



LIGHTHAWK 560

Opacity / Dust Monitor



The LightHawk® measures zero, upscale cal and dust compensation using only one moving part. It employs a single gear motor that, unlike competitors' designs, is located safely inside the sealed optical housing, completely isolated from the potential damage of stack gas.

Advantages

Consistent Operation

The electronically modulated, intensity-controlled solid state LED (light emitting diode) ensures unusually stable operation, without the interference from sunlight or room lights. The uniform LED beam provides accuracy even with small shifts in alignment, which is always visible on the built-in indicator. In addition, unlike some opacity monitors, it operates well in heat, high noon conditions or when the stack/duct walls shift slightly due to temperature and wind.

Trouble-Free Operation

The various components of this unit are interconnected via a commercial network protocol. It uses transformer isolated data lines which nearly eliminate the potential effects of electro-static discharge. Also, the optical head and remote panel provide all parameters needed for maintenance and diagnostics. This approach provides interconnect topology and flexible options.

How it works

The heart of the monitor has an electronically modulated, intensity controlled LED that located in the optical head assembly. The light from the LED is projected from the optical head across the stack/duct sample area into a retro-reflector on the opposite side. The reflected light then re-enters the optical head where it is evaluated by a signal detector. If the stack is clear, the light transmission is 100% (zero opacity) and visa versa. Opacity can be correlated against reference methods to calculate dust loading.

The System

Purge System

The system supplies purge air to the optical head and retro-reflector, which protects the instruments from stack gases and reduces maintenance intervals.

Calibration Kit

Used as an additional check of the unit's proper operation and calibration.

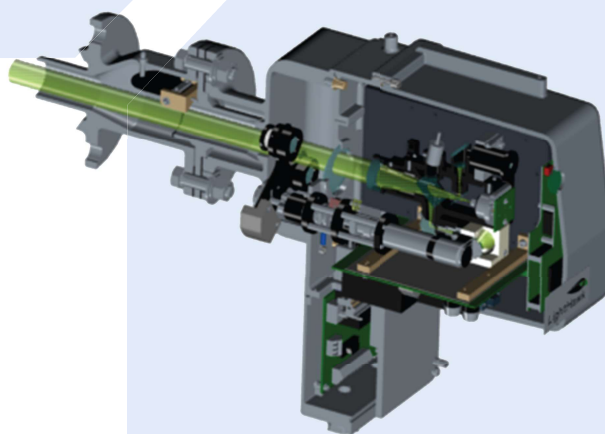


The Construction

The Optical Head and Retro-reflector have a rugged design and extremely low heat generation which allows them to operate over a wide range of ambient temperatures. Also, since they are built of heavy gauge aluminum parts and finished with acid-resistant enamel paint, they are able to withstand the typical hostile environments that are associated with outdoor industrial applications, including substantial shock and vibration.

Reduced Labor

In addition to it being easy to calibrate, all of the hardware and software needed for the system setup, control and maintenance are all packaged within a single optical housing. With this, you can perform clear-stack zeroing, span/zero setup, reset window dirt calculation following maintenance, input dust load correlation data and access the full set of diagnostic parameters.



Optical Head

The optical head contains the active electronics to project a light beam across the stack/duct to the retro reflector and detect reflected light. It is also designed for simple cover removal allowing for complete access to the electronics.



Remote Display Panel

Provides ready access to all information needed for full use of the system.



SPECIFICATIONS

Typical Range	Temperature: $\pm 2\%$ Opacity Maximum per 40°F (22.2°C) change in temp. Voltage: $\pm 1\%$ Opacity Maximum (as per ASTM D6216)
Response Time	< 10 seconds
Temperature	Optical Head: -4 to +140°F (-20 to +60°C) startup Enhanced Remote Panel: +32 to +104°F (0 to +40°C)
Relative Humidity	Optical Head: 0 to 100% condensing Enhanced Remote Panel: 0 to 95% non-condensing
Display	Optical Head: Six 7 segment LED's Fault, Set, In Cal, Power 10-key keypad Enhanced Remote Panel: Graphics mode liquid crystal with LED backlight 240 x 125 Fault, Alarm, Power 20-key keypad, security keyswitch
Pressure	Single Purge Blower: -15 to +5 in. H ₂ O gauge Dual Purge Blower: -15 to +15 in. H ₂ O gauge
Power	Optical Head: 85-245 VAC, 47-63Hz, Single Phase, 30 VA Max. Enhanced Remote Panel: 85-245 VAC, 47-63Hz, Single Phase, 30 VA Max. Single Purge Blower: 115 VAC/230 VAC, 60/50Hz, Single Phase 414 VA Max. Dual Purge Blower: Two circuits, each with same requirement as single.
Dimensions	Optical Head (w/ purge shutter): 17"L x 9 1/4"W x 15"H (46.2 x 23.5 x 38.1 cm) Optical Head (w/o purge shutter): 22"L x 9 1/4"W x 15"H (55.9 x 23.5 x 38.1 cm) Retro Assembly (w/ purge shutter): 10"L x 7" diameter (25.4 x 17.8 cm) Retro Assembly (w/o purge shutter): 15"L x 7" diameter (38.1 x 17.8 cm) Enhanced Remote Panel: 3U 19"H Rack Mount x 5 1/4"H x 9" (48.3 x 13.3 x 22.9 cm)



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