE DISTORTION DETECTION TECHNOLOGY PROVIDES TRUE 100% CONTINUOUS MONITORING

From all the technical alternatives available, ESD Systems.com has chosen wave distortion technology for all its Continuous Monitor product offerings. Wave distortion circuitry monitors current/voltage phase shifts and provides true 100% continuous monitoring. Electrical current will lead voltage at various points due to the combinations of resistance and capacitive reactance. By monitoring these “distortions” or phase shifts, the wave distortion Workstation Continuous Monitor will reliably determine if the circuit is complete.

Wave distortion technology is sometimes known as “impedance monitoring”. This description is valid as the wave distortion technology measures the impedance at the monitored banana jack and looks for changes in either the capacitance or resistance of the circuit which includes the wrist strap and its wearer. It uses filtering and time domain sampling to filter out false signals caused by voltage offsets, 60 Hz fields and other electro-magnetic and electrostatic interference.

In normal factory environments, and with persons whose impedance to ground are within design limits (5 feet tall 90 pound person to 6 foot 5 inch 250 pound person), the Workstation Continuous Monitor cannot be “fooled”. It will provide a reliable alarm only when the wrist strap or work surface becomes dysfunctional or unsafe according to accepted industry standards. The Workstation

Continuous Monitor is drift-free and designed to be insensitive to the effects of squeezing or stretching the coil cord.

ADVANTAGES OF WAVE DISTORTION AND SINGLE-WIRE TECHNOLOGY

The ESD Systems.com Workstation Continuous Monitor allows the use of any standard, single-wire wrist strap and coil cord. The monitor/wrist strap/cord system life-cycle costs are by far lower than alternative systems which require expensive and fragile dual-wire cords and special wrist straps. Dual-wire cords are expensive and are the weak link of the system, the most likely component to need replacement. Over a five year period, this can make the dual-wire system three to five times as expensive as a system utilizing single-wire wrist straps and cords.

The dictionary defines constant as uniform and unchanging, and continuous as uninterrupted. Nonetheless, some dual-wire resistance monitors utilize a pulsed test current and do not really provide continuous monitoring. For example, during each 2.2 second pulse cycle of a leading "constant" resistive monitor, electrical current is pulsed for only 0.2 seconds followed by an unmonitored interval of 2 seconds. This leaves the user/wrist strap unmonitored for over 90% of each cycle. Damaging static charges can easily occur in the portion of the time in between the pulses. The off period of 2 seconds equals 2 billion nanoseconds, and "it takes only about 25 volts applied for 100 nanoseconds to blow most memories or microprocessors".* The dual-wire system does not reliably meet all industry specifications, as the cords do not meet the EOS/ESD Association guidelines for the 1 to 5 pound "breakaway force" requirement for operator safety.

By using the reliable wave distortion technology to determine if the circuit is complete, there are no false alarms. There is no need to adjust or tune the monitor to a specific user or installation. The miniscule amount of electrical current (less than 1 volt coil cord signal) required to generate the waveform has never caused reported skin irritation and is extremely safe for use in voltage sensitive applications such as disk drive manufacturing.

Installation

Remove the Monitor from the carton and inspect for shipping damage. Confirm that worksurface RTG (surface resistance) is 1×10^8 or less. Each unit should include the following:

- 1 41114 monitor
- 1 attached power cord terminated with European ground plug
- 1 13258 mat monitor cord
- 1 12102 push & clinch snap

The Workstation Continuous Monitor may be mounted in a convenient position using pressure-sensitive two piece hook and loop fastener which is supplied. It is normally mounted toward the front edge of a workstation where the LEDs are easily visible.

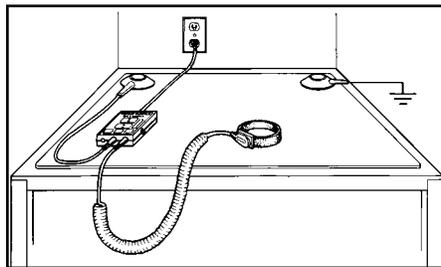


Figure 2. Installation of the 41114. Unit is shown as it is worn by the operator.

Operation

When the monitor is first plugged into a properly wired electrical outlet, both red LEDs will light and the alarm will sound.† The alarm will be sounding at this time since no wrist strap wearer or work surface is hooked up.

With a wrist strap on the wrist and the coil cord attached to the band, plug the banana plug of the wrist strap ground into the banana jack marked "Operator". This will cause the operator green LED to light if the wrist strap is functioning properly.

