



Ideal for monitoring particulate levels in the exhaust gas of industrial combustion or air filtration processes.

- In situ measurement directly in exhaust gas flow
- Measurement reading as % Opacity and/or particulate as mg/m<sup>3</sup>
- Modulated green LED source for long lifetime stability and immunity to ambient light
- Rugged 316 stainless steel construction
- Integrated visual alignment aid to simplify installation
- In-situ zero and calibration manual check facility
- Intelligent analyser with optional DSCU operator interface with dual parameter display
- Plug and socket connectors for ease of installation

The DSL-460 is an optical instrument designed to measure the concentration of particulate matter in an exhaust gas passing through a duct, stack or flue; typically the exhaust gas from an industrial combustion process or air filtration system.

The DSL-460 Opacity Monitor uses the double pass light transmission measurement technique, with a folded beam Transceiver / Reflector arrangement, to measure particulate, dust and smoke emissions. A light beam emitted from the Transceiver (TRX) passes across the duct, stack or flue to a Reflector, which then returns the light to the Transceiver where the intensity of the received light is measured. Increased particulate density in the stack gas attenuates the transmitted light and causes the intensity of the received light to fall. This reduction in intensity can be presented as % opacity or when calibrated against standard reference measurements, can be used to calculate the particulate concentration and present a reading in mg/m<sup>3</sup>.

The light source in the Transceiver is a high intensity, high reliability green LED which provides long life and stable intensity. The transmitted light beam is pulsed to give complete immunity to ambient light levels. The intensity of the transmitted light is monitored at source so that any variations in the emitted light level are compensated in the received signal. The Transceiver has on board temperature measurement to provide stability over the ambient operating temperature range.

The DSL-460 is an intelligent analyser which can operate as a "stand-alone" instrument consisting of the Transceiver head (TRX) and Reflector head, with all electrical connections (including outputs such as the alarm relays, 4-20 mA analogue outputs and ModBus) being made inside the TRX head. As a stand-alone instrument the DSL-460 is set-up and controlled using the supplied utility software, installed on a PC or laptop, and connected via the USB connector on the RX.

The DSL-460 is also available with the DSCU operator interface. When supplied with the DSCU all power supply and output connections are made in the DSCU rather than the TRX. The DSCU is a wall mounted control unit consisting of a numeric / directional keypad, a two line LCD display and a terminal compartment, which allows full command and control of the instrument. The DSCU is suitable for mounting locally to the instrument or remotely, such as in a control room.

The DSL-460 has no moving parts, is of rugged design and has an excellent reliability record. Regular maintenance simply involves cleaning the TRX and Reflector lenses, which are easily accessible due to our latched head and lid design. Both the TRX and Reflector are supplied with an air purge body, which when connected to a high volume source of clean air, (a blower is recommended), will resist particle deposition on the lenses and further lengthen service intervals.

### Specification:

#### Measurement Performance

No.	Parameter	Units	Min	Max	Comment
1	Path Length (flange to flange)	m	0.5	10	Flange-to-flange separation
2	Measuring Range Opacity Particulate Density	% mg/m <sup>3</sup>	0.0 0.0	100.0 1000.0	User selectable (Optical Density also available)
3	Accuracy	%	-2	+2	
4	Resolution	% mg/m <sup>3</sup>		0.1 0.1	Display resolution
5	Damping	s	1	60	Selectable
6	Drift with Temperature	%	-2	+2	Over the full operating temperature range
7	Operating Wavelength	nm	510	540	Green LED
8	Visual Alignment Aid	%	-1	+1	To first target in the reticle

#### Power & Air Requirements

9	Voltage	Vdc	+24		Optional 90-260 Vac PSU available
10	Voltage Tolerance	%	-10	+10	
11	Nominal Current Consumption	mA		500	
12	Power Up Current Consumption	mA		500	
13	Air Supply Volume	L/min	50	200	To each air purge body
14	Air Supply Fitting				1" BSP threaded aperture in each air-purge body

#### Interface Options

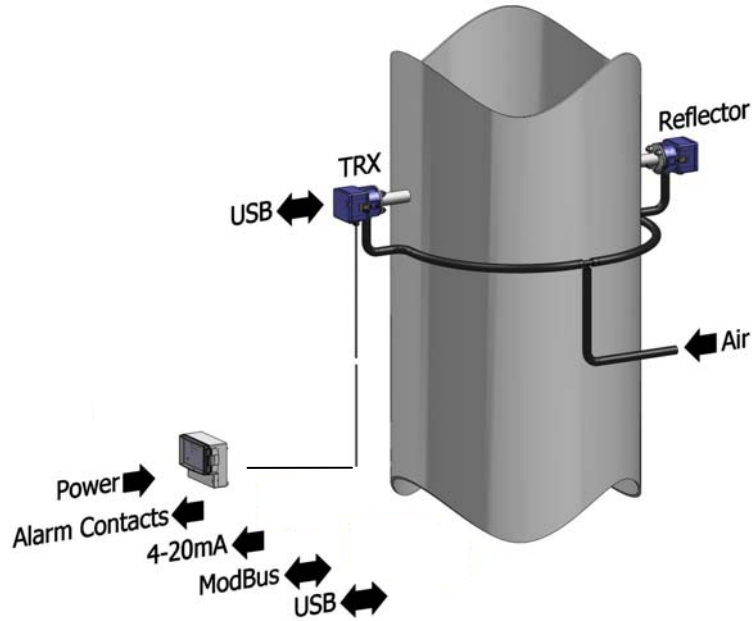
15	Serial Comms				ModBus RTU via RS485 (OI or TRX) Internal USB (OI); external USB (TRX)
16	Analogue Output (one)	mA	0 / 2 / 4	20.0	Isolated and scalable
17	Relay Contacts (two)	A	0	3	@30 Vdc (level alarm and data valid)

#### Physical

18	Ingress Protection		IP65		For external use
19	Ambient Operating Temperature	°C	-20	+55	Air temperature around the heads.
20	Operating Humidity	%		100	Air humidity around the heads.
21	Gas Temperature	°C		+600	Heat insulating gaskets included (Higher temperatures on request)
22	Regulatory Compliance				89/336/EEC (Electromagnetic Radiation) 73/23/EEC (Low Voltage)
23	Materials – TRX/Reflector Heads – Air Purge Bodies		316 Stainless Steel (powder coated) Powder coated cast aluminium (optional stainless steel version available)		
24	Weight	kg		2.5	Head plus air-purge body
25	Warranty	months	24		Return to base warranty. Extensions available

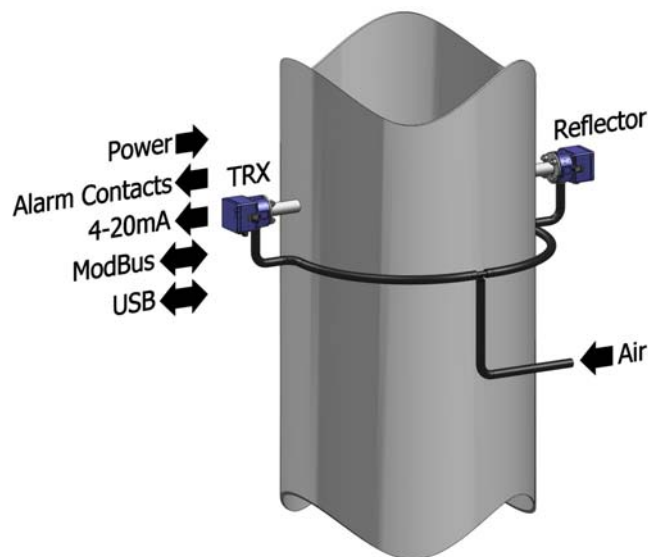
### Configuration Options:

Configured with a  
DSCU

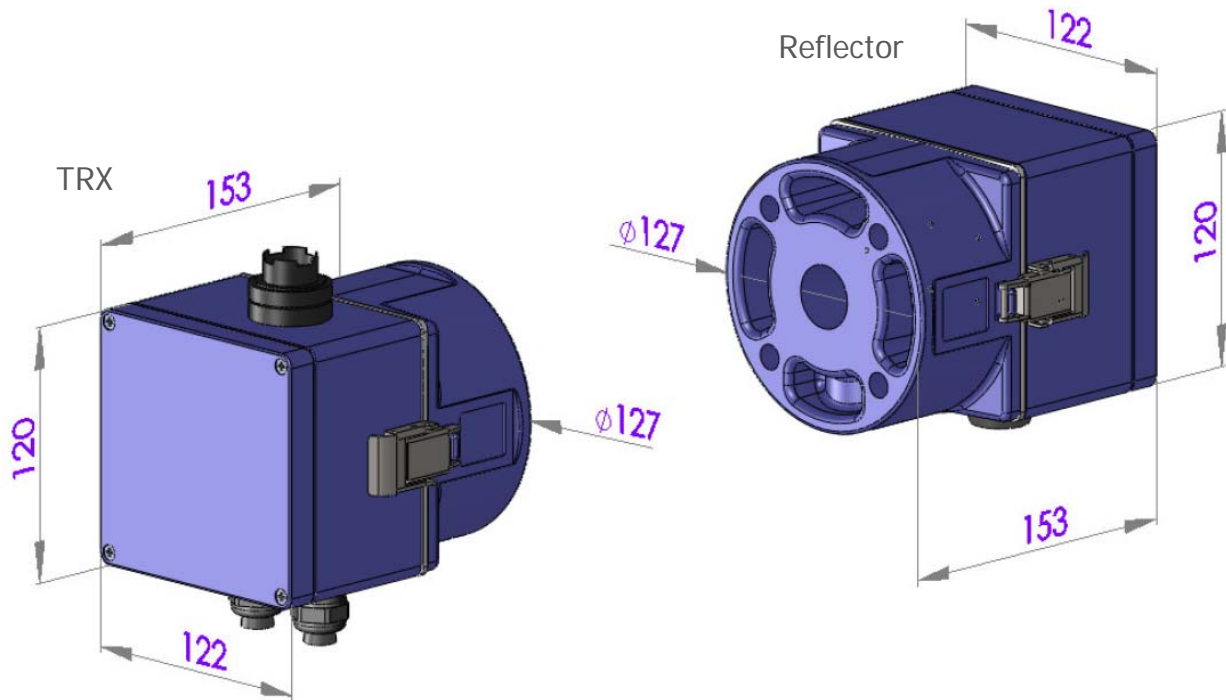


OR

Stand Alone  
Configuration



## Dimensions (mm):



## Ordering Details:

DSL-460 MkII **X X X X**




A = Aluminium air-purge heads  
S = Stainless steel air-purge heads

D = 24 Vdc powered  
A = 90-260 Vac powered

N = No OI

S = Short path length version (0.5 – 4 m)  
L = Long path length version (2 – 10 m)

### Options & Accessories:

Description	Order Code	Notes
Mounting Flange 	ASY-067	1.5" ANSI 150 flange pattern with 240mm long extension tube (set of 2).
Fixing Kit	ASY-071	Contains M14 x 100mm studding, flat washers, spring washers and M14 nuts.
Weather Cover 	ASY-080	Hinged stainless steel weather / heat cover for protecting externally mounted heads.
Laser Alignment Tool 	DSL-LAT08	Tool to aid the alignment of the reflector head across the stack.
Blower Kit 	BK-40B-110	Blower kit for purge air; 110 Vac; single phase
	BK-40B-240	Blower kit for purge air; 240 Vac; single phase
	BK-40B-415	Blower kit for purge air; 415 Vac; three phase

<p>Compressed Air Kit</p> 	ASY-181	<p>For use with compressed air purge.</p> <p>Includes pressure regulator, in-line filters, and compressed air adaptors for the purge body.</p>
Power / Comms Cable Assembly	CBL-119	2m cable with connector
Outputs Cable Assembly	CBL-092	2m cable with connector
<p>Boxed PSU</p> 	PSU-007	Multi AC input, 24Vdc output 25W, IP67 rated enclosure
<p>Calibration Head</p> 	DSL-CH350A	For use between the TRX head and the purge body to perform calibration checking.
<p>Zero Mirror for Calibration Checking</p> 	DSL-CH350Z07	<b>DSL-460S:</b> path lengths 0.5m to 1.5m <b>DSL-460L:</b> path lengths 2.0m to 4.0m
	DSL-CH350Z10	<b>DSL-460S:</b> path lengths 1.5m to 4.0m <b>DSL-460L:</b> path lengths 4.0m to 8.0m
	DSL-CH350Z12	<b>DSL-460L:</b> path lengths 8.0m to 10.0m
<p>Span Filter for Calibration Checking</p> 	DSL-CH350S9	Approximate opacity 10%.
	DSL-CH350S8	Approximate opacity 20%.
	DSL-CH350S65	Approximate opacity 35%.
<p>Calibrated Opacity Filters</p> 	ASY-190	Calibration filter, approx 8% opacity
	ASY-133	Calibration filter, approx 20% opacity
	ASY-183	Calibration filter, approx 35% opacity

Note that the actual part may differ from the above representative pictures.