

PPB

Engineering

+ Systems Design

Model 200 TDC

Tube Diameter Control System



Model 200 TDC Tube Diameter Control System



The Model 200 TDC Tube Diameter Control System provides an MCVD preform manufacturing lathe with the capability to control the diameter of the quartz deposition tube throughout the deposition process. By providing a consistent diameter down the entire length of the deposition tube and maintaining a repeatable diameter profile as each layer is deposited from preform to preform, much higher quality preform rods can be produced. This results in an optical fiber manufacturing process with higher yields and product quality. The Model 200 TDC is also an essential component for larger process sizes by allowing the use of larger diameter and thinner walled quartz deposition tubes.

The Model 200 TDC consists of a vision module, an internal pressure control module, and control circuitry. The vision module incorporates a CCD image sensor that provides an accurate diameter measurement of the deposition tube within the hot zone region. The internal pressure control module adjusts the outlet opening from the deposition tube (or outlet tube) to utilize the process flows to control the internal pressure within the tube. It also includes components for effectively removing the waste gases and particulate to the scrubber system. The control circuitry consists of an embedded microprocessor for interfacing with the vision module, the internal pressure control module, and the existing MCVD lathe supervisory control system.

Model 200 TDC Tube Diameter Control System

Internal Pressure Control Module Features:

- 0 to 5 inches of H₂O internal pressure measurement, with ± 0.1 inches of H₂O resolution
- Internal tube pressure controlled within ± 0.1 inches of H₂O of set point **
- Diameter of tube controlled within ± 0.1 mm of set point **
- Embedded microprocessor control
- Designed for fast and easy process set-up
- Constructed with corrosion resistant materials

Vision Module Features:

- Industry leading CCD Image Sensor Technology
- ± 0.05 mm diameter measurement resolution
 - ≥ 5 diameter outputs per second
 - ≥ 200 measurement samples per second
- Self-adjusting for variations in light intensity
- Ovality and camming outputs

External Requirements:

- 100 – 240 VAC, 50-60 Hz, 100 W max
- 0 – 100 liters per minute of purified O₂ or N₂ purge flow
- 60 – 80 psi regulated N₂ or compressed air
- Waste gas and particulate scrubber connection with 1000 fpm minimum suction

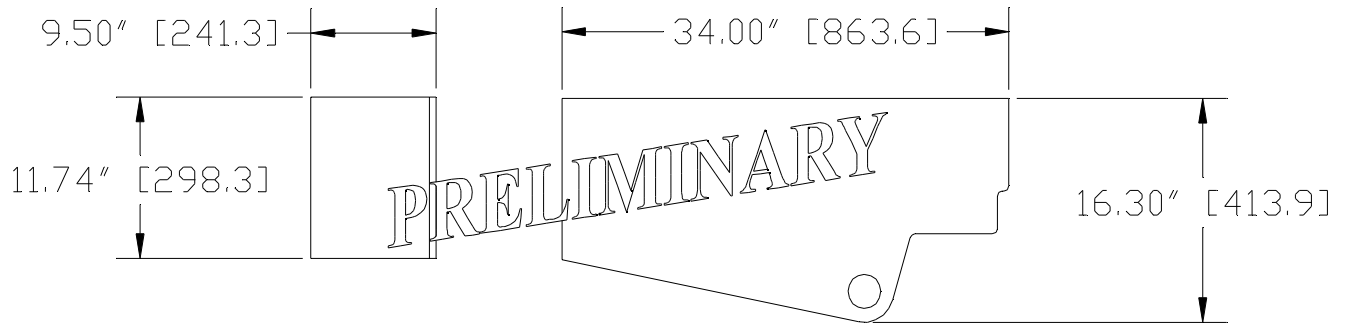
System I/O:

- 0 – 10 Volt standard, other ranges available
- Inputs:
 - Control State (disable or control)
 - Pressure set point
 - Diameter set point (optional)
- Outputs:
 - Measured diameter
 - Ovality
 - Camming

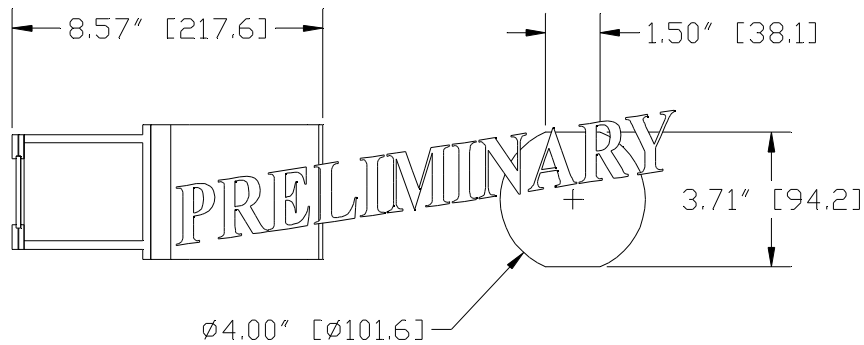
** Under normal process conditions

External Dimensions

Internal Pressurization Control System



Vision System



Note: The vision system must be mounted such that it has an unobstructed view of the tube hot zone.

Order Info:

For inquiries regarding the Series 200 TDC, or other products and services of PPB Engineering, contact us at:

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