



# SENTRY™ 1510

## Atmospheric Diffusion Furnace Controller

Hardware

### Pressure Control for Atmospheric Processes

The SENTRY 1510 controls pressure in atmospheric vertical diffusion furnaces and other atmospheric process chambers. Controlling pressure in processes, such as thermal oxidation and diffusion, improves oxide uniformity and repeatability while dramatically increasing the usable load size. The fast response of the SENTRY 1510 provides a stable process environment even with widely fluctuating house exhaust or gas flows. Harmful fumes can be contained improving workplace safety.

### Rapid, Mechanical Pressure Control

The SENTRY 1510 is a fast-response mechanical pressure regulator. The heart of the SENTRY 1510 control system is a piston tied to a fixed point through a 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 is accomplished mechanically, the process set point is controlled electronically. The microprocessor-based SENTRY TIM (Tool Interface Module) applies a PID algorithm to the sensed pressure and commands a stepper motor in the SENTRY 1510 accordingly. Once the new set point is reached the piston takes control.

### LCD Display Views the Process

An LCD is integrated into the sophisticated electronics of the TIM to provide the user with a display 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 can also work with a tool controller.

### Features

- Sealed system
- Repeatable process pressures
- Prevents back streaming from house exhaust
- Fast response
- Automatic set point control
- Analog or digital host communications

### Process Benefits

- Improves process repeatability
- Improves oxide quality through contamination-free work environment
- Increased usable load size

> [SENTRY™ 1510](#)



The TIM 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 a personal computer.

**Specifically Designed for HCl Processing**

The SENTRY 1510 itself is fully compatible with HCl as no metallic parts are exposed to the wetted gas path. More importantly, in processes utilizing HCl, all potentially hazardous materials are confined to the isolated chamber and house exhaust minimizing risk to personnel.

**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 1510 to control unwanted condensate.

<b>Sentry 1510 Specifications</b>			
	<b>0-1" of water column. (0-25.4 mm of water column.)</b>	<b>0-2" of water column. (0-50.8 mm of water column.)</b>	
<b>Negative pressure configuration:</b>	-0.12" to -0.9" of water column. (-3 mm to -23 mm of water column.)	-0.12" to -1.85" of water column. (-3 mm to -47 mm of water column.)	
<b>Positive pressure configuration:</b>	+0.12" to + 0.9" of water column. (+3 mm to +23 mm of water column.)	+0.12" to +1.85" of water column. (+3 mm to +47 mm of water column.)	
<b>Flow range:</b>	0.01 to 1.05 SFCM (0.3 to 30 LPM)		
<b>Accuracy to set point:</b>	+0.04" of water column. (+1.0 mm of water column.) for dry process ±0.08" of water column. (±2.0 mm of water column.) for pyrogenic processes		
<b>Response time:</b>	50 milliseconds to exhaust fluctuations of 100% Response to pyrogenic ignition or extinguish will vary by installation.		
<b>Materials:</b>	Ryton and Teflon with Viton elastomers		
<b>Set point control:</b>	0-5 volt analog RS422/RS485 at 9600 baud Stand alone operator keypad		
<b>Power requirements</b>			
TIM:	+15 to +24 VDC, 650 mA and -15 to -24 VDC, 50 mA		
Power supply:	90-260 VAC, 47-63 Hz, 12 W nominal		
<b>Facilities requirements</b>			
Minimum house exhaust:	Negative pressure configuration	0.4" w.c. (10 mm w.c.)	more negative than set point
Maximum house exhaust:	Positive pressure configuration	-0.5" w.c. (-13 mm w.c.)	
<b>Nitrogen:</b>	5.0" of water column (125 mm of water column.)		
Input Tube OD	.25"		
Minimum Pressure	40 psig (2.8 Kg/cm <sup>2</sup> )		
Maximum Pressure	100 psig (7.0 Kg/cm <sup>2</sup> )		
Minimum Grade	House grade or better		
<b>Input and output connections:</b>	1" female NPT		
<b>Dimensions</b>	<b>Sentry 1510 Valve:</b>	<b>Sentry 1510 Valve w/condenser:</b>	<b>TIM Module</b>
Length	6.0" (152mm)	11.0" (279 mm)	8.25" (209 mm)
Width	3.0" (76mm)	3.5" (89 mm)	2.38" (60 mm)
Height	8.5" (216 mm)	38.0" (968 mm)	5.25" (133 mm)
Weight	7 lbs. (3.2 kg)	15 lbs. (6.8 kg)	2 lbs (0.9 kg)

