

# Detector F-Gas de Crowcon

Detectores de gas de punto fijo



- Sensor infrarrojo de larga duración
- Alta fiabilidad
- Bajo coste de mantenimiento



# Detector F-Gas

## Detector de gas refrigerante y SF<sub>6</sub>

**Cuando las vidas y la propiedad corren peligro y usted necesita un equipo de detección de gas de absoluta confianza, necesita Crowcon. Crowcon lleva más de 40 años desarrollando y fabricando productos de alta calidad reputados por su fiabilidad e innovación técnica.**

**Los detectores fijos de Crowcon han sido puestos a prueba en muchos entornos difíciles, incluyendo exploraciones petroleras y gasísticas, tratamiento de aguas y plantas químicas y siderúrgicas. El detector F-Gas de Crowcon proporciona una detección fiable de los gases refrigerantes y del hexafluoruro de azufre en aplicaciones de salas de control o de cuadros eléctricos.**



## Selección del detector de gas fijo que necesita

El detector F-Gas de Crowcon es un detector infrarrojo de punto fijo de alta calidad que proporciona una detección fiable de los gases de freón. Capaz de detectar una amplia variedad de gases refrigerantes y también hexafluoruro de azufre (SF<sub>6</sub>), el detector F-Gas de Crowcon puede conectarse a cualquier sistema de control que acepte una señal analógica.

El detector F-Gas de Crowcon utiliza un sensor infrarrojo de alta calidad específicamente calibrado para detectar los gases F o gases fluorados de uso común. El detector F-Gas funciona a 24 V CC y proporciona una señal de 4-20 mA (la salida también puede configurarse a 0-20 mA, 0-2 V, 0-5 V o 0-10 V CC).

Alojado en una resistente carcasa con grado de protección IP54, el detector F-Gas es adecuado para su uso en áreas no peligrosas como salas de control o salas de cuadros eléctricos.

Además de proteger al personal de los riesgos del gas tóxico, la instalación del detector F-Gas también le ayuda a reducir el peligro de fuga al medio ambiente de los potentes "gases de efecto invernadero".



## Preciso y fiable

Sensor infrarrojo de alta tecnología	Brinda un rendimiento rápido, estable y confiable con un bajo mantenimiento y una larga vida útil. A diferencia de sensores más baratos basados en semiconductores, el detector F-Gas no se ve afectado por otros tipos de gases ni por cambios en la temperatura o la humedad.
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## Sencillo y versátil

Indicadores LED	Los LED tricolor indican el estado de funcionamiento del detector y, en combinación con las teclas de función, facilitan la realización de ajustes sencillos como la puesta a cero y la calibración.
Elección de las señales de salida	La señal de salida analógica puede fijarse a 4-20 mA, 0-20 mA, 0-2 V, 0-5 V o 0-10 V CC a fin de ser compatible con prácticamente cualquier sistema de control.

## Larga vida útil con bajo coste de mantenimiento

Sin piezas consumibles	Brinda muchos años de servicio sin necesidad de reemplazar el sensor ni ningún otro componente.
Fácil de comprobar	Únicamente requiere de una revisión cada dos años. Solamente será necesario recalibrar en caso de que las lecturas se encuentren fuera de rango.
Grado de protección IP54	Goza de una buena protección contra el ingreso de polvo y agua en interiores.

## Seguridad y conformidad

Se ajusta a los reglamentos sobre el gas F	Permite que tanto proveedores como usuarios cumplan con los reglamentos europeos obligatorios sobre el gas F.
Rápida detección de fugas de gas	Proporciona una alerta temprana de fugas de gas, con lo que se mantiene la eficiencia del sistema y se reducen los elevados costes derivados de restituir el gas.
Protección medioambiental	Ayuda a reducir el peligro de fuga al medio ambiente de los potentes "gases de efecto invernadero".

## Accesorios del detector F-Gas



**Adaptador de calibración**  
Permite aplicar gas de calibración al sensor.



**Gas de calibración y reguladores**  
Gases freón y SF<sub>6</sub> disponibles para la comprobación y calibración del sensor.

Consulte las especificaciones técnicas completas al dorso.

## Especificaciones del detector F-Gas:

<b>Tamaño</b>	151 x 80 x 60 mm (tamaño total con pasacables: 151 mm x 102 mm x 60 mm)
<b>Peso</b>	0,25 kg
<b>Grado de protección</b>	IP54
<b>Principio de medición</b>	Sensor de infrarrojo no dispersivo (NDIR)
<b>Rango</b>	0-1000 ppm
<b>Resolución</b>	1 ppm
<b>Tensión</b>	12-28 V CC
<b>Salida analógica</b>	Fuente de corriente 4-20 mA (puede configurarse a 0-20 mA, 0-2 V, 0-5 V o 0-10 V)
<b>Temperatura de funcionamiento</b>	-20 a +40 °C
<b>Humedad</b>	0-95 % HR sin condensación
<b>Repetibilidad</b>	+/- 1 % FSD
<b>Linealidad</b>	+/- 2 % FSD
<b>Tiempo de arranque</b>	<120 segundos
<b>Tiempo de respuesta</b>	30 segundos aproximadamente
<b>Presión</b>	800-1200 mbar
<b>Autorizaciones</b>	EMC: EN50270

Este producto está diseñado únicamente para su uso en áreas no peligrosas.

## Opciones de gas refrigerante:

### Fluidos puros:

Fluidos	Fórmula	Nombre	Grado de medición
<b>HCFC 22 (R22)</b>	CHClF <sub>2</sub>	Clorodifluorometano	1000 ppm
<b>HCFC 123 (R123)</b>	CHCl <sub>2</sub> CF <sub>3</sub>	2,2-dicloro-1,1,1-trifluoroetano	1000 ppm
<b>HFC 125 (R125)</b>	C <sub>2</sub> HF <sub>5</sub>	Pentafluoroetano	1000 ppm
<b>HFC 134a (R134a)</b>	CH <sub>2</sub> FCF <sub>3</sub>	1,1,1,2-tetrafluoroetano	1000 ppm

### Mezclas de fluidos empleados en el mercado de refrigeración y aire acondicionado:

Refrigerante	Componentes	Grado de medición
<b>R404a</b>	R143a/125/134a	1000 ppm
<b>R407a</b>	R32/125/134a	1000 ppm
<b>R407c</b>	R32/125/134a	1000 ppm
<b>R410a</b>	R32/125	1000 ppm
<b>R507</b>	R143a/125	1000 ppm

### Fluido especializado para la refrigeración de vehículos:

Fluido	Fórmula	Nombre	Grado de medición
<b>R1234yf</b>	CH <sub>2</sub> =CF <sub>3</sub>	Tetrafluoropropeno	1000 ppm

### Gas aislante:

Gas	Nombre	Grado de medición
<b>SF<sub>6</sub></b>	Hexafluoruro de azufre	1000 ppm

Crowcon se reserva el derecho a modificar el diseño o las especificaciones del producto sin previo aviso.

Le rogamos consulte [www.crowcon.com](http://www.crowcon.com) para obtener la información más actualizada.

[www.crowcon.com](http://www.crowcon.com)

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**CROWCON**  
Detecting Gas Saving Lives

# Xgard

## Detector de gas fijo

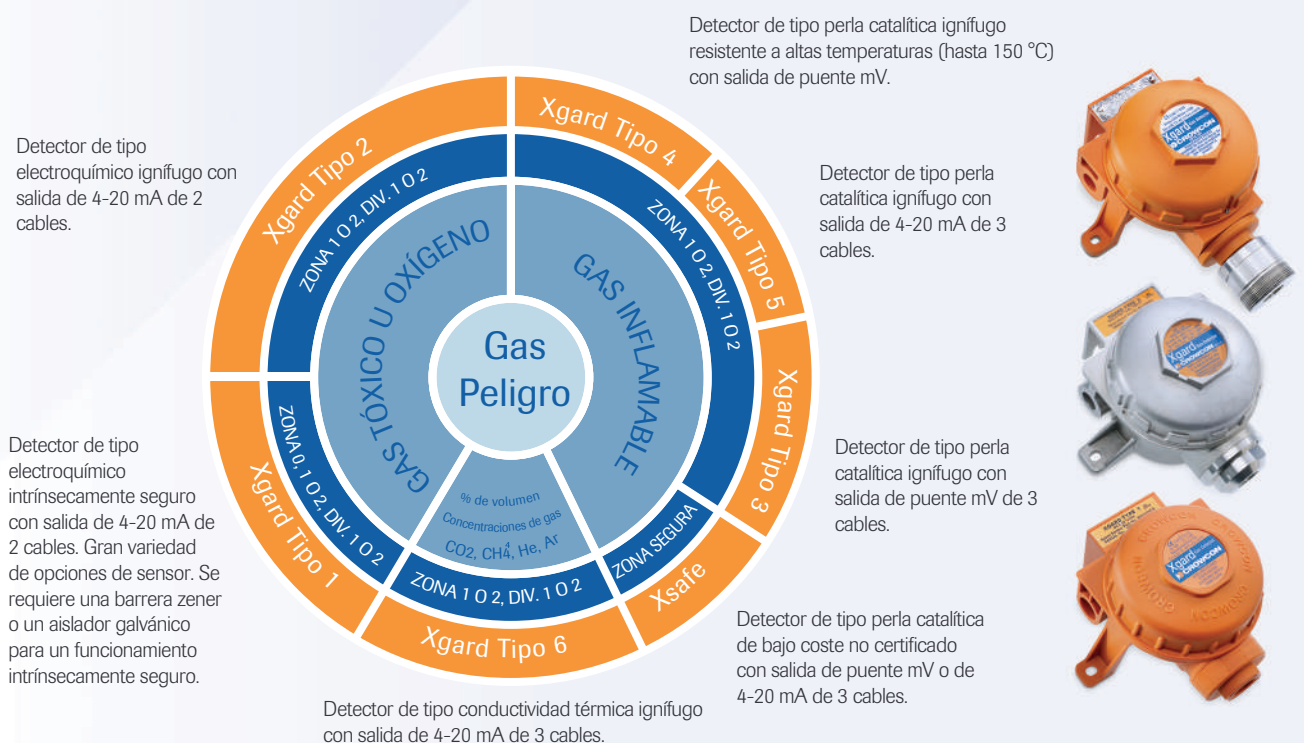
### Elección del detector de gas que se adapte a sus necesidades

Xgard ofrece tres conceptos de sensor diferentes para que pueda elegir exactamente lo que necesita para sus instalaciones. Xgard está disponible en formatos ignífugo, intrínsecamente seguro o de zona segura para utilizarlo en todos los entornos, independientemente de su clasificación.

### Características

Bajo coste de propiedad	Los detectores Xgard están diseñados para una fácil instalación y mantenimiento a fin de mantener los costes bajos. Las tres opciones con caja de empalmes están diseñadas para facilitar al máximo la sustitución de los sensores y sínteres. Conexión directa de los sensores de repuesto. Muchos repuestos son comunes para todos los modelos Xgard, lo que reduce al mínimo los requisitos de stock de repuestos.
Gran variedad de sensores	Pellistores resistentes a venenos para todas las necesidades de detección de gases inflamables, como hidrocarburos, hidrógeno, amoníaco, combustible para aviones, gasolina con plomo y vapores que contienen halógenos. Los sensores electroquímicos se utilizan para detectar una gran variedad de gases tóxicos y oxígeno. Los sensores de conductividad térmica están disponibles para supervisar porcentajes de volumen de concentraciones de gases.
Opciones de instalación flexibles	Xgard está diseñado para el montaje en pared o techo sin necesidad de soportes adicionales. Xgard puede albergar pasacables M20, NPT de 0,5 pulgadas o NPT de 0,75 pulgadas para adaptarse a las necesidades de todas las instalaciones. Hay modelos resistentes a altas temperaturas para entornos calientes (hasta 150 °C). Existen accesorios para el montaje de conductos y aplicaciones de muestreo, así como el gaseado remoto para una sencilla comprobación de los sensores.
Robusto y fiable	Xgard se fabrica mediante una selección de tres materiales: nailon reforzado con vidrio, aluminio de alta duración con un recubrimiento de poliéster resistente o acero inoxidable 316 para la máxima resistencia a la corrosión. Todas las versiones están diseñadas para funcionar incluso en las condiciones más adversas. Existen deflectores en spray y tapones impermeables para utilizarlos en zonas sometidas a lavados periódicos o para entornos marítimos. Todos los modelos han sido validados de conformidad con la norma de seguridad funcional IEC 61508 (SIL 1 a SIL 3).

La gama Xgard ofrece una completa selección de detectores de gas de emplazamiento fijo que cubre los distintos requisitos de detección de gases tóxicos e inflamables y de monitorización de oxígeno en industrias de todo el mundo. Este diagrama esta diseñado para ayudarle a elegir el detector Xgard correcto que se adapte a sus necesidades.



Xgard también está disponible como variante infrarroja (IR) para la detección de hidrocarburos o de dióxido de carbono. Consulte la ficha técnica de Xgard IR para obtener más información.

## Gases y rangos

Gas	LEL (ppm) LEL (% de vol.)	STEL UEL (% de vol.)	Rango disponible: Tipo 1	Rango disponible: Tipo 2	Rango disponible: Tipo 3, 4, 5 y Xsafe	Rango disponible: Tipo 6
Acetileno (C <sub>2</sub> H <sub>2</sub> )	2,3	100	-	-	0-100 %* de LEL	-
Amoniaco (NH <sub>3</sub> )	25 15	35 33,6	50, 100, 250, 500, 1000 ppm	-	0-25 %* de LEL	-
Argón (Ar)	-	-	-	-	-	Póngase en contacto con Crowcon
Arsina (AsH <sub>3</sub> )	0,05	-	1 ppm	-	-	-
Bromo (Br <sub>2</sub> )	0,1	0,2	3 ppm	-	-	-
Butano (C <sub>4</sub> H <sub>10</sub> )	1,4	9,3	-	-	0-100 %* de LEL*	-
Dióxido de carbono (CO <sub>2</sub> )	5000 (0,5 % de vol.)	5000 (1,5 % de vol.)	-	-	-	Póngase en contacto con Crowcon
Monóxido de carbono (CO)	30	200	50, 100, 200, 250, 500, 1000, 2000 ppm	50, 100, 200, 250, 500, 1000, 2000 ppm	-	-
Cloro (Cl <sub>2</sub> )	-	0,5	3, 5, 10, 20, 50, 100 ppm	-	-	-
Dióxido de cloro (ClO <sub>2</sub> )	0,1	0,3	1 ppm	-	-	-
Diborano (B <sub>2</sub> H <sub>6</sub> )	0,1	-	1 ppm	-	-	-
Etano (C <sub>2</sub> H <sub>6</sub> )	2,4	15,5	-	-	0-100 %* de LEL	-
Etileno (C <sub>2</sub> H <sub>4</sub> )	2,3	36	-	-	0-100 %* de LEL	-
Óxido de etileno (C <sub>2</sub> H <sub>4</sub> O)	5	-	10, 50, 100 ppm	-	-	-
Flúor (F <sub>2</sub> )	1	1	1 ppm	-	-	-
Germano (GeH <sub>4</sub> )	0,2	0,6	2 ppm	-	-	-
Helio (He)	-	-	-	-	-	Póngase en contacto con Crowcon
Hidrógeno (H <sub>2</sub> )	4	77	200, 2000 ppm	200, 2000 ppm 100 % de LEL	0-100 %* de LEL 50 % de LEL, 100 % de LEL	0-5 %, 10 %, 50 % vv (en aire) 0-20 %, 25 %, 30 %, 50 % vv (H <sub>2</sub> en N <sub>2</sub> )
Cloruro de hidrógeno (HCl)	1	5	10, 25 ppm	-	-	-
Cianuro de hidrógeno (HCN)	-	10	25 ppm	-	-	-
Fluoruro de hidrógeno (HF)	1,8	3	10 ppm	-	-	-
Ácido sulfhídrico (H <sub>2</sub> S)	5	10	5, 10, 20, 25, 50, 100, 200, 250, 300, 1000 ppm	5, 10, 20, 25, 50, 100, 200 ppm	-	-
GLP	2	10	-	-	0-100 % de LEL	-
Metano (CH <sub>4</sub> )	4,4	17	-	-	0-100 % de LEL	-
Óxido nítrico (NO)	5*1	5*1	25, 50, 100 ppm	-	-	-
Dióxido de nitrógeno (NO <sub>2</sub> )	1*1	1*1	10, 50, 100 ppm	-	-	-
Ozono (O <sub>3</sub> )	-	0,2	1 ppm	-	-	-
Oxígeno (O <sub>2</sub> )	-	-	25 % de vol.	25 % de vol.	-	-
Pentano (C <sub>5</sub> H <sub>12</sub> )	1,1 600 ppm	8,7 1800 ppm	-	-	0-100 %* de LEL	-
Vapor de petróleo	1,4	6	-	-	0-100 %* de LEL	-
Fosgeno (COCl <sub>2</sub> )	0,02	0,06	1 ppm	-	-	-
Fosfina (PH <sub>3</sub> )	0,1	0,2	1 ppm	-	-	-
Propano (C <sub>3</sub> H <sub>8</sub> )	1,7	10,9	-	-	0-100 %* de LEL	-
Silano (SiH <sub>4</sub> )	0,5	1	1 ppm	-	-	-
Dióxido sulfúrico (SO <sub>2</sub> )	1*1	1*1	10, 20, 50, 100, 250 ppm	-	-	-
Cloruro de vinilo (VCM) (CH <sub>2</sub> = CHCl)	3,6 3	33 -	-	-	0-100 %* de LEL	-
Compuesto orgánicos volátiles (VO)*2	-	-	0-100 ppm *2	-	-	-

\* Rangos no disponibles para Xsafe o Xgard tipo 4  
 Las cifras de LTEL y STEL se han obtenido del documento HSE del Reino Unido: EH40 2011  
 Pueden aplicarse umbrales alternativos en países que no pertenecen al Reino Unido  
 Cifras de LEL obtenidas de EN60079-20-1: 2010

\*1 Límites de corriente aconsejados en el Reino Unido  
 \*2 Rango nominal de 0-100 ppm con monóxido de carbono (CO).  
 Hay otros sensores y rangos disponibles. Póngase en contacto con Crowcon.

# Especificaciones

	Tipo 1	Tipo 2	Tipo 3	Tipo 4	Tipo 5	Tipo 6	Xsafe
Tamaño	156 x 166 x 111 mm (6,1 x 6,5 x 4,3 pulgadas)			195 x 166 x 111 mm (7,6 x 6,5 x 4,3 pulgadas)	156 x 166 x 111 mm (6,1 x 6,5 x 4,3 pulgadas)		
Peso	Nylon: 0,5 kg (1,1 libras) Aleación: 1 kg (2,2 libras) Acero inoxidable 316: 3,1 kg (6,8 libras)	Aluminio: 1 kg (2,2 libras) Acero inoxidable: 3,1 kg (6,8 libras)		1,5 kg (3,3 libras)	Aluminio: 1 kg (2,2 libras) Acero inoxidable: 3,1 kg (6,8 libras)		1 kg (2,2 libras)
Material del alojamiento	Con certificación ATEX: vidrio nylon reforzado o acero inoxidable 316 Con certificación UL: aluminio o acero inoxidable 316	Aluminio o acero inoxidable 316		Aluminio	Aluminio o acero inoxidable 316		Aluminio
Protección hermética	IP65			IP54	IP65		
Entradas de cables	1 x M20, NTP de 0,5 pulgadas o NTP* de 0,75 pulgadas en el lado derecho						
Terminaciones	De 0,5 a 2,5 mm <sup>2</sup>						
Tipos de sensor	Electroquímico		Perla catalítica	Alojamiento de sensor de acero inoxidable 316 con perlas catalíticas	Perla catalítica	Conductividad térmica	Perla catalítica
Temperatura de funcionamiento	De -20 a +50 °C (de -40 a 122 °F) (según el sensor)	De -20 a +50 °C (de -4 a 122 °F) (según el sensor)	De -40 a +80 °C (de -40 a 176 °F)	De -20 a +150 °C (de -4 a 302 °F)	De -40 a +55 °C (de -40 a 131 °F)	De +10 a +55 °C (de 50 a 301 °F)	mV: de -40 a +80 °C (de -40 a 176 °F) mA: de -40 a +55 °C (de -40 a 131 °F)
Humedad	De 0 a 90 % de HR sin condensación		De 0 a 99 % de HR sin condensación			De 0 a 90 % de HR	De 0 a 99 % de HR
Repetibilidad	<2 % FSD (valor típico)						
Desviación de cero	<2 % FSD al mes (valor típico)						
Tiempo de respuesta	T90 <15 s oxígeno T90 de <30 s a 120 s gases tóxicos (según el sensor)		T90 <15 s (valor típico)				
Tensión de funcionamiento	8-30 V CC		2,0 V CC +/-0,1 V (valor típico)		10-30 V CC		mA: 10-30 V CC mV: 2,0 V CC
Requisitos de alimentación	24 mA como máximo		300 mA (valor típico)		50 mA a 24 V CC 1,2 W		mA: 50 mA a 24 V CC 1,2 W mV: 300 mA (valor típico)
Salida eléctrica	2 cables 4-20 mA (disipación de corriente)		Puente mV de 3 cables Señal típica: 12-15 mV/% de LEL CH4	Puente mV de 3 cables Señal típica: >10 mV/% de LEL CH4	3 cables 4-20 mA (fuente o disipación de corriente)		mA: 3 cables 4-20 mA (fuente o disipación de corriente) mV: puente mV de 3 cables Señal típica: 12-15 mV/% de LEL CH4
Autorizaciones	ATEX: II 1 G Exia IIC T4 Ga (Tamb de -40 a +55 °C) UL/cUL: Clase I, Div. 1 Grupos A, B, C, D IECEX GOST-R	ATEX: II 2 GD Exd IIC T6 Gb (Tamb de -40 a +50 °C) UL: Clase I, Div. 1 Grupos B, C, D IECEX GOST-R	ATEX: II 2 GD Exd IIC T4 Gb (Tamb de -40 a +80 °C) Exd IIC T6 Gb (Tamb de -40 a +50 °C) Ex tb IIIC T180oc Db UL: Clase I, Div. 1 Grupos B, C, D IECEX GOST-R	ATEX: II 2 GD Exd IIC T3 Gb (Tamb de -40 a +150 °C)	ATEX: II 2 GD Exd IIC T6 Gb (Tamp de -40 a +50 °C) Exd IIC T4 Gb (Tamb de -40 a +80 °C) Ex tb IIIC T180°c Db UL: Clase 1, Div. 1 Grupos B, C, D IECEX GOST-R		
Cumplimiento de CEM	EN 50270	FCC Parte 15	ICES- 003				

\* Entrada de cables de 0,75 pulgadas solo disponible en caja de empalmes de aluminio

# XgardIQ

## Transmisor y detector de gas inteligentes

Reduzca al mínimo el tiempo que los operarios pasan en zonas peligrosas.

XgardIQ ofrece unas potentes funciones que reducen al mínimo el tiempo que los operarios pasan en zonas peligrosas para realizar tareas de mantenimiento rutinarias.



### Fácil de usar

Indicador de seguridad positiva	Comprobación de estado de un vistazo y a distancia.
Pantalla OLED	La pantalla clara y brillante indica el nivel de gas, incluso en lugares oscuros.
Botones	Funciones realizadas a través de botones, sin necesidad de herramientas ni imanes especiales.
Registro de eventos	Historial de uso claro del detector.

### Instalación y mantenimiento sencillos

Módulos de sensores de intercambio en caliente	Fácil extracción y sustitución con la herramienta suministrada sin necesidad de autorizaciones para trabajos en caliente ni herramientas especiales.
Función de detección automática	Detecta automáticamente si el sistema de control es una fuente o disipación de corriente de 4-20 mA, lo que ahorra tiempo y averías.
Función de configuración automática	Detecta cuándo está enchufado el módulo de sensores y carga los niveles de alarma, unidades, rango y tipo de gas apropiados.
Prueba de funcionamiento inteligente y de funcionamiento rápida	Estado del sensor y respuesta verificados de forma rápida y fácil siguiendo unas sencillas instrucciones en pantalla. El detector ofrece automáticamente un recordatorio cuando deba llevarse a cabo la siguiente prueba de funcionamiento.
Advertencia de calibración pendiente	Avisa automáticamente al usuario cuando deba llevarse a cabo la calibración para garantizar que los sensores sigan siendo precisos en todo momento.
Selección del rango del sensor	Los usuarios pueden establecer el rango de escala completa del sensor a través del menú en pantalla de acuerdo con los requisitos de las instalaciones o de un emplazamiento concreto.

### Descripción del producto

XgardIQ es un transmisor y detector de gas inteligente y versátil compatible con la gama completa de tecnologías de sensor Crowcon. XgardIQ se ofrece integrado con diversos sensores de oxígeno y de gases tóxicos e inflamables y proporciona una pantalla OLED brillante con información clara y completa sobre el estado en varios idiomas.





