

Opacity Meter Open Exhaust / Facility Support System

Opacity Meter Open Exhaust

The Opacity Meter's 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, instruction manual and a carrying case.

The Sensor Head Assembly

This is a partial flow sensor head and requires an open exhaust system for use. Attachment of the partial flow head depends on the shape of the stack. Both a straight and curved end is provided. The nozzles are attached with simple snap buckles. The bayonet (straight) nozzle hooks over the straight stack. The curved nozzle has a stop that allows correct positioning. The unit is held in place with strong magnets, which are part of the extension pole assembly. The connecting cable is 25 ft (7.62 m) long. Optional lengths of up to 50 ft (15.24 m) are available.

The Control Unit

The control unit is operated by a membrane keypad, which consists of 8 tactile feedback pushbuttons. 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' DynPro₂ Data Acquisition and Control System.

Applications

The Opacity Meter can be used on any diesel engine, with primary application in testing trucks, busses and cars.



Sensor Head

Electrical Specifications

- Light Source:** LED - Green Gallium Phosphide 570 Nm
- Light Sensor:** Si Photo Diode with IR Filter
- 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