Ion Gauge Controller

IGC100 — Ion gauge controller with graphical display



- 1000 Torr to UHV range
- Highly accurate, stable controller
- Pressure vs. time curves
- 4 analog input/output ports
- 8-channel process control (opt.)
- RS-232 and GPIB (opt.) interfaces

IGC100 Ion Gauge Controller

The IGC100 is a high-accuracy controller that offers pressure measurement and process automation never before available in a single instrument. It measures pressure from Bayard-Alpert ionization gauges, convection-enhanced Pirani gauges, and capacitance manometers, providing uninterrupted pressure readings from 1000 Torr to UHV.

The IGC100 has a touchscreen display that can present data in a variety of formats including pressure vs. time curves. There are built-in relays for process control, and several multipurpose input/output ports.

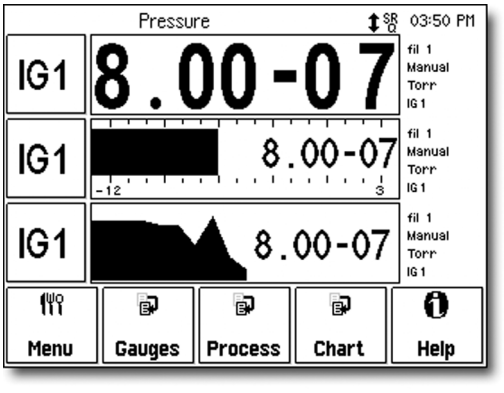
Accurate Measurements

The IGC100 is designed to be a highly accurate, stable controller. Its low-noise, autoranging electrometer delivers high-accuracy pressure readings into the UHV range. A low-noise, direct current (DC) supply powers the filament and establishes the emission current. The IGC100's precision electronics eliminate controller-to-controller variations and the measurement uncertainties (up to 15 %) associated with traditional instruments.

Graphical Touchscreen Display

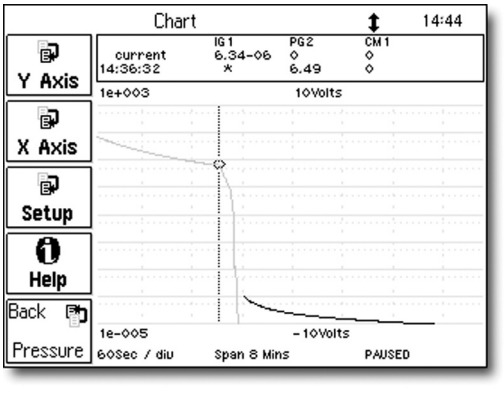
The IGC100 has a large, back-lit LCD touchscreen display — new to ion gauge controllers. The instrument shows large numeric readings from each gauge (easily read from across the room), and can also display readings in bar graph or trend

format. The screen is updated twice a second, and results are presented in units of Torr, mbar, bar, Pa or microns.



Numeric readout, bar graph and trend plots

The IGC100 also displays pressure versus time curves (chart recordings), allowing you to follow pump down and venting cycles and to keep track of your vacuum system's performance.

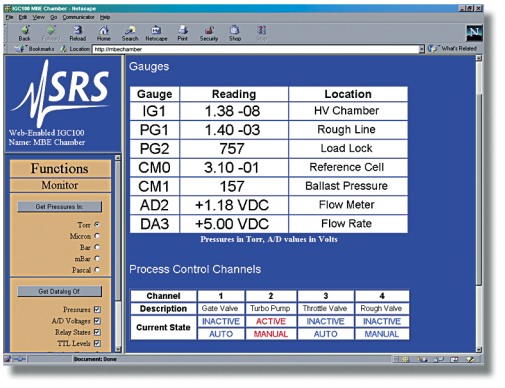


Pressure vs. time display

IGC100 data is continuously logged into memory. There is a real-time clock with date for precise time stamps. In addition to pressure readings, you can log the ADC voltages and relay activity. Data can be viewed on the IGC100 or downloaded to your computer for further analysis.

Useful I/O Ports

The IGC100 has four auxiliary analog input/output ports. When configured as inputs, the ports can be monitored on the front panel or read through the GPIB, RS-232, and can be used for a variety of applications. For instance, they might be used to monitor the pressure of a capacitance manometer, measure pump speed, record temperature from a turbo pump controller, or monitor a mass flow controller.



