



SENTRY™ 1510AP

Absolute Pressure Diffusion Furnace Controller

Hardware

The Absolute Process Pressure Controller

Brooks Automation has coupled the unique features of the world's most advanced process pressure controller with the latest evolution in absolute pressure (AP) transducer technology to create the SENTRY 1510AP, Absolute Pressure Controller. The SENTRY 1510AP is the first process pressure controller for atmospheric diffusion furnaces to provide the same process isolations.

One Process Worldwide

Unlike standard atmospheric pressure controllers developed to isolate the process from house exhaust fluctuation, the SENTRY 1510AP has a much wider control window to span both barometric pressure changes and pressure offsets due to the altitude of the semiconductor manufacturing facility.

- Barometric fluctuations can be up to 50 times larger than house exhaust fluctuations.
- Process pressure offsets due to the elevation of the facility can be an additional 150 times greater than house exhaust fluctuations.

The unique fail-safe design of the SENTRY 1510AP allows a sealed process to be run exactly as it was developed.

Breakthrough Technology

At the heart of the SENTRY 1510AP control system is a piston and spring. Four forces work on the piston to maintain a constant process pressure: gravity, clean room pressure, spring tension and process pressure itself. The Piston reacts within 50 milliseconds to changes in house exhaust, process flow rate and even pyrogenic ignition.

Automatic Set Point Control

While dynamic control of exhaust fluctuations and barometric pressure are accomplished mechanically, the process set point is controlled electronically. The microprocessor-based SENTRY TIM-100 (Tool Interface Module) applies a PID algorithm to the sensed pressure and commands a stepper motor in the SENTRY 1510AP accordingly. Once the new set point is reached, the piston takes control.

Features

- > Isolation of process from barometric pressure fluctuations
- > Repeatable process pressures
- > Sealed system
- > Prevents back streaming from house exhaust
- > Fast response
- > Automatic set point control
- > Analog or digital communications

Process Benefits

- > Removes barometric pressure as process variable
- > Improves process repeatability
- > Improves oxide quality through contamination control
- > Helps maintain an HCl-free work environment

- > SENTRY™ 1510AP Furnace Controller

SENTRY™ 1510AP provides absolute pressure control for Atmospheric Diffusion Furnaces



LCD Display Windows the Process

The sophisticated electronics of the TIM-100 provide the user with an LCD displayed view of the process:

- Real time trend chart of actual pressure data
- Real time numeric read-out of set point and process pressure
- 4-key menu driven programming of set points, timing or remote control modes

Host Communications

In addition to stand alone, closed-loop control; the TIM-100 also works with a tool controller. The TIM-100 has a 0-5V analog interface for remote set point control from the process tool. An RS422/485 serial communications port is available for use by the process tool or the facility integrated control system.

Specially Designed for HCI Processing

The SENTRY 1510AP itself is fully compatible with the use of hydrochloric acid as no metallic parts are exposed to the wetted gas path.

Condenser for Pyrogenic Process

In pyrogenic processes, unwanted condensation can affect process results and system maintainability. As an option for pyrogenic systems, Brooks manufactures a condenser that is integrated with the SENTRY 1510AP to control unwanted condensate.

Sentry 1510 AP Specifications

Performance:

Absolute pressure: 800 – 1100mbar (650 – 800 mm Hg)

Accuracy to set point:

±1.33 mbar (±1 mm Hg)
±2.67 mbar (±2 mm Hg) on pyrogenic process

Response time:

Process flow rates

Response to pyrogenic ignition and extinguish will vary by installation
.01 to 1.05 SCFM (0.3 to 30 SLM)

Physical:

Dimensions
SENTRY 1510 Controller
TIM-100/120

Length	Width	Height	Weight
7.5" (191 mm)	3.0" (76 mm)	8.5" (216 mm)	7 lbs (3.2 kg)
8.32" (211.3 mm)	5.41" (137.3mm)	2.33" (59.1mm)	2 lbs (0.9 kg)

Wetted path materials

Ryton and Teflon with Viton elastomers

Power options

DC supply: +15 to +24 VDC, 650 mA and –15 to –24 VDC, 50mA
AC supply: 90 to 260 VAC, 47 to 63 Hz

Set point control types

0-5 Volt Analog Interface
RS422/485 Serial Communication
Stand alone using operator key pad

Safety cut-off device

The TIM-100/120 contains a cartridge fuse holder for a 5 X 20mm fuse. The fuse is a 0.8 amp fuse
BROOKS AUTOMATION part # 12270.

AC disconnect device

The SENTRY 1510 relies upon the process tool or house facility for AC mains disconnect and start/stop device

Operating environment:

Ambient temperature
Relative humidity
Altitude

40-104°F (4-40°C)
30-90% non-condensing
Up to 6500 ft. (2000 M.)

Facility requirements:

Nitrogen:

Input tube OD
Minimum pressure
Maximum pressure
Minimum grade

.25" (6.35mm)
40 psig (2.8 Kg/cm²)
100 psig (7.0 Kg/cm²)
House grade or better

House Exhaust:

Drain:

Contact BROOKS AUTOMATION
Contact BROOKS AUTOMATION

Connections:

From process
To house exhaust

1" (25.4mm) Female NPT. Connect using Teflon 1" (25.4mm) NPT Male.
1" (25.4mm) Female NPT. Connect using Teflon 1" (25.4mm) NPT Male.

