ION SYSTEMS
An ITW Company

Air Ionizing Cartridge

Model 6110/6110A

User's Manual

About ION Systems

ION Systems, an ITW Company develops, manufactures, and markets system solutions to manage electrostatic charge. As the world's largest provider of electrostatics management products and services, ION Systems improves its customers' business results by providing a total solution to their electrostatic discharge and electromagnetic interference challenges. ION Systems is a wholly-owned subsidiary of Illinois Toolworks, and is located in Alameda, California. For more information, visit www.ion.com or call 800-367-2452. ION Systems is ISO 9001 and ANSI ESD S20.20 certified.

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Description

1.1 Air Ionization Cartridge Model 6110/6110A

The Air Ionization Cartridge Model 6110/6110A is a self-contained compressed air ionizing cartridge. It controls static charge in production, packaging, laboratory and other environments where static build up can cause contamination, ESD, material handling problems or microprocessor lock up. Compact and rugged, the cartridge can be used either for in-line ionization or as an ionizing blow-off gun.

For in-line use, the Model 6110(A) connects to a compressed air source and it is ready to ionize any type of production equipment. The Model 6110A may be attached to an ordinary air gun and the airstream is ionized for effective particle removal. An internal sensor on the Model 6110A initiates ionization only when the gun is triggered, ensuring on-demand control of static charge.

ION Systems patented IsoStat Technology[1] guarantees intrinsically balanced ionization and eliminates complicated feedback circuits. Ionizers incorporating this technology never need calibration and require very little maintenance.

Note: This manual covers both Model 6110 and 6110A Air Cartridges. They share the same design and operate in the same way, but the Model 6110A features an internal airflow sensor. In this manual, models are referred to as follows:

- Model 6110A refers to the version with airflow sensor.
- Model 6110(A) refers to both versions.

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1. U.S. Patent No. 5,055,963

1.2 Performance

Charged Plate Monitor (CPM). ION Systems offers the CPM Model 280A.

Contact ION Systems for more information.

	In-line Ionizing Cartridge
Discharge Time	<4 seconds, 1000V to 100V for either polarity. Measured with 6110(A) air output connector 6 inches from the plate of a charged plate monitor (CPM) and an inlet air flow rate of at least 2 SCFM. The minimum flow rate for operation of the 6110(A) is 2 SCFM.
Offset Voltage Balance	Better than 25V with the air on or off, measured at 6 inches from the CPM. Shall not exceed 50V at 1 inch from the CPM under any operating conditions.

1.3 Power Requirements

The 6110(A) ionizer is typically used in conjunction with a 24 VAC wall or desktop transformer. The transformer connects to line power and provides 24 VAC to the ionizer unit using cables made with modular cable and telephone-style connectors. ION Systems offers the following transformers for use with the 6110(A) ionizer:

- 100 VAC input power transformer (p/n 14-1306)
- 120 VAC input power transformer (p/n 14-1310)
- 230 VAC input power transformer (p/n 14-1523)

To ensure correct performance of the transformer, please note the following:

- The transformer should not be operated beyond the specified electrical limit as described in the Specifications section of this manual.
- Damage caused to the transformer from operation in an environment that exceeds the specified limits will void the warranty.

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Setup & Operation

Box Contents

Model 6110

Model 6110A

Figure 1. Nozzle and Adapter Pieces included with the Model 6110A

Setup

Remove and discard the two red protective plugs from each end of the ionizer.

No equipment or tools are required for setting up the 6110(A), except as needed for the air line fittings.

The 6110(A) is designed to be used with clean dry air (CDA). Appropriate filtering must be used to remove moisture, oil, and particles from the compressed gas supply. Consult manufacturers of air compressor equipment for recommendations.

Gas Inlet Attachment

Teflon center tube of 6110(A) is threaded for 1/4” NPT fittings. Appropriate adapters for 1/4” NPT or 1/8” NPT may be used. Use of the 6110(A) is not recommended with fittings smaller than 1/8” NPT.

The end user must provide a means to control and monitor the input pressure and gas flowrate.

Caution:	Fittings must be slowly and carefully installed to avoid cross-threading the Teflon tube. Teflon tape and cleanroom compatible components should be used as necessary.
	Only Teflon is used in the 6110(A) internal air flow path. While this is a cleanroom compatible material, the unit should be purged with clean dry air for at least one hour before connecting it to any cleanroom production equip-ment. If possible, monitor the purge air output for particles.
	The 6110(A) cartridge is not designed to withstand high air pressures. It should be installed downstream from any system valves or shutoffs with the output side open to atmospheric pressure.