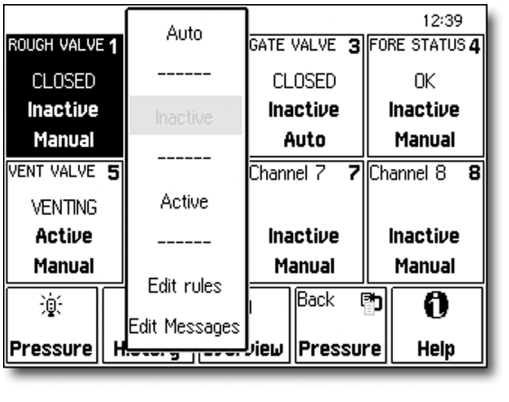
Sample of IGC100 web page

The ports can also be configured as analog outputs with a voltage range of ±12 VDC, and can be used to send control voltages to other devices.

Powerful Process Control

The IGC100 does more than simply measure pressure. It can also be an eight-channel process controller. There are eight relays, with corresponding TTL outputs, that can be used to control your vacuum system. They can be set by gauge pressure, status conditions (gauge on/off, filament on/off, etc.), the system clock, the analog I/O ports, or TTL input signals. The relays and TTL outputs can also be manually controlled from the front panel, and the status of all eight channels can be displayed.

Additionally, there are twelve dedicated TTL inputs for triggering functions like gauge on/off, filament on/off, degas, ion gauge lockout, etc. All process control events are time stamped and recorded in memory, and can be viewed at any time. User-programmable audible alarms and text messages can provide advance warning of potential problems.



8-channel process control

Gauge Auto-Start

The IGC100 can be set to automatically turn on an ion gauge once a Pirani gauge has reached a preset pressure level. If a UHV Pirani gauge is used in the same high-vacuum chamber as the ion gauge, you can make uninterrupted pressure measurements from atmosphere to UHV. In the event of overpressure, the IGC100's built-in filament protection algorithm, with user-programmable set point, immediately turns off your gauge filament.

Easy Operation

Despite its multitude of features, the IGC100 is easy to use. The menu based interface is intuitive, and parameter entry is quick and simple. And of course, there is interactive help for all functions of the instrument. There are dedicated front-panel buttons for filament emission, degas, and filament auto-start, and LEDs indicate their status. The IGC100 is compatible with virtually all Bayard-Alpert ion gauges including glass tubulated, nude, nude-UHV, STABIL_ION®, and MICRO_ION®. You can select from a variety of standard gauge configurations or program your own.



IGC100 rear panel (with Opt. 01 and Opt. 03)

You can also assign a location name to each gauge, which is then displayed on the front panel of the unit. No more messy, confusing stickers on the face of your instrument. There are no DIP switches, trim pots or thumbwheel adjustments in the IGC100 — you'll never need to open the box.

A sensor on/off function has been added so you can shut down your Pirani gauges in the presence of flammable gases without having to physically disconnect them from the controller.

Password protection is provided to keep casual users from accidentally altering important parameters.

A high-level command set, along with an RS-232 and optional GPIB interface, allows you to fully control the IGC100 from your computer.

SRS Gauges

SRS supplies a wide range of hot-cathode ionization gauges. These include tubulated and nude designs with a variety of mounting options, and a choice of tungsten (W) or thoriated-iridium (ThO_2/Ir) filaments. We also offer convection-enhanced Pirani gauges (PG108).

