

## IC256-42 - LARGE AREA STRIP IONIZATION CHAMBER

### Key Features

- **Large Active Area:** 42 × 35 cm sensitive region optimized for most particle-scanning and beam-diagnostic systems.
- **High-Resolution Strip Readout:** Fine-pitch electrodes provide sub-millimeter (<1 mm) precision for accurate beam position and size measurements.
- **High-Speed Data Acquisition:** Fully integrated electronics support data rates up to **6 kHz**, enabling real-time beam monitoring.
- **Environmental Compensation:** Built-in temperature and pressure sensors allow automated ideal-gas-law corrections for stable, reliable measurements.
- **Maintained Internal Gas Stability:** Replaceable desiccant ensures long-term control of internal gas conditions.



IC256-42

### Typical Applications

- Particle accelerator commissioning and tuning
- Calibration of particle-beam scanning magnet systems
- Characterization of beam quality and stability

The **IC256-42** is a large-format, high-speed, and high-resolution ionization chamber engineered for advanced beam diagnostics. Its fine-strip electrode design provides simultaneous two-axis beam projections, enabling precise analysis of position and axial beam shape. Designed as a versatile isocenter-diagnostics instrument, the IC256-42 consolidates the functionality of multiple measurement devices while delivering enhanced insight into beam behavior.

## PRODUCT SPECIFICATION

### MECHANICAL

<b>Weight</b>	10.2 kg (22.4 lbs.)
<b>Dimensions</b>	594 x 634 x 62 mm (overall approximate; see figures)
<b>Chassis Material</b>	Aluminum and Carbon Fiber Composite
<b>IP Rating</b>	IP54 (protected against limited dust ingress and against splashing water from any direction.)

### IONIZATION CHAMBER

<b>Active Area</b>	420 x 350 mm
<b>Strip Count</b>	256 x 256 strips
<b>Strip Pitch</b>	1.65 x 1.38 mm (Center to Center)
<b>Gap Size</b>	6, 7, 7 mm (A, B, Integral)

### MICROPROCESSOR

<b>Processor</b>	AM5728 Dual ARM Cortex A15, 1.5 GHz
<b>Memory</b>	1 GB DDR3 RAM
<b>Storage</b>	32 GB micro-SD card
<b>Operating System</b>	Blackberry QNX real-time OS
<b>Control System</b>	Pyramid IGX modular real-time control system
<b>Software API</b>	Supports HTTP (JSON), WebSockets (JSON), EPICS, and more. See Programmer manual for full details.

### ANALOG TO DIGITAL CONVERTER

<b>Type</b>	Delta-sigma simultaneous sampling dual integrator
<b>Resolution</b>	20-bit raw conversion, 32-bit sample averaging
<b>Conversion Frequency</b>	Programmable from 1 Hz to 6 kHz
<b>Sample Frequency</b>	Programmable from 0.1 Hz to 6 kHz
<b>Sample Filter</b>	Block averaging, each conversion into sub-samples

### OPERATING ENVIRONMENT

<b>Temperature</b>	10 to 45°C (optimal range: 15 to 25°C)
<b>Humidity</b>	Less than 70%, non-condensing
<b>Vibration</b>	Less than 0.1g across all axes (0.1 to 100 Hz)
<b>Environment</b>	Clean and dust-free environment



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**SHIPPING AND STORAGE ENVIRONMENT**

<b>Temperature</b>	-10 to 50°C
<b>Humidity</b>	Less than 80%, non-condensing
<b>Vibration</b>	Less than 1g across all axes (0.1 to 100 Hz)

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## PHYSICAL INTERFACE SPECIFICATION