## Gases y rangos

Gas	Tipo de sensor	Unidades	Rango máx.*	Rango estándar	Nivel de alarma 1+	Nivel de alarma 2+	Rango de temp. °C
Oxígeno (O <sub>2</sub> )	Electroquímico	% de vol.	30	25	19 (decreciente)	17 (decreciente)	De -20 a +50
Amoniaco (NH <sub>3</sub> )	Electroquímico	ppm	100/1000	50	25	35	De -20 a +40
Monóxido de carbono (CO)	Electroquímico	ppm	1000	250	30	200	De -30 a +50
Fluoruro de hidrógeno (HF)	Electroquímico	ppm	10	10	1,8	3	De +5 a +40
Ácido sulfhídrico (H <sub>2</sub> S)	Electroquímico	ppm	100/200	25	5	10	De -30 a +50
Temp. alta (H <sub>2</sub> S)	Electroquímico	ppm	100	100	5	10	De -30 a +70
Cloro (Cl <sub>2</sub> )	Electroquímico	ppm	20	5, 10 o 20	0,5	1	De -20 a +50
Ozono (O <sub>3</sub> )	Electroquímico	ppm	1	1	0,1	0,2	De -20 a +40
Dióxido sulfúrico (SO <sub>2</sub> )	Electroquímico	ppm	100	10	1	1	De -30 a +50
Hidrógeno (H <sub>2</sub> )	Pellistor	% de LEL	100	100	20	40	De -40 a +75
Metano (CH <sub>4</sub> )	Pellistor	% de LEL	100	100	20	40	De -40 a +75
Pentano (C <sub>5</sub> H <sub>12</sub> )	Pellistor	% de LEL	100	100	20	40	De -40 a +75
Propano (C <sub>3</sub> H <sub>8</sub> )	Pellistor	% de LEL	100	100	20	40	De -40 a +75
Etanol (C <sub>2</sub> H <sub>6</sub> O)	IR	% de LEL	100	100	20	40	De -20 a +55
GLP	IR	% de LEL	100	100	20	40	De -20 a +55
Metano (CH <sub>4</sub> )	IR	% de LEL	100	100	20	40	De -20 a +55
Pentano (C <sub>5</sub> H <sub>12</sub> )	IR	% de LEL	100	100	20	40	De -20 a +55
Propano (C <sub>3</sub> H <sub>8</sub> )	IR	% de LEL	100	100	20	40	De -20 a +55

\* NOTA: El propio usuario puede seleccionar los rangos de medición en el transmisor XgardIQ

\* NOTA: El propio usuario puede ajustar los niveles de alarma en el transmisor XgardIQ

También disponible para otros tipos de gases. Póngase en contacto con Crowcon para realizar su pedido.

## Especificaciones

Tamaño	Transmisor XgardIQ	Al. 278 x An. 140 x Pr. 89 mm (10,9 x 5,5 x 3,5 pulgadas)
Peso	Transmisor XgardIQ	4,1 kg (9 libras, acero inoxidable)
Material del alojamiento		Acero inoxidable 316
Protección hermética		IP66
Conexión		Tres entradas de pasacables M20 o NPT de 0,5 pulgadas. Hay enchufes extraíbles certificados integrados en las entradas a la izquierda y en la parte inferior a la derecha
Alimentación eléctrica		14-30 V CC < 4 W
Pantalla	Pantalla principal	OLED 128 x 64 píxeles, texto en amarillo sobre fondo negro
	Indicadores	LED ámbar, rojo y verde para indicar el estado del detector LED azul de seguridad positiva
Salida eléctrica		Fuente o disipación de corriente de 4-20 mA (selección manual o detección automática) Las señales de advertencia y avería son configurables De conformidad con NAMUR NE 43 RS-485 Modbus RTU HART 7 a través de una señal de 4-20 mA y a través de puntos de prueba I.S. locales (opcional)
	Relés (opcionales)	Alarma 1, Alarma 2, Avería Contactos SPDT con un valor nominal de 5 A, 230 V CA (relé de avería: contactos SPST)
	Opciones de configuración de relés	Activados o desactivados Con bloqueo o sin bloqueo Creciente o decreciente Retardos de activación y desactivación configurables para relés de alarma
Registro de eventos		Registra eventos de alarma, avería y mantenimiento. Los eventos pueden visualizarse en la pantalla y descargarse a un PC
Temperatura de funcionamiento		Solo transmisor: de -40 °C a +75 °C (de -40 °F a 167 °F) Tipo de sensor Oxígeno (de -20 °C a +50 °C temperatura ambiente) Gas tóxico (de -40 °C a +50 °C temperatura ambiente) Gas tóxico (sensor de H2S a alta temperatura de -40 °C a +75 °C temperatura ambiente) Pellistor (de -40 °C a +75 °C temperatura ambiente) Infrarrojos (IR) (de -20 °C a +55 °C temperatura ambiente)
Humedad		Solo transmisor: de 0 a 95 % de HR sin condensación Nota: el rango operativo de la humedad del sensor puede variar. Póngase en contacto con Crowcon para obtener los datos de un sensor en concreto
Repetibilidad		+/-2 % FSD
Desviación de cero		+/-2 % FSD por año, máximo
Tiempo de respuesta		Depende del sensor: póngase en contacto con Crowcon para obtener los datos de un sensor en concreto
Rendimiento	Probado de acuerdo con:	EN60079-29-1 (sensores de gases inflamables)* EN50104 (sensores de oxígeno)*
Seguridad funcional		IEC61508, EN50402, SIL 2*
Autorizaciones		ATEX e IECEx, SGS Ex II 2 G Ex db ia IIC T4 Gb (consulte los rangos de temperatura ambiente anteriores) Certificación CU-EAC
Cumplimiento de CEM		EN50270, EN61000-6-4 FCC CFR47 Parte 15B

\* Funciones pendientes en el momento de la publicación. Póngase en contacto con Crowcon para obtener más información.

# IRmax

## Detector de gases hidrocarburos por infrarrojos



IRmax es un detector de gas por infrarrojos compacto, de bajo consumo de energía y muy resistente para detectar de forma segura y a prueba de averías metano, butano, propano y muchos otros gases y vapores de hidrocarburos.

### Fácil instalación

Tamaño compacto	Requiere menos espacio, esfuerzo y tiempo de instalación
Varias opciones de instalación	Puede montarse en una pared, fijarse a una tubería de 50 mm (2 pulgadas) o conectarse a una caja de empalmes auxiliar mediante una selección de accesorios de montaje
Salida de 4-20 mA estándar del sector	
Opciones para comunicaciones HART y RS-485-Modbus	IRmax es compatible con prácticamente cualquier sistema de control

### Fácil mantenimiento

Calibración remota no invasiva	La pantalla remota puede montarse a una distancia de hasta 30 metros del IRmax y puede aplicarse gas de prueba sin necesidad de acceder directamente al detector
Calibrador portátil intrínsecamente seguro (I.S.)	Los detectores IRmax equipados con un módulo de barrera intrínsecamente seguro pueden comprobarse y calibrarse con una pantalla portátil intrínsecamente segura
Óptica STAY-CLIR	Evita la condensación en componentes ópticos

### Bajo coste de propiedad

Bajo consumo de energía	El IRmax solo consume 1 W de potencia, lo que permite el uso de fuentes de alimentación y sistemas de respaldo con pilas más pequeños
Control de oscurecimiento óptico automático	
Intervalo de pruebas anual	El reducido mantenimiento rutinario mantiene los costes al mínimo



## Gases y rangos

Linealización			Rango
Acetona (C <sub>3</sub> H <sub>6</sub> O)	Pentano (C <sub>5</sub> H <sub>12</sub> )	Paraxileno (C <sub>8</sub> H <sub>10</sub> )	0-100 % de LEL
Butano (C <sub>4</sub> H <sub>10</sub> )	Vapor de petróleo	Etano (C <sub>2</sub> H <sub>6</sub> )	
Etanol (C <sub>2</sub> H <sub>5</sub> OH)	Propano (C <sub>3</sub> H <sub>8</sub> )	Dicloruro de etileno (EDC)	
Etileno (C <sub>2</sub> H <sub>4</sub> )	Propileno (C <sub>3</sub> H <sub>6</sub> )	Ciclohexano (C <sub>6</sub> H <sub>12</sub> )	
Acetato de etilo (C <sub>4</sub> H <sub>8</sub> O <sub>2</sub> )	THF (tetrahidrofurano) (C <sub>4</sub> H <sub>8</sub> O)	Butadieno (C <sub>4</sub> H <sub>6</sub> )	
Heptano (C <sub>7</sub> H <sub>16</sub> )	Xileno (C <sub>8</sub> H <sub>10</sub> )	Tolueno (C <sub>7</sub> H <sub>8</sub> )	
Hexano (C <sub>6</sub> H <sub>14</sub> )	Acetato de metilo (C <sub>3</sub> H <sub>6</sub> O <sub>2</sub> )	Buteno (C <sub>4</sub> H <sub>6</sub> )	
GLP	Propilacetato (C <sub>5</sub> H <sub>10</sub> O <sub>2</sub> )	Metilacetona (MEK)	
Metanol (CH <sub>3</sub> OH)	Hexeno (C <sub>6</sub> H <sub>12</sub> )	Isopropanol (IPA)	
Metano (CH <sub>4</sub> )			

Puede haber otros rangos y calibraciones disponibles. Póngase en contacto con Crowcon si no se muestra lo que necesita.

## Especificaciones

Tamaño	IRmax	158 x 75 x 57 mm (6,2 x 2,9 x 2,3 pulgadas)		
	IRmax con pantalla IR fija	230 x 75 x 57 mm (9 x 2,9 x 2,3 pulgadas)		
	IRmax con módulo de barrera IS	261 x 75 x 57 mm (2,3 x 2,9 x 2,3 pulgadas)		
	Pantalla IR remota	60 x 54 x 48 mm (2,3 x 2,1 x 1,9 pulgadas)		
Peso	IRmax	1,58 kg (3,5 libras)		
	IRmax con pantalla IR fija	2 kg (4,4 libras)		
	IRmax con módulo de barrera IS	2,4 kg (5,3 libras)		
	Pantalla IR remota	0,2 kg (0,4 libras)		
Material del alojamiento		Acero inoxidable 316		
Descripción		Detector de gases hidrocarburos por infrarrojos de doble haz con pantalla opcional		
Protección hermética		IP66		
Conexión		Una entrada de pasacables M20 o NTP de 0,5 pulgadas		
Alimentación eléctrica		12-30 V CC < 1 W		
Salida eléctrica		Disipación o fuente de corriente de 4-20 mA		
		Advertencia de óptica sucia de 2 mA (con un oscurecimiento del 75 %, configurable)		
		Señal de avería del detector de 0 mA (con un oscurecimiento del 90 %, configurable)		
		RS-485-Modbus (opcional), HART 7 (opcional)		
Pantalla IR		Pantalla LCD de 4 dígitos con retroiluminación		
		Los botones de función pueden desactivarse si es necesario		
		Terminales para conectar comunicadores HART (función opcional)		
	LED	Rojo: gas detectado	Ámbar: avería de IRmax	Verde: estado correcto
	Funciones de pantalla	Nivel de gas, nivel de oscurecimiento, tensión de alimentación, corriente de señal		
	Funciones protegidas por contraseña	Puesta a cero, calibración, salida de rampa. mA de ajuste a cero, mA de intervalo de ajuste		
Temperatura de funcionamiento		De -40 °C a +75 °C (de -40 °F a 167 °F)		
Humedad		De 0 a 95 % de HR sin condensación		
Rango de presión		Atmosférica +/- 10 %		
Repetibilidad		+/- 2 % FSD		
Desviación de cero		+/- 2 % FSD por año, máximo		
Tiempo de respuesta		T90 < 4 segundos		
Seguridad funcional		IEC61508, EN50402 SIL2		
Autorizaciones ATEX e IECEx	IRmax sin pantalla	Ex II 2 GD Ex db IIC T6 Gb (Tamb -40 °C ≤ Ta ≤ +50 °C) Ex II 2 GD Ex db IIC T4 Gb (Tamb -40 °C ≤ Ta ≤ +75 °C) Ex II 2 GD Ex tb IIIC T135 °C Db (Tamb -40 °C ≤ Ta ≤ +75 °C)		
	IRmax con pantalla remota y portátil	Ex II 2 GD Ex db ia IIC T4 Gb (Tamb -40 °C ≤ Ta ≤ +75 °C) Ex II 2 GD Ex tb ia IIIC T135 °C Db (Tamb -40 °C ≤ Ta ≤ +40 °C)		
	IRmax con pantalla fija	EX II 2G Ex db ia IIC T4 Gb (Tamb -40 °C ≤ Ta ≤ +75 °C)		
Cumplimiento de CEM		EN50270, FCC CFR47 Parte 15B, ICES-003		
Precisión		+/- 2 % de lectura		
Linealidad		+/- 3 % de escala completa		

Visite [www.crowcon.com](http://www.crowcon.com) para obtener actualizaciones.

# Xgard Bright

## Detector de gas de emplazamiento fijo direccionable con pantalla



Xgard Bright es una plataforma versátil que ofrece detección de gases tóxicos e inflamables y monitorización de oxígeno, al tiempo que permite un funcionamiento sencillo y costes de instalación reducidos.

Al reducir el coste de instalación, la implantación direccionable de 4 cables reduce drásticamente los requisitos de cableado. La pantalla OLED de gran tamaño permite a los usuarios trabajar fácilmente con Xgard Bright durante la instalación, la calibración y el mantenimiento rutinarios sin necesidad de abrir el alojamiento.

### Características

Sensor versátil opcional	Admite un sensor de oxígeno y de gases tóxicos e inflamables Alojamiento a prueba de explosiones Clasificación IP65 o IP66 (con tapón impermeable)
Fácil instalación y mantenimiento	Bloques de terminales de tipo enchufable para un fácil cableado Opción de conexión de conductos M20 o NPT de 0,5 pulgadas Configuración a través de llave magnética Calibración no invasiva sin suprimir el acceso Comunicación MODBUS o Hart para un acceso remoto
Tamaño compacto	Requisito de bajo consumo (-3 W máx.)

### Gases y rangos

Gas	Rangos disponibles
Ácido sulfhídrico (H <sub>2</sub> S)	10, 20, 25, 50, 100, 200 ppm
Oxígeno (O <sub>2</sub> )	0-25 % de vol.
Monóxido de carbono (CO)	0-25, 50, 100, 200, 250, 300, 1000, 2000 ppm
Metano (CH <sub>4</sub> )	0-100 % de LEL

Se incorporarán otros sensores y rangos. Envíe sus peticiones a Crowcon.



## Reducción del tiempo que los operarios emplean en zonas potencialmente peligrosas:

En Crowcon, reconocemos los procesos necesarios y los peligros a los que se enfrenta un operario cada vez que accede a una instalación u obra clasificada como zona peligrosa. Se requieren permisos, formación específica y equipos, y deben seguirse unos determinados procedimientos. Todo ello consume recursos, lo que en definitiva aumenta el coste de las operaciones.

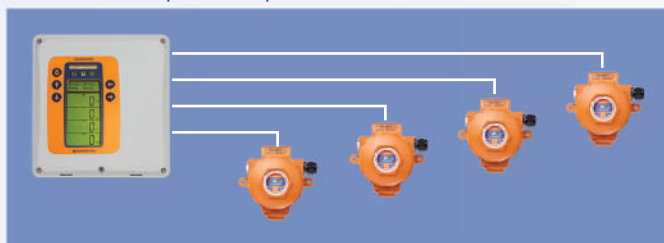
Xgard Bright ha sido diseñado teniendo en cuenta todo esto y ha agilizado y simplificado las operaciones de calibración y mantenimiento rutinarias para reducir el tiempo que los operarios pasan en zonas peligrosas:

Calibración no invasiva	Las funciones de puesta a cero y calibración (más configuración, pruebas y ajustes) se realizan a través de la pantalla mediante la varilla magnética, sin necesidad de abrir el alojamiento, lo que reduce la necesidad de autorización para trabajos en caliente.
Pantalla OLED	La pantalla de «diodo emisor de luz orgánica» iluminada con brillo indica claramente el nivel de gas y las unidades, y ofrece menús completos para la configuración y el diagnóstico. En condiciones de poca luz ambiental, como una sala oscura, la pantalla OLED logra mucho mayor contraste que las pantallas LCD utilizadas en los detectores de gas convencionales.

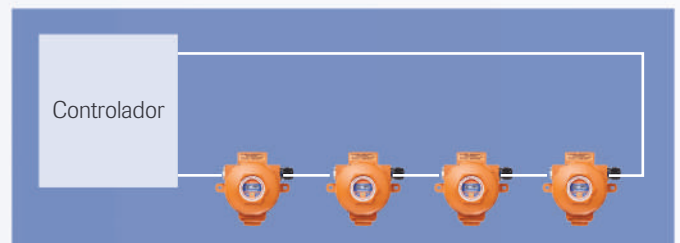
## Reducción del coste de instalación y mantenimiento

Comunicaciones direccionables	Los detectores Xgard Bright pueden conectarse a una red direccionable mediante RS-485 Modbus. Esta opción reduce significativamente los costes de cables e instalación, al tiempo que aumenta la flexibilidad y funcionalidad de todo el sistema.
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### Tradicional o punto a punto



### Direccionable o circuito



## Especificaciones

Material del alojamiento	Aleación de aluminio ADC 12
Dimensiones	156 x 166 x 109 mm (6,1 x 6,5 x 4,3 pulgadas)
Peso	Aleación de aluminio 1 kg (2,2 libras)
Protección hermética	IP65 e IP66 (con tapón impermeable)
Entrada de cables	2 x M20 (tapón de cierre integrado en la entrada del lado izquierdo) o suministrada con adaptadores NTP de 0,5 pulgadas
Alimentación eléctrica	10-30 V CC 3 W máx.
Salida eléctrica	Fuente de alimentación o disipación de corriente de 4-20 mA RS-485 Modbus RTU HART (opcional)
Relés	Alarma 1, Alarma 2, Avería Contactos SPST con valor nominal de 1 A 30 V CC
Salida de sirena	24 V CC (nominal), 250 mA de carga máxima
Temperatura de funcionamiento	De -40 °C a +70 °C (de -40 °F a 158 °F) Nota: las temperaturas de funcionamiento del sensor varían en gran medida Consulte la ficha técnica del sensor o póngase en contacto con Crowcon para obtener los datos de un sensor en concreto.
Humedad	De 0 a 95 % de HR sin condensación
Repetibilidad	+/-2 % FSD
Desviación de cero	+/-2 % FSD por año, máximo
Códigos de aprobación	ATEX e IECEx Ex II 2G Ex db IIC T6 Gb Ex II 2D Ex tb IIIC T 80 °C Db Números de certificado: TUV 16 ATEX 7908 X IECEx TUR 16.0035 X
Normativa	EN60079-0:2012 + A11:2013 EN60079-1:2014 EN60079-31:2014 IEC60079-0:2017 Edición 7 IEC60079-1:2014-06 IEC60079-31:2013
Zonas	Certificado para usarlo en Zona 1 y Zona 2
Cumplimiento de CEM	EN50270:2015



# TXgard & Flamgard Plus

## Toxic and oxygen gas detector with display

With 3 models available, we have a detector to suit your requirements.



Flamgard Plus



Flamgard Plus is a Flameproof (Ex d), ATEX, IECEx and UL certified flammable gas detector, which uses poison-resistant pellistors to detect explosive levels of hydrocarbons, hydrogen and other flammable gases and vapours, including aviation fuel and leaded petrol vapours.

TXgard Plus



TXgard Plus is a Flameproof (Ex d), ATEX, IECEx and UL certified toxic or oxygen gas detector with local LCD display. A choice of sensors are available enabling use in a wide range of applications, including water treatment, oil and gas exploration, chemical plants and steel production.

TXgard-IS+



TXgard-IS+ is an Intrinsically Safe (I.S.), 2-wire, toxic and oxygen gas detector with local LCD display. A wide choice of sensors is available for use in a variety of applications. TXgard-IS+ is ATEX and IECEx certified for use in Zone 0, 1 or 2 hazardous areas, and also UL and cUL certified for use in Division 1 or 2 hazardous areas.

### Low cost of ownership

Non-intrusive one man calibration	Easy to operate and maintain
Long life sensors	Keeps interruption to on-site activity to a minimum
Simple parts replacement	
Wide range of sensor options	Reduced training requirements

## Gases and ranges

Gas	LTEL (ppm)	STEL (ppm)	Range available: TXgard-IS+	Range available: TXgard Plus
Ammonia (NH <sub>3</sub> )	25	35	50, 100, 1000ppm	-
Carbon monoxide (CO)	20	100	250, 500ppm	100, 250, 500, 1000ppm
Chlorine (Cl <sub>2</sub> )	-	0.5	5, 10, 20ppm	-
Chlorine dioxide (ClO <sub>2</sub> )	0.1	0.3	1 ppm	-
Hydrogen (H <sub>2</sub> )	-	-	2000ppm, 50% LEL, 100% LEL	-
Hydrogen cyanide (HCN)	0.9	4.5 (MEL)	25ppm	-
Hydrogen fluoride (HF)	1.8	3	10ppm	-
Hydrogen sulphide (H <sub>2</sub> S)	5	10	25, 50, 100, 200ppm	15, 20, 25, 50, 100, 200ppm
Nitrogen dioxide (NO <sub>2</sub> )	0.5	1	10ppm	-
Oxygen (O <sub>2</sub> )	19.5% Vol. typical alarm	23.5% typical alarm	25% Vol.	25% Vol.
Ozone (O <sub>3</sub> )	-	0.2	1ppm	-
Phosgene (COCl <sub>2</sub> )	0.02	0.06	1ppm	-
Phosphine (PH <sub>3</sub> )	0.1	0.2	2ppm	-
Sulphur dioxide (SO <sub>2</sub> )	0.5	1	10, 20, 30ppm	-

STEL & LTEL figures are derived from the UK HSE document: EH40. Other thresholds may apply in countries outside the UK.

Gas	LEL (%vol.)	Range available: Flamgard Plus
Acetylene (C <sub>2</sub> H <sub>2</sub> )*	2.3	0-100% LEL
Ammonia (NH <sub>3</sub> )	15	
Butane (C <sub>4</sub> H <sub>10</sub> )	1.4	
Ethanol (C <sub>2</sub> H <sub>5</sub> OH)	3.1	
Ethane (C <sub>2</sub> H <sub>6</sub> )	2.4	
Ethylene (C <sub>2</sub> H <sub>4</sub> )	2.3	
Hexane (C <sub>6</sub> H <sub>14</sub> )	1.0	
Hydrogen (H <sub>2</sub> )	4	
LPG	2	
Methane (CH <sub>4</sub> )	4.4	
Methanol (CH <sub>3</sub> OH)	6	
Pentane (C <sub>5</sub> H <sub>12</sub> )	1.1	
Petrol vapor	1.4	
Propane (C <sub>3</sub> H <sub>8</sub> )	1.7	
Propanol (C <sub>3</sub> H <sub>8</sub> O)	2.1	

LEL figures derived from EN60079-20-1:2010

\*Acetylene option not available on UL certified version

**Further gas types may be available** - contact Crowcon with your requests.

## Specification

	Flamgard Plus	TXgard Plus	TXgard-IS+
Size	200 x 115 x 115mm (7.9 x 6.1 x 6.1ins)		160 x 123 x 92mm (6.3 x 4.8 x 4.5ins)
Weight	2.2kg (4.9lbs)		0.7kg (1.5lbs)
Enclosure material	Junction box: Marine grade alloy Sensor housing: 316 stainless steel		Junction box: Carbon loaded nylon Sensor housing: ABD Plastic
Ingress protection	IP65		
Cable entries	2 x M20 or 1/2" NPT		1 x M20 or 1/2" NPT with adaptor
Power	10-30Vdc, 210mA max (relay version) 160mA max (non relay)		8-32Vdc, 4-20mA loop-powered
Operating temperature	-10°C to +55°C (14°F to 131°F)	-10°C to +55°C (14°F to 131°F) *	-20°C to +55°C (-4°F to 131°F) *
Humidity	0-99% RH non-condensing	15 to 90% RH non-condensing	
Relays (optional)	SPNO or SPNC contacts rated 30Vdc 1A (non-inductive load) for Alarm 1, Alarm 2, Fault		N/A
Display	3-digit LCD back-lit display, LED status indicator		2-Line, 16 character LCD
Calibration method	Via magnetically operated buttons		Via push-buttons
Electrical output	3 wire 4-20mA, sink or source		2 wire 4-20mA sink
Terminals	Suitable for up to 1.5mm <sup>2</sup> cable		Suitable for up to 2.5mm <sup>2</sup> cable
Sensor type	Catalytic bead	Electrochemical	
Repeatability	+/- 2% FSD typically		
Zero drift	+/-2% FSD, 6 months typically		
Response time	T90 <15 seconds typically	Contact Crowcon for a full list of sensor response times	
Hazardous area zones	Zone 1 or 2		Zone 0, 1 or 2, Division 1 or 2 (when connected via an isolation device)
Approvals	Ex II 2G Ex db IIC T6 Gb Tamb -20°C/+55°C		Ex II 1G Ex ia IIC T4 (-40°C to +65°C)
EMC compliance	EN50270, FCC: CFR 47 Part 15; ICES-003		

\* Figures shown exclude the sensors - Please contact Crowcon for a full list of sensor operating temperatures

### Disclaimer

Every effort has been made to ensure the accuracy of this document at the time of printing. In accordance with the company's policy of continued product improvement Crowcon Detection Instruments Limited reserves the right to make product changes without notice. The products are routinely subject to a programme of testing which may result in some changes in the characteristics quoted. Technical information contained in this document or otherwise provided by Crowcon are based upon records, tests, or experience that the company believes to be reliable, but the accuracy, completeness, and representative nature of such information is not guaranteed.

Many factors beyond Crowcon Detection Instruments' control and uniquely within user's knowledge and control can affect the use and performance of a Crowcon product in a particular application.

As the products may be used by the client in circumstances beyond the knowledge and control of Crowcon Detection Instruments Limited, we cannot determine the relevance of these to an individual customer's application. It is the clients' sole responsibility to carry out the necessary tests to evaluate the usefulness of the products and review all applicable regulations and standards to ensure their safety of operation in a particular application.