Now connect a mat ground cord to the work surface. (NOTE: The work surface should be already grounded with another mat ground cord.) Plug the banana plug of the mat ground cord (ESD Systems.com Item #13258) into the banana jack marked "Work Surface" (See Figure 3). This will cause the "Work Surface" green LED to light if the work surface is properly grounded.

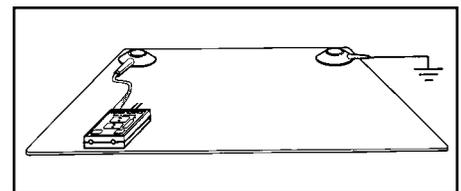


Figure 3. Installing ground cords on the work surface.

The user may disconnect the coil cord from the wrist band and leave the workstation by first touching the Standby Snap. This deactivates the alarm for six seconds and allows the operator to attach the coil cord to the Standby Snap. Using this procedure, the alarm will not sound, which otherwise could be interpreted as a problem. Note that if the coil cord is removed from the wrist band and not placed on the Standby Snap within ten seconds, the alarm will sound.

*1981 article by Donald E. Frank - Electrical Overstress Electronic Discharge Symposium Proceedings

†The Workstation Continuous Monitor takes 6 seconds to activate its alarm circuitry when it is first plugged in.

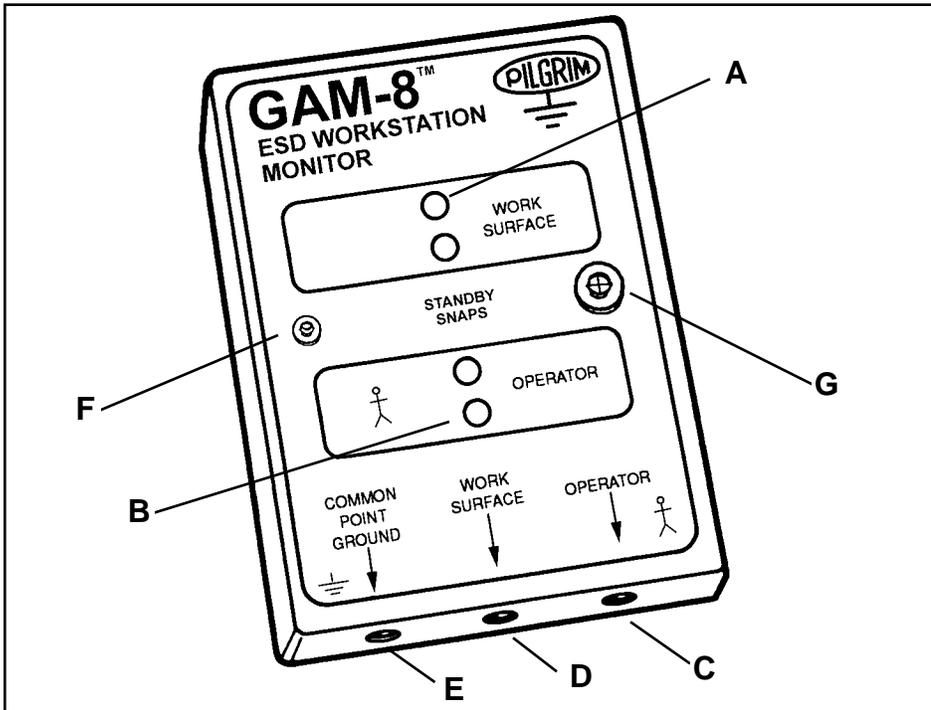


Figure 4. 41114 Workstation Continuous Monitor Features

Features

A. Work Surface Ground LEDs:

When the green LED is lit, the work surface is properly grounded. When red LED is lit, the work surface is not properly grounded.

B. User Ground LEDs: When the green LED is lit, the operator is properly grounded. When red LED is lit, the operator is not properly grounded.

C. Operator: The banana jack for the wrist strap being monitored.

D. Work Surface: The banana jack for the work surface being monitored.

E. Common Point Ground: Can be used to ground either user or work surface.

F. 4mm Parking Snap: When touched by the wrist strap wearer, this snap will deactivate the alarm function for six seconds. This allows time for the wearer to disconnect the coil cord from the wristband and “park it” on

this snap. While parked, the coil cord disables the alarm function to allow the wearer to leave the workstation. The “Operator” LED will remain off while cord is parked. Upon returning and removing the coil cord from the parking snap, the wearer has six seconds to hook up to the wristband before the alarm sounds.

