Ionization Systems

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Ion Systems

In-line Gas Ionizer

MODEL 4210U/UN

Most high technology manufacturers rely on air ionization to control problems associated with static charge—thus increasing yields, minimizing down-time and microprocessor lock-up and reducing cost of ownership. Unfortunately, mini-environments and process equipment prevent ceiling-mounted ionizers from reaching one of the most important production areas—the inside of process equipment.

In the heart of process equipment, where limited space or proximity to sensitive products makes ionizing bars impractical, Ion's 4210 pipes compressed ionized gas for balanced charge neutralization. Either Clean Dry Air (CDA) or nitrogen can be ionized, depending on process requirements. The ionized gas is plumbed to the static-sensitive product or fixture through thin (6-10 mm) ultraclean Teflon™ tubing, bathing the area in conductive gas. Manifolds can be routed through the equipment to the desired area, while staying clear of moving products and robotics.

Features and Benefits

- Directly connects to delivery manifolds
- Precise delivery of balanced ionization to confined areas
- Ionizes either Clean Dry Air or Nitrogen (u/un models)
- Class 1 operation (u/un models)
- IsoStat® technology
- No calibration needed
- Steady-state DC ion emission
- Fast discharge times
- Single crystal silicon emitter points (u/un models)
- Cleanest emitter points available
- Ultraclean construction with carefully controlled current and geometry
- Maintenance-free for two years

Specifications

In-line Gas Ionizer Model 4210	
Ion balance	±25V at specified flow and pressure Measured at 6" from CPM; tested in accordance with Ionization Standard ANSI EOS/ESD S3.1-1991.
Discharge	4210: 10 sec., 4210u: 6 sec., 4210un 10 sec.; Measured through 6" long, 1/4" ID Teflon tube held 6" from the CPM; airflow rate of 120 SCFH (2 SCFM)
Ion emission	Steady-state DC
Input power	120 VAC, 50-60 Hz, approximately 2 watts; 100 and 230 VAC models available
Temperature	Ambient: -4°F (-20°C) -140°F (60°C) Max. inlet gas supply: 250°F (120°C) in a 73°F (23°C) ambient environment
Gas flow rate	Minimum: 1.5 CFM Maximum: set by manifold back pressur
Input pressure	10-50 psi safe range; unit is NOT designed to withstand high pressures. It should be installed downstream from any valves, with the output open to atmospheric pressure.
Manifold pressure	*Model 4210:* 0-70 psi; 4210u 0-50 psi; *Model 4210un:* 0-15 psi to achieve ionization
Manifold	Teflon tubing with flare fittings for interconnects; nitrogen: 3/8" (9.5 mm) ID tubing; CDA: 1/4" (6 mm) ID tubing. For details on manifold design, refer to Ion's Technical Note, In-line Gas Ionization Considerations: 4210 Use and Application Guide.
Gas connectors	1/4" NPT female Teflon fittings, at both gas input and output
Casing	Painted cast aluminum
Mounting	Four 6-32 threaded holes provided; wall and bulkhead mount brackets available
Dimensions	2.5D x 4.75L x 3.2W inches (6.3D x 12.1L x 8.1W cm)
Weight	37 oz (1.04 kg) including fittings
Maintenance	2 years continuous use (suggested)
Warranty	2 year limited warranty
Certifications	CE, TÜV Rheinland Product Safety, GS

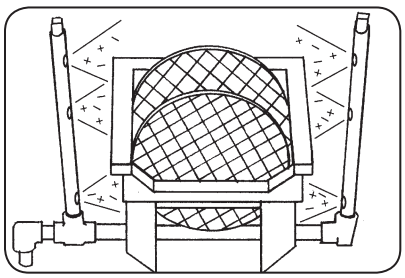
Ordering Information

91-4210	Model 4210 In-line Gas Ionizer with tungsten emitter points, 120 VAC, US wall plug
	-100V, -230V, -UK
91-4210U	Model 4210 In-line Gas Ionizer with silicon emitter points, 120 VAC, US wall plug
	-100V, -230V, -UK
91-4210UN	Model 4210 In-line Gas Ionizer with silicon emitter points for nitrogen, 120 VAC, US wall plug
	-100V, -230V, -UK

-100V includes US wall plug
-230V includes German Schuko plug
-UK includes UK wall plug

Ultraclean Ionization

When fed from an ultraclean gas source, the 4210u and 4210un typically operate 10 times better than Class 1 cleanroom requirements. To virtually eliminate particle emissions, their designs include tightly controlled emitter point shape, corona voltage and current. Careful material selection, including single crystal silicon emitter points, and control of internal geometry ensure ultraclean ionized gas delivery.



For details on measuring cleanliness, refer to Ion's Technical Note, "Particulate Cleanliness Certification for the 4210 Family of In-line Gas Ionizers."

Applications

The 4210 has been used to solve static charge problems in a variety of applications, including:

- Steppers
- Spin rinser dryers
- Load and unload stations
- Disk certifiers
- Wafer management systems
- Furnaces

The 4210 Family

Versions of the 4210 are available for use with both CDA and nitrogen, using either ultraclean single crystal silicon emitter points or high output tungsten alloy points. The following table provides a product family overview:

	4210	4210u	4210un
Environment	Class 100	Class 1	< Class 1
Gas Ionization	CDA/ Nitrogen	CDA	Nitrogen
Emitter Point Materials	Tungsten Alloy	Silicon	Silicon

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