2.4 Ionized Gas Output Connection

Gas flow rate through the ionizer should be 2 SCFM, minimum

- PFA Teflon tubing is recommended to maintain cleanliness
- A minimum inside diameter of 3/16” is recommended for the outlet tubing
- Limit the outlet tubing to a maximum length of about 3’ (914 mm)

Static discharge performance will diminish as the output tubing length increases or if the ionized air is forced around bends. For best results, keep the tubing straight, short (36” max) and use a minimum number of fittings to make connections. A single 90° bend in the tubing can increase the static neutralizing time by a factor of two or more.

Example: Using a 3/16” ID x 36” long outlet tube will require an inlet pressure of between 2 to 3 PSI to generate about 2 SCFM (57 LPM) minimum flow through the 6110(A) cartridge. An inlet presssure of between 6 to 7 PSI will generate about 4 SCFM (113 LPM) flow through the cartridge.

The end user will need to test any tubing or fittings installed on the ionized outlet of the 6110(A) to determine suitablilty and performance levels in their own installation.

2.5 Blow-off Gun Attachment

least 0.125" ID. OSHA approved nozzles are recommended.

In order to comply with OSHA regulations limiting hand-held air blow-off devices to a maximum pressure of 30PSI, it is recommended that the input pressure to the 6110(A) be limited to a maximum of 30PSI when it is used as an attachment to a blow-off gun.

Hose Kit

Figure 2. The Optional Air Gun/Hose Kit

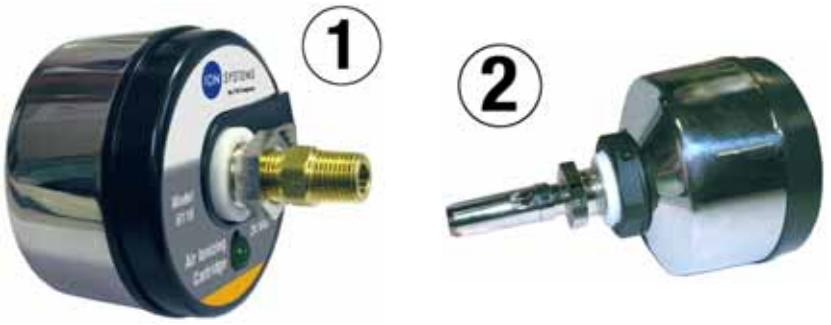

Figure 3. Connecting the Adapter and Nozzle Pieces

Figure 4. Connecting the Gun Handle to Adapter Piece

2.7 Connection to 24 VAC Source

source; use the included 10 foot interconnect cable. See the figure below for wiring information on connecting the Model 6110(a) to a 24 VAC source.

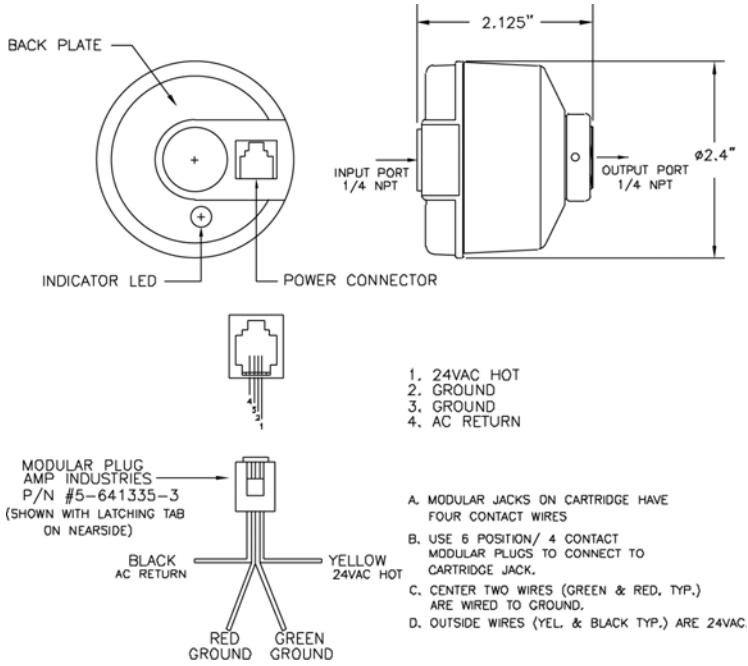

Figure 5. Wiring Connections for 6110(A) to 24 VAC Source

2.8 Operation

The 6110(A) does not have a “power on” switch. It will be powered on as soon as it is connected to a 24 VAC source.. An LED on the air input side of the unit will indicate power as follows:

6110 Power Indication

6110A Power Indication

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Maintenance

3.1 Cleaning

Cleaning solution of 50% IPA (electronic-grade isopropanol)/ 50% de-ionized water or ION Systems Emitter Point Cleaner (#22-1000).