Ordering Information

IGC100	Ion gauge controller w/ RS-232
Option 01	GPIB computer interface
Option 03	8-channel process control
O100IGRM	Rack mount tray
O100C110	10' cable (glass, single fil. gauge)
O100C125	25' cable (glass, single fil. gauge)
O100C210	10' cable (glass, dual fil. gauge)
O100C225	25' cable (glass, dual fil. gauge)
O100C310	10' cable for nude gauge
O100C325	25' cable for nude gauge
O100CA1	Adapter for Micro-Ion® gauge

IGC100 Specifications

Operation

Pressure range	1000 Torr to UHV ($<10^{-11}$)
Compatible gauges	Bayard-Alpert ion gauges, convection-enhanced Pirani gauges, capacitance manometers (0 to 10 VDC linear output)
Display	
Type	4.7", back-lit, touchscreen LCD, 320 × 240 pixels
Modes	Numeric, bar graph, *P* vs. *T*
Units	Torr, mbar, bar, Pa and micron
Numeric res.	3-digit mantissa plus exponent
Update rate	2 samples per second
Dual Pirani gauge	Simultaneous readout of two Pirani gauges (std.)
Auto-start	Use PG1 or PG2 to automatically turn IG1 or IG2 on/off when pressure goes through a user-defined level.

Electrical (20 °C to 30 °C)

Electron emission current	
Range	10 µA to 12 mA
Stabilization	Electronically controlled
Accuracy	±1 % of setting
Anode	
Potential	+180 VDC
Accuracy	±0.3 % of setting
Filament	
Potential	+30 VDC
Accuracy	±0.3 % of setting
Filament power	7 ADC, 7 VDC
Degas	
Mode	Electron bombardment
Power	1 to 75 W, adjust. in 1 W steps
Time	1 to 30 min., adjust. in 1 min. steps
Anode potential	500 VDC
Emission current	2 to 150 mA
Display	Approximate pressure, degas power and remaining time
Electrometer	
Accuracy	1 % of reading
Zero drift	0.4 pA
Analog I/O	
Ports	4 configurable analog ports
Range	±12 VDC
Resolution	14-bit (In), 12-bit (Out)
Update rate	2 Hz
Connector	BNC

Ionization Gauge

Gauge type	Bayard-Alpert ionization gauges including glass tubulated, nude, nude-UHV, STABIL_ION®, MICRO_ION®. Supports tungsten and thoriated-iridium filaments.
Pressure range	10^{-11} Torr to 10^{-1} Torr
Lower limit	X-ray limit of Bayard-Alpert gauge
Upper limit	Maximum operating pressure specified by gauge manufacturer
Pressure calculation	From sensitivity constant or full-range calibration curve
Sensitivity constant	0.1/Torr to 100/Torr
Filament selection	Fil 1, Fil 2, or both
Overpress. protection	Programmable trip points, auto-start protection
Analog output	Log, 1 V/decade, 1 to 10 V w/ fault and off indication

Convection-Enhanced Pirani Gauge

Gauge type	PG108 convection-enhanced Pirani gauge, CONVECTRON®, and HPS™ Series 317 convection-enhanced Pirani gauges
Pressure range	10^{-3} to 999 Torr. Lower pressure limit to 10^{-4} Torr w/ zero adjust.
Gas type calibration	Direct readings for air, N_2 and Ar. Zero and atmospheric adjustments.
Analog output	Log, 1 V/decade, 1 to 8 V

Capacitance Manometer

Number of gauges	Simultaneous readout of up to four capacitance manometers using the auxiliary inputs
Aux. power output	±15 VDC, 100 mA (for CM power)

Process Control (opt.)

Number of channels	8 channels with programmable setpoint, polarity, hysteresis, delay, audio signal, and text messages. All channels can be manually operated from front panel.
Process variables	Pressure (any gauge), voltage (I/O ports), time (internal clock), TTL inputs, and gauge status
Relays	8 relays, SPDT (form C), 5 A/250 VAC/30 VDC, resistive load
TTL control	8 TTL inputs and 8 TTL outputs (active low, opto-isolated) corresponding to relays
Additional inputs	12 opto-isolated TTL inputs corresponding to: Remote Enable, IG1 on/off, IG2 on/off, Degas on/off, Fil 1/Fil 2 select, both Fil select, IG lockout, IG keypad lockout, PG1 on/off, PG2 on/off, data logging time reset, touchscreen enable/disable

General

Interfaces	RS-232 (std.), GPIB (opt.)
Power	90 to 264 VAC, 47 to 63 Hz, 240 W
Operating temperature	0 °C to 40 °C, non-condensing
Weight, dimensions	15 lbs., 8.5" × 5.25" × 16" (WHD)
Warranty	One year parts and labor on defects in materials and workmanship