# TXgard & Flamgard Plus

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With 3 models available, we have a detector to suit your requirements.



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Flamgard Plus is a Flameproof (Ex d), ATEX and IECEx certified flammable gas detector, which uses poison-resistant pellistors to detect explosive levels of hydrocarbons, hydrogen and other flammable gases and vapours, including aviation fuel and leaded petrol vapours.

TXgard Plus



TXgard Plus is a Flameproof (Ex d), ATEX and IECEx certified toxic or oxygen gas detector with local LCD display. A choice of sensors are available enabling use in a wide range of applications, including water treatment, oil and gas exploration, chemical plants and steel production.

TXgard-IS+



TXgard-IS+ is an Intrinsically Safe (I.S.), 2-wire, toxic and oxygen gas detector with local LCD display. A wide choice of sensors is available for use in a variety of applications. TXgard-IS+ is ATEX and IECEx certified for use in Zone 0,1 or 2 hazardous areas.

### Low cost of ownership

Non-intrusive one man calibration

Long life sensors

Simple parts replacement

Wide range of sensor options

Easy to operate and maintain

Keeps interruption to on-site activity to a minimum

Reduced training requirements

## Gases and ranges

Gas	LTEL (ppm)	STEL (ppm)	Range available: TXgard-IS+	Range available: TXgard Plus
Ammonia (NH <sub>3</sub> )	25	35	50, 100, 1000ppm	-
Carbon monoxide (CO)	20	100	250, 500ppm	100, 250, 500, 1000ppm
Chlorine (Cl <sub>2</sub> )	-	0.5	5, 10, 20ppm	-
Chlorine dioxide (ClO <sub>2</sub> )	0.1	0.3	1 ppm	-
Hydrogen (H <sub>2</sub> )	-	-	2000ppm, 50% LEL, 100% LEL	-
Hydrogen cyanide (HCN)	0.9	4.5 (MEL)	25ppm	-
Hydrogen fluoride (HF)	1.8	3	10ppm	-
Hydrogen sulphide (H <sub>2</sub> S)	5	10	25, 50, 100, 200ppm	15, 20, 25, 50, 100, 200ppm
Nitrogen dioxide (NO <sub>2</sub> )	0.5	1	10ppm	-
Oxygen (O <sub>2</sub> )	19.5% Vol. typical alarm	23.5% typical alarm	25% Vol.	25% Vol.
Ozone (O <sub>3</sub> )	-	0.2	1ppm	-
Phosgene (COCl <sub>2</sub> )	0.02	0.06	1ppm	-
Phosphine (PH <sub>3</sub> )	0.1	0.2	2ppm	-
Sulphur dioxide (SO <sub>2</sub> )	0.5	1	10, 20, 30ppm	-

STEL & LTEL figures are derived from the UK HSE document: EH40. Other thresholds may apply in countries outside the UK.

Gas	LEL (%vol.)	Range available: Flamgard Plus
Acetylene (C <sub>2</sub> H <sub>2</sub> )*	2.3	0-100% LEL
Ammonia (NH <sub>3</sub> )	15	
Butane (C <sub>4</sub> H <sub>10</sub> )	1.4	
Ethanol (C <sub>2</sub> H <sub>5</sub> OH)	3.1	
Ethane (C <sub>2</sub> H <sub>6</sub> )	2.4	
Ethylene (C <sub>2</sub> H <sub>4</sub> )	2.3	
Hexane (C <sub>6</sub> H <sub>14</sub> )	1.0	
Hydrogen (H <sub>2</sub> )	4	
LPG	2	
Methane (CH <sub>4</sub> )	4.4	
Methanol (CH <sub>3</sub> OH)	6	
Pentane (C <sub>5</sub> H <sub>12</sub> )	1.1	
Petrol vapor	1.4	
Propane (C <sub>3</sub> H <sub>8</sub> )	1.7	
Propanol (C <sub>3</sub> H <sub>8</sub> O)	2.1	

LEL figures derived from EN60079-20-1:2010

**Further gas types may be available** - contact Crowcon with your requests.

## Specification

	Flamgard Plus	TXgard Plus	TXgard-IS+
Size	200 x 115 x 115mm (7.9 x 6.1 x 6.1ins)		160 x 123 x 92mm (6.3 x 4.8 x 4.5ins)
Weight	2.2kg (4.9lbs)		0.7kg (1.5lbs)
Enclosure material	Junction box: Marine grade alloy Sensor housing: 316 stainless steel		Junction box: Carbon loaded nylon Sensor housing: ABD Plastic
Ingress protection	IP65		
Cable entries	2 x M20 or 1/2" NPT		1 x M20 or 1/2" NPT with adaptor
Power	10-30Vdc, 210mA max (relay version) 160mA max (non relay)		8-32Vdc, 4-20mA loop-powered
Operating temperature	-10°C to +55°C (14°F to 131°F)	-10°C to +55°C (14°F to 131°F) *	-20°C to +55°C (-4°F to 131°F) *
Humidity	0-99% RH non-condensing	15 to 90% RH non-condensing	
Relays (optional)	SPNO or SPNC contacts rated 30Vdc 1A (non-inductive load) for Alarm 1, Alarm 2, Fault		N/A
Display	3-digit LCD back-lit display, LED status indicator		2-Line, 16 character LCD
Calibration method	Via magnetically operated buttons		Via push-buttons
Electrical output	3 wire 4-20mA, sink or source		2 wire 4-20mA sink
Terminals	Suitable for up to 1.5mm <sup>2</sup> cable		Suitable for up to 2.5mm <sup>2</sup> cable
Sensor type	Catalytic bead	Electrochemical	
Repeatability	+/- 2% FSD typically		
Zero drift	+/-2% FSD, 6 months typically		
Response time	T90 <15 seconds typically	Contact Crowcon for a full list of sensor response times	
Hazardous area zones	Zone 1 or 2		Zone 0, 1 or 2, Division 1 or 2 (when connected via an isolation device)
Approvals	Ex II 2G Ex db IIC T6 Gb Tamb -20°C/+55°C		Ex II 1G Ex ia IIC T4 (-40°C to +65°C)
EMC compliance	EN50270, FCC: CFR 47 Part 15; ICES-003		

\* Figures shown exclude the sensors - Please contact Crowcon for a full list of sensor operating temperatures

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# TXgard & Flamgard Plus

## Toxic and oxygen gas detector with display

With 3 models available, we have a detector to suit your requirements.



Flamgard Plus



Flamgard Plus is a Flameproof (Ex d), ATEX and IECEx certified flammable gas detector, which uses poison-resistant pellistors to detect explosive levels of hydrocarbons, hydrogen and other flammable gases and vapours, including aviation fuel and leaded petrol vapours.

TXgard Plus



TXgard Plus is a Flameproof (Ex d), ATEX and IECEx certified toxic or oxygen gas detector with local LCD display. A choice of sensors are available enabling use in a wide range of applications, including water treatment, oil and gas exploration, chemical plants and steel production.

TXgard-IS+



TXgard-IS+ is an Intrinsically Safe (I.S.), 2-wire, toxic and oxygen gas detector with local LCD display. A wide choice of sensors is available for use in a variety of applications. TXgard-IS+ is ATEX and IECEx certified for use in Zone 0,1 or 2 hazardous areas.

### Low cost of ownership

Non-intrusive one man calibration

Long life sensors

Simple parts replacement

Wide range of sensor options

Easy to operate and maintain

Keeps interruption to on-site activity to a minimum

Reduced training requirements

## Gases and ranges

Gas	LTEL (ppm)	STEL (ppm)	Range available: TXgard-IS+	Range available: TXgard Plus
Ammonia (NH <sub>3</sub> )	25	35	50, 100, 1000ppm	-
Carbon monoxide (CO)	20	100	250, 500ppm	100, 250, 500, 1000ppm
Chlorine (Cl <sub>2</sub> )	-	0.5	5, 10, 20ppm	-
Chlorine dioxide (ClO <sub>2</sub> )	0.1	0.3	1 ppm	-
Hydrogen (H <sub>2</sub> )	-	-	2000ppm, 50% LEL, 100% LEL	-
Hydrogen cyanide (HCN)	0.9	4.5 (MEL)	25ppm	-
Hydrogen fluoride (HF)	1.8	3	10ppm	-
Hydrogen sulphide (H <sub>2</sub> S)	5	10	25, 50, 100, 200ppm	15, 20, 25, 50, 100, 200ppm
Nitrogen dioxide (NO <sub>2</sub> )	0.5	1	10ppm	-
Oxygen (O <sub>2</sub> )	19.5% Vol. typical alarm	23.5% typical alarm	25% Vol.	25% Vol.
Ozone (O <sub>3</sub> )	-	0.2	1ppm	-
Phosgene (COCl <sub>2</sub> )	0.02	0.06	1ppm	-
Phosphine (PH <sub>3</sub> )	0.1	0.2	2ppm	-
Sulphur dioxide (SO <sub>2</sub> )	0.5	1	10, 20, 30ppm	-

STEL & LTEL figures are derived from the UK HSE document: EH40. Other thresholds may apply in countries outside the UK.

Gas	LEL (%vol.)	Range available: Flamgard Plus
Acetylene (C <sub>2</sub> H <sub>2</sub> )*	2.3	0-100% LEL
Ammonia (NH <sub>3</sub> )	15	
Butane (C <sub>4</sub> H <sub>10</sub> )	1.4	
Ethanol (C <sub>2</sub> H <sub>5</sub> OH)	3.1	
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Ethylene (C <sub>2</sub> H <sub>4</sub> )	2.3	
Hexane (C <sub>6</sub> H <sub>14</sub> )	1.0	
Hydrogen (H <sub>2</sub> )	4	
LPG	2	
Methane (CH <sub>4</sub> )	4.4	
Methanol (CH <sub>3</sub> OH)	6	
Pentane (C <sub>5</sub> H <sub>12</sub> )	1.1	
Petrol vapor	1.4	
Propane (C <sub>3</sub> H <sub>8</sub> )	1.7	
Propanol (C <sub>3</sub> H <sub>8</sub> O)	2.1	

LEL figures derived from EN60079-20-1:2010

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## Specification

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Ingress protection	IP65		
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Humidity	0-99% RH non-condensing	15 to 90% RH non-condensing	
Relays (optional)	SPNO or SPNC contacts rated 30Vdc 1A (non-inductive load) for Alarm 1, Alarm 2, Fault		N/A
Display	3-digit LCD back-lit display, LED status indicator		2-Line, 16 character LCD
Calibration method	Via magnetically operated buttons		Via push-buttons
Electrical output	3 wire 4-20mA, sink or source		2 wire 4-20mA sink
Terminals	Suitable for up to 1.5mm <sup>2</sup> cable		Suitable for up to 2.5mm <sup>2</sup> cable
Sensor type	Catalytic bead	Electrochemical	
Repeatability	+/- 2% FSD typically		
Zero drift	+/-2% FSD, 6 months typically		
Response time	T90 <15 seconds typically	Contact Crowcon for a full list of sensor response times	
Hazardous area zones	Zone 1 or 2		Zone 0, 1 or 2, Division 1 or 2 (when connected via an isolation device)
Approvals	Ex II 2G Ex db IIC T6 Gb Tamb -20°C/+55°C		Ex II 1G Ex ia IIC T4 (-40°C to +65°C)
EMC compliance	EN50270, FCC: CFR 47 Part 15; ICES-003		

\* Figures shown exclude the sensors - Please contact Crowcon for a full list of sensor operating temperatures

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## Hazardous Locations Demand Superior Gas Detection!

Quasar 900 provides the most reliable gas detection in all weather conditions!

The SafEye Quasar 900 Series is the very latest open path IR technology and detects a wide range of hydrocarbon gases – including alkanes (methane to hexane) and ethylene. Path lengths can be up to 660ft (200m). Quasar 900 models can be tailored to protect your high-risk installation. Reliability and performance is key and is assured with SIL2 approval and successful 3rd party FM performance / function testing to FM and EN standards

## Why Open Path Gas Detectors?

Spectrex invented the xenon flash lamp design that revolutionized the open-path gas detection market, which, until then, was plagued by false alarms due to the drawbacks of the previous designs. Now, Open path detectors complement the use of individual point detectors, take executive action and offer many significant benefits including:

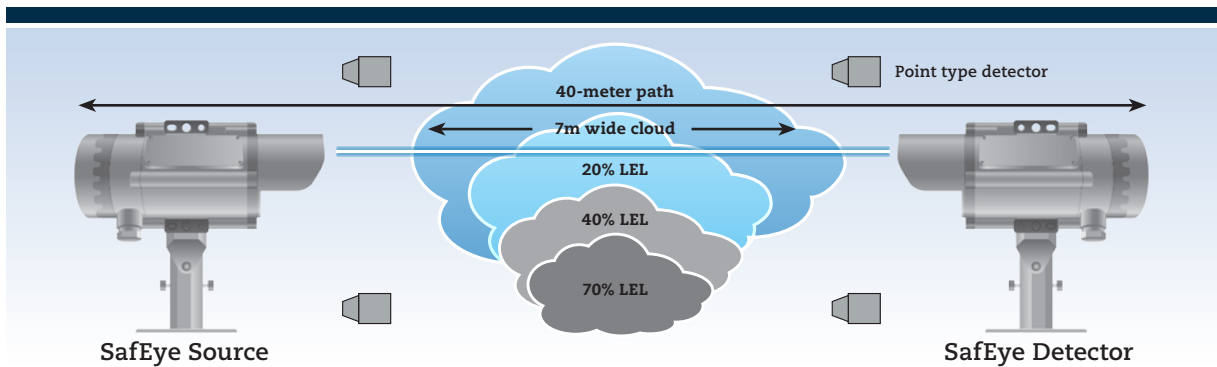
- Wider area coverage
- Most likely method to pick up any leak
- Very high speed of response
- No unrevealed failure modes
- Beam block warning
- Detector location is less critical
- Size of gas hazard indicated

# From the Arctic Circle to Middle Eastern Deserts

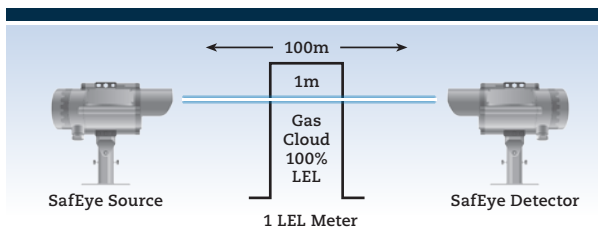
## Applications include:

- Offshore platforms & FPSOs
- Petrochemical plants
- Chemical processing plants
- Gas filling and distribution terminals
- Gas transport and pipelines
- Large storage areas & buildings
- Perimeter monitoring

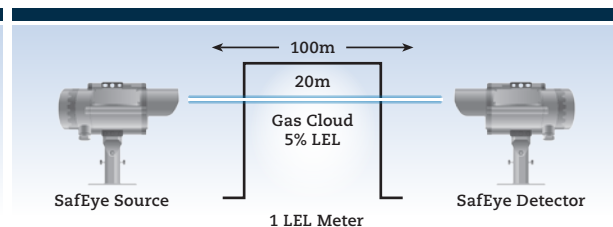
Gas leak can be picked up by Open Path Detectors that point detectors miss!



This scenario shows how the matrix of point type detectors can miss a leak or eventually only see diluted gas levels whereas SafEye 900 Open-Path will, in this case, measure 20% LEL x 7m = 1.4 LEL.m - well above 1 LEL.m alarm level



1 LEL meter (1 LEL.m) = a cloud of 100% LEL methane gas that is 1 meter wide



1 LEL meter (1 LEL.m) = a cloud of 5% LEL methane gas that is 20 meter wide



## Don't just take our word for it!

We had Factory Mutual (FM) independently test Quasar 900 to recognized worldwide Function and Performance standards for open-path gas detectors (FM6325 and EN60079-29-4). Guess what – we passed with flying colors!

## Why do we do this?

*(apart from anything else, it costs a lot).* Well, its to give you the assurance that what we say about Quasar 900 is true – and in safety, that's important!

### IMMUNITY TO FALSE ALARMS

Quasar 900 is totally immune to interference from sunlight or any other sources of radiation such as flare stacks, arc welding or lightning.

### PERFORMANCE IN ALL WEATHERS

The Quasars 900's high power xenon lamp will compensate for changing weather conditions, including rain, fog, mist, snow and makes it immune to influences from solar radiation, arc-welding, stack flares or vibration from machinery.

The optical lenses are thermostatically heated to prevent the formation of ice and build up of snow on the optics even under severe weather conditions. It also eliminates build up of condensation on the lenses.

Quasar is rated for operation over a very wide temperature range from -67°F to + 149°F (-55°C to + 65°C) - a truly worldwide product

### RELIABILITY

Quasar 900 is approved to SIL2 (IEC61508), equipped with heated optics and tolerates a very wide temperature range to provide reliable detection

### FAILSAFE

No unrevealed failures. In normal operation, the output signal is 4 to 20 mA, depending on the measured gas concentration.

Sub-4mA signals includes indications for beam blockage (2mA), a fault (1mA). In addition, a continuous self-test of the Quasar 900 will issue a pre-warning signal (3mA) where the detector is still operational but requires some attention – for example when the transmitter or receiver is misaligned or if there is a deposit build-up on the optics. Maintenance without downtime!

### BUILT-IN DATA LOGGER

An internal data-logger keeps a detailed record of the previous 100 events.

### GAS LIBRARY

The detectors can be calibrated to methane, propane or ethylene. The calibration selection must be determined when ordering.

### MINIMUM DETECTABLE LEVEL

Due to Quasar 900's inherent stability and sensitivity, the minimum detectable level is 0.15 LEL.m

### SIMPLE TO ALIGN AND COMMISSION

One person can easily align and commission the system without the need for special training or skills. After an initial coarse adjustment by eye, a telescope is fitted allowing fine adjustment to optimized the adjustment for maximum signal strength.

## Installation Options

### QUASAR OFFERS OPTIONS FOR YOUR INSTALLATION:

- 0-20mA analog output with HART capability
- RS485 Modbus, where up to 256 detectors can be linked.

## Worldwide Approvals

- **Hazardous area (Zone 1)**  
FM/FMC, ATEX, IECEx, GOST R Inmetro
- **Performance (3<sup>rd</sup> party):**  
FM 6325 approved by FM EN60079-29-4 tested by FM
- **Reliability:**  
SIL2 (TUV)

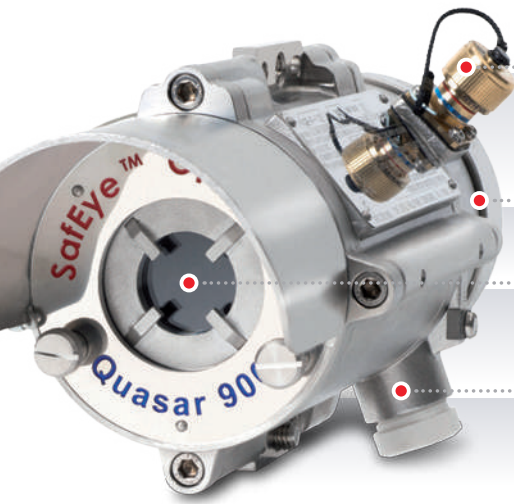
## HART

HART capabilities within the Quasar 900 can provide digital communications between the field and the safe area. This can provide real time information on the status of an individual detector as well as configuration and historical data of each device, without the need for extra cable cores.

A key feature of HART is that digital signals are transmitted on the same two wires as the 0-20mA current signal.

Useful and useable information available via HART includes:

- Display set-up
- Reconfigure set-up – such as heater control, address
- Display detector status and definition
- Perform detector diagnostics
- Troubleshooting
- View Event Log



I.S. approved connection port for hand held terminal in field or safe area

316L Stainless Steel housing

Heated optics

Electrical entries (x2)  
3/4" NPT or M25





## Complete Access in the Field or Safe Area

The unique, intrinsically safe approved connection port on the Quasar 900 receiver allows simple connection of various types of handheld unit that will communicate with Quasar 900 in the hazardous area. These handheld devices allow user to check alignment, zero, perform configuration changes, view event log, perform diagnostic functions, in conjunction with Spectrex software.

The handheld units are robust weather-proof devices, certified intrinsically safe for use in a hazardous, classified area.

Two options are available, both able to connect to the intrinsically safe approved connection port on the Quasar 900 receiver.

- HART handheld
- RS485 handheld

For work in a safe area / workshop, other options are available, still connected via the I.S. port. for your convenience.

These take the form of cable harnesses to connect with our Mini Laptop kit (p/n 777820-1) or to your own PC/laptop, using free Spectrex software



## GENERAL SPECIFICATIONS

<b>Detection Range</b>	<b>Model</b>	<b>901</b>	<b>902</b>	<b>903</b>	<b>904</b>
	Feet	23-66	50-132	115-330	265-660
	Meters	7-20	15-40	35-100	80-200
<b>Detected Gas</b>	C1-C8				
<b>Response Time</b>	3 sec.				
<b>Immunity to False Alarm</b>	Not influenced by solar radiation, hydrocarbon flames and other external IR radiation sources.				
<b>Sensitivity Range</b>	0-5 LEL.m methane and propane 0-8 LEL.m ethylene				
<b>Spectral Response</b>	2.0 - 3.0µm				
<b>Displacement/Misalignment Tolerance</b>	±0.5°				
<b>Drift</b>	±7.5% of the reading or ±4% of the full scale (whichever is greater)				
<b>Minimum Detectable Level</b>	0.15 LEL.m				
<b>Temperature Range</b>	-67°F (-55°C) to 149°F (65°C)				
<b>Humidity</b>	Up to 95% non-condensing (withstands up to 100% RH for short periods)				
<b>Heated Optics</b>	To eliminate condensation and icing on the window				
<b>Warranty</b>	Safety system – 3 years Flash source bulb – 10 years				

## ELECTRICAL SPECIFICATIONS

<b>Power Supply</b>	24VDC nominal (18-32 VDC)				
<b>Power Consumption (peak includes heated optics)</b>	Detector: 250mA (300mA Peak) Source: 250mA (300mA Peak)				
<b>Warm Up Time</b>	30 sec for transmitter and receiver				
<b>Electrical Connection (specify)</b>	2 x 3/4" – 14NPT conduits or 2 x M25 x 1.5mm ISO				
<b>Electrical Input Protection</b>	per MIL-STD-1275B				
<b>Electromagnetic Compatibility</b>	EMI/RFI protected per EN50270				

## OUTPUTS – INTERFACES

<b>0-20mA Current Output</b>	Sink (source option) configuration - maximum load of 500 ohm at 18-32 VDC			
	Gas reading	4-20mA	Obscuration/beam block	2mA
	Normal, zero reading	4mA	Zero calibration mode	1mA
	Maintenance call	3mA	Fault	0mA
	Misalignment	2.5mA		
<b>RS-485 Interface – Modbus Compatible</b>	The RS-485 input/output provides complete data information to a PC and receives control commands from the PC or handheld unit			
<b>HART</b>	HART communications on 0-20mA analog current (FSK) – used for maintenance and asset management			
<b>Visual Status Indicator</b>	3 color LED: Green – Power on, Yellow – Fault, Red – Alarm			

## MECHANICAL SPECIFICATIONS

<b>Hazardous Area Approval</b>	ATEX/IECEX	Approved per Ex d e ib [ib Gb] IIB + H2 T4 Gb Ex tb IIIC T135°C Db The detector or source units have a combination of approvals. Each is a single enclosure (Exd) with integral, segregated rear terminal section (Exe) and intrinsically safe (Exia) data-port for external in-situ connection to Hand-Held Diagnostic unit.
	FM/FMC	Approved per Class I Div 1 Groups B, C and D Class II,III Div 1 Groups E, F and G
	Inmetro	Approved per Ex d e ib [ib Gb] IIB+H2 T4 Gb
<b>Performance</b>	Approved per FM6325 and tested by FM per EN60079-29-4	
<b>Reliability</b>	SIL2 per IEC61508 (TUV)	
<b>Enclosure</b>	The source and detector housings are stainless steel 316L with electro polish finish. The circuit boards are conformal coated and protected from mechanical vibrations. The tilt mount is also stainless steel 316L.	
<b>Dimensions</b>	Detector/Source	10.5 x 5.1 x 5.1 inch (267 x 130 x 130mm)
	Tilt Mount	4.7 x 4.7 x 5.5 inch (120 x 120 x 158mm)
<b>Weight</b>	Detector/Source	11lb (5kg)
	Tilt Mount	4.2lb (1.9kg)
<b>Water and Dust Tight</b>	IP66 and IP68 NEMA 250 6P	
<b>Environmental</b>	Meets MIL-STD-810C for Humidity, Salt and Fog, Vibration, Mechanical Shock, High and Low Temperature	

## ACCESSORIES

<b>Tilt Mount</b>	P/N 888270	<b>HART Harness Kit</b>	P/N 888815
<b>Pole Mount (U-bolt 5 inch)</b>	P/N 799225	<b>USB/RS485 Harness Converter Kit</b>	P/N 794079-8
<b>Commissioning Kit</b>	P/N 888247	<b>Mini Laptop Kit</b>	P/N 777820-1
<b>HART Hand-Held Diagnostic Unit</b>	P/N 888810	<b>Sunshade</b>	P/N 888263

## Accessories



### COMMISSIONING KIT

P/N 888247

The Commissioning/Alignment Kit is required for commissioning and maintenance checks. Only one kit is required per site, Includes: Alignment Telescope, Magnetic Mode Selector, Function Check Filters (2) and set of Socket keys for access to units



### SUNSHADE, STAINLESS STEEL

P/N 888263

### TILT MOUNT

P/N 888270

### POLE MOUNT (U-Bolt, 5 inch)

P/N 799225

## Communication, Diagnostics, Set-up

Commissioning, maintenance and diagnostics tools for the Quasar 900 Series, which provides verification, status and instructions for changing detector parameters.



