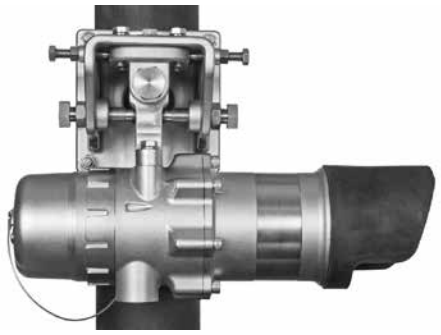
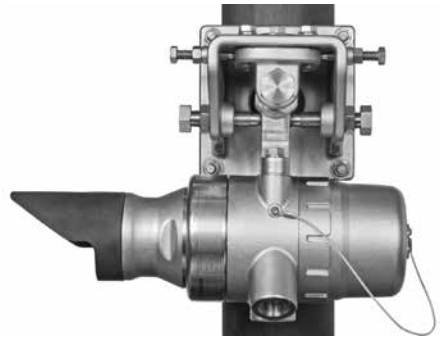
DET-TRONICS

FlexSight™ LS2000 Line-of-Sight Infrared Hydrocarbon Gas Detector – Ethylene and Extended Range Models





DESCRIPTION

5 YEAR WARRANTY

The FlexSight Line-of-Sight Infrared Hydrocarbon Gas Detector model LS2000 is a gas detection system that provides continuous monitoring of combustible hydrocarbon gas concentrations in the range of 0–5 LFL-meters, over a distance of 5–200 meters. Standard system outputs include an electrically isolated/non-isolated 4-20 mA DC current output, with HART communication and RS-485 Modbus communication. Alarm and fault relays are available as an option.

The system consists of two stainless steel modules — a transmitter and a receiver, along with mounting fixture hardware. Both modules are powered from an external 24 volt DC supply. The receiver provides the measurement signal outputs and is furnished with onboard "status indication" LEDs and an internal magnetic calibration switch. The transmitter houses a high-quality Xenon flash lamp.

The LS2000 is certified explosion-proof for use in Class I, Division 1 and 2; Class II, Division 1; Class I, Zone 1; and Zone 1, Zone 2 hazardous areas. The LS2000E model is Det-Tronics performance verified for Ethylene detection. The LS2000 Extended range models are Det-Tronics performance verified for Methane, Propane, and Butane detection. It can be used as a stand-alone detector, or as part of a larger facility protection system using other Det-Tronics equipment.

By connecting the transmitter and receiver via a three-wire shielded cable, an optional "communication link" can be created between the two devices to enable: single-point system diagnostics, dynamic lamp power optimization, synchronized LEDs, transmitter configuration via connection to the receiver, and calibration initiation from either device.

FEATURES AND BENEFITS

- Third-party certified for hazardous locations and Det-Tronics verified for performance
- ± 0.8 degree misalignment tolerance (~±56cm @ 40m; ~±168cm @ 120m; ~±280cm @ 200m)
- IR source: High performance, long-lasting Xenon flashlamp - **10-year warranty on IR source**
- Large detection coverage area (detection range 5–200 meters)
- Microprocessor-controlled heated optics for increased resistance to moisture and ice
- Standard 4–20 mA output (configurable), HART communication, RS-485 Modbus
- Optional alarm relays (Ex d only)
- Mounting hardware and alignment brackets included
- Mounts to pole (4.5" nominal OD) or flat surface
- Built-in locking adjusters deliver fine control of alignment angles
- A telescope is the only tool needed for optimal alignment
- Multi-color LEDs are provided on both modules for detailed visual indication of operating status
- Non-intrusive zero calibration options: onboard magnetic switch, Modbus communication, HART communication, or external switch
- Modular design for ease of maintenance
- Compatible with the UD10 FlexVu Universal Display

Carrier

SPECIFICATIONS

Operating Voltage (Both Modules) 24 Vdc nominal. Operating range is 18 to 30 Vdc. Ripple cannot exceed 0.5 volts P-P

Power Consumption

Inrush Current 1 amp typical inrush current at 24 Vdc

Power Consumption (Watts)			
		TX Max	RX Max
@ 24VDC	Total Unit, No Heaters or Relays	6.5	2.6
	30% Heater Only	1.4	1.1
	50% Heater Only	2.5	2.0
	70% Heater Only	3.5	2.7
	100% Heater Only	4.2	3.3
	Relay Only	N/A	1.2
	Total Unit, Max	10.7	7.2
@ 33VDC*	Total Unit, Max	16.0	10.0

* Per regulatory approval requirements, the unit power consumption was measured at 33 VDC input voltage (10% above claimed range) and results listed on the product label.

Transmitter Lamp Xenon flash lamp, field-replaceable module

Warmup Time 15 seconds minimum, 150 seconds maximum from power-up, depending upon alignment accuracy

Current Output Linear 0-20 mA (isolated/non-isolated) rated at 600 ohms maximum loop resistance @ 24 Vdc operating voltage. Levels below 4 mA indicate a fault condition. Fault output levels are user-configurable.

Relay Outputs (Optional) Available on Ex d approved models only. Two-alarm, one-fault relay. Form C Type (NO/NC).
Contact Rating: 3 amperes at 30 Vdc

Alarm Relay Setpoint Range
Low Alarm: 0.5 to 4.5 LFL-meters (default = 1)
High Alarm: 0.5 to 4.5 LFL-meters (default = 3)

Visual Status Indicator Multi-color LED on each module indicates operating status.