G. 7mm Parking Snap: Same features as the 4mm Parking Snap.

Specifications

RESISTANCE LIMITS

Worksurface limit*
set to 100 megohms

Power Source
220 VAC, 50-60 Hz

Current Drain
<15 mA RMS

Response time to alarm
<50 mS

Standby “parking” snap delay
10 seconds

Long Term Drift
1/2% per decade
(1st decade is 1 hr)

Temperature
10-40 degrees C°

Field Adjustment
None required

Size
1/2" x 3-1/4" x 4-3/8"

Maintenance and Calibration†

The Workstation Continuous Monitor is solid state and designed to be maintenance free. The unit is calibrated to NIST traceable standards. There are no user adjustments that can be made. Because of the impedance sensing nature of the test circuit, special equipment is required for calibration. For more information please call or fax our Marlboro, MA factory, or e-mail us at: service@esdsystems.com

**Limit can be varied and set to 1 gigohm maximum.*

†This cannot be verified with standard DC test equipment. The Workstation Continuous Monitor is an impedance sensing device and the limits are determined by the magnitude and angle of the impedance.

Limited Warranty

ESD Systems.com expressly warrants that for a period of five (5) years from the date of purchase, our Continuous Monitors will be free of defects in material (parts) and workmanship (labor). Within the warranty period, a credit for purchase of replacement ESD Systems.com Continuous Monitors, or, at our option, the Continuous Monitor will be repaired or replaced free of charge. If product credit is issued, the amount will be calculated by multiplying the unused portion of the expected five year life times the original unit purchase price. Call Customer Service at 508-485-7390 for a Return Material Authorization (RMA) and proper shipping instructions and address. You should include a copy of your original packing slip, invoice, or other proof of purchase date. Any unit under warranty should be shipped prepaid to the ESD Systems.com factory. Warranty replacements will take approximately two weeks.

If your unit is out of warranty, ESD Systems.com will quote repair charges necessary to bring your unit up to factory standards. Call Customer Service at 508-485-7390 for a Return Material Authorization (RMA) and proper shipping instructions and address.

Warranty Exclusions

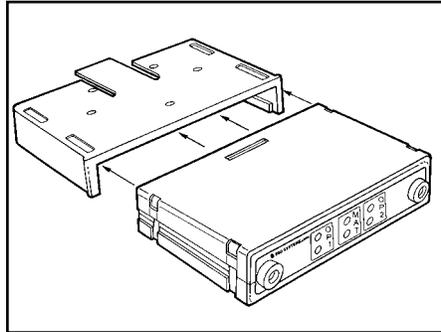
THE FOREGOING EXPRESS WARRANTY IS MADE IN LIEU OF ALL OTHER PRODUCT WARRANTIES, EXPRESSED AND IMPLIED, INCLUDING MERCHANTABILITY AND FITNESS FOR A PARTICULAR PURPOSE WHICH ARE SPECIFICALLY DISCLAIMED. The express warranty will not apply to defects or damage due to accidents, neglect, misuse, alterations, operator error, or failure to properly maintain, clean or repair products.

Limit of Liability

In no event will ESD Systems.com or any seller be responsible or liable for any injury, loss or damage, direct or consequential, arising out of the use of or the inability to use the product. Before using, users shall determine the suitability of the product for their intended use, and users assume all risk and liability whatsoever in connection therewith.

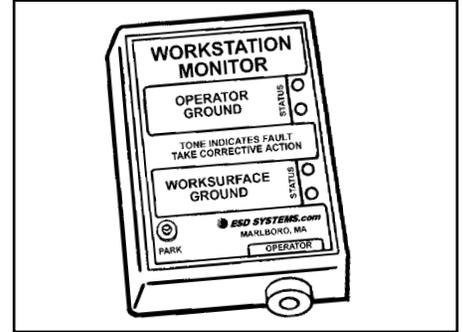
Other Test Products Available From ESD Systems.com

Dual Operator Continuous Monitor - Model 41137



The ESD Systems.com 41137 Dual Operator Workstation Continuous Monitor continuously monitors the grounding integrity of two operators, and an ESD protective work surface's discharge path to ground. The monitor will provide virtually instantaneous notification of static control equipment failures, eliminating the need of costly record keeping. The 41137 is highly cost effective as it is designed to monitor any conventional single conductor wrist strap and ground cord system. For more information on this tester ask for Tech Brief PS-2080.

Workstation Continuous Mini Monitor - Model 41126



The ESD Systems.com Workstation Continuous Mini Monitor continuously monitors the integrity of one operator and an ESD protective work surface's discharge path to ground. The Monitor will provide virtually instantaneous notification of static control equipment failures, eliminating the need of periodic testing and costly record keeping. This unit is highly cost effective as it is designed to monitor any conventional single conductor wrist strap and ground cord system. There are no additional wires to connect and its small package makes it highly suitable to install on a worksurface. For more information ask for Tech Brief PS-2100.

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