### HART HAND-HELD DIAGNOSTIC UNIT

P/N 888810

Certified I.S. (EExia) for use in the hazardous area and connects to I.S. port on 900.



### MINI LAPTOP KIT

P/N 777820-1

Preloaded with Spectrex software. For use in Safe area only. Connects, for convenience, to port on 900 or RS 485 terminals.

*If, instead, user wishes to use their own HART handheld or PC / laptop in safe area, we offer:*

### HART HARNESS KIT

P/N 888815

For standard HART Hand-Held (I.S.) to connect between the Hand-Held and the I.S. Port on 900, including a harness.

### USB RS485 HARNESS CONVERTER KIT

P/N 794079-8

With RS485/USB converter, kit is used with Spectrex Host software, enables the user to connect to any available PC or laptop. For use in safe area only. Connects, for convenience, to connection port on 900 or RS485 terminals



# How to choose your new Quasar 900

## Quasar 900 Part numbers

Model	=	Receiver	+	Transmitter	Installation Distance
901		QR-X-11X	+	QT-X-11X	23-66 ft / 7-20m
902		QR-X-11X	+	QT-X-21X	50-132 ft / 15-40m
903		QR-X-11X	+	QT-X-31X	115-330 ft / 35-100m
904		QR-X-11X	+	QT-X-41X	265-660 ft / 80-200m

## Part no. code for specific requirements



RECEIVER

QR

- X -

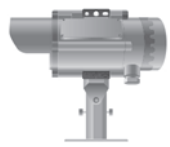
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1

X

C: ATEX  
F: FM  
B: Inmetro

1: M25  
2: 3/4" NPT



TRANSMITTER

QT

- X -

X

1

X

C: ATEX  
F: FM  
B: Inmetro

1: 7-20m: Short Range  
2: 15-40m: Medium Range 1  
3: 35-100m: Medium Range 2  
4: 80-200m: Long Range

1: M25  
2: 3/4" NPT



For more information view manual or website [www.spectrex.net](http://www.spectrex.net)

For all technical assistance or support, contact a Spectrex office or your local distributor listed online. Specifications subject to change



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Tel: +886 2 8626 2893  
deryk@spectrex.net

# SafEye

OPEN-PATH GAS DETECTION SYSTEM

# XENON 700

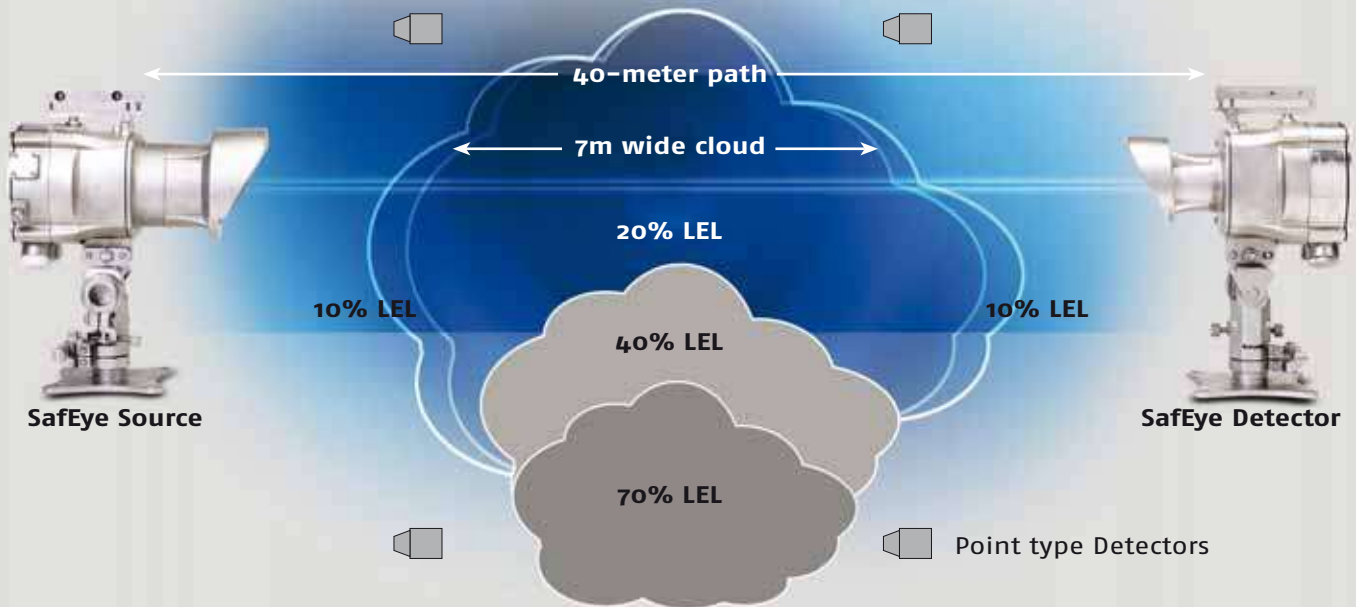


**WE INVENTED IT... WE PERFECTED IT!**



# LEL METERS

## OPEN-PATH GAS DETECTION CONCEPTS



*This scenario shows how the matrix of point type detectors can miss a leak or eventually only see diluted gas levels whereas SafEye 700 Open-Path will, in this case, measure 20% LEL x 7 m = 1.4 LEL.m - well above 1 LEL.m alarm level*

Not all gas clouds are hazardous - only if a flammable gas cloud or plume is wide enough to allow flame acceleration to speeds greater than 100 m/sec does it become a significant threat.

- Just as an athlete performing the long jump needs a run-up distance, so too a flame front needs distance to reach the velocities which cause the damaging effects of over-pressure, pressure pulse and windage.
- The generally accepted quantity of gas that creates the potential to cause consequential damage if ignited is a cloud of the size 5 m diameter a stoichiometric concentration (about 200% LEL).
- To provide a safety margin, this concentration is halved to 100% LEL. Thus an open path beam traversing this cloud would indicate 5 LEL.m.
- Location of the SafEye 700 Open-Path Gas Detector is less important than with point type detectors as it provides a warning alarm from a diluted gas cloud and does not need to be close to the leakage source.
- Point type detectors measure gas at their location in terms of % LEL, whereas open-path gas detectors measure the amount of gas anywhere along the length of the path, in terms of the integral of concentration and length (LEL x meters).

## LEL.METERS

Detector output = gas cloud length (m) x gas cloud concentration (LEL)

The unit of measurement is LEL.meters:  
 100% LEL of the gas = 1 LEL  
 1 LEL.meter = 1 LEL x 1 meter

Therefore:  
 20 m x 5% LEL = 1 LEL.meter  
 1 m x 100% LEL = 1 LEL.meter  
 10 m x 10% LEL = 1 LEL.meter

# HIGHEST QUALITY BACKED BY

..... 3-YEAR WARRANTY FOR THE 700-SYSTEM  
..... 10-YEAR WARRANTY FOR XENON FLASH BULB

*Integrates well-proven and superior Xenon Flash technology which has an excellent operational record in many installations ranging from the deserts of Africa and Asia and the very hot and humid Far East, to the wet and cold North Sea and the dry and cold regions of Alaska.*

- **PROVEN TECHNOLOGY**

The NEW SafEye Version is based on proven technology and performance. Thousands of first generation Flash Type SafEye are installed on offshore platforms, FPSO's, refineries, and other onshore applications operated by British Petroleum (BP), Shell, ExxonMobil, Statoil, and others.

- **ONE-PERSON COMMISSIONING AND INSTALLATION**

One person can simply and easily align and commission SafEye with separate horizontal and vertical adjustments.

- **FAST RESPONSE**

Direct reading, high sensitivity and fast response (3 sec) ensures instant action and maximum safety.

- **HARSH ENVIRONMENT**

Well-proven in harsh environments (rain, snow, fog, hot and humid weather), up to 90% beam blockage, an excellent operational record in many installations worldwide.

- Heated Optics on the source and detector increase the temperature of the optical surface to reduce icing, condensation and snow.
- Resilient and excellent performance withstanding extreme vibrations, displacement and shock.
- Solar blind and immune to false alarms from industrial environments.

- **DETECTS A WIDE RANGE OF GASES**

Reliable detection of gas leaks including a wide range of gaseous hydrocarbons, such as: Alkanes, Alkenes (C1-C8), Alcohols, LNG, LPG, Ethylene, etc.

- **COST EFFECTIVE**

Less units needed for protection compared with point type detection. One system can replace from 5 to 20 point gas detectors. Low cost of ownership, much lower installation cost!

- **LARGE MISALIGNMENT TOLERANCE**

Provides relatively wide angle of view, better than 1°, to withstand vibration, mechanical shock and displacements.

- **STANDARD INTERFACE OPTIONS**

Standard 4-20 mA output with a new mode (3 mA) "Maintenance call" or RS-485, Modbus-compatible output to allow networking (up to 256 detectors) to a central monitoring / PC system. This feature also enables easy maintenance, local and remote diagnostic tools.

- **NO POISONING EFFECT**

Electro-optical system, not affected by chemicals.

- **RUGGED STRUCTURE**

Stainless steel 316L, IP66/67, Zone 1 ready design.

# TYPICAL APPLICATIONS



## **OIL RIGS**

SafEye Open Path Gas Detection System provides alarm and shutdown signals that enable emergency and preventive measures.



## **ONSHORE OIL & GAS INDUSTRY**

Many process and storage areas in the modern refinery are protected by the SafEye systems.



## **FPSO VESSELS**

SafEye Open Path Systems protect duct, air intakes and HVAC providing warning and alarm in case of migration of dangerous gas concentrations.



## **PROCESS PLANTS & PIPELINES**

LNG/LPG, Polymers or toxic substances like Ammonia or Benzene, are being monitored by the SafEye system that detects at LEL or PPM levels.

## **OPEN-PATH APPLICATIONS:**

- Offshore Oil & Gas drilling and production
- Petrochemical and Chemical storage and production areas
- Storage & loading of hazardous materials and waste areas
- Engine & Turbine air intake and modules
- LNG-LPG storage, pumping and filling
- Fence-line emission monitoring
- Storage Tank Farm protection
- Paint industries, including paint-booths
- Bus terminals (natural gas powered)
- Waste disposal and processing

# PRODUCT DESCRIPTION



The SafEye 700 Optical Open Path (Line-of-Sight) Gas Detection System employs “spectral fingerprint” analysis of the atmosphere using the Differential Optical Absorption Spectroscopy (DOAS) technique in a unique (patented) method.

SafEye 700 consists of an advanced Xenon Flash infrared transmitter (source) and infrared detector (receiver), separated over a line of sight from 13 ft. (4 m) up to 460 ft. (140 m) to detect and quantify flammable gas presence, even when challenged by extremely harsh environments where dust, fog, rain, snow or vibration can cause a high reduction of signal.

The SafEye 700 analyzes atmospheric absorption at three selected spectral bands, two in a region where the target gas absorbs and one where it does not absorb. The ratio between these absorption lines can provide accurate information of the gas concentration along an optical path.

The reference sensor detects beam blockage,

compensates for changing humidity and detects failed light source or dirty optics.

SafEye’s source and detector units are both housed in low profile, rugged, stainless steel, ATEX approved enclosures. The main enclosure is approved EExd flameproof with an integral, segregated, EExe increased safety terminal section. The hand-held communication unit can be connected in-situ via the intrinsically safe approved (EExia) data port on the detector. The combined ATEX approval is therefore Ex II 2(1) GD, EExde ia [ia] IIC T5 (55°C).

SafEye 700 includes heated optics on the transmitter (source) and receiver (detector) to address icing, condensation and snow.

Modern accessories include an Intrinsically Safe approved, Hand-Held Unit which is an all-in-one Diagnostic / Calibration / Interrogation plug-in unit that assists one-person installation and maintenance.



# PRODUCT SPECIFICATIONS

## GENERAL SPECIFICATIONS

<b>Detection Range</b>	Model	701	702	703	721	722	723
	ft	13 - 66	50 - 230	165 - 460	13 - 66	50 - 230	165 - 460
	m	4 - 20	15 - 70	50 - 140	4 - 20	15 - 70	50 - 140
	Detected gas	C <sub>1</sub> -C <sub>8</sub>			Ethylene		
The detectors are available with SIL2 approval and HART protocol (SafEye 700S Series). For more information, contact Spectrex or your local authorized distributor							
<b>Response Time</b>	T90 - 3 sec						
<b>Immunity to False Alarm</b>	Not influenced by solar radiation, hydrocarbon flames and other external IR radiation sources						
<b>Spectral Response</b>	2.0 - 4.0 μm.						
<b>Sensitivity Range</b>	0 - 5 LEL.m (optional 0 - 2 LEL.m)						
<b>Displacement/Misalignment Tolerance</b>	±1°						
<b>Drift</b>	Long term ±5% of full scale						
<b>Temperature Range</b>	-40°F (-40°C) to 131°F (55°C)						
<b>Warranty</b>	SafEye system - 3 years Flash source bulb - 10 years						

## ELECTRICAL SPECIFICATIONS

<b>Power Supply</b>	24 VDC nominal (18-32 VDC)
<b>Power Consumption</b> (peak includes heated optics)	Detector: 150mA (300 mA Peak) Source: 100mA (300 mA Peak)
<b>Electrical Connection</b> (specify)	2 x 3/4" - 14NPT conduits or 2 x M25 x 1.5 mm ISO
<b>Electric Input Protection</b>	According to MIL-STD-1275B
<b>Electromagnetic Compatibility</b>	EMI/RFI protected CE Marked

## OUTPUTS - INTERFACES

### 4-20 mA Current Output

Sink (source option) configuration

Maximum load	600Ω at 18-32 VAC
4-20mA	Gas reading
4mA	Normal, zero reading
3mA	Maintenance call
2mA	Obscuration/misalignment /beam block
1mA	Zero calibration mode
0mA	Fault

### RS-485 Interface - Modbus Compatible

The RS-485 input/output provides complete data information to a PC and receives control commands from the PC or handheld unit

### Relays

Alarm, Fault and Accessory  
SPST volt-free contacts rated 5A at 30 VDC or 250 VAC  
Fault relay normally closed, others normally open

## MECHANICAL SPECIFICATIONS

### Hazardous Area Approval

ATEX	EX II 2(1) GD, EExde ia [ia] IIC T5 (55°C). The detector or source units have a combination of approvals. Each is a single enclosure (EExd) with integral, segregated rear terminal section (EExe) and intrinsically safe (EExia) data-port for external in-situ connection to Hand-Held Diagnostic unit
IECEX	Ex d e ia [ia] IIC T5 (Ta=-40°C to +55°C or -40°C to +70°C)

### Enclosure

The source and detector housings are stainless steel 316L with electropolish finish. The circuit boards are conformal coated and protected from mechanical vibrations. The tilt mount is also Stainless Steel 316L.

### Dimensions

Detector	8.2 x 5.7 x 6 inch (210 x 145 x 154 mm)
Source	10 x 5.3 x 6.9 inch (255 x 135 x 175 mm)
Tilt Mount	4.7 x 4.7 x 5.5 inch (120 x 120 x 140 mm)

### Weight

Detector	9.2 Lb (4.2 Kg.)
Source	10.1 Lb (4.6 Kg.)
Tilt Mount	4.2 Lb (1.9 Kg.)

### Water and Dust Tight

IP66 and IP67  
NEMA 250 6P

### Environmental

Meets MIL-STD-810C for Humidity, Salt & Fog, Vibration, Mechanical Shock, High Temp, Low Temp

## ACCESSORIES

### Tilt Mount

Stainless steel 316L, enables the detector to rotate in all directions and fine alignment up to 5°. (P/N 799640)

### Installation Kit

This kit includes a Telescope (P/N 799210), Function Check Filter (P/N 792260 (1-5)) and set of Socket Keys

### Hand-Held Kit

See on the next page (P/N 799810)



## HAND-HELD COMMUNICATOR KIT (P/N 799810)



The Hand-Held Unit is a diagnostic/calibration/interrogation tool with quick plug connection, which provides easy and economical SafEye maintenance.

The hand-held unit will provide verification, status and instructions for correcting the detector's parameters.

### FEATURES

- An Intrinsically Safe approved, all-in-one Hand-Held Diagnostic unit can assist one-person installation and maintenance.
- Fast and easy analysis of the operating status, correct operation and the need for maintenance of SafEye Xenon.
- On site programming of SafEye detector's functions and changing detector's set-up.
- Verification that the installation has been performed successfully and provides all the detector's parameters during installation.
- Maintenance/Trouble Shooting - provides recommendations of maintenance actions to overcome problems and optimize the detector's performance.
- Recommends corrective actions including: cleaning the window; aligning the detector/source; performing zero calibration; replacing the detector or source.

## CONTACT INFORMATION

### NEW JERSEY (HEADQUARTERS)

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Represented by:



# SafEye

OPEN PATH GAS MONITORING SYSTEMS

# MODEL 200



**WELL-PROVEN HIGH RELIABILITY**



## MAIN FEATURES

### PROVEN TECHNOLOGY

Used in highly sensitive areas to detect low gas concentration levels to activate alarms measures only when specific hazardous concentration levels are exceeded.

Thousands are installed on offshore platforms, FPSO's, refineries and other onshore applications operated by British Petroleum (BP), Shell, ExxonMobil, Statoil and others.

### COST SAVING

One system can replace from 5 to 20 point gas detectors in a straight line of sight, up to 460 ft. (140 m). Low cost of ownership, much lower installation cost!

### FAST RESPONSE

Adjustable light source flash rate gives high sensitivity and extremely fast detection time. Also prevents detector from going into obscuration when a large cloud of gas passes through the beam.

### HARSH ENVIRONMENT

Specially designed to perform under extreme conditions such as high-speed airflows, humidity and corrosive gases where point detectors may not be effective.

### LOW MAINTENANCE

High reliability, simple installation, alignment and maintenance, equipment not subject to poisoning.

### STANDARD INTERFACE OPTIONS

Standard 4-20 mA outputs or RS-485 output to allow networking (up to 64 detectors) to a central monitoring/PC system.

This feature also enables easy maintenance, local and remote diagnostic tools.



SafEye 200 Open Path Gas Detector is a self-contained, fast response optical gas detection system. It detects combustible gases at concentrations lower than the explosion limit (LEL) over a "Line of Sight" of up to 460 ft. (140 m) long.

SafEye is the preferred system for offshore oil companies because it is immune to false alarms caused by partial blockage and extreme weather conditions (fog, rain, snow) and direct or reflected sunlight, flame and other black body radiation sources.



The SafEye system can be factory calibrated to a gas mixture most probable to leak in a specific location. This results in the most accurate gas concentration measurement.

SafEye is fully functional in heavy fog, rain, etc., which result in up to 90% of the signal obscuration. In a North Sea offshore installation, tested for over six harsh winter months which included very dense fog, snow and rain, the SafEye was fully operational at all times.

SafEye is built for reliability and continued operation under all types of extreme environmental conditions. This is the field experience, which is demonstrated by the SafEye operational installations, ranging from the very humid and hot Far East to the wet and cold North Sea to the dry and cold slopes of Alaska.

The SafEye, due to its special optics design, provides for a misalignment tolerance of  $\pm 1^\circ$  in all directions and is protected against false gas reading and alarms.

The SafEye unique flash source gives a very powerful radiation signal for a very short time, less than one millisecond at pre-selected intervals. This patented feature enables the detector to address only the high intensity and ultra fast signals that correspond to fast changes in gas concentration, while ignoring all other background radiation.

## GENERAL SPECIFICATIONS

<b>Detection Range and Response Time</b>	Model No.	202/252	203/253	204/254	226/256	227/257
	Distance (ft)	9.8-39	33-131	50-198	98-295	164-460
	Distance (m)	3-12	10-40	15-60	30-90	50-140
	Response Time	2 sec.	5 sec.	5 sec.	5 sec.	5 sec.
<b>Detected Gases</b>	C <sub>1</sub> -C <sub>8</sub> flammables by models 202-227, Ethylene by models 252-257					
<b>Immunity to False Alarm</b>	Not influenced by solar radiation, hydrocarbon flames and other external IR radiation sources					
<b>Spectral Response</b>	3.0-4.0 μm					
<b>Sensitivity Range</b>	0-5 LEL.m Standard 0-2 LEL.m by dip-switch setting					
<b>Displacement/Misalignment Tolerance</b>	±1°					
<b>Drift</b>	Long-term ±5% of full scale					
<b>Temperature Range</b>	-40°F (-40°C) to 131°F (55°C)					

## ELECTRICAL SPECIFICATIONS

<b>Power Supply</b>	Standard - 24 VDC (18-32 VDC)
<b>Power Consumption</b>	Detector: 150mA @ 24 VDC (200 mA Peak) Source: 100mA @ 24 VDC (220 mA Peak)
<b>Electrical Connection</b>	2 x 3/4" - 14NPT conduits or 2 x M25 x 1.5 mm ISO
<b>Electrical Input Protection</b>	Complete electrical interface protection against reversed polarity voltage, surges and spikes according to MIL-STD-1275A
<b>Electromagnetic Compatibility</b>	EMI/RFI protected CE Marked

## OUTPUTS

<b>4-20mA</b>	The 4-20mA current output is source configuration Resistance Loop 100-600 Ω		
<b>RS-485</b>	Serial communication for full control with maintenance and trouble shooting facility can be integrated for a network of max 64 detectors		
<b>Relays</b>	Type	Normal Position	Maximum Ratings
	Alarm	SPDT	NO, NC
	Accessory	SPST	Open
	Fault	SPST	Closed
			2A at 30VDC or 0.5 at 250 VAC 5A at 30VDC or 250VAC 5A at 30VDC or 250 VAC

## MECHANICAL SPECIFICATIONS

<b>Dimensions</b>	5.2" (132mm) x 5.2" (132mm) x max. 11" (280mm)		
<b>Weight</b>	Al. Encl.	Detector: max 8.8 lb (4 kg)	Source: max 10.8 lb (4.9 kg)
	St. Encl.	Detector: max 14.3 lb (6.5 kg)	Source: max 16.7 lb (7.6 kg)
<b>Mechanical Design</b>	The standard detector housing is heavy-duty, copper-free (less than 1%) aluminum. The housing is finished in white epoxy enamel and is also available in 316L Stainless Steel* upon request. * Carries an additional charge.		
<b>Environmental Standards</b>	Meets MIL-STD-810C for Humidity, Salt & Fog, Vibration, Mechanical shock, High Temp, Low Temp		
<b>Water and Dust Tight</b>	IP66 and 67 NEMA 250 6P		

## HAZARDOUS AREA APPROVALS

<b>ATEX</b>	EX II 2G EExd IIB + H <sub>2</sub> T <sub>6</sub> (55°C) EX II 2G EExde IIB + H <sub>2</sub> T <sub>6</sub> (55°C)
<b>UL</b>	UL No. - E209870, Class I Groups C and D Hazardous Location
<b>GOST R</b>	Approved

## ACCESSORIES

The following optional accessories designed for the SafEye system are available.



### MOUNTING

- **Swivel mount** -The swivel mount is made of stainless steel 316L. The swivel mount enables the detector to rotate up to 30° in all directions and fine alignment of up to 3°. (P/N 794765).
- **Tilt device** - Stainless steel 316L, designed for easy and precise alignment. Enables the detector to rotate up to 30° in all directions and fine alignment of up to 5°. (P/N 796640)

### FUNCTION CHECK FILTER

Used for on-site functional testing of the detector (P/N 794260).

### ALIGNMENT TELESCOPE

Is used for simple on-site alignment of the detector with the light source. (P/N 794110)

### MAGNETIC SWITCH

The magnetic mode selector is used in the field to change the detector's modes for alignment and calibration procedures (P/N 790285).



## TYPICAL APPLICATIONS

Offshore Oil & Gas Exploration Oil Rigs and FPSOs; Onshore Oil & Gas Terminals; Storage Farms and Filling Stations; Petrochemical and Chemical Industries; Power Utilities and Turbines areas; Waste Processing and Treatment; Transportation Terminals; Automotive, Painting, Printing, Pharmaceutical Industries and many more...

Specific applications include: • Fence-line emission monitoring • Process and storage areas • Control rooms and auxiliary equipment enclosures • Vessels and tanks roof monitoring • Bus garages and terminals (switching from diesel to natural gas) • Pipelines • LNG-LPG storage, pumping and filling • Paint-booths and paint production

## CONTACT INFORMATION

### NEW JERSEY (HEADQUARTERS)

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Represented by:





# SafEye

# AIR DUCT

SERIES 200 & 300 GAS DETECTION SYSTEMS



**RELIABLE HIGH SPEED DETECTION**





## MAIN FEATURES



### HIGH SENSITIVITY

- Alarm up to 0.5 LEL.m
- 5 times more sensitive than the normal Open Path equipment

### FAST RESPONSE

- Fast response time of 2 seconds (300 series) and ultra fast response of 1 second (200 series).
- 5 to 10 times faster than the commonly used Open Path detector and 20-50 times faster than the Point Detector.

### LOW MAINTENANCE

High reliability, simple installation, alignment and maintenance, equipment not subject to poisoning.

### PROVEN TECHNOLOGY

Used in air ducts on FPSO's and offshore rigs for British Petroleum (BP), Shell and ABB Lummus for turbines, air intakes, etc.

### HARSH ENVIRONMENT

Specially designed to perform under extreme conditions such as high-speed airflows, high temperatures (up to 158°F (70°C)), humidity and corrosive gases, where point detectors may not be effective.

### STANDARD INTERFACE OPTIONS

Standard 4-20 mA outputs or RS-485 output to allow networking (up to 64 detectors) to a central monitoring/PC system.

This feature also enables easy maintenance, local and remote diagnostic tools.

The Duct SafEye Open Path detector was specially designed and is widely used to monitor and alarm against ingress of hazardous gas concentrations into air intakes of turbine engines and HVAC air ducts. Formation and migration of gas clouds and their possible penetration into safe places, control rooms, turbine engines, etc. is a substantial risk that needs to be addressed.

Users, designers and safety and operational engineers are increasingly required to provide for adequate and fast detection and alarm to protect these hazards.

For duct applications, over a small path across an air inlet, the system is designed to respond with a very high sensitivity, full scale of 1 LEL.m for 2-6.6 ft. (0.6-2 m) wide inlet and full scale of 2.5 LEL.m for 6.6-23 ft. (2-7 m) wide inlet.

The Duct SafEye, due to its special optics design, provides for a misalignment tolerance of 2° in all directions and is protected against false gas reading and alarms which are caused by partial obscuration and blocking, misalignment, vibration, flexing or tilts.

Each SafEye unit is factory calibrated in a temperature cycle run at the entire operating temperature range. The temperature compensating mechanism allows correct operation in changing and extreme temperatures while maintaining the system's accuracy. Its internal microprocessor will automatically compensate for low signals with its internal Automatic Gain Control (AGC).

The Duct Safeye system can be factory calibrated to gas mixtures that are associated with offshore production and processing and onshore installations.





## GENERAL SPECIFICATIONS

<b>Detected Gases</b>	Simultaneous detection of C1-C8 flammable gases			
<b>Detection Range and Response Time</b>	Model	202FD	301FD	302FD
	Distance (ft)	6.6-23	2-11.5	9.9-49.5
	Distance (m)	2-7	0.6-3.5	3-15
	Response Time	1 sec.	2 sec.	2 sec.
<b>Immunity to False Alarm</b>	Not influenced by solar radiation, hydrocarbon flames, other external IR radiation sources, high airflows and high loaded streams			
<b>Spectral Response</b>	3.0-4.0 $\mu\text{m}$			
<b>Sensitivity Range</b>	0-2.5 LEL.m Standard			
	0-1 LEL.m by dip-switch setting			
<b>Displacement/Misalignment Tolerance</b>	2°			
<b>Drift</b>	Long-term $\pm 5\%$ of full scale			
<b>Temperature Range</b>	-40°F (-40°C) to 131°F (55°C) for Series 200			
	-40°F (-40°C) to 158°F (70°C) for Series 300			

## ELECTRICAL SPECIFICATIONS

<b>Power Supply</b>	Standard - 24 VDC (18-32 VDC)
<b>Power Consumption</b>	Detector: 150mA @ 24 VDC (200 mA Peak)
	Source: 100mA @ 24 VDC (220 mA Peak)
<b>Electrical Connection</b>	2 x 3/4" - 14NPT conduits or 2 x M25 x 1.5 mm ISO
<b>Electrical Input Protection</b>	Complete electrical interface protection against reversed polarity voltage, surges and spikes according to MIL-STD-1275
<b>Electromagnetic Compatibility</b>	EMI/RFI protected CE Marked

## OUTPUTS

<b>4-20mA</b>	The 4-20mA current output is source configuration Resistance Loop 100-600 $\Omega$			
<b>RS-485</b>	Serial communication for full control with maintenance and trouble shooting facility can be integrated for a network of max 64 detectors			
<b>Relays</b>	Type	Normal Position	Maximum Ratings	
	Alarm	SPDT	NO, NC	2A at 30 VDC or 0.5 at 250 VAC
	Accessory	SPST	Open	5A at 30VDC or 250VAC
	Fault	SPST	Closed	5A at 30VDC or 250 VAC

## MECHANICAL SPECIFICATIONS

<b>Dimensions</b>	5.2" (132mm) x 5.2" (132mm) x max. 4.7" (120mm)		
<b>Weight</b>	Al. Encl.	Detector: max 8.7 lb (3.7 kg)	Source: max 8.58 lb (3.9 kg)
	St. Encl.	Detector: max 13.4 lb (6.1 kg)	Source: max 13.84 lb (6.3 kg)
<b>Mechanical Design</b>	The standard detector housing is heavy-duty, copper-free (less than 1%) aluminum. The housing is finished in white epoxy enamel and is also available in 316 Stainless Steel* upon request. *Carries an additional charge.		
<b>Environmental Standards</b>	Meets MIL-STD-810C for Humidity, Salt & Fog, Vibration, Mechanical shock, High Temp, Low Temp		
<b>Water and Dust Tight</b>	IP66 and 67 per En60529 NEMA 250 6P		

## HAZARDOUS AREA APPROVALS

<b>ATEX</b>	SIRA 00ATEX 1161, EX II 2G EExd IIB + H2 T5 (70°C), T6 (55°C) SIRA 00ATEX 1165, EX II 2G EExde IIB + H2 T5 (70°C), T6 (55°C)
<b>UL</b>	UL No. - E209870, Class I Groups C and D Hazardous Location
<b>FM (300 Series)</b>	Class I, Division 1, Groups B, C and D, Dust Ignition proof for Class II, Division 1, Groups E, F and G

Specifications subject to changes





## ACCESSORIES

The following optional accessories designed for the SafEye system are available.

### Duct Mounting

The duct mount interfaces between the detector and the duct surface.

The duct mount enables the detector's alignment up to 3° in all directions (P/N 794716).

### Function Check Filter

Used for on-site functional testing of the detector (P/N 794220).

**Alignment Telescope** is used for simple on-site alignment of the detector with the light source (P/N 794245).

**Magnetic Switch** The magnetic mode selector is used in the field to change the detector's mode for alignment and calibration procedures (P/N 790285).



*Air Duct Installation on ETAP Platform in the North Sea*

## TYPICAL APPLICATIONS

Offshore Oil & Gas Exploration Oil Rigs and FPSOs; Onshore Oil & Gas Terminals; Storage Farms and Filling Stations; Petrochemical and Chemical Industries; Power Utilities and Turbines areas; Automotive, Painting, Printing, Pharmaceutical Industries and many more...

Specific applications include:

- HVAC ducts (Heating Ventilation Air Conditioning) in accommodations areas
- Air ducts in process areas
- Stacks and exhaust towers
- Compressors and generators enclosures
- Curing ovens and drying equipment, printing equipment
- Engine & Turbine air intake and exhaust
- Air intake to safety enclosures
- Paint-booths and paint production and drying processes
- Air ventilation shafts

## CONTACT INFORMATION

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Represented by:



DS-G-AirDuct (200&300), July 2010

keep a **SharpEye™** on your safety



# 40/40I

## Triple IR (IR3) Flame Detector

*Superior performance, reliability and immunity to false alarms*



**SharpEye™**

*The new 40/40I Triple IR (IR3) Flame Detector detects fuel and gas fires at long distances with the highest immunity to false alarms. The 40/40I IR3 can detect a 1ft<sup>2</sup> (0.1m<sup>2</sup>) gasoline pan fire at 215 ft (65m) in less than 5 seconds.*

*The 40/40I is the most durable and weather resistant flame detector currently on the market. Its new features include a heated window, to eliminate condensation and icing; HART capabilities for digital communications; lower power requirements; and a compact, lighter design.*

*Due to increased reliability, the 40/40 Series warranty period has been extended to 5 years and is SIL2 (TUV) approved to IEC 61508.*

### FEATURES & BENEFITS

- Triple Spectrum Design - for long distance detection and high false alarm immunity
- Sensitivity Selection - to ensure no zone crossover detection
- Automatic and Manual Built-In-Test (BIT) - to assure continued reliable operation
- Heated window - for operation in harsh weather conditions (snow, ice, condensation)
- Multiple output options for maximum flexibility and compatibility
  - Relays (3) for Alarm, Fault and Auxiliary
  - 0-20mA (stepped)
  - HART Protocol for maintenance and asset management
  - RS-485, Modbus Compatible
- High Reliability - MTBF - minimum 150,000 hours
- Approved to Safety Integrity Level 2 (SIL2 - TUV)
- 5-Year Warranty
- User Programmable via HART or RS-485
- Ex approved for Zone 1 hazardous area location
  - ATEX
  - IECEx
  - FM/FMC
  - CSA
- 3<sup>rd</sup> party Performance Tested
  - EN54-10 (LPCB)
  - FM3260 (FM)
  - DNV Marine Approval

### APPLICATIONS

Offshore Oil & Gas installations	Power Generation facilities
Onshore Oil & Gas installations and pipelines	Pharmaceutical Industry
Chemical plants	Printing Industry
Petrochemicals plants	Warehouses
Storage Tank farms	Automotive Industry
Aircraft hangars	Explosives & Munitions
	Waste Disposal facilities

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## GENERAL SPECIFICATIONS

<b>Spectral Response</b>	Three IR Bands					
<b>Detection Range</b> (at highest Sensitivity Setting for 1ft <sup>2</sup> (0.1m <sup>2</sup> ) pan fire)	<b>Fuel</b>	<b>ft / m</b>	<b>Fuel</b>	<b>ft / m</b>	<b>Fuel</b>	<b>ft / m</b>
	n-Heptane	215 / 65	Kerosene	150 / 45	Methane*	100 / 30
	Gasoline	215 / 65	Ethanol 95%	135 / 40	LPG *	100 / 30
	Diesel Fuel	150 / 45	Methanol	115 / 35	Polypropylene Pellets	16 / 5
	JP5	150 / 45	IPA (Isopropyl Alcohol)	135 / 40	Office Paper	33 / 10
	* 20" (0.5m) high, 8" (0.2m) width plume fire					
<b>Response Time</b>	Typically 5 seconds					
<b>Adjustable Time Delay</b>	Up to 30 seconds					
<b>Sensitivity Ranges</b>	4 Sensitive ranges for 1 ft <sup>2</sup> (0.1m <sup>2</sup> ) n-heptane pan fire from 50 ft (15m) to 215 ft (65m)					
<b>Field of View</b>	Horizontal 100°; Vertical 95°					
<b>Built-in-Test (BIT)</b>	Automatic (and Manual)					
<b>Temperature Range</b>	Operating:	-67°F to +167°F		(-55°C to +75°C)		
	Option:	-67°F to +185°F		(-55°C to +85°C)		
	Storage:	-67°F to +185°F		(-55°C to +85°C)		
<b>Humidity</b>	Up to 95% non-condensing (withstands up to 100% RH for short periods)					
<b>Heated Optics</b>	To eliminate condensation and icing on the window					

## ELECTRICAL SPECIFICATIONS

<b>Operating Voltage</b>	24 VDC nominal (18-32 VDC)					
<b>Power Consumption</b>	Standby:	Max. 90mA (110mA with heated window)				
	Alarm:	Max. 130mA (160mA with heated window)				
<b>Cable Entries</b>	2 x 3/4" - 14NPT conduits or 2 x M25 x 1.5 mm ISO					
<b>Wiring</b>	12 - 22AWG (2.5mm <sup>2</sup> - 0.3mm <sup>2</sup> )					
<b>Electrical Input Protection</b>	According to MIL-STD-1275B					
<b>Electromagnetic Compatibility</b>	EMI/RFI protected to EN61326-3 and EN61000-6-3					
<b>Electrical Interface</b>	The detector includes twelve (12) terminals with five (5) wiring options (factory set)					

## OUTPUTS

<b>Relays</b>	Alarm, Fault and Auxiliary SPST volt-free contacts rated 5A at 30 VDC or 250 VAC.					
<b>0-20mA (stepped)</b>	Sink (source option) configuration					
	Fault:	0 +1mA	Warning:	16mA ± 5%		
	BIT Fault:	2mA ± 10%	Alarm:	20mA ± 5%		
	Normal:	4mA ± 10%	Resistance Loop:	100-600 Ω		
<b>HART Protocol</b>	Optional HART communications on the 0-20mA analog current (FSK) - used for maintenance, configuration changes and asset management, available in mA source output wiring options					
<b>RS-485</b>	RS-485 Modbus compatible communication link that can be used in computer controlled installations					

## MECHANICAL SPECIFICATIONS

<b>Materials</b>	- Stainless Steel 316L with electro polish finish					
Enclosure options	- Heavy duty copper free aluminum (less than 1%), red epoxy enamel finish					
<b>Mounting</b>	Stainless Steel 316L with electro polish finish					
<b>Dimensions</b>	Detector	4" x 4.6" x 6.18" (101.6 x 117 x 157 mm)				
<b>Weight</b>	Detector (St.St.)	6.1 lb (2.8 kg)	Tilt mount	2.2 lb (1.0 kg)		
	Detector, aluminum	2.8 lb (1.3 kg)				
<b>Environmental Standards</b>	Meets MIL-STD-810C for Humidity, Salt & Fog, Vibration, Mechanical Shock, High Temp, Low Temp					
<b>Water and Dust</b>	IP66 and IP67 per EN60529, NEMA 250 6P					

## APPROVALS

<b>Hazardous Area</b>	ATEX and IECEx	Ex II 2 GD, Ex de IIC T5 (-55°C to +75°C) Ex tD A21 IP66/X7 T 95°C	Ex de IIC T4 (-55°C to +85°C) Ex tD A21 IP66/X7 T 105°C
	FM/FMC/CSA	Class I Div. 1, Groups B, C & D Class II/III Div. 1, Groups E, F & G	
<b>Performance</b>	EN54-10 (LPCB) FM-3260 (FM) DNV Marine Approval		
<b>Reliability</b>	IEC61508 - SIL2 (TUV)		

## ACCESSORIES

<b>Fire Simulator</b>	20/20-310	<b>U-Bolt/Pole Mount</b>	789260-2 (2" pole)	<b>Mini Laptop Kit</b>	777820	<b>Laser Pointer</b>	777166
<b>Tilt Mount</b>	40/40-001		789260-1 (3" pole)	<b>Weather Protector</b>	777163	(Detector area coverage)	
<b>Duct Mount</b>	777670	<b>USB RS485 Harness Kit</b>	794079-5	<b>Air Shield</b>	777161		

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# 40/40M

## Multi IR Flame Detector

*Superior performance, reliability and immunity to false alarms*



**SharpEye™**

*The new 40/40M Multi IR Flame Detector is specifically designed for detection of hydrocarbon and hydrogen flames. It detects hydrocarbon-based fuel and gas fires at long distances with the highest immunity to false alarms. The 40/40M can detect a gasoline pan fire at 215 ft (65m) or a hydrogen flame at 100 ft (30m) in less than 5 seconds.*

*The 40/40M is the most durable and weather resistant flame detector currently on the market. Its new features include a heated window, to eliminate condensation and icing; HART capabilities, for digital communications; lower power requirements, and a compact, lighter design.*

*Due to increased reliability, the 40/40 Series warranty period has been extended to 5 years and is SIL2 (TUV) approved to IEC 61508.*

### FEATURES & BENEFITS

- Multi Spectrum Design - for long distance detection of hydrocarbons and hydrogen flames
- High false alarm immunity
- Sensitivity Selection - to ensure no zone crossover detection
- Automatic and Manual Built-In-Test (BIT) - to assure continued reliable operation
- Heated window - for operation in harsh weather conditions (snow, ice, condensation)
- Multiple output options for maximum flexibility and compatibility
  - Relays (3) for Alarm, Fault and Auxiliary
  - 0-20mA (stepped)
  - HART Protocol for maintenance and asset management
  - RS-485, Modbus Compatible
- High Reliability - MTBF - minimum 150,000 hours
- Approved to Safety Integrity Level 2 (SIL2 - TUV)
- 5-Year Warranty
- User Programmable via HART or RS-485
- Ex approved for Zone 1 hazardous area location
  - ATEX
  - IECEx
  - FM/FMC
  - CSA
- 3<sup>rd</sup> party Performance Tested
  - EN54-10 (LPCB)
  - FM3260 (FM)

### APPLICATIONS

- |   |                                      |
|---|--------------------------------------|
| Offshore Oil & Gas installations              | Automotive Industry                  |
| Onshore Oil & Gas installations and pipelines | Explosives & Munitions               |
| Chemical plants                               | Waste Disposal facilities            |
| Petrochemicals plants                         | Hydrogen Fuel Cell Industry          |
| Storage Tank farms                            | Hydrogen Vehicle Parking & Refueling |
| Aircraft hangars                              | Battery Charging areas               |
| Power Generation facilities                   | Refinery Hydrogenation               |
| Pharmaceutical Industry                       | Space Industry hydroxyl propellant   |
| Printing Industry                             | Static Fuel Cell systems             |
| Warehouses                                    |                                      |

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### GENERAL SPECIFICATIONS

<b>Spectral Response</b>	Multi IR Bands					
<b>Detection Range</b> (at highest Sensitivity Setting for 1ft <sup>2</sup> (0.1m <sup>2</sup> ) pan fire)	<b>Fuel</b>	<b>ft / m</b>	<b>Fuel</b>	<b>ft / m</b>	<b>Fuel</b>	<b>ft / m</b>
	n-Heptane	215 / 65	Ethanol 95%	135 / 40	LPG *	100 / 30
	Gasoline	215 / 65	Methanol	115 / 35	Polypropylene Pellets	16 / 5
	Diesel Fuel	150 / 45	IPA (Isopropyl Alcohol)	135 / 40	Office Paper	33 / 10
	JP5	150 / 45	Hydrogen*	100 / 30	* 20" (0.5m) high, 8" (0.2m) width plume fire	
	Kerosene	150 / 45	Methane*	100 / 30		
<b>Response Time</b>	Typically 5 seconds					
<b>Adjustable Time Delay</b>	Up to 30 seconds					
<b>Sensitivity Ranges</b>	4 Sensitive ranges for 1 ft <sup>2</sup> (0.1m <sup>2</sup> ) n-heptane pan fire from 50 ft (15m) to 215 ft (65m)					
<b>Field of View</b>	Horizontal 67°, Vertical 70° for Gasoline Horizontal 80°, Vertical 80° for Hydrogen					
<b>Built-in-Test (BIT)</b>	Automatic (and Manual)					
<b>Temperature Range</b>	Operating: -67°F to +167°F		(-55°C to +75°C)			
	Option: -67°F to +185°F		(-55°C to +85°C)			
	Storage: -67°F to +185°F		(-55°C to +85°C)			
<b>Humidity</b>	Up to 95% non-condensing - withstands up to 100% RH for short periods					
<b>Heated Optics</b>	To eliminate condensation and icing on the window					

### ELECTRICAL SPECIFICATIONS

<b>Operating Voltage</b>	24 VDC nominal (18-32 VDC)					
<b>Power Consumption</b>	Standby: Max. 90mA (110mA with heated window) Alarm: Max. 130mA (160mA with heated window)					
<b>Cable Entries</b>	2 x 3/4" - 14NPT conduits or 2 x M25 x 1.5 mm ISO					
<b>Wiring</b>	12 - 22AWG (2.5mm <sup>2</sup> - 0.3mm <sup>2</sup> )					
<b>Electrical Input Protection</b>	According to MIL-STD-1275B					
<b>Electromagnetic Compatibility</b>	EMI/RFI protected to EN61326-3 and EN61000-6-3					
<b>Electrical Interface</b>	The detector includes twelve (12) terminals with five (5) wiring options (factory set)					

### OUTPUTS

<b>Relays</b>	Alarm, Fault and Auxiliary SPST volt-free contacts rated 5A at 30 VDC or 250 VAC.					
<b>0-20mA (stepped)</b>	Sink (source option) configuration Fault: 0 +1mA      Normal: 4mA ± 10%      Alarm: 20mA ± 5% BIT Fault: 2mA ± 10%      Warning: 16mA ± 5%      Resistance Loop: 100-600 Ω					
<b>HART Protocol</b>	Optional HART communications on the 0-20mA analog current (FSK) - used for maintenance, configuration changes and asset management, available in mA source output wiring options					
<b>RS-485</b>	RS-485 Modbus compatible communication link that can be used in computer controlled installations					

### MECHANICAL SPECIFICATIONS

<b>Materials</b>	- Stainless Steel 316L with electro polish finish Enclosure options - Heavy duty copper free aluminum (less than 1%), red epoxy enamel finish					
<b>Mounting</b>	Stainless Steel 316L with electro polish finish					
<b>Dimensions</b>	Detector 4" x 4.6" x 6.18" (101.6 x 117 x 157 mm)					
<b>Weight</b>	Detector (St.St.) 6.1 lb (2.8 kg)		Tilt mount 2.2 lb (1.0 kg)		Detector, aluminum 2.8 lb (1.3 kg)	
<b>Environmental Standards</b>	Meets MIL-STD-810C for Humidity, Salt & Fog, Vibration, Mechanical Shock, High Temp, Low Temp					
<b>Water and Dust</b>	IP66 and IP67 per EN60529, NEMA 250 6P					

### APPROVALS

<b>Hazardous Area</b>	ATEX and IECEx	Ex II 2 GD, Ex de IIC T5 (-55°C to +75°C) Ex tD A21 IP66/X7 T 95°C	Ex de IIC T4 (-55°C to +85°C) Ex tD A21 IP66/X7 T 105°C
	FM/FMC/CSA	Class I Div. 1, Groups B, C & D Class II/III Div. 1, Groups E, F & G	
<b>Performance</b>	EN54-10 (LPCB) FM-3260 (FM)		
<b>Reliability</b>	IEC61508 - SIL2 (TUV)		

### ACCESSORIES

<b>Fire Simulator</b>	20/20-313	<b>U-Bolt/Pole Mount</b>	789260-2 (2" pole)	<b>Mini Laptop Kit</b>	777820	<b>Laser Pointer</b>	777166
<b>Tilt Mount</b>	40/40-001		789260-1 (3" pole)	<b>Weather Protector</b>	777163	(Detector area coverage)	
<b>Duct Mount</b>	777670	<b>USB RS485 Harness Kit</b>	794079-5	<b>Air Shield</b>	777161		

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# 40/40 UV/IR Flame Detector Series

*Maximum choice of features in a high performance package*



**SharpEye™**

*Spectrex offers two versions of the new 40/40 Series UV/IR Flame Detectors:*

**Model 40/40L (& LB)** provides a combination of UV and IR sensors, where the IR sensor operates at a wavelength of 2.5-3.0  $\mu\text{m}$ , and can detect hydrocarbon-based fuel and gas fires, hydroxyl and hydrogen fires, as well as metal and inorganic fires.

**Model 40/40L4 (& L4B)** is identical to the 40/40L except that the IR sensor works at a wavelength of 4.5  $\mu\text{m}$  and is only suitable for hydrocarbon-based fires.

*The UV/IR flame detector senses radiant energy in the short wave section of both the ultraviolet and infrared portions of the electromagnetic spectrum. The signals from both sensors are analyzed for frequency, intensity and duration.*

*Simultaneous detection of radiant energy in both the UV and IR sensors triggers an alarm signal.*

*The UV sensor incorporates a special logic circuit that helps prevent false alarms caused by solar radiation.*

*Due to increased reliability, the 40/40 Series warranty period has been extended to 5 years and is SIL2 (TUV) approved to IEC 61508.*

## FEATURES & BENEFITS

- UV/IR Dual-Sensor
- High-Speed Response - 150 msec Response to Saturated Signal
- Solar blind
- Automatic Built-In-Test (BIT)\* and Manual - to assure continued reliable operation
- Heated window - for operation in harsh weather conditions (snow, ice, condensation)
- Multiple output options for maximum flexibility and compatibility
  - Relays (3) for Alarm, Fault and Auxiliary
  - 0-20mA (stepped)
  - HART Protocol for maintenance and asset management
  - RS-485, Modbus Compatible
- High Reliability - MTBF - minimum 150,000 hours
- Approved to Safety Integrity Level 2 (SIL2 - TUV) Models 40/40LB and 40/40L4B only
- 5-Year Warranty
- User Programmable via HART or RS-485
- Ex approved for Zone 1 hazardous area location
  - ATEX
  - IECEx
  - FM/FMC
  - CSA
- 3<sup>rd</sup> party Performance Tested
  - EN54-10 (LPCB)
  - FM3260 (FM)

\*option

## APPLICATIONS (model dependent)

- |   |                                   |
|---|-----------------------------------|
| Offshore Oil & Gas installations              | Printing Industry                 |
| Onshore Oil & Gas installations and pipelines | Warehouses                        |
| Chemical plants                               | Automotive Industry               |
| Petrochemicals plants                         | Explosives & Munitions            |
| Storage Tank farms                            | Waste Disposal facilities         |
| Aircraft hangars                              | Aerospace Industry                |
| Power Generation facilities                   | Paint, Polymer and Glue processes |
| Pharmaceutical Industry                       |                                   |

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 E-mail: spectrex@spectrex.net | Website: www.spectrex-inc.com

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### GENERAL SPECIFICATIONS

<b>Spectral Response</b>	40/40L-LB: UV: 0.185 - 0.260 $\mu\text{m}$ ; IR: 2.5-3.0 $\mu\text{m}$ 40/40L4-L4B: UV: 0.185 - 0.260 $\mu\text{m}$ ; IR: 4.4-4.6 $\mu\text{m}$																																				
<b>Detection Range</b> (at highest Sensitivity Setting for 1ft <sup>2</sup> (0.1m <sup>2</sup> ) pan fire)	<table border="1"> <thead> <tr> <th>Fuel</th> <th>ft / m</th> <th>Fuel</th> <th>ft / m</th> <th>Fuel</th> <th>ft / m</th> </tr> </thead> <tbody> <tr> <td>n-Heptane</td> <td>50 / 15</td> <td>Ethanol 95%</td> <td>25 / 7.5</td> <td>LPG *</td> <td>16 / 5</td> </tr> <tr> <td>Gasoline</td> <td>50 / 15</td> <td>Methanol</td> <td>25 / 7.5</td> <td>Polypropylene Pellets</td> <td>13 / 4</td> </tr> <tr> <td>Diesel Fuel</td> <td>37 / 11</td> <td>IPA (Isopropyl Alcohol)</td> <td>25 / 7.5</td> <td>Office Paper</td> <td>16 / 5</td> </tr> <tr> <td>JP5</td> <td>37 / 11</td> <td>Hydrogen**</td> <td>16 / 5</td> <td>* 20" (0.5m) high, 8" (0.2m) width</td> <td></td> </tr> <tr> <td>Kerosene</td> <td>37 / 11</td> <td>Methane*</td> <td>16 / 5</td> <td>plume fire ** 40/40L/LB only</td> <td></td> </tr> </tbody> </table>	Fuel	ft / m	Fuel	ft / m	Fuel	ft / m	n-Heptane	50 / 15	Ethanol 95%	25 / 7.5	LPG *	16 / 5	Gasoline	50 / 15	Methanol	25 / 7.5	Polypropylene Pellets	13 / 4	Diesel Fuel	37 / 11	IPA (Isopropyl Alcohol)	25 / 7.5	Office Paper	16 / 5	JP5	37 / 11	Hydrogen**	16 / 5	* 20" (0.5m) high, 8" (0.2m) width		Kerosene	37 / 11	Methane*	16 / 5	plume fire ** 40/40L/LB only	
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<b>Response Time</b>	Typically 5 seconds. High speed 150 msec response to saturated signal																																				
<b>Adjustable Time Delay</b>	Up to 30 seconds																																				
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<b>Temperature Range</b>	Operating: -67°F to +167°F (-55°C to +75°C) Option: -67°F to +185°F (-55°C to +85°C) Storage: -67°F to +185°F (-55°C to +85°C)																																				
<b>Humidity</b>	Up to 95% non-condensing (withstands up to 100% RH for short periods)																																				
<b>Heated Optics</b>	To eliminate condensation and icing on the window																																				

### ELECTRICAL SPECIFICATIONS

<b>Operating Voltage</b>	24 VDC nominal (18-32 VDC)
<b>Power Consumption</b>	Standby: Max. 90mA (110mA with heated window) Alarm: Max. 130mA (160mA with heated window)
<b>Cable Entries</b>	2 x 3/4" - 14NPT conduits or 2 x M25 x 1.5 mm ISO
<b>Wiring</b>	12 - 22AWG (2.5mm <sup>2</sup> - 0.3mm <sup>2</sup> )
<b>Electrical Input Protection</b>	According to MIL-STD-1275B
<b>Electromagnetic Compatibility</b>	EMI/RFI protected to EN61326-3 and EN61000-6-3
<b>Electrical Interface</b>	The detector includes twelve (12) terminals with five (5) wiring options (factory set)

### OUTPUTS

<b>Relays</b>	Alarm, Fault and Auxiliary SPST volt-free contacts rated 5A at 30 VDC or 250 VAC.
<b>0-20mA (stepped)</b>	Sink (source option) configuration Fault: 0 +1mA IR: 8mA $\pm$ 5% Alarm: 20mA $\pm$ 5% BIT Fault: 2mA $\pm$ 10% UV: 12mA $\pm$ 5% Resistance Loop: 100-600 $\Omega$ Normal: 4mA $\pm$ 10% Warning: 16mA $\pm$ 5%
<b>HART Protocol</b>	Optional HART communications on the 0-20mA analog current (FSK) - used for maintenance, configuration changes and asset management, available in mA source output wiring options
<b>RS-485</b>	RS-485 Modbus compatible communication link that can be used in computer controlled installations

### MECHANICAL SPECIFICATIONS

<b>Materials</b>	- Stainless Steel 316L with electro polish finish - Heavy duty copper free aluminum (less than 1%), red epoxy enamel finish
<b>Mounting</b>	Stainless Steel 316L with electro polish finish
<b>Dimensions</b>	Detector 4" x 4.6" x 6.18" (101.6 x 117 x 157 mm)
<b>Weight</b>	Detector (St.St.) 6.1 lb (2.8 kg) Tilt mount 2.2 lb (1.0 kg) Detector, aluminum 2.8 lb (1.3 kg)
<b>Environmental Standards</b>	Meets MIL-STD-810C for Humidity, Salt & Fog, Vibration, Mechanical Shock, High Temp, Low Temp
<b>Water and Dust</b>	IP66 and IP67 per EN60529, NEMA 250 6P

### APPROVALS

<b>Hazardous Area</b>	ATEX and IECEx Ex II 2 GD, Ex de IIC T5 (-55°C to +75°C) Ex de IIC T4 (-55°C to +85°C) Ex tD A21 IP66/X7 T 95°C Ex tD A21 IP66/X7 T 105°C
	FM/FMC/CSA Class I Div. 1, Groups B, C & D Class II/III Div. 1, Groups E, F & G
<b>Performance</b>	EN54-10 (LPCB) FM-3260 (FM)
<b>Reliability</b>	IEC61508 - SIL2 (TUV) - models 40/40LB and 40/40L4B only

### ACCESSORIES

<b>Fire Simulator</b>	20/20-311	<b>U-Bolt/Pole Mount</b>	789260-2 (2" pole)	<b>Mini Laptop Kit</b>	777820	<b>Laser Pointer</b>	777166
<b>Tilt Mount</b>	40/40-001		789260-1 (3" pole)	<b>Weather Protector</b>	777163	(Detector area coverage)	
<b>Duct Mount</b>	777670	<b>USB RS485 Harness Kit</b>	794079-5	<b>Air Shield</b>	777161		

keep a **SharpEye™** on your safety



# 40/40 UV/IR Flame Detector Series

*Maximum choice of features in a high performance package*



**SharpEye™**

*Spectrex offers two versions of the new 40/40 Series UV/IR Flame Detectors:*

**Model 40/40L (& LB)** provides a combination of UV and IR sensors, where the IR sensor operates at a wavelength of 2.5-3.0  $\mu\text{m}$ , and can detect hydrocarbon-based fuel and gas fires, hydroxyl and hydrogen fires, as well as metal and inorganic fires.

**Model 40/40L4 (& L4B)** is identical to the 40/40L except that the IR sensor works at a wavelength of 4.5  $\mu\text{m}$  and is only suitable for hydrocarbon-based fires.

*The UV/IR flame detector senses radiant energy in the short wave section of both the ultraviolet and infrared portions of the electromagnetic spectrum. The signals from both sensors are analyzed for frequency, intensity and duration.*

*Simultaneous detection of radiant energy in both the UV and IR sensors triggers an alarm signal.*

*The UV sensor incorporates a special logic circuit that helps prevent false alarms caused by solar radiation.*

*Due to increased reliability, the 40/40 Series warranty period has been extended to 5 years and is SIL2 (TUV) approved to IEC 61508.*

## FEATURES & BENEFITS

- UV/IR Dual-Sensor
- High-Speed Response - 150 msec Response to Saturated Signal
- Solar blind
- Automatic Built-In-Test (BIT)\* and Manual - to assure continued reliable operation
- Heated window - for operation in harsh weather conditions (snow, ice, condensation)
- Multiple output options for maximum flexibility and compatibility
  - Relays (3) for Alarm, Fault and Auxiliary
  - 0-20mA (stepped)
  - HART Protocol for maintenance and asset management
  - RS-485, Modbus Compatible
- High Reliability - MTBF - minimum 150,000 hours
- Approved to Safety Integrity Level 2 (SIL2 - TUV) Models 40/40LB and 40/40L4B only
- 5-Year Warranty
- User Programmable via HART or RS-485
- Ex approved for Zone 1 hazardous area location
  - ATEX
  - IECEx
  - FM/FMC
  - CSA
- 3<sup>rd</sup> party Performance Tested
  - EN54-10 (LPCB)
  - FM3260 (FM)

\*option

## APPLICATIONS (model dependent)

- |   |                                   |
|---|-----------------------------------|
| Offshore Oil & Gas installations              | Printing Industry                 |
| Onshore Oil & Gas installations and pipelines | Warehouses                        |
| Chemical plants                               | Automotive Industry               |
| Petrochemicals plants                         | Explosives & Munitions            |
| Storage Tank farms                            | Waste Disposal facilities         |
| Aircraft hangars                              | Aerospace Industry                |
| Power Generation facilities                   | Paint, Polymer and Glue processes |
| Pharmaceutical Industry                       |                                   |

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 E-mail: spectrex@spectrex.net | Website: www.spectrex-inc.com

**SPECTREX INC.**



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### GENERAL SPECIFICATIONS

<b>Spectral Response</b>	40/40L-LB: UV: 0.185 - 0.260 $\mu\text{m}$ ; IR: 2.5-3.0 $\mu\text{m}$ 40/40L4-L4B: UV: 0.185 - 0.260 $\mu\text{m}$ ; IR: 4.4-4.6 $\mu\text{m}$																																				
<b>Detection Range</b> (at highest Sensitivity Setting for 1ft <sup>2</sup> (0.1m <sup>2</sup> ) pan fire)	<table border="1"> <thead> <tr> <th>Fuel</th> <th>ft / m</th> <th>Fuel</th> <th>ft / m</th> <th>Fuel</th> <th>ft / m</th> </tr> </thead> <tbody> <tr> <td>n-Heptane</td> <td>50 / 15</td> <td>Ethanol 95%</td> <td>25 / 7.5</td> <td>LPG *</td> <td>16 / 5</td> </tr> <tr> <td>Gasoline</td> <td>50 / 15</td> <td>Methanol</td> <td>25 / 7.5</td> <td>Polypropylene Pellets</td> <td>13 / 4</td> </tr> <tr> <td>Diesel Fuel</td> <td>37 / 11</td> <td>IPA (Isopropyl Alcohol)</td> <td>25 / 7.5</td> <td>Office Paper</td> <td>16 / 5</td> </tr> <tr> <td>JP5</td> <td>37 / 11</td> <td>Hydrogen**</td> <td>16 / 5</td> <td>* 20" (0.5m) high, 8" (0.2m) width</td> <td></td> </tr> <tr> <td>Kerosene</td> <td>37 / 11</td> <td>Methane*</td> <td>16 / 5</td> <td>plume fire ** 40/40L/LB only</td> <td></td> </tr> </tbody> </table>	Fuel	ft / m	Fuel	ft / m	Fuel	ft / m	n-Heptane	50 / 15	Ethanol 95%	25 / 7.5	LPG *	16 / 5	Gasoline	50 / 15	Methanol	25 / 7.5	Polypropylene Pellets	13 / 4	Diesel Fuel	37 / 11	IPA (Isopropyl Alcohol)	25 / 7.5	Office Paper	16 / 5	JP5	37 / 11	Hydrogen**	16 / 5	* 20" (0.5m) high, 8" (0.2m) width		Kerosene	37 / 11	Methane*	16 / 5	plume fire ** 40/40L/LB only	
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<b>Response Time</b>	Typically 5 seconds. High speed 150 msec response to saturated signal																																				
<b>Adjustable Time Delay</b>	Up to 30 seconds																																				
<b>Sensitivity Ranges</b>	1 ft <sup>2</sup> (0.1m <sup>2</sup> ) n-heptane pan fire from 50 ft (15m)																																				
<b>Field of View</b>	Horizontal 100°; Vertical 95°																																				
<b>Built-in-Test (BIT)</b>	Automatic (and Manual)																																				
<b>Temperature Range</b>	Operating: -67°F to +167°F (-55°C to +75°C) Option: -67°F to +185°F (-55°C to +85°C) Storage: -67°F to +185°F (-55°C to +85°C)																																				
<b>Humidity</b>	Up to 95% non-condensing (withstands up to 100% RH for short periods)																																				
<b>Heated Optics</b>	To eliminate condensation and icing on the window																																				

### ELECTRICAL SPECIFICATIONS

<b>Operating Voltage</b>	24 VDC nominal (18-32 VDC)
<b>Power Consumption</b>	Standby: Max. 90mA (110mA with heated window) Alarm: Max. 130mA (160mA with heated window)
<b>Cable Entries</b>	2 x 3/4" - 14NPT conduits or 2 x M25 x 1.5 mm ISO
<b>Wiring</b>	12 - 22AWG (2.5mm <sup>2</sup> - 0.3mm <sup>2</sup> )
<b>Electrical Input Protection</b>	According to MIL-STD-1275B
<b>Electromagnetic Compatibility</b>	EMI/RFI protected to EN61326-3 and EN61000-6-3
<b>Electrical Interface</b>	The detector includes twelve (12) terminals with five (5) wiring options (factory set)

### OUTPUTS

<b>Relays</b>	Alarm, Fault and Auxiliary SPST volt-free contacts rated 5A at 30 VDC or 250 VAC.
<b>0-20mA (stepped)</b>	Sink (source option) configuration Fault: 0 +1mA IR: 8mA $\pm$ 5% Alarm: 20mA $\pm$ 5% BIT Fault: 2mA $\pm$ 10% UV: 12mA $\pm$ 5% Resistance Loop: 100-600 $\Omega$ Normal: 4mA $\pm$ 10% Warning: 16mA $\pm$ 5%
<b>HART Protocol</b>	Optional HART communications on the 0-20mA analog current (FSK) - used for maintenance, configuration changes and asset management, available in mA source output wiring options
<b>RS-485</b>	RS-485 Modbus compatible communication link that can be used in computer controlled installations

### MECHANICAL SPECIFICATIONS

<b>Materials</b>	- Stainless Steel 316L with electro polish finish - Heavy duty copper free aluminum (less than 1%), red epoxy enamel finish
<b>Mounting</b>	Stainless Steel 316L with electro polish finish
<b>Dimensions</b>	Detector 4" x 4.6" x 6.18" (101.6 x 117 x 157 mm)
<b>Weight</b>	Detector (St.St.) 6.1 lb (2.8 kg) Tilt mount 2.2 lb (1.0 kg) Detector, aluminum 2.8 lb (1.3 kg)
<b>Environmental Standards</b>	Meets MIL-STD-810C for Humidity, Salt & Fog, Vibration, Mechanical Shock, High Temp, Low Temp
<b>Water and Dust</b>	IP66 and IP67 per EN60529, NEMA 250 6P

### APPROVALS

<b>Hazardous Area</b>	ATEX and IECEx Ex II 2 GD, Ex de IIC T5 (-55°C to +75°C) Ex de IIC T4 (-55°C to +85°C) Ex tD A21 IP66/X7 T 95°C Ex tD A21 IP66/X7 T 105°C FM/FMC/CSA Class I Div. 1, Groups B, C & D Class II/III Div. 1, Groups E, F & G
<b>Performance</b>	EN54-10 (LPCB) FM-3260 (FM)
<b>Reliability</b>	IEC61508 - SIL2 (TUV) - models 40/40LB and 40/40L4B only

### ACCESSORIES

<b>Fire Simulator</b>	20/20-311	<b>U-Bolt/Pole Mount</b>	789260-2 (2" pole)	<b>Mini Laptop Kit</b>	777820	<b>Laser Pointer</b>	777166
<b>Tilt Mount</b>	40/40-001		789260-1 (3" pole)	<b>Weather Protector</b>	777163	(Detector area coverage)	
<b>Duct Mount</b>	777670	<b>USB RS485 Harness Kit</b>	794079-5	<b>Air Shield</b>	777161		

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# 40/40R

## Single IR Flame Detectors

*A low cost solution in a durable, high spec package*



**SharpEye™**

*The new 40/40R Single IR Flame Detector detects hydrocarbon-based fuel and gas fires using advanced flame analysis tools. The detector provides early warning of flaming fires working at 4.5  $\mu$ m for maximum sensitivity, and immunity to false alarms from IR sources such as sunlight and IR projectors.*

*The 40/40R is the most durable and weather resistant single IR flame detector currently on the market. Its new features include a heated window, to eliminate condensation and icing; HART capabilities, for digital communications; lower power requirements; and a compact, lighter design.*

*Due to increased reliability, the 40/40 Series warranty period has been extended to 5 years and is SIL2 (TUV) approved to IEC 61508.*

### FEATURES & BENEFITS

- Sensitivity selection
- Automatic and Manual Built-In-Test (BIT) - to assure continued reliable operation
- Heated window - for operation in harsh weather conditions (snow, ice, condensation)
- Multiple output options for maximum flexibility and compatibility
  - Relays (3) for Alarm, Fault and Auxiliary
  - 0-20mA (stepped)
  - HART Protocol for maintenance and asset management
  - RS-485, Modbus Compatible
- High Reliability - MTBF - minimum 150,000 hours
- Approved to Safety Integrity Level 2 (SIL2 - TUV)
- 5-Year Warranty
- User Programmable via HART or RS-485
- Ex approved for Zone 1 hazardous area location
  - ATEX
  - IECEx
  - FM/FMC
  - CSA
- 3<sup>rd</sup> party Performance Tested
  - EN54-10 (LPCB)
  - FM3260 (FM)

### APPLICATIONS

Offshore Oil & Gas installations  
Onshore Oil & Gas installations and pipelines  
Chemical plants  
Petrochemicals plants  
Storage Tank farms  
Power Generation facilities  
Pharmaceutical Industry  
Printing Industry  
Warehouses  
Automotive Industry  
Waste Disposal facilities

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E-mail: spectrex@spectrex.net | Website: www.spectrex-inc.com

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### GENERAL SPECIFICATIONS

<b>Spectral Response</b>	Single band IR 4.4-4.6 $\mu$ m					
<b>Detection Range</b> (at highest Sensitivity Setting for 1ft <sup>2</sup> (0.1m <sup>2</sup> ) pan fire)	<b>Fuel</b>	<b>ft / m</b>	<b>Fuel</b>	<b>ft / m</b>	<b>Fuel</b>	<b>ft / m</b>
	n-Heptane	50 / 15	Kerosene	37 / 11	Methane*	16 / 5
	Gasoline	50 / 15	Ethanol 95%	25 / 7.5	LPG *	16 / 5
	Diesel Fuel	37 / 11	Methanol	25 / 7.5	Polypropylene Pellets	10 / 3
	JP5	37 / 11	IPA (Isopropyl Alcohol)	25 / 7.5	Office Paper	20 / 6
	* 20" (0.5m) high, 8" (0.2m) width plume fire					
<b>Response Time</b>	Typically 5 seconds					
<b>Adjustable Time Delay</b>	Up to 30 seconds					
<b>Sensitivity Ranges</b>	2 ranges; 1 ft <sup>2</sup> (0.1m <sup>2</sup> ) n-heptane pan fire from 15 ft (5m) or 50 ft (15m)					
<b>Field of View</b>	Horizontal 90°; Vertical 90°					
<b>Built-in-Test (BIT)</b>	Automatic (and Manual)					
<b>Temperature Range</b>	Operating: -67°F to +167°F		(-55°C to +75°C)			
	Option: -67°F to +185°F		(-55°C to +85°C)			
	Storage: -67°F to +185°F		(-55°C to +85°C)			
<b>Humidity</b>	Up to 95% non-condensing (withstands up to 100% RH for short periods)					
<b>Heated Optics</b>	To eliminate condensation and icing on the window					

### ELECTRICAL SPECIFICATIONS

<b>Operating Voltage</b>	24 VDC nominal (18-32 VDC)					
<b>Power Consumption</b>	Standby: Max. 90mA (110mA with heated window) Alarm: Max. 130mA (160mA with heated window)					
<b>Cable Entries</b>	2 x 3/4" - 14NPT conduits or 2 x M25 x 1.5 mm ISO					
<b>Wiring</b>	12 - 22AWG (2.5mm <sup>2</sup> - 0.3mm <sup>2</sup> )					
<b>Electrical Input Protection</b>	According to MIL-STD-1275B					
<b>Electromagnetic Compatibility</b>	EMI/RFI protected to EN61326-3 and EN61000-6-3					
<b>Electrical Interface</b>	The detector includes twelve (12) terminals with five (5) wiring options (factory set)					

### OUTPUTS

<b>Relays</b>	Alarm, Fault and Auxiliary SPST volt-free contacts rated 5A at 30 VDC or 250 VAC.					
<b>0-20mA (stepped)</b>	Sink (source option) configuration					
	Fault:	0 +1mA	Warning:	16mA $\pm$ 5%		
	BIT Fault:	2mA $\pm$ 10%	Alarm:	20mA $\pm$ 5%		
	Normal:	4mA $\pm$ 10%	Resistance Loop:	100-600 $\Omega$		
<b>HART Protocol</b>	Optional HART communications on the 0-20mA analog current (FSK) - used for maintenance, configuration changes and asset management, available in mA source output wiring options					
<b>RS-485</b>	RS-485 Modbus compatible communication link that can be used in computer controlled installations					

### MECHANICAL SPECIFICATIONS

<b>Materials</b>	- Stainless Steel 316L with electro polish finish					
Enclosure options	- Heavy duty copper free aluminum (less than 1%), red epoxy enamel finish					
<b>Mounting</b>	Stainless Steel 316L with electro polish finish					
<b>Dimensions</b>	Detector	4" x 4.6" x 6.18" (101.6 x 117 x 157 mm)				
<b>Weight</b>	Detector (St.St.)	6.1 lb (2.8 kg)	Tilt mount	2.2 lb (1.0 kg)		
	Detector, aluminum	2.8 lb (1.3 kg)				
<b>Environmental Standards</b>	Meets MIL-STD-810C for Humidity, Salt & Fog, Vibration, Mechanical Shock, High Temp, Low Temp					
<b>Water and Dust</b>	IP66 and IP67 per EN60529, NEMA 250 6P					

### APPROVALS

<b>Hazardous Area</b>	ATEX and IECEx	Ex II 2 GD, Ex de IIC T5 (-55°C to +75°C) Ex tD A21 IP66/X7 T 95°C	Ex de IIC T4 (-55°C to +85°C) Ex tD A21 IP66/X7 T 105°C
	FM/FMC/CSA	Class I Div. 1, Groups B, C & D Class II/III Div. 1, Groups E, F & G	
<b>Performance</b>	EN54-10 (LPCB) FM-3260 (FM)		
<b>Reliability</b>	IEC61508 - SIL2 (TUV)		

### ACCESSORIES

<b>Fire Simulator</b>	20/20-312	<b>U-Bolt/Pole Mount</b>	789260-2 (2" pole)	<b>Mini Laptop Kit</b>	777820	<b>Laser Pointer</b>	777166
<b>Tilt Mount</b>	40/40-001		789260-1 (3" pole)	<b>Weather Protector</b>	777163	(Detector area coverage)	
<b>Duct Mount</b>	777670	<b>USB RS485 Harness Kit</b>	794079-5	<b>Air Shield</b>	777161		

**SPECTREX INC.**

HIGH PERFORMANCE  
LOW COST  
FLAME DETECTION



**SharpEye™**



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**THE NEW**

**20/20M**

“MINI” FLAME DETECTOR SERIES

.....

# High Performance, Low Cost Flame Detection

The 20/20M Mini Series Flame Detectors are high performance, unique IR3 and UV/IR flame detectors featuring **lower cost, lower power, and more compact structures**. The mini detectors are highly resistant to harsh environments, immune to false alarms and are designed for use in OUTDOOR or INDOOR applications. The IR3 model is also available as intrinsically safe (I.S.) approved format.

The detectors' small size, low cost and low power allow easy installation in small or congested areas where Ex hazardous area approvals are not a prime requirement. Both models are packaged in rugged, stainless steel enclosures that are less than 50% of the size of our standard explosion-proof detectors and weigh only 2.5 lbs (1.2 kg).

### **20/20MI-1** **MINI TRIPLE IR (IR3) FLAME DETECTOR**

The 20/20MI-1 is an economical and compact Triple IR (IR3) Flame Detector with the highest immunity to false alarms, in a rugged stainless steel housing. It is available in either general-purpose, non-Ex approved or intrinsically safe approved (EExia) format.

### **20/20MI-3** **MINI TRIPLE IR (IR3) FLAME DETECTOR**

The 20/20MI-3 is similar to the 20/20MI-1, but has lower sensitivity. It is designed especially for small areas that require fast and reliable detection, with high immunity to false alarms. The 20/20MI-3 is suitable for applications like Turbine Enclosures, Heavy Duty Vehicles and Windmills.

### **20/20ML** **MINI UV/IR FLAME DETECTOR**

The low cost, compact, lightweight 20/20ML UV/IR Flame Detector comprises both UV and IR sensors, detecting hydrocarbon-based fuel and gas fires, hydroxyl and hydrogen fires, as well as metal and inorganic fires at distances of up to 50 ft (15m). The UV sensor incorporates a special logic circuit that helps prevent false alarms caused by solar radiation. Simultaneous detection of radiant energy by both the UV and IR sensors triggers an alarm signal.



## **Main Features**

Immune to False Alarms

Large Field of View (100° horizontal/vertical)

Low Power Consumption

High-Speed Response

Standard 4-Wire Connection

4-20mA Sink or Source (3-4 wires) Configuration

RS-485 Modbus Compatible

Automatic and Manual Built-In-Test (BIT)

User-Programmable Function Configurable via software from a PC or handheld device

MTBF Minimum 100,000 Hours

3 Year Warranty

# Main Applications



## AIRCRAFT HANGARS

Leaking fuel is the main danger in aircraft hangars, easily causing fires and potentially harming personnel, equipment and facilities. The SharpEye Mini Optical Flame Detectors allow military and commercial requirements for reliable fire protection to be met. Due to the 100° cone of vision, there is wider coverage of the protected area. The area around the walls of the hangar where the detectors are mounted does not require EX proof so the 20/20MI non EX is suitable.



## OFF ROAD HEAVY DUTY VEHICLE

Large mining vehicles are vulnerable to catastrophic fires particularly in engine compartments, as have been experienced in recent times. It is vitally important that fire protection capabilities are up to date with the latest technologies. The high-speed short-range version of 20/20MI-3 (up to 10 ft) is ideal to protect the large engine compartment of the vehicles, and is used in coal, metals and minerals mining.



## OFFICE AREAS AND ATRIUM AREAS

While an atrium space has many merits, there is a danger that it could become a building's weakness in fire protection, potentially allowing a fire to rapidly spread. The 20/20M Mini's fast detection identifies a fire in its earliest stages, facilitating suppression. Modern hospitals feature large atria and open space areas. Due to the difficulty or impossibility of moving patients in an emergency, hospitals must follow a defend and protect in place policy rather than conventional evacuation. Hospital fire protection and evacuation requirements are therefore highly complex and the SharpEye Mini Optical Flame Detector is responsible for meeting them with its low cost and supreme reliability.



## WASTE HANDLING

Recycling reduces the quantities of materials deposited in the world's landfill sites and saves natural resources, but must be coupled with appropriate fire safety measures. Unique risks are posed at recycling and waste handling operations, such as disposal and recycling of combustible materials. The 20/20M Mini Flame Detector is a successful choice to solve these issues, and has the additional benefit of low cost and low energy requirement. Recently, a recycling and waste handling plant in the Netherlands installed 84 SharpEye Optical Flame Detectors model 20/20MI to detect fire in the various deluge zones.

# Main Applications

## UNMANNED GAS STATIONS

Modern automobile fueling areas are designed with high-speed self-service pumps, enabling customers to fuel their vehicles fast, but more susceptible to fire. Risks can include customers forgetting to return the nozzle, burning cigarettes, running engines, sparks and other heat sources, whereby flammable liquids can be easily ignited. The 20/20ML was designed to prevent any such hazards from spreading, combining UV and IR sensors to detect hydrocarbon-based fuel and gas fires, hydroxyl and hydrogen fires, as well as metal and inorganic fires.



## MARINE VESSELS ENGINE ROOMS

The engine room on a marine vessel is where the machinery of a ship is located. Fuel or oil spills from the machinery are a fire risk factor, alongside petrochemicals used for the cleaning and servicing of the machinery. The fuel, oil and petrochemicals are flammable and can easily ignite. Therefore, Spectrex Optical Flame Detectors are required to identify a fire and subsequently activate the installed fire suppression system. Spectrex 20/20M Mini Optical Flame Detectors are suitable for both commercial and military vessels.



Alongside the above-mentioned applications, the 20/20M Mini Series is specifically suited to the following applications:

- Automotive parts manufacturing
- Burners, boilers, and heaters
- Car parking towers and garages
- Chemical industry
- Nuclear power plants
- Power generation – pumps, generators and unmanned stations
- Recreational and sports arenas (facilities)
- Storage areas



## General Specifications

		20/20MI-1	20/20MI-3	20/20ML
<b>Spectral Response</b>		Triple Spectrum Design		UV/IR Dual Sensor
		ft (m)	ft (m)	ft (m)
<b>Detection Range</b> (Highest Sensitivity Setting for 1 ft <sup>2</sup> (0.1m <sup>2</sup> ) pan fire.	Gasoline	133 (40)	33 (10)	50 (15)
	n-Heptane	133 (40)	33 (10)	50 (15)
	Diesel Fuel	90 (27)	23.1 (7)	37 (11)
	JP5	100 (30)	23.1 (7)	37 (11)
	Kerosene	100 (30)	23.1 (7)	37 (11)
	Alcohol (Ethanol)	100 (30)	24.8 (7.5)	25 (7.5)
	IPA (Isopropyl Alcohol)	100 (30)	24.8 (7.5)	25 (7.5)
	Methanol	100 (30)	24.8 (7.5)	25 (7.5)
	Methane*	40 (12)	10 (3)	15 (5)
	LPG (Propane)*	40 (12)	10 (3)	15 (5)
	Hydrogen*	---	---	15 (5)
	Silane*	---	---	15 (5)
	Polypropylene Pellets	16 (5)	6 (2)	15 (5)
	Office Paper	50 (15)	13 (4)	12 (4)
<i>*20" (0.5m) long 8" (0.2m) width plume fire</i>				
<b>Response Time</b>	Typical 5 sec.			
<b>Adjustable Time Delay</b>	Up to 30 sec.			
<b>Sensitivity Range</b>	4 Sensitivity Ranges for 1 ft <sup>2</sup> (0.1m <sup>2</sup> ) gasoline pan fire: 33 ft (10m)–133 ft (40m)	4 Sensitivity Ranges for 1 ft <sup>2</sup> (0.1m <sup>2</sup> ) gasoline pan fire: 7.5 ft (2.5m)–33 ft (10m)	1 Sensitivity Range for 1 ft <sup>2</sup> (0.1m <sup>2</sup> ) gasoline pan fire: 50 ft (15m)	
<b>Field of View</b>	100° horizontal, 100° vertical			
<b>Built-in-Test</b>	Manual and Automatic BIT			
<b>Temperature Range</b>	Operating: -40°F (-40°C) to 160°F (70°C) Storage: -65°F (-55°C) to 185°F (85°C)			
<b>Humidity</b>	Up to 95%			

## Electrical Specifications

	20/20MI-1	20/20MI-3	20/20ML
<b>Power Supply</b>	Operating Voltage: 18-32 VDC		
<b>Power Consumption</b>	Max. 25 mA in stand-by Max. 50 mA in alarm		Max. 40 mA in stand-by Max. 70 mA in alarm
<b>Electrical Connection</b>	12 wires 6 ft (2m) cable (for junction box connection) Optional: 12-wires electrical connector (the suitable connector will be supplied)		
<b>Electrical Input Protection</b>	According to MIL-STD-1275B		
<b>Electromagnetic Compatibility</b>	EMI/RFI protected CE Marked		

## Outputs

	20/20MI-1	20/20MI-3	20/20ML
<b>Relays*</b>	Alarm and Fault SPST volt-free contact rates 2A at 30 VDC or 0.5A at 250 VAC Fault relay normally closed, Alarm Relay normally open <i>*The Relays do not apply to 20/20MI EX approved version</i>		
<b>4-20mA</b>	Sink (source option) configuration		Source configuration
	Fault:	0 + 0.5mA	0 + 0.5mA
	BIT Fault:	2mA + 10%	2mA + 10%
	Normal:	5mA + 10%	4mA +5%
	IR Detection:	---	8mA +5%
	UV Detection:	---	12mA +5%
	Warning:	10mA + 5%	16mA + 5%
	Alarm:	15mA + 5%	20mA + 5%
	Resistance Loop:	100-600 Ω	100-600 Ω
<b>RS-485</b>	The detector is equipped with an RS-485 communication link that can be used in installation with computerized controllers. The RS-485 is Modbus compatible.		

## Mechanical Specifications

<b>Dimensions</b>	4" x 4" x 2.5" (100 x 100 x 62 mm)
<b>Weight</b>	St.St 316L 2.5lb (1.2 kg) Tilt Mount 0.8lb (0.37 kg)
<b>Enclosure</b>	Stainless Steel 316L with electro polish finish
<b>Environmental standards</b>	Meets MIL-STD-810C for humidity, Salt & Fog, Vibration, Mechanical Shock, High Temp, Low Temp
<b>Water and Dust</b>	IP66 and IP67 per EN60529 NEMA 250 6P

## Approvals

	20/20MI-1	20/20MI-3	20/20ML
<b>Hazardous Area Ex Approvals</b>			
<b>ATEX**</b>	04ATEX2010 EX II 1 GD, EExia IIC T5 (60°C), T4 (85°C) Zener barriers (not included) are required to achieve the stated approval <i>** The Relays do not apply to 20/20MI EX approved version</i>	---	---
<b>Functional Approvals</b>			
<b>FM</b>	Project ID 3020071	Project ID 3013906	Project ID 3020071
<b>VdS (EN54-10)</b>	G207073	---	---
<b>CPD Certificate of Conformity</b>	0786-CPD-20916	---	---
<b>GOST R</b>	POCC US.H006.B00103		
<b>Other Approvals</b>			
<b>DNV</b>	A-12318		---
<b>ABS</b>	Project No. 1627964		---
<b>GOST K</b>	KZ.7500507.01.01.00029		

# Accessories



## LONG-RANGE FIRE SIMULATORS

The Spectrex Long-Range Flame Simulator allows testing of optical flame detectors in areas where real fires cannot be ignited. Testing is also mandatory in some industries to proof-test flame detector operation and to satisfy statutory requirements.

PN 20/20-310 for 20/20MI; PN 20/20-311 for 20/20ML

For more information, see datasheet of the Long Range Fire Simulators.



## TILT MOUNT

The Tilt Mounting Brackets allow accurate directional setting of the detector for optimum area coverage. These brackets' movement ensure maximum effectiveness and accurate location of the detector's coverage area.

PN 20/20-005



## RAIN COVER

The Rain Cover is designed to protect the detector from rain and snow.

PN 787980



## AIR SHIELD

The special Air Shield, developed for SharpEye optical flame detectors, allows installation of optical flame detectors under tough environmental conditions where they may be exposed to oil vapors, sand, dust and other particulate matter.

PN 20/20-787



## LASER AIMER

The Laser Detection Area Coverage Pointer designates the optical flame detector's area of coverage (cone of vision) on-site at the specific installation. This add-on accessory enables the designer and installer to optimize the detector's location and the actual detection area coverage of each installed detector.

PN 787969



For more information view manual or website [www.spectrex.net](http://www.spectrex.net)

For all technical assistance or support, contact a Spectrex office or your local distributor listed online.

Specifications subject to change



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**SPECTREX INC.**

HIGH PERFORMANCE  
LOW COST  
FLAME DETECTION



**SharpEye™**



© Courtesy of Foster + Partners

**THE NEW**  
**20/20M**  
"MINI" FLAME DETECTOR SERIES

.....

# High Performance, Low Cost Flame Detection

The 20/20M Mini Series Flame Detectors are high performance, unique IR3 and UV/IR flame detectors featuring **lower cost, lower power, and more compact structures**. The mini detectors are highly resistant to harsh environments, immune to false alarms and are designed for use in OUTDOOR or INDOOR applications. The IR3 model is also available as intrinsically safe (I.S.) approved format.

The detectors' small size, low cost and low power allow easy installation in small or congested areas where Ex hazardous area approvals are not a prime requirement. Both models are packaged in rugged, stainless steel enclosures that are less than 50% of the size of our standard explosion-proof detectors and weigh only 2.5 lbs (1.2 kg).

## **20/20MI-1** **MINI TRIPLE IR (IR3) FLAME DETECTOR**

The 20/20MI-1 is an economical and compact Triple IR (IR3) Flame Detector with the highest immunity to false alarms, in a rugged stainless steel housing. It is available in either general-purpose, non-Ex approved or intrinsically safe approved (EExia) format.

## **20/20MI-3** **MINI TRIPLE IR (IR3) FLAME DETECTOR**

The 20/20MI-3 is similar to the 20/20MI-1, but has lower sensitivity. It is designed especially for small areas that require fast and reliable detection, with high immunity to false alarms. The 20/20MI-3 is suitable for applications like Turbine Enclosures, Heavy Duty Vehicles and Windmills.

## **20/20ML** **MINI UV/IR FLAME DETECTOR**

The low cost, compact, lightweight 20/20ML UV/IR Flame Detector comprises both UV and IR sensors, detecting hydrocarbon-based fuel and gas fires, hydroxyl and hydrogen fires, as well as metal and inorganic fires at distances of up to 50 ft (15m). The UV sensor incorporates a special logic circuit that helps prevent false alarms caused by solar radiation. Simultaneous detection of radiant energy by both the UV and IR sensors triggers an alarm signal.



# **Main Features**

Immune to False Alarms

Large Field of View (100° horizontal/vertical)

Low Power Consumption

High-Speed Response

Standard 4-Wire Connection

4-20mA Sink or Source (3-4 wires) Configuration

RS-485 Modbus Compatible

Automatic and Manual Built-In-Test (BIT)

User-Programmable Function Configurable via software from a PC or handheld device

MTBF Minimum 100,000 Hours

3 Year Warranty

# Main Applications



## AIRCRAFT HANGARS

Leaking fuel is the main danger in aircraft hangars, easily causing fires and potentially harming personnel, equipment and facilities. The SharpEye Mini Optical Flame Detectors allow military and commercial requirements for reliable fire protection to be met. Due to the 100° cone of vision, there is wider coverage of the protected area. The area around the walls of the hangar where the detectors are mounted does not require EX proof so the 20/20MI non EX is suitable.



## OFF ROAD HEAVY DUTY VEHICLE

Large mining vehicles are vulnerable to catastrophic fires particularly in engine compartments, as have been experienced in recent times. It is vitally important that fire protection capabilities are up to date with the latest technologies. The high-speed short-range version of 20/20MI-3 (up to 10 ft) is ideal to protect the large engine compartment of the vehicles, and is used in coal, metals and minerals mining.



## OFFICE AREAS AND ATRIUM AREAS

While an atrium space has many merits, there is a danger that it could become a building's weakness in fire protection, potentially allowing a fire to rapidly spread. The 20/20M Mini's fast detection identifies a fire in its earliest stages, facilitating suppression. Modern hospitals feature large atria and open space areas. Due to the difficulty or impossibility of moving patients in an emergency, hospitals must follow a defend and protect in place policy rather than conventional evacuation. Hospital fire protection and evacuation requirements are therefore highly complex and the SharpEye Mini Optical Flame Detector is responsible for meeting them with its low cost and supreme reliability.



## WASTE HANDLING

Recycling reduces the quantities of materials deposited in the world's landfill sites and saves natural resources, but must be coupled with appropriate fire safety measures. Unique risks are posed at recycling and waste handling operations, such as disposal and recycling of combustible materials. The 20/20M Mini Flame Detector is a successful choice to solve these issues, and has the additional benefit of low cost and low energy requirement. Recently, a recycling and waste handling plant in the Netherlands installed 84 SharpEye Optical Flame Detectors model 20/20MI to detect fire in the various deluge zones.

# Main Applications

## UNMANNED GAS STATIONS

Modern automobile fueling areas are designed with high-speed self-service pumps, enabling customers to fuel their vehicles fast, but more susceptible to fire. Risks can include customers forgetting to return the nozzle, burning cigarettes, running engines, sparks and other heat sources, whereby flammable liquids can be easily ignited. The 20/20ML was designed to prevent any such hazards from spreading, combining UV and IR sensors to detect hydrocarbon-based fuel and gas fires, hydroxyl and hydrogen fires, as well as metal and inorganic fires.



## MARINE VESSELS ENGINE ROOMS

The engine room on a marine vessel is where the machinery of a ship is located. Fuel or oil spills from the machinery are a fire risk factor, alongside petrochemicals used for the cleaning and servicing of the machinery. The fuel, oil and petrochemicals are flammable and can easily ignite. Therefore, Spectrex Optical Flame Detectors are required to identify a fire and subsequently activate the installed fire suppression system. Spectrex 20/20M Mini Optical Flame Detectors are suitable for both commercial and military vessels.



Alongside the above-mentioned applications, the 20/20M Mini Series is specifically suited to the following applications:

- Automotive parts manufacturing
- Burners, boilers, and heaters
- Car parking towers and garages
- Chemical industry
- Nuclear power plants
- Power generation – pumps, generators and unmanned stations
- Recreational and sports arenas (facilities)
- Storage areas



## General Specifications

		20/20MI-1	20/20MI-3	20/20ML
<b>Spectral Response</b>		Triple Spectrum Design		UV/IR Dual Sensor
		ft (m)	ft (m)	ft (m)
<b>Detection Range</b> (Highest Sensitivity Setting for 1 ft <sup>2</sup> (0.1m <sup>2</sup> ) pan fire.	Gasoline	133 (40)	33 (10)	50 (15)
	n-Heptane	133 (40)	33 (10)	50 (15)
	Diesel Fuel	90 (27)	23.1 (7)	37 (11)
	JP5	100 (30)	23.1 (7)	37 (11)
	Kerosene	100 (30)	23.1 (7)	37 (11)
	Alcohol (Ethanol)	100 (30)	24.8 (7.5)	25 (7.5)
	IPA (Isopropyl Alcohol)	100 (30)	24.8 (7.5)	25 (7.5)
	Methanol	100 (30)	24.8 (7.5)	25 (7.5)
	Methane*	40 (12)	10 (3)	15 (5)
	LPG (Propane)*	40 (12)	10 (3)	15 (5)
	Hydrogen*	---	---	15 (5)
	Silane*	---	---	15 (5)
	Polypropylene Pellets	16 (5)	6 (2)	15 (5)
	Office Paper	50 (15)	13 (4)	12 (4)
*20" (0.5m) long 8" (0.2m) width plume fire				
<b>Response Time</b>	Typical 5 sec.			
<b>Adjustable Time Delay</b>	Up to 30 sec.			
<b>Sensitivity Range</b>	4 Sensitivity Ranges for 1 ft <sup>2</sup> (0.1m <sup>2</sup> ) gasoline pan fire: 33 ft (10m)–133 ft (40m)	4 Sensitivity Ranges for 1 ft <sup>2</sup> (0.1m <sup>2</sup> ) gasoline pan fire: 7.5 ft (2.5m)–33 ft (10m)	1 Sensitivity Range for 1 ft <sup>2</sup> (0.1m <sup>2</sup> ) gasoline pan fire: 50 ft (15m)	
<b>Field of View</b>	100° horizontal, 100° vertical			
<b>Built-in-Test</b>	Manual and Automatic BIT			
<b>Temperature Range</b>	Operating: -40°F (-40°C) to 160°F (70°C) Storage: -65°F (-55°C) to 185°F (85°C)			
<b>Humidity</b>	Up to 95%			

## Electrical Specifications

	20/20MI-1	20/20MI-3	20/20ML
<b>Power Supply</b>	Operating Voltage: 18-32 VDC		
<b>Power Consumption</b>	Max. 25 mA in stand-by Max. 50 mA in alarm		Max. 40 mA in stand-by Max. 70 mA in alarm
<b>Electrical Connection</b>	12 wires 6 ft (2m) cable (for junction box connection) Optional: 12-wires electrical connector (the suitable connector will be supplied)		
<b>Electrical Input Protection</b>	According to MIL-STD-1275B		
<b>Electromagnetic Compatibility</b>	EMI/RFI protected CE Marked		

## Outputs

	20/20MI-1	20/20MI-3	20/20ML
<b>Relays*</b>	Alarm and Fault SPST volt-free contact rates 2A at 30 VDC or 0.5A at 250 VAC Fault relay normally closed, Alarm Relay normally open <i>*The Relays do not apply to 20/20MI EX approved version</i>		
<b>4-20mA</b>	Sink (source option) configuration		Source configuration
	Fault:	0 + 0.5mA	0 + 0.5mA
	BIT Fault:	2mA + 10%	2mA + 10%
	Normal:	5mA + 10%	4mA +5%
	IR Detection:	---	8mA +5%
	UV Detection:	---	12mA +5%
	Warning:	10mA + 5%	16mA + 5%
	Alarm:	15mA + 5%	20mA + 5%
	Resistance Loop:	100-600 Ω	100-600 Ω
<b>RS-485</b>	The detector is equipped with an RS-485 communication link that can be used in installation with computerized controllers. The RS-485 is Modbus compatible.		

## Mechanical Specifications

<b>Dimensions</b>	4" x 4" x 2.5" (100 x 100 x 62 mm)
<b>Weight</b>	St.St 316L 2.5lb (1.2 kg) Tilt Mount 0.8lb (0.37 kg)
<b>Enclosure</b>	Stainless Steel 316L with electro polish finish
<b>Environmental standards</b>	Meets MIL-STD-810C for humidity, Salt & Fog, Vibration, Mechanical Shock, High Temp, Low Temp
<b>Water and Dust</b>	IP66 and IP67 per EN60529 NEMA 250 6P

## Approvals

	20/20MI-1	20/20MI-3	20/20ML
<b>Hazardous Area Ex Approvals</b>			
<b>ATEX**</b>	04ATEX2010 EX II 1 GD, EExia IIC T5 (60°C), T4 (85°C) Zener barriers (not included) are required to achieve the stated approval <i>** The Relays do not apply to 20/20MI EX approved version</i>	---	---
<b>Functional Approvals</b>			
<b>FM</b>	Project ID 3020071	Project ID 3013906	Project ID 3020071
<b>VdS (EN54-10)</b>	G207073	---	---
<b>CPD Certificate of Conformity</b>	0786-CPD-20916	---	---
<b>GOST R</b>	POCC US.H006.B00103		
<b>Other Approvals</b>			
<b>DNV</b>	A-12318		---
<b>ABS</b>	Project No. 1627964		---
<b>GOST K</b>	KZ.7500507.01.01.00029		

# Accessories



## LONG-RANGE FIRE SIMULATORS

The Spectrex Long-Range Flame Simulator allows testing of optical flame detectors in areas where real fires cannot be ignited. Testing is also mandatory in some industries to proof-test flame detector operation and to satisfy statutory requirements.

PN 20/20-310 for 20/20MI; PN 20/20-311 for 20/20ML

For more information, see datasheet of the Long Range Fire Simulators.



## TILT MOUNT

The Tilt Mounting Brackets allow accurate directional setting of the detector for optimum area coverage. These brackets' movement ensure maximum effectiveness and accurate location of the detector's coverage area.

PN 20/20-005



## RAIN COVER

The Rain Cover is designed to protect the detector from rain and snow.

PN 787980



## AIR SHIELD

The special Air Shield, developed for SharpEye optical flame detectors, allows installation of optical flame detectors under tough environmental conditions where they may be exposed to oil vapors, sand, dust and other particulate matter.

PN 20/20-787



## LASER AIMER

The Laser Detection Area Coverage Pointer designates the optical flame detector's area of coverage (cone of vision) on-site at the specific installation. This add-on accessory enables the designer and installer to optimize the detector's location and the actual detection area coverage of each installed detector.

PN 787969



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Specifications subject to change



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**SharpEye™**  
**FLAME DETECTOR**  
**“MINI” SERIES**  
**Model 20/20MPI**

Finally...

...a Low Cost,  
 High Performance,  
 High Reliability,  
 Long Distance...

**NEW IR3 Flame Detector  
 for INDOOR applications!!!**

The 20/20MPI is a low cost, high performance, compact Triple IR (IR3) Flame Detector in a lightweight polycarbonate housing. It retains all the benefits of IR3 technology - long distance detection (up to 140ft / 43m) along with the highest immunity to false alarms.

The IR3 detector, with its lightweight housing and low power consumption, is especially suited to indoor applications, such as airport terminals, train stations, storage areas, public buildings and many more.

**MAIN FEATURES**

Long distance Flame Detection (up to 140ft / 43m)

Large Field of View (100° horizontal / 90° vertical)

Highest immunity to false alarms

Output options (two models):

- Alarm and Fault relay outputs (4 wire)
- or
- Stepped mA output (3 wire source)

RS-485 Modbus Compatible

Automatic and Manual Built-In-Test (BIT)

3 Year Warranty

**APPLICATIONS**

- Airport terminals • Train stations and terminals •
- Storage areas • Archives • Malls • Hospitals •
- Car parking towers and garages • Public buildings •
- Banks • Historical Sites • Offices

## GENERAL SPECIFICATIONS

<b>Spectral Response</b>	Three IR Bands				
<b>Detection Range</b>	n-Heptane	140 ft (43m)	:	Methanol	100 ft (30m)
*Highest sensitivity setting for 1 ft <sup>2</sup> (0.1m <sup>2</sup> ) pan fire	Gasoline	140 ft (43m)	:	IPA (Isopropyl Alcohol)	115 ft (35m)
	Diesel Fuel	100 ft (30m)	:	Methane*	40 ft (12m)
	JP5	100 ft (30m)	:	LPG (Propane)*	40 ft (12m)
	Kerosene	100 ft (30m)	:	Polypropylene Pellets	50 ft (15m)
	Alcohol (Ethanol)	100 ft (30m)	:	Office Paper	50 ft (15m)
					*20" (0.5m) long 8" (0.2m) width plume fire
<b>Response Time</b>	Typically 5 sec.				
<b>Adjustable Time Delay</b>	Up to 30 seconds				
<b>Sensitivity Range</b>	4 sensitivity ranges for 1 ft <sup>2</sup> (0.1m <sup>2</sup> ) gasoline pan fire: 35 ft (11m) up to 140 ft (43m)				
<b>Field of View</b>	100° horizontal, 90° vertical				
<b>Built-in-Test</b>	Manual and Automatic BIT				
<b>Temperature Range</b>	Operating: -40°F (-40°C) to +160°F (+70°C)		:	Storage: -40°F (-40°C) to +160°F (+70°C)	
<b>Humidity</b>	Up to 95%				

## ELECTRICAL SPECIFICATIONS

<b>Power Supply</b>	Operating Voltage: 18-32 VDC			
<b>Power Consumption</b>	20/20MPI-R at 24V DC:	Max. 15mA at Normal Max. 25mA at Alarm	20/20MPI-M at 24V DC:	Max. 16mA at Normal Max. 36mA at Alarm
<b>Electrical Connection</b>	M20 Gland Connection			
<b>Electrical Input Protection</b>	Per EN54-10			
<b>Electromagnetic Compatibility</b>	EMI/RFI protected CE Marked per EN50130-4			

## OUTPUTS

<b>20/20MPI-R</b>	Relays	:	Alarm and Fault SPST volt-free contacts rated 2A at 30 VDC or 0.5A at 250 VAC Alarm Relay normally open		
<b>20/20MPI-M</b>	0-20mA	:	Source configuration	:	
		:	Fault: 0 +0.5mA	:	Warning: 16mA ±5%
		:	BIT Fault: 2mA ±10%	:	Alarm: 20mA ±5%
		:	Normal: 4mA ±10%	:	Resistance Loop: 100-600 Ω

## MECHANICAL SPECIFICATIONS

<b>Dimensions</b>	4.7" dia x 2.9" (119mm x 74mm)
<b>Weight</b>	10.6 oz (300g)
<b>Tilt Mount Weight</b>	2.5 oz (70g)
<b>Enclosure and Tilt Mount</b>	Polycarbonate
<b>Water and Dust</b>	IP55

## PERFORMANCE APPROVALS

<b>FM3260</b>	Approved
<b>EN54-10 (CPD)</b>	Pending

## ACCESSORIES

<b>Tilt Mount</b>	768004 (included with each new detector)
<b>Protective Cover</b>	768005 (included with each new detector)
<b>Fire Simulator</b>	20/20-310

CO<sub>2</sub>  
H<sub>2</sub>S  
Cl<sub>2</sub>  
NH<sub>3</sub>  
O<sub>3</sub>  
CO  
O<sub>2</sub>  
CH<sub>4</sub>  
SO<sub>2</sub>  
CO<sub>2</sub>  
H<sub>2</sub>S

# Xgard

**Detectores fijos** para gases inflamables, tóxicos u oxígeno



- Xgard Tipo 1:** Detector de gas tóxico y oxígeno intrínsecamente seguro
- Xgard Tipo 2:** Detector antideflagrante de gas tóxico y oxígeno
- Xgard Tipo 3:** Detector antideflagrante de gas inflamable
- Xgard Tipo 4:** Detector antideflagrante de gas inflamable a alta temperatura
- Xgard Tipo 5:** Detector antideflagrante de gas inflamable con salida de 4-20 mA
- Xgard Tipo 6:** Detector antideflagrante de gas de tipo de conductividad térmica
- Xsafe:** Detector de gas inflamable de área segura

# Xgard

La gama Xgard de detectores de gas ha sido diseñada específicamente para satisfacer los requisitos del cliente. Los peligros presentados por los gases tóxicos e inflamables así como por la deficiencia de oxígeno varían con cada aplicación.

Xgard ofrece tres diferentes conceptos de sensor por lo tanto puede escoger exactamente lo que necesita para su lugar de actividades.

Xgard está disponible en formatos antideflagrantes, intrínsecamente seguros o de área segura para que puedan utilizarse en todos los entornos, sea cual sea la clasificación.

## Bajo coste de propiedad

- Los detectores Xgard están diseñados para proporcionar una instalación y un mantenimiento fáciles para mantener los costes reducidos.
- Las tres opciones de caja de empalmes están diseñadas para que el cambio de sensores y sinters sea sumamente simple. Los sensores de repuesto simplemente se enchufan.
- Muchas piezas de repuesto son comunes a todos los modelos Xgard, lo cual mantiene los requisitos de existencias de piezas de repuesto al mínimo.

## Opciones de instalación flexibles

- Xgard está diseñado para montaje en pared o techo sin necesidad de soportes adicionales.
- Xgard acepta pasacables M20, NPT de 1/2" o NPT de 3/4", permitiendo satisfacer todos los requisitos del lugar de instalación.
- Hay disponibles modelos de alta temperatura para entornos calientes (hasta 150°C).
- Hay disponibles accesorios para montaje en conducto, y aplicaciones de muestreo así como gasificación remota para comprobación simple de sensor.

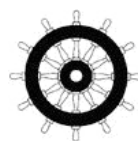
## Amplia gama de sensores

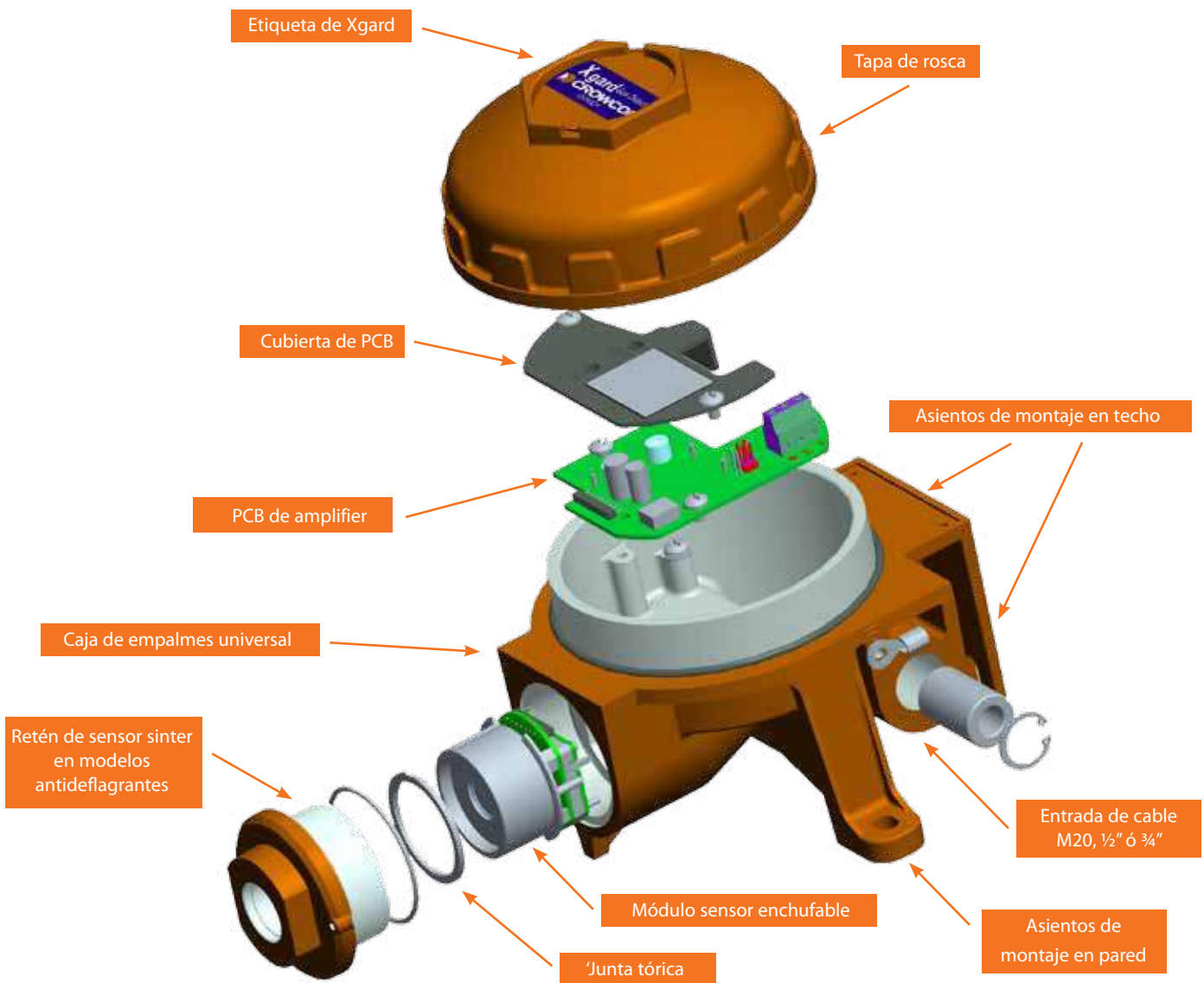
Xgard ofrece una gama sumamente amplia de sensores para todas las aplicaciones.

- Pelistores resistentes al veneno, para todas las necesidades de detección de sustancias inflamables, como hidrocarburos, hidrógeno, amoníaco, combustible jet, gasolina con plomo y vapores que contienen halógenos.
- Los sensores electroquímicos se utilizan para detectar una amplia gama de gases tóxicos y oxígeno.
- Hay disponibles sensores de conductividad térmica para monitorizar la concentración de volúmenes de gases.

## Resistentes y fiables

- Xgard se fabrica utilizando una selección de tres materiales: nylon reforzado con vidrio, aluminio de alta duración con un duro revestimiento de poliéster o acero inoxidable 316 para resistencia máxima a la corrosión. Todas las versiones están diseñadas para que funcionen incluso en las condiciones más difíciles.
- Hay disponibles deflectores de salpicaduras y tapas impermeables para utilizarse en áreas sujetas a mojaduras regulares o entornos fuera de costa.
- Todos los modelos han sido validados para los estándares de seguridad IEC 61508 (SIL1 a SIL3)





## Accesorios

(todos los accesorios requieren la instalación de un adaptador de accesorios en la caja de empalmes Xgard)

### Deflector de salpicaduras

Para utilizarse en áreas sujetas a lluvias regulares o entornos fuera de costa.



### Escudo contra el sol

Para utilizarse cuando un detector se instala en un lugar expuesto al sol



### Tapa impermeable

Para utilizarse en condiciones muy húmedas, como instalaciones fuera de costa y embarcaciones.



### Cono colector

Para ayudar a detectar gases que son más ligeros del aire, como hidrógeno y metano.



### Adaptador de flujo

Para utilizarse en aplicaciones de muestreo.



### Adaptador de accesorios

Para instalar accesorios en el Xgard





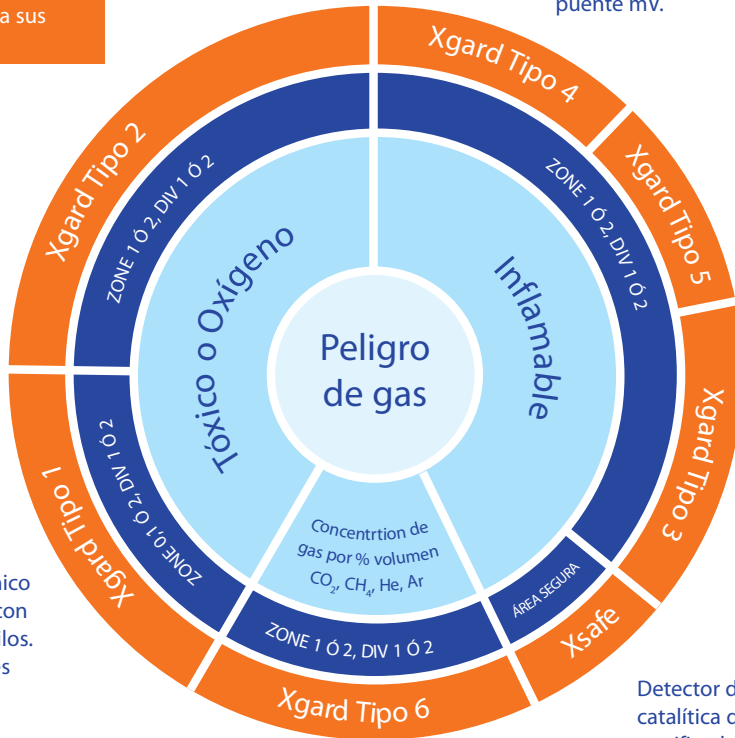
# Selector de detectores

La gama Xgard ofrece una selección completa de detectores de gas de punto fijo que satisfacen los diversos requisitos de detección de gases inflamables y tóxicos y monitorización de oxígeno en industrias de todo el mundo.

Este diagrama tiene el objetivo de ayudarle a escoger el detector Xgard correcto para sus necesidades.

Detector de tipo electroquímico con salida de 4-20 mA de 2 hilos.

Detector de tipo electrónico intrínsecamente seguro con salida de 4-20 mA de 2 hilos. Amplia gama de opciones de sensor. Se requiere una barrera zener o aislador galvánico para funcionamiento I.S.



Detector de tipo de conductividad térmica antideflagrante con salida de 4-20 mA de 3 hilos.

Detector de tipo de perla catalítica antideflagrante de alta temperatura (hasta 150°C) con salida de puente mV.



Detector de tipo de perla catalítica antideflagrante con salida de 4-20 mA de 3 hilos.

Detector de tipo de perla catalítica antideflagrante con salida de puente mV de 3 hilos.

Detector de tipo de perla catalítica de bajo coste no certificado con salida de 4-20 mA o puente mV de 3 hilos.

## Requisitos de solicitud de pedidos

El código siguiente tiene el objetivo de ayudar a seleccionar el detector correcto. El número de referencia de producto debe completarse insertando el número entero apropiado en cada cuadro.

Detector	Tipo N. Cód.	Salida	Caja empalmes Cód.	Entrada cable Cód.	Certificación Cód.	Tipo de gas	Gama
XGARD	Tipo 1 1		Estándar*1 A	M20 M20	ATEX AT	Abreviado a	De selección
XSAFE	Tipo 2 2		Acero inox.*2 S	1/2"NPT 1/2	UL UL	hasta 8 caracteres	mostrada en tabla
	Tipo 3 3			3/4"NPT 3/4			
	Tipo 4 4						
	Tipo 5 5						
	Tipo 6 6						
	XSAFE XS		mV or mA				

\*1. Los detectores certificados ATEX Tipo 1 Xgard se suministran de serie en caja de nylon reforzado con vidrio o, opcionalmente, en caja de acero inoxidable 316. Los detectores certificados UL Tipo 1 Xgard y todos los otros tipos de Xgard se suministran de serie en caja de aluminio o, opcionalmente, de acero inoxidable 316.

\*2. La opción de acero inoxidable no está disponible para Xsafe y Xgard tipo 4. Referencia de producto de ejemplo para un detector I.S. 0-25 ppm H2S con certificación ATEX y entrada de cable M20 en una caja de empalmes estándar (nylon): XGARD/1/A/M20/AT/H2S/25

## Gases y Gamas:

Tipo de gas	LTEL(ppm) LEL(%Vol)	STEL(ppm) UEL(%Vol)	Gamas disponibles: Tipo 1	Gamas disponibles: Tipo 2	Gamas disponibles: Tipo 3,4,5 & Xsafe	Gamas disponibles: Tipo 6
Acetileno (C <sub>2</sub> H <sub>2</sub> )	2.3 (2.4)	100			0-100% Iel*	
Amoníaco (NH <sub>3</sub> )	25 15 (15)	35 33.6 (28)	50, 100, 250, 500, 1000 ppm		0-25% Iel*	
Argón (Ar)	-	-				Contacte on Crowcon
Arsina (AsH <sub>3</sub> )	0.05	-	1 ppm			
Bromino (Br <sub>2</sub> )	0.1	0.2	3 ppm			
Butano(C <sub>4</sub> H <sub>10</sub> )	1.4 (1.8)	9.3 (9)			0-100% Iel*	
Dióxido de carbono (CO <sub>2</sub> )	5000 (0.5%Vol)	15000 (1.5%Vol)				Contacte on Crowcon
Monóxido de carbono (CO)	30	200	50, 100, 200, 250, 500, 1000, 2000 ppm	50, 100, 250, 500, 1000, 2000 ppm		
Cloro (Cl <sub>2</sub> )	-	0.5	3,5,10,20,50,100 ppm			
Dióxido de cloro (ClO <sub>2</sub> )	0.1	0.3	1 ppm			
Diborano (B <sub>2</sub> H <sub>6</sub> )	0.1	-	1 ppm			
Etano (C <sub>2</sub> H <sub>6</sub> )	2.5 (3)	15.5			0-100% Iel*	
Etileno (C <sub>2</sub> H <sub>4</sub> )	2.3 (2.7)	36			0-100% Iel*	
Óxido de etileno (C <sub>2</sub> H <sub>4</sub> O)	5	-	10, 50, 100 ppm			
Fluoreno (F <sub>2</sub> )	1	1	1 ppm			
Germano (GeH <sub>4</sub> )	0.2	0.6	2 ppm			
Helio (He)	-	-				Contacte on Crowcon
Hidrógeno (H <sub>2</sub> )	4	77 (80)	200, 2000 ppm	200, 2000 ppm	0-100% Iel*	0-5%, 10%, 50% vv (en aire) 0-20%, 25%, 30%, 50% vv (H <sub>2</sub> in N <sub>2</sub> )
Cloruro de hidrógeno (HCl)	1	5	10, 25 ppm			
Cianuro de hidrógeno (HCN)	-	10	25ppm			
Fluoruro de hidrógeno (HF)	1.8	3	10 ppm			
Sulfuro de hidrógeno (H <sub>2</sub> S)	5	10	5, 10, 20, 25, 50, 100, 200, 250, 300, 1000 ppm	5, 10, 20, 25, 50 100, 200 ppm		
LPG	2	10			0-100% Iel	
Metano (CH <sub>4</sub> )	4.4 (5)	17 (15)			0-100% Iel	
Óxido nítrico (NO)	5*1	15*1	25, 50, 100 ppm			
Dióxido de nitrógeno (NO <sub>2</sub> )	1	1	10, 50, 100 ppm			
Ozono (O <sub>3</sub> )	-	0.2	1 ppm			
Oxígeno (O <sub>2</sub> )	-	-	25% Vol	25% Vol		
Pentano (C <sub>5</sub> H <sub>12</sub> )	1.4 (1.5) 600ppm	7.8 (7.8) 1800ppm			0-100% Iel*	
Gasolina	1.3	6			0-100% Iel*	
Fosgeno (COCl <sub>2</sub> )	0.02	0.06	1 ppm			
Fosfino (PH <sub>3</sub> )	0.1	0.2	1 ppm			
Propano (C <sub>3</sub> H <sub>8</sub> )	1.7 (2.2)	10.9 (10)			0-100% Iel	
Silano (SiH <sub>4</sub> )	0.5	1	1 ppm			
Dióxido de azufre (SO <sub>2</sub> )	1	1	10, 20, 50, 100, 250 ppm			
Cloruro de vinilo (VCM) (CH <sub>2</sub> =CHCl)	3.6 3	33 -			0-100% Iel*	
Orgánicos volátiles (VO)*2	-	-	0 - 100 ppm*2			

**Notas:** Pueden haber disponibles otros sensores y gamas, por favor contacte con Crowcon.

\*Gamas no disponibles para Xsafe o Xgard Tipo 4

† Contacte con Crowcon para informarse sobre la disponibilidad







Las cifras de LTEL y STEL se derivan del documento UK HSE (Salud/Seguridad/Medioambiente del RU): EH40 Oct. 07. En países fuera del Reino Unido pueden aplicarse umbrales alternativos

Las cifras de LEL se derivan de EN 61779-1: 2000

\*1 Límites actuales aconsejados en el Reino Unido

\*2 Gama de 0-100 ppm nominal con monóxido de carbono (CO). Contacte con Crowcon para obtener una lista completa de los gases que pueden detectarse utilizando este sensor

## Especificaciones de Xgard:

Modelo de Xgard	Tipo 1	Tipo 2	Tipo 3	Tipo 4	Tipo 5	Tipo 6	Xsafe
Material de caja de empalmes	Certificado por ATEX: Nylon reforzado con vidrio o acero inox. 316 UL. Certificado: aluminio o acero inox. 316	Aluminio o acero inox. 316	Aluminio o acero inox. 316	Aluminio	Aluminio o acero inox. 316	Aluminio o acero inox. 316	Aluminio
Dimensiones	156 x 166 x 111mm	156 x 166 x 111mm	156 x 166 x 111mm	195 x 166 x 111mm	156 x 166 x 111mm	156 x 166 x 111mm	156 x 166 x 111mm
Peso	Nylon 0.5Kg (1.1lbs) Aleación 1Kg (2.2 lbs) 316 S/S: 3.1kg (6.8 lbs)	AL 1Kg (2.2 lbs) 316 S/S: 3.1kg (6.8 lbs)	AL 1Kg (2.2 lbs) 316 S/S: 3.1kg (6.8 lbs)	1.5Kg (3.3 lbs)	AL 1Kg (2.2 lbs) 316 S/S: 3.1kg (6.8 lbs)	AL 1Kg (2.2 lbs) 316 S/S: 3.1kg (6.8 lbs)	1Kg (2.2 lbs)
Protección contra penetración	IP65	IP65	IP65	IP54	IP65	IP65	IP65
Entradas de cable	1 x M20 o NPT de ½" en lado derecho	1 x M20, ½" *NPT o NPT de ¾" en lado derecho	1 x M20, ½" *NPT o NPT de ¾" en lado derecho	1 x M20, ½" *NPT o NPT de ¾" en lado derecho	1 x M20, ½" *NPT o NPT de ¾" en lado derecho	1 x M20, ½" *NPT o NPT de ¾" en lado derecho	1 x M20, or ½" *NPT o NPT de ¾" en lado derecho
Terminaciones	0.5 a 2.5mm <sup>2</sup>	0.5 a 2.5mm <sup>2</sup>	0.5 a 2.5mm <sup>2</sup>	0.5 a 2.5mm <sup>2</sup>	0.5 a 2.5mm <sup>2</sup>	0.5 a 2.5mm <sup>2</sup>	0.5 a 2.5mm <sup>2</sup>
Tipo de sensor	Electroquímico	Electroquímico	Catalytic bead	Alojamiento de sensor de acero inox. 316 con perlas catalíticas	Perla catalítica	Conductividad térmica	Perla catalítica
Temperatura operativa	-20 a +50°C (según sensor)	-20 a +50°C (según sensor)	-40 a +80°C	-20 a +150°C	-40 a +55°C	+10 a +55°C	-40 a +80°C (versión mV) -40 a +55°C (versión mA)
Humedad	15-90% HR sin condensación	15-90% HR sin condensación	0-99% HR sin condensación	0-99% HR sin condensación	0-99% HR sin condensación	0-90% HR sin condensación	0-99% HR sin condensación
Repetibilidad, deriva cero	<2% FSD (Típ.) <2% FSD / mes (Típ.)	<2% FSD (Típ.) <2% FSD / mes (Típ.)	<2% FSD (Típ.) <2% FSD / mes (Típ.)	<2% FSD (Típ.) <2% FSD / mes (Típ.)	<2% FSD (Típ.) <2% FSD / mes (Típ.)	<2% FSD (Típ.) <2% FSD / mes (Típ.)	<2% FSD (Típ.) <2% FSD / mes (Típ.)
Tiempo de respuesta	T90 <10s Oxígeno T90 <30s a 120s Tóxico (según sensor)	T90 <10s Oxígeno T90 <30s a 120s Tóxico (según sensor)	T90 <15s (Típ)	T90 <15s (Típ)	T90 <15s (Típ)	T90 <15s (Típ)	T90 <15s (Típ)
Voltaje operativo	8 – 30V dc	8 – 30V dc	2.0V dc +/- 0.1V (Típ)	2.0V dc +/- 0.1V (Típ)	10 – 30V dc	10 – 30V dc	10 – 30V dc (versión mA) 2.0V dc (versión mA)
Requisitos eléctricos	24mA máx.	24mA máx.	300mA (Típ)	300mA (Típ)	50mA @ 24V dc 1.2W	50mA @ 24V dc 1.2W	versión mA: 50mA @ 24V dc 1.2W versión mV: 300mA (Típ.)
Potencia eléctrica	2-hilos 4-20mA (sumidero de corriente)	2-hilos 4-20mA (sumidero de corriente)	Puente mV 3 hilos Señal típica 12-15 mV / %lel CH4	Puente mV 3 hilos Señal típica > 10 mV / %lel CH4	3-hilos 4-20mA (sumidero o fuente de corriente)	3-wire 4-20mA (sumidero o fuente de corriente)	versión mA: 3-hilos 4-20mA (sumidero o fuente de corriente) Versión mV: Puente mV 3 hilos Señal típica > 12-15 mV / %lel CH4
Aprobaciones	ATEX:  II 1 G Exia IIC T4 (Tamb –40 to +55°C) UL/cUL: Cl I, Div 1 Grupos A,B,C,D IECEX MED Marine oxígeno solamente GOST-R	ATEX:  II 2 GD Exd IIC T6 (Tamb –40 to +50°C) UL: Clase 1, Div. 1 Grupos B,C,D IECEX MED Marine oxígeno solamente GOST-R	ATEX:  II 2 GD Exd IIC T4 (Tamb –40 to +80°C) Exd IIC T6 Tamb (-40 to +50°C) UL: Clase 1, Div. 1 Grupos B,C,D IECEX GOST-R	ATEX:  II 2 G Exd IIC T3 (Tamb –20 to +150°C)	ATEX:  II 2 GD Exd IIC T6 (Tamb –40 to +50°C) Exd IIC T4 (Tamb –40 to +80°C) UL: Clase 1, Div. 1 Grupos B,C,D IECEX GOST-R	ATEX:  II 2 GD Exd IIC T6 (Tamb –40 to +50°C) Exd IIC T4 (Tamb –40 to +80°C) UL: Clase 1, Div. 1 Grupos B,C,D IECEX GOST-R	No certificado para utilizarse en un entorno peligroso.
EMC compliance	EN 50270 FCC Part 15 ICES-003	EN 50270 FCC Part 15 ICES-003	EN 50270 FCC Part 15 ICES-003	EN 50270 FCC Part 15 ICES-003	EN 50270 FCC Part 15 ICES-003	EN 50270 FCC Part 15 ICES-003	EN 50270 FCC Part 15 ICES-003

\* entrada de cable de ¾" sólo disponible en cajas de empalmes de aluminio

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