



**2-wire loop powered toxic
and Oxygen gas detector
for use in potentially
explosive atmospheres**

Series 3000 MkII



Reliable detection

- Proven electrochemical sensing technology
- Uses Surecell™ electrochemical cells, ideal for hot and humid environments
- Long-life sensing elements (typical >2 years)
- Patented 'Reflex' sensing element verification diagnostics

Reduced installation costs

- Integral surface mounting lugs
- Optional horizontal or vertical pipe mounting bracket
- Flameproof transmitter allows field wiring to be run along with other non-IS instruments
- Plug-in sensor removes wiring

Reduced commissioning costs

- Sensor recognition software auto configures transmitter
- Non-intrusive configuration
- Plug and play factory configured sensors

Reduced maintenance costs

- IS sensor connection permits hot swap, reducing downtime
- User programmable calibration frequency
- Integral fault diagnostic software
- Menu/icon driven calibration procedure

Regulatory compliance

- European (ATEX)
- US (UL)
- Canadian (c-UL)
- International (IECEx)

Range of optional accessories

- Remote sensor mounting kit
- Duct mounting kit (for H₂, CO and H₂S only)
- Calibration cup to apply test gas
- Collecting cone (for H₂ and CO only)

Typical applications

- Exploration and drilling platform
- Production platforms
- Onshore oil and gas terminals
- Refineries and chemical plants
- Power plants
- Waste water facilities
- Utilities

The Series 3000 MkII provides comprehensive monitoring of toxic and Oxygen gas hazards in potentially explosive atmospheres, both indoors and outdoors. This low powered gas detector operates on an industry standard 2-wire 4-20mA loop, making it ideal for both new and retrofit applications. Users can configure the detector without the need of a 'hot work permit' by using the LCD and magnetic switches. Fault diagnostic software and programmable calibration due frequency simplifies maintenance procedures.



The intrinsically safe smart sensors are supplied pre-configured and can be 'hot swapped' without having to remove power to the detector, saving time and money during commissioning and routine servicing. A remote sensor mounting kit is available that allows the sensor to be mounted up to 15m (50ft) from the transmitter, making it ideal for operation in areas that are difficult to access.

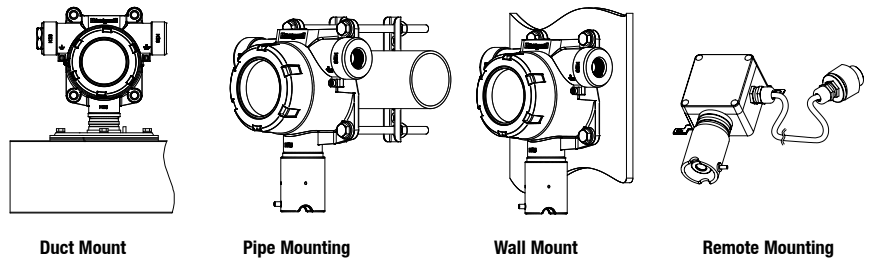
Series 3000 MkII is supplied with all necessary accessories for easy installation. The detector can be wall mounted using the integral mounting lugs or pipe mounted (horizontal or vertical) using the optional pipe mounting kit. Electrical installation is made using the 2 x M20 cable entries (ATEX/IECEx version) or 2 x 3/4" NPT conduit entries (UL/c-UL versions). A suitable blanking plug is also supplied to seal any unused entries. A weatherproof cap is also included for use in the harshest outdoor conditions.

Installation

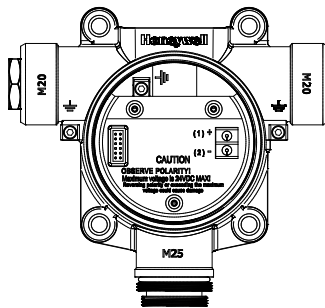


Mechanical Installation Options

Series 3000 MKII is designed for use in potentially explosive atmospheres. As such, installation should follow national guidelines using suitable mechanically protected cable and glands (M20 or ¾" NPT) or conduit (¾" NPT). Use 0.5mm² (20AWG) to 2.0mm² (~14AWG) cross sectional area cable as needed to ensure minimum operating voltage at the detector, depending on installed cable length. Various accessories are available for different applications.

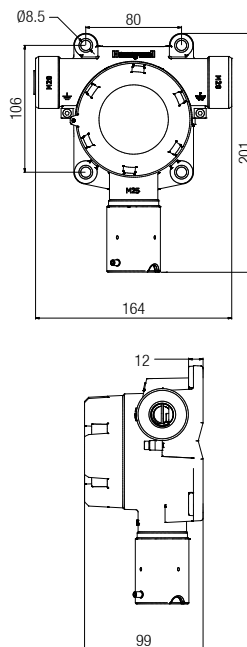


Electrical Connections

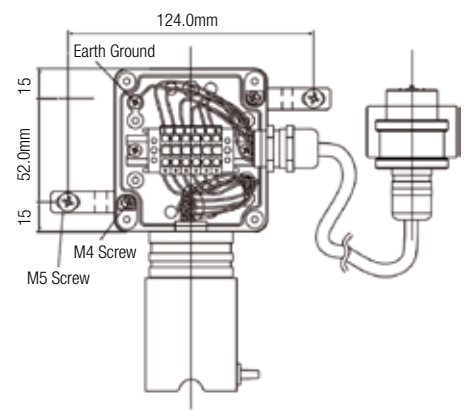


Terminal Number	Detector Terminal	Controller Connection
1	+	+VE
2	-	Signal

Dimensions



Remote Mounting Arrangement



Note: All dimensions in mm (1" = 25.4mm)

Typical Maximum Installed Cable Lengths

The maximum cable length between a controller and detector is dependent upon:

- The minimum guaranteed supply voltage to the detector at the controller (V_c).
- The minimum operating voltage of the detector (V_d).
- The maximum current draw of the detector (I_m).
- The input impedance of the controller (R_L).
- The resistance of the cable (R_c).

Using the example values opposite, the table below shows typical cable lengths.

For a specific application, the cable manufacturer's resistance data for a specific cable type must be used.

A cable length calculation formula can be found in the detector's product technical manual.

Maximum Cable Length km (m)

Cable Size	Cable Resistance R_c Ω /km (Ω /m)	Cable distance km (m) where the Input Impedance $R_L = 33\Omega$	Cable distance km (m) where the Input Impedance $R_L = 250\Omega$
0.5mm ² (20AWG*)	36.8 (59.2)	3.9 (6.3)	0.9 (1.0)
1.0mm ² (17AWG*)	19.5 (31.4)	7.3 (11.7)	1.7 (2.7)
1.5mm ² (16AWG*)	12.7 (20.4)	11.2 (18.0)	2.7 (4.3)
2.0mm ² (14AWG*)	10.1 (16.3)	14.1 (22.7)	3.4 (5.5)

*Nearest equivalent

Wiring Schematics

Detector supply V_d

- Assumed to be 17VDC

Maximum detector signal I_m

- Assumed to be 22mA (over range)

Cable resistance R_c

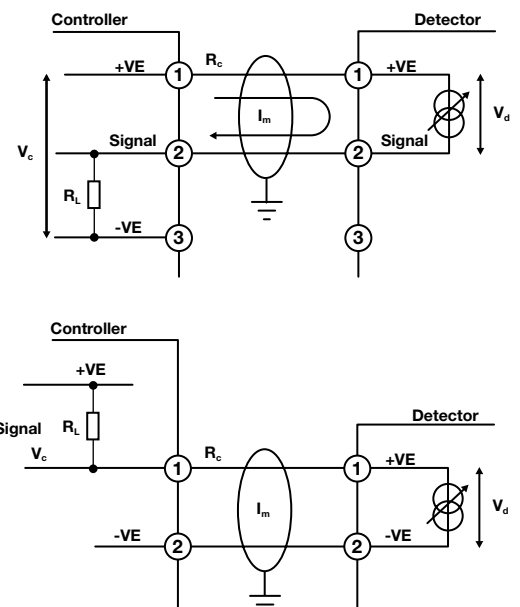
- Subject to cable type

Load resistor of control panel R_L

- Assumed 33 Ω (min) or 250 Ω (max)
- Subject to controller manufacturer

Controller supply voltage V_c

- Subject to controller manufacturer
- Assumed nominal of 24VDC



Technical Summary



Series 3000 MkII Detector

Use	Rugged and reliable gas detector for the protection of personnel from toxic and Oxygen gas hazards. Suitable for use in Zone 1 or 2 hazardous areas and North American Class I and II Division 1 or 2 areas.
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Detectable Gases

Gas	Formula	Selectable Full Scale Range	Default Range	Operating Temperature**	
				Min	Max
Oxygen	O ₂	25.0% / Vol only	25.0%Vol	-40°C / -40°F	55°C / 131°F
Hydrogen Sulphide	H ₂ S	10.0 to 50.0ppm	15.0ppm	-40°C / -40°F	55°C / 131°F
Hydrogen Sulphide	H ₂ S	50 to 500ppm	100ppm	-20°C / -4°F	55°C / 131°F
Carbon Monoxide	CO	100 to 1,000ppm	300ppm	-40°C / -40°F	55°C / 131°F
Sulphur Dioxide	SO ₂	5.0 to 20.0ppm	15.0ppm	-40°C / -40°F	55°C / 131°F
Ammonia*	NH ₃	50 to 200ppm	200ppm	-20°C / -4°F	50°C / 122°F
Ammonia*	NH ₃	200 to 1,000ppm	1,000ppm	-20°C / -4°F	40°C / 104°F
Chlorine	Cl ₂	5.0 to 20ppm	5.0ppm	-10°C / 14°F	55°C / 131°F
Chlorine Dioxide	ClO ₂	1.00ppm only	1.00ppm	-20°C / -4°F	55°C / 131°F
Nitric Oxide	NO	100ppm only	100ppm	-20°C / -4°F	55°C / 131°F
Nitrogen Dioxide	NO ₂	5.0 to 50.0ppm	10ppm	-20°C / -4°F	55°C / 131°F
Hydrogen	H ₂	1,000ppm only	1,000ppm	-20°C / -4°F	55°C / 131°F
Hydrogen	H ₂	9,999ppm only	9,999ppm	-20°C / -4°F	55°C / 131°F
Hydrogen Chloride***	HCl	10.0 to 20.0ppm	10ppm	-20°C / -4°F	55°C / 131°F
Hydrogen Cyanide***	HCN	20.0ppm only	20.0ppm	-20°C / -4°F	55°C / 131°F
Hydrogen Fluoride	HF	12.0ppm only	12.0ppm	-20°C / -4°F	55°C / 131°F
Ozone***	O ₃	0.4ppm only	0.4ppm	-20°C / -4°F	55°C / 131°F
Phosphine	PH	1.2ppm only	1.2ppm	-20°C / -4°F	55°C / 131°F

Electrical

Connections and Power	2-wire loop powered 17VDC (+ / -10%) to 24VDC (max) operation 22mA max. over range
Recommended Cable	2-wire with screen (90% coverage) or conduit 0.5mm ² (20AWG) to 2.0mm ² (14AWG)
Signal	0-100% FSD 4-20mA Fault = 3mA Calibration due selectable off or 3mA Max. over range 22mA Inhibit (toxic sensors) = Selectable 3mA or 4mA Inhibit (Oxygen sensors) = Selectable 3mA or 17.4mA

Construction

Material	Transmitter: Epoxy painted aluminium alloy LM25 or 316 Stainless Steel Sensor: 316 Stainless Steel with PTFE filter
Maximum Dimensions	164mm x 201mm x 99mm 6.4" x 7.9" x 3.9"
Weight	Aluminium alloy LM25: 1.7kg (3.75lbs.) Stainless Steel 316: 3.7kg (8.16lbs.)

Environmental

IP Rating	IP66 (EN 60529), NEMA 4X
Certified Temperature	ATEX/IECEX: -20°C to +55°C (-4°F to +131°F) UL/c-UL: -40°C to +55°C (-40°F to +131°F)
Operating Humidity	Continuous 20-90% RH (non-condensing) Intermittent 0-99% RH (non-condensing)
Operating Pressure	90-110kPa
Storage Conditions	15°C to 30°C (59°F to 86°F) 30-70% RH (non-condensing)
Certification	UL/c-UL Class I, Div 1 & 2, Groups B, C & D; Class II, Div 1, Groups E, F, G; Class II, Div 2, Groups F & G, Class I Zone 1, Group 2B + H2 Hazardous Locations ATEX: Ⓔ II 2 (1) G Ex d [ia] IIB+H ₂ T4 (T _{amb} -20°C to +55°C / -4°F to 131°F) IECEX Ex d [ia] IIB + H2 T4
Approvals	CE compliant in accordance with: ATEX Directive 94/9/EC EMC Directive 2004/108/EC EN 50270

*Suitable for applications without NH₃ ambient background concentrations only.

**When operating in Hazardous Area applications the detector must not be operated outside the certified temperature range. See Certification details for UL, c-UL and ATEX/IECEX certified temperature ranges.

***Contact Honeywell Analytics for availability.

¹ +55°C intermittent.



Ordering Information



Ordering Information

A complete assembly consists of two parts, a transmitter and sensor which must be ordered separately.

- Transmitter PN#: Two certified versions are available:**
 - ATEX/IECEx approved version (Aluminium version part number S3KAL2, Stainless Steel version part number S3KAS2)
 - UL/CSA approved version (Aluminium version part number S3KUL2, Stainless Steel version part number S3KUS2)
- Sensor PN#: All certified ATEX, IECEx, UL, CSA (c-UL) with two digits to specify gas type and range:**
 - e.g. S3KXXC1SS (C1 denotes Carbon Monoxide, with a default range of 0-300ppm and user configurable for ranges from 0-100ppm to 0-999ppm)

Transmitter

S3KAL2 or S3KAS2 or S3KUL2 or S3KUS2	Series 3000 MkII transmitter is supplied complete with integral surface mounting lugs, 2 x M20 cable entries (ATEX/IECEx version) or 2 x 3/4"NPT conduit entries (UL/c-UL version), 1 x blanking plug, 1 x hex wrench set, weatherproof cover, operating magnet, configuration/test certificate and instruction manual. Units are 100% inspected prior to despatch from the factory. Order the required sensor separately.
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Sensor Part Numbers and Available Gases

S3KXS01SS	Oxygen (O ₂) 0-25% Vol
S3KXSC1SS	Carbon Monoxide (CO) 0-300ppm (default) 0-100 to 0-999ppm selectable
S3KXSH1SS	Hydrogen Sulphide (H ₂ S) 0-15ppm (default) 0-10 to 0-50ppm selectable
S3KXSH2SS	Hydrogen Sulphide (H ₂ S) 0-100ppm (default) 0-50 to 0-500ppm selectable
S3KXSL1SS	Chlorine (Cl ₂) 0-5ppm (default) 0-5 to 0-20ppm selectable
S3KXSZ1SS*	Ozone (O ₃) 0-0.4ppm only
S3KXSS1SS	Sulphur Dioxide (SO ₂) 0-15ppm (default) 0-5 to 0-20ppm selectable
S3KXSX1SS	Chlorine Dioxide (ClO ₂) 0-1ppm only
S3KXSM1SS	Nitrogen Monoxide (NO) 0-100ppm only
S3KXSN1SS	Nitrogen Dioxide (NO ₂) 0-10ppm only
S3KXSG1SS	Hydrogen (H ₂) 0-1000ppm only
S3KXSG2SS	Hydrogen (H ₂) 0-10,000 only
S3KXSR1SS*	Hydrogen Chloride (HCl) 0-10ppm (default) 0-10 to 0-20ppm selectable
S3KXSY1SS*	Hydrogen Cyanide (HCN) 0-20ppm only
S3KXSF1SS	Hydrogen Fluoride (HF) 0-12ppm only
S3KXSA1SS	Ammonia (NH ₃) 0-200ppm (default) 0-50 to 0-200ppm selectable
S3KXSA2SS	Ammonia (NH ₃) 0-1000ppm (default) 0-200 to 0-1,000ppm selectable
S3KXSP1SS	Phosphine (PH ₃) 0-1.2ppm only

Shipping Details

Shipping carton dimensions: 315mm (12.4") (L) x 230mm (9.0") (W) x 115mm (4.5") (D)
Approximate weight: Aluminium alloy LM25 : 1.7kg (3.75lbs.) Stainless Steel 316 : 3.7kg (8.16lbs.)

Optional Accessories

SPXCMTBR	Pipe Mounting Bracket
SPXCSDP	Sunshade/Deluge Protection
S3KCAL	Calibration gas flow housing
S3KCC	Collecting cone (for use when detecting Hydrogen gas only)
S3KDMK	Duct mounting kit (for use when detecting O ₂ , CO, H ₂ S or H ₂ gas)
S3KRMK	ATEX/UL/c-UL approved remote sensor mounting kit (includes enclosure with sensor socket, 15m (50 feet) of digital cable and glands, transmitter cable plug, mounting screws)
Calibration Gases	Contact Honeywell Analytics representative

Note: *Contact Honeywell Analytics for availability.



Our Product Range



Fixed Gas Monitoring

Honeywell Analytics offers a wide range of fixed gas detection solutions for a diverse array of industries and applications including: Commercial properties, industrial applications, semiconductor manufacturers, energy plants and petrochemical sites.

- » Detection of flammable, oxygen and toxic gases (including exotics)
- » Innovative use of 4 core sensing technologies – paper tape, electrochemical cell, catalytic bead and infrared
- » Capability to detect down to Parts Per Billion (ppb) or Percent by Volume (%v/v)
- » Cost effective regulatory compliance solutions

Portable Gas Monitoring

When it comes to personal protection from gas hazards, Honeywell Analytics has a wide range of reliable solutions ideally suited for use in confined or enclosed spaces. These include:

- » Detection of flammable, oxygen and toxic gases
- » Single gas personal monitors – worn by the individual
- » Multi-gas portable gas monitors – used for confined space entry and regulatory compliance
- » Multi-gas transportable monitors – used for temporary protection of area during site construction and maintenance activities

Technical Services

At Honeywell Analytics, we believe in the value of great service and customer care. Our key commitment is providing complete and total customer satisfaction. Here are just a few of the services we can offer:

- » Full technical support
- » Expert team on hand to answer questions and queries
- » Fully equipped workshops to ensure quick turnaround on repairs
- » Comprehensive service engineer network
- » Training on product use and maintenance
- » Mobile calibration service
- » Customised programmes of preventative/corrective maintenance
- » Extended warranties on products

Find out more

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