### POWER INPUT

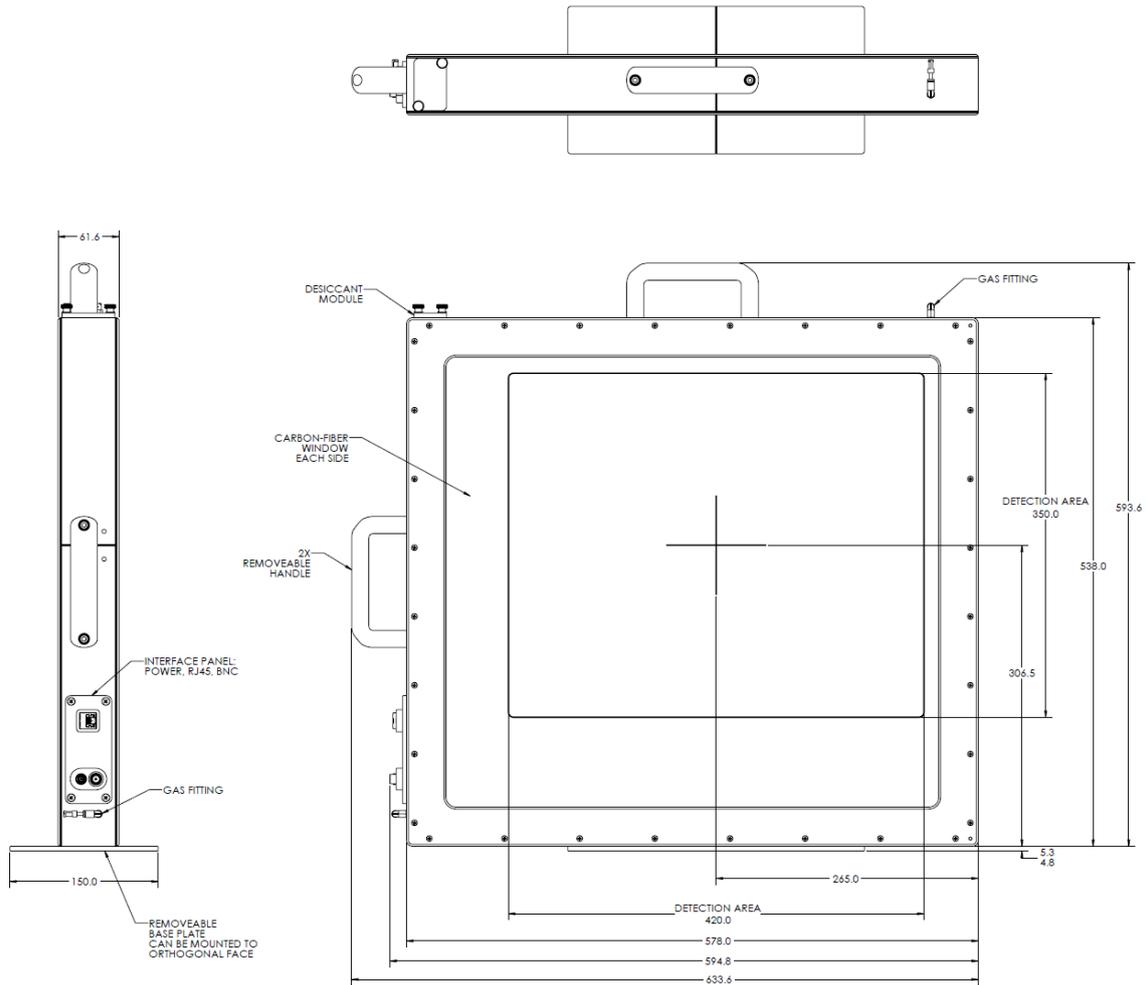
<b>Device Connector</b>	Switchcraft 2.1 mm threaded jack L721
<b>Mating Connector</b>	Switchcraft S761K
<b>Nominal Voltage</b>	24 VDC
<b>Voltage Range</b>	9 - 36 VDC
<b>Maximum Power</b>	25 Watts

### ETHERNET

<b>Device Connector</b>	Shielded RJ45 Jack
<b>Isolation</b>	Magnetics, HIPOT test up to 1500 Vrms
<b>Speed Rating</b>	10/100/1000 Base-T (IEEE 802.3)



## MECHANICAL DRAWINGS



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