Available Gases Det-Tronics performance approved to Methane, Propane, Butane, and Ethylene.

Detection Range
Short Range: 5–60 meters
Long Range: 30–120 meters
Extended Range: 100–200 meters

Misalignment Tolerance ±0.8 degree minimum (~±56cm @ 40m; ~±168cm @ 120m; ~±280cm @ 200m)

Calibration LS2000 systems are span calibrated for Methane, Propane, and Butane at the factory. LS2000E systems are span calibrated for Ethylene at the factory.
Zero calibration can be accomplished in the field using the on-board magnetic reed switch.

Response Time T90: 2 seconds (5.0 LFL-meters applied)

Accuracy/Linearity ±5% of full scale gas concentration or ±10% of applied gas concentration, whichever is greater. Stated accuracy is at 0% attenuation of the optical signal and 25°C.

Repeatability ±5%

Temperature Range
Operating: –55°C to +75°C (–67°F to +167°F)
Relay version: –55°C to +65°C (–67°F to +149°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, tested to 800 ±50 W/m^2 at ≥ 3° to the 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 3/4 inch NPT or M25, with two entries for the transmitter and four entries for the receiver

Optics Protection Microprocessor-controlled heated optics mitigate against ice and dew formation.

Ingress Protection IP66/67; Type 4X

Tropicalization / PCBD Protection Conformal coated printed circuit boards: CTI Rating of 600V, maximum allowed by standard Third party tested per ASTM-D-3638-07

Wiring Field wiring screw terminals are UL/CSA rated for up to 14 AWG shielded wire and are DIN/VDE rated for 2.5 mm^2 wire.

Shipping Weight Transmitter and receiver with mounting hardware: 85 pounds (38 kg)

Warranty 5-year limited warranty from date of manufacture. 10-year warranty on IR source.

Certification

Receiver with Relays (Ex d)
USA
CL I, DIV 1, GRP B,C,D (T4)
Tamb –50°C TO +75°C
CL II/III, DIV 1, GRP E,F,G (T4)
Tamb –50°C TO +65°C
CL I, DIV 2, GRP A,B,C,D (T3C)
Tamb –50°C TO +75°C
CL II/III, DIV 2, GRP E,F,G (T4)
Tamb –50°C TO +65°C
CL I, ZONE 1, AEx db IIC T4
Tamb –50°C TO +65°C
Type 4X, IP66/67

CANADA
CL I, DIV 1, GRP B,C,D (T4)
CL I, DIV 2, GRP A,B,C,D (T3C)
CL II/III, DIV 2, GRP E,F,G (T3C)
CL I, ZONE 1, Ex db IIC T4
Tamb –55°C TO +75°C
Type 4X, IP66/67

Receiver without Relays (Ex d e)
USA
CL I, DIV 1, GRP B,C,D (T4)
CL II/III, DIV 1, GRP E,F,G (T4)
CL I, DIV 2, GRP A,B,C,D (T3C)
CL II/III, DIV 2, GRP E,F,G (T3C)
CL I, ZONE 1, AEx db eb IIC T4
Tamb –50°C TO +75°C
Type 4X, IP66/67

CANADA
CL I, DIV 1, GRP B,C,D (T4)
CL II/III, DIV 1, GRP E,F,G (T4)
Tamb –55°C TO +75°C
CL I, DIV 2, GRP A,B,C,D (T3C)
CL II/III, DIV 2, GRP E,F,G (T4)
Tamb –55°C TO +75°C
CL I, ZONE 1, Ex db eb IIC T4 IEC
Tamb –50°C TO +75°C
Type 4X, IP66/67

Receiver without Relays (Ex d)
USA
CL I, DIV 1, GRP B,C,D (T4)
CL II/III, DIV 1, GRP E,F,G (T4)
CL I, DIV 2, GRP A,B,C,D (T3C)
CL II/III, DIV 2, GRP E,F,G (T3C)
CL I, ZONE 1, AEx db IIC T4
Tamb –50°C TO +75°C
Type 4X, IP66/67

CANADA
CL I, DIV 1, GRP B,C,D (T4)
CL II/III, DIV 1, GRP E,F,G (T4)
Tamb –55°C TO +75°C
CL I, DIV 2, GRP A,B,C,D (T3C)
CL II/III, DIV 2, GRP E,F,G (T4)
Tamb –55°C TO +75°C
CL I, ZONE 1, Ex db IIC T4 IEC
Tamb –55°C TO +75°C
Type 4X, IP66/67

Transmitter
USA
CL I, DIV 1, GRP B,C,D (T4)
CL I, DIV 2, GRP A,B,C,D (T3C)
CL II/III, DIV 1, GRP E,F,G (T4)
CL II/III, DIV 2, GRP E,F,G (T3C)
CL I, ZONE 1, AEx db IIC T4
CL I, ZONE 1, AEx db eb IIC T4
Tamb –50°C TO +75°C
Type 4X, IP66/67

CANADA
CL I, DIV 1, GRP B,C,D (T4)
Tamb –55°C TO +75°C
CL I, DIV 2, GRP A,B,C,D (T4)
Tamb –55°C TO +75°C
CL II/III, DIV 1, GRP E,F,G (T4)
Tamb –55°C TO +75°C
Ex db IIC T4 IP66/67
Tamb –55°C TO +75°C
Ex db eb IIC T4 IP66/67
Tamb –50°C TO +75°C
Type 4X, IP66/67

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