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unauthorized service will void the warranty. The warranty does not cover breakage of the emitter points or cross-threading of the input and output connections.

Before performing any maintenance on emitter points, remove the power plug from the ionizer. Allow a minute for the high voltage power supply to discharge.

Normally, the emitter points will be cleaned by the compressed air that flows through the units. If for some reason the points have become contaminated (poor air filtration, long term operation, etc.), they may be cleaned using a lint-free swab moistened with the IPA solution. Remove the input or output fitting and gently swab the emitter points and the Teflon tube. Emitter points are made of a proprietary material which will last 3 to 5 years in normal operation.

The emitter points are not replaceable.

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Specifications

Model 6110(A) Air Ionizing Cartridge	
Input	24 VAC @ 40 mA, <1W from 1310 wall transformer
Wall Transformer Power Source	120 VAC (powers up to 10 units),100 VAC (14-1306) and 230 VAC (14-1523) models available
	Green LED
Ion Emission	Steady-state DC
Emitter Points	Permanent tungsten alloy, est. life 5 years of continuous use
Air Flow Requirements	2 SCFM (57 LPM), min
Air Line Connector Requirements	1/4" NPT female (input and output); 1/8" NPT adapter available 2-3 PSI (nominal) is needed to create a 2 SCFM min flow through the Model 6110(A) cartridge with a 3/16" ID x 36" long outlet tube installed; for safety reasons, the inlet pressure to a blow-off gun with a 6110(A) cartridge installed should be limited to 30 PSI max; the 6110(A) is not designed to be pressurized
(Model 6110A only)	Turns ionizer off when air is not flowing; Model 6110 without sensor also available for continuous flow applications
Dimensions	2.2D x 3.1L in. (5.6 x 7.9 cm) not including fittings
	6 oz (170.1 g)
	RoHS Compliant

14-1306 Transformer (This desktop transformer requires an optional IEC power cord)	
Input	
Output	No load V (max) 29 VAC; Full load V (nom) 24 VAC ±5%
	117 VAC ±10%, 60 Hz, 270 mA
	0-50°C (32-122°F)
	The power supply is provided with protection against short circuit by means of the primary thermal fuse
	2.2"H x 2.6"W x 2.9"L (55 x 65 x 76 mm)
	CE

	120 VAC, 60 Hz, 32W, alternate transformer available for 230 VAC operation; powers up to ten 6110(A) cartridges
	117 VAC ±10%, 60 Hz, 270 mA
	V (max) 29.0 VAC (no load); V (nom) 24.0 VAC ±5% (full load)
	0-50 °C (32-122°F)
	The power supply is provided with protection against short circuit by means of the primary thermal fuse.
Cabling	8 ft. (243.8 cm) with RJ-11 connectors; custom lengths available
	3.2" H x 2.5" W x 1.9" D (8.1 x 6.6 x 4.8 cm)
	1 lb. (454 g)
	c UL us (120 VAC Model)

14-1523 Transformer (This desktop transformer requires an optional IEC power cord)	
Input	
Output	
Temperature Range	
Short Circuit Protection	
Dimensions	
Certifications	 

Available Parts & Accessories

ION Systems P/N	Description
	Optional air gun/hose kit for Model 6110A
14-1306	100 VAC input transformer
14-1310	120 VAC input wall transformer
14-1523	230 VAC input transformer
25-20660	IEC power cable with US plug, 8.2 ft (2.5m)
25-0670	IEC power cable with US plug, 10 ft (3m)
25-0680	IEC power cable with US plug, 15 ft (4.6m)
25-0700	IEC power cable with no plug, 10 ft (3m)
25-20710	IEC power cable with UK plug, 8.2 ft (2.5m)
25-20735	IEC power cable with German Schuko plug, 8.2 ft (2.5m)
25-20750	IEC power cable with China plug, 8.2 ft (2.5m)

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Warranty & Service

Notes

Notes

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1750 North Loop Road
Alameda, CA USA 94502
Tel: 510-217-0600
Fax: 510-217-0484
Toll free: 800-367-2452
Sales services: 510-217-0460
Tech support: 510-217-0470

info@ion.com
salesservices@ion.com
techsupport@ion.com
service@ion.com
www.ion.com