



Series 47K Gas Sensor

[Remote combustible gas detection]

MSA remote sensors, Series 47K, are designed to detect potentially hazardous concentrations of flammable gas and vapour in air.

A cost effective range of sensors for detecting up to 100% LEL including Poison Resistant, Standard and High Temperature versions.

Series 47K sensors are available with either EExd – 3/4" NPT or EExe – M25 junction boxes.

A complete range of accessories for calibration, environmental protection, sampling and duct mounting makes it suitable for virtually all applications in combustible gas detection.

Series 47K sensors used in combination with MSA Controllers fully meet the requirements of ATEX Directive 94/9/EC, including performance, and can be used as part of a safety related system.

MSA

Broad range of sensors

[Features & Benefits]

- 0–100% LEL
- EExe junction box with M25 cable gland thread
- EExd junction box with 3/4" NPT cable gland thread
- Standard [ST], Poison Resistant [PRP] and High Temperature [HT] versions
- Suitable for use in safety related systems [ATEX 94/9/EC]
- 3, 4 or 5 wire connection
- Stainless steel body
- Complete range of accessories
- Fast response time
- Excellent performance cost ratio

[Installation & Operation]

The number and location of sensors is important to achieve the most reliable detection of flammable gas or vapour. There are several factors to be considered before installing the sensor.

[See also EN 50073 "Guide for selection, installation, use and maintenance of apparatus for the detection and measurement of combustible gases or oxygen"]

[Sensor Types]

MSA sensors are available as standard in a stainless steel body.

Series 47K-PRP: high resistance to atmospheres containing silicones, lead, sulphur compounds and halogenated hydrocarbons over a temperature range –40 °C to +90 °C

Series 47K-ST: for general purpose applications over the ambient temperature range –40 °C to +90 °C

Series 47K-HT: to operate over a temperature range –20 °C to +160 °C

- Location of potential sources of a gas leak
- Location of potential sources of ignition
- Ventilation and airflow patterns
- The gas or vapour density with respect to air
- The physical properties of the gas or vapour
- Structural arrangements which could allow gas to accumulate
- Environmental conditions

[Applications]

- Chemical & Petrochemical Industry
- Printing Industry
- Pipelines
- Gas Industry
- Refrigeration Industry
- LPG Storage and Transportation
- Shipboard
- Paint Manufacture
- Solvent Recovery & Storage
- Loading-Unloading of Hazardous Gas & Vapour
- Automotive Test Benches
- Boiler Rooms
- Turbine & Compressors



and accessories

[Accessories]

There are applications where the sensors cannot be installed close to the potential source of a gas or vapour leak. This may be due to extremely high temperature, higher or lower atmospheric pressure, difficult to access locations, high flow-rate of air to be monitored or the presence of dust.

For these applications, MSA offers a variety of accessories such as flow-through adaptors or duct mount flanges, which allow reliable, trouble-free detection with minimum maintenance.

Additional accessories are available for environmental protection and a remote/in-situ calibration kit for ease of maintenance.

[Measuring Principle]

The MSA 47K Series of sensors operate on the principle of catalytic combustion. The sensing element consists of a pair of filaments ["pellistors"] connected to a pair of precision resistors to form a Wheatstone bridge.

One of the filaments, the detector, is coated with a catalyst, whilst the other, the compensator is used as a reference to achieve the best stability.

The gas or vapour diffuses through a porous Stainless Steel sintered disc, which acts as a flashback arrestor. When gas comes into contact with the surface of the detector filament, it is oxidised.

The heat generated by the reaction increases the temperature of the detector, which results in a change of the detector electrical resistance, and hence an unbalance of the Wheatstone bridge. The result is an output signal directly proportional to the concentration of the flammable gas or vapour.

[Approvals]

The Series 47K sensors are "performance" approved according to EN 61779-1-4 when operated in conjunction with an MSA type approved Controller. They can therefore be used as safety related devices meeting the requirements of ATEX Directive 94/9/EC.

The sensors are ATEX approved for use with or without an EExd or EExe certified junction box.

EC Type Certificate:

II 2G INERIS 03 ATEX 0208
EEx d IIC T6 -40 °C +40 °C
EEx d IIC T4 -40 °C +90 °C
EEx d IIC T3 -20 °C +160 °C

EXAM Test Reports:

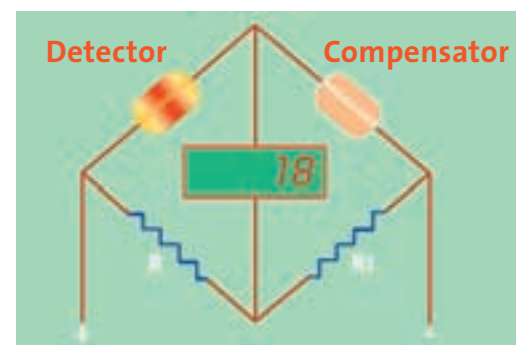
PFG-41300204P/NI 47K-ST and 47K-PRP
PFG-41300204P/NII 47K-ST
PFG-41300204P/NIII 47K-HT



47K 3/4" NPT



47K M 25 x 1.5



HT sensor and wall mount bracket

[Specifications]

Sensor

Power consumption:	1 watt typical		
Measuring range:	0–100% LEL		
Response time:	$\tau_{50} \leq 10$ sec. $\tau_{90} \leq 30$ sec.		
Operating life:	3 years minimