

Infrared Hydrocarbon Gas Detector

Open Path Eclipse™

Model OPECL

DESCRIPTION

The Model OPECL IR Gas Detector delivers superior open-path infrared combustible gas detection for protection of oil/gas and other industrial facilities. With a single OPECL pair capable of covering a sensing path between 5 and 120 meters, the OPECL system offers industry leading features including dual xenon flashlamps, stainless steel construction, HART and MODBUS communication protocols, ease of installation and alignment, field replaceable transmitter and receiver modules, and a standard 2 year warranty. The OPECL system is especially useful for perimeter monitoring and applications where combustible gas/vapor leaks can happen over a widely dispersed area. The system is optimized for low maintenance, no false alarms, and low cost, and is housed in flameproof enclosures approved for use in Class I, Div. 1, IECEx, EExe and Zone 1 hazardous areas. The OPECL system utilizes onboard heaters in both modules to melt snow and ice, enabling unattended and uninterrupted operation in inclement weather.

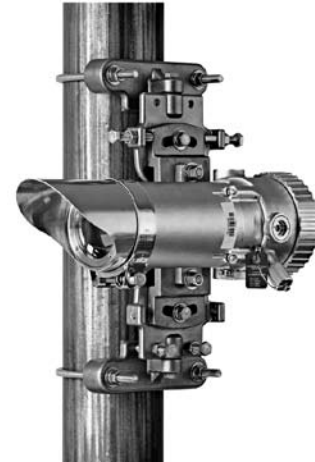
THEORY OF OPERATION

The OPECL transmitter module illuminates a direct linear path ending at the OPECL receiver module. As flammable hydrocarbon gases intersect the light beam between the two modules, certain IR wavelengths are absorbed by the gas, while other IR wavelengths are not. The amount of IR absorption is determined by the concentration of the hydrocarbon gas. A pair of optical detectors and associated electronics located in the receiver module measure the absorption. The change in intensity of the absorbed light (active signal) is measured relative to the intensity of light at a non-absorbed wavelength (reference signal).

SPECIFICATIONS

INPUT VOLTAGE (Both Modules)—

24 Vdc nominal. Operating range is 18 to 30 Vdc. Ripple cannot exceed 0.5 volts P-P.



POWER CONSUMPTION (Per Module)—

Transmitter

5.0 watts nominal @ 24 Vdc, 6.9 watts @ 30 Vdc.
5.8 watts peak @ 24 Vdc, 7.5 watts peak @ 30 Vdc.

Receiver Without Relays

6.0 watts nominal @ 24 Vdc, 7.6 watts nominal @ 30 Vdc.

Receiver With Relays

6.4 watts nominal @ 24 Vdc, 8.0 watts nominal @ 30 Vdc.

TRANSMITTER LAMPS

Two xenon flashlamps, field-replaceable module.

WARM-UP TIME—

1 minute for transmitter. 30 seconds for receiver from power-up when correctly aligned.

CURRENT OUTPUT—

Linear 4 to 20 mA (isolated/non-isolated) rated at 600 ohms maximum loop resistance @ 24 Vdc operating voltage.

VISUAL STATUS INDICATOR—

Tri-color LED:

Red = Alarm or calibration (receiver only)
Green = Power on / OK
Amber = Fault / warm-up

ALARM RELAY SETPOINT RANGE—

Low Alarm: 0.25 to 3 LFL-meters (default = 1 LFL-meter)

High Alarm: 1 to 3 LFL-meters (default = 2 LFL-meters)

DETECTION RANGE—

5 to 120 meters

CALIBRATION—

Calibrated for methane at the factory.

RESPONSE TIME—

T90: <5 seconds

TEMPERATURE RANGE—

Operating: -40°C to +60°C (-40°F to +140°F)

Storage: -55°C to +85°C (-67°F to +185°F)

HUMIDITY—

5 to 99% relative humidity; designed for outdoor applications.

MEASUREMENT RANGE—

0-5 LFL-meters

INTERFERENCE RESISTANCE—

Immune to sun and flare radiation, up to $750 \text{ W/m}^2 \geq 3^\circ$ to optical axis and common contaminants.

SELF-DIAGNOSTIC TEST—

Fail-Safe operation ensured by performing all critical tests once per second.

MODULE HOUSING MATERIAL—

316 stainless steel (CF8M)

CONDUIT ENTRY OPTIONS—

Two entries, 3/4 inch NPT or 25 mm

HART COMMUNICATION PORT—

Intrinsically safe port on receiver to connect HART devices.

OPTICS PROTECTION—

Stainless steel brow protects against windblown dirt and rain. Heated optics minimize ice and dew formation.

WIRING—

Field wiring screw terminals are UL/CSA rated for up to 14 AWG wire, and are DIN/VDE rated for 2.5 mm² wire. Screw terminal required torque range is 3.5–4.4 lb.-in. (0.4–0.5 N-m). Receiver can be wired using 3 or 4 wires. Transmitter requires two wires (power only).

INGRESS PROTECTION—

NEMA 4X, IP67

CERTIFICATION—

CSA: Class I, Div. 1, Groups B, C & D (T4).
Class I, Div. 2, Groups A, B, C & D (T4).

FM: Performance verified in accordance with FM 6325, ANSI/ISA 12.13.04.
Class I, Div. 1, Groups B, C & D (T4).
Class I, Div. 2, Groups A, B, C & D (T4).

IECEX: ULD 05.0001X
Ex d [ib] IIC T5 or
Ex de [ib] IIC T5.

ATEX: Performance verified in accordance with EN 50241-1 and EN 50241-2.

CE 0539 II 2 G

DEMKO 06 ATEX 141002X

EEx de [ib] IIC, T5.

T5 (T_{amb} -40°C to +60°C).

IP67.

(Transmitter, Receiver without relays)

--OR--

EEx d [ib] IIC, T5

T5 (T_{amb} -55°C to +60°C).

IP67.

(Receiver with relays)

CE: Conforms to:

Low Voltage Directive: 73/23/EEC,

EMC Directive: 2004/108/EC,

ATEX Directive: 94/9/EC.

DIMENSIONS—

Receiver and Transmitter: Length: 14.3 inches (36.3 cm)
Diameter: 4.5 inches (11 cm) max

Mounting Plate: Height: 14.5 inches (36.8 cm)
Width: 6 inches (15 cm)

Designed to affix to 4 inch (10 cm) nominal diameter pipe.

SHIPPING WEIGHT—

Transmitter (with mounting hardware): 35 pounds (16 kg)

Receiver (with mounting hardware): 35 pounds (16 kg)

WARRANTY—

2 year limited warranty from date of manufacture.

ORDERING INFORMATION

When ordering, please specify:

Model OPECL Open Path Eclipse IR Gas Detector

Conduit Entry: 3/4 inch NPT or M25

Outputs: 4 to 20 mA standard, relay board optional

Detector Electronics Corporation

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