

## Opacity Meter Closed Exhaust / Facility Support System

### Opacity Meter Closed Exhaust

The simple design makes it easy to obtain accurate measurements. It provides an accurate means ( $\pm 1\%$ ) of detecting and measuring the opacity of smoke emitted by a diesel engine. The use of an Opacity Meter promotes combustion efficiency for fuel economy and ensures compliance with diesel emission standards set by environmental air quality requirements. The complete system consists of a control unit, sensor head assembly, various connecting cables, calibration filter and instruction manual.

### The Sensor Head Assembly

This is a full flow sensor head designed for use in closed exhaust systems. The sensor head (stack piece) is mounted using mating flanges, and in best case scenarios, should be placed in a straight segment of exhaust line which allows 5 exhaust diameters prior to the light path, and 3 exhaust diameters following the light path. This will assure that the concentration of smoke is free from turbulence, which could adversely affect the accuracy of measurements. The standard stack piece pipe diameter is 8 in. (203 mm), custom sizes are available upon request.

### The Control Unit

The control unit is operated by a membrane keypad, which consists of 8 tactile feedback push buttons. The display is an alphanumeric LCD, containing 16 characters by two rows. In low light situations, the display can be backlit. The display shows the prompts the operator follows throughout the test sequence or during operation. The banana jacks (red and black) allow a 0 - 1 VDC output for connection to Dyne Systems' DynPro<sub>2</sub> Data Acquisition and Control System.

### Applications

The Opacity Meter can be used on any diesel engine. The system is set up for an Engine Test Cell using a sealed (closed) or direct capture type of engine exhaust system. If left bank/right bank measurements are needed, two assemblies will be required.



Sensor Head

#### Electrical Specifications

**Light Source:** LED - Green Gallium Phosphide 570 Nm

**Light Sensor:** Si Photo Diode with IR Filter

**Flange Mounted Stack Sensor:**

Available for 4 - 12 in. (102 - 305 mm)

8 in. (203 mm) standard, custom sizes available

**Display:** (Backlit) Liquid Crystal Display (LCD)

**Meter Accuracy:** +1.0% Nominal

**Peak Hold:** No Drift

**Analog Output:** 0 - 1 Volt

**Battery:** 12V, 2.2 amp hour, sealed, lead-acid cell

#### Performance Specifications

**Range:** 0.0 - 100.0% opacity

**Warm Up Time:** Negligible

**Response Time/Display:** 0.45 seconds for 0 - 90% opacity

**Linearity:** +1% from 0 - 100% opacity

**Zero Stability (Drift):** Less than 1% in 60 minutes

**Temperature Stability/Sensor Heads:**

+1% from 32 - 120°F (0 - 49°C)

**Battery Life:** 40 hours (1 hour after low battery indication)

8 hours to full charge

**Battery Life (night light on):** 20 hours

*Everything you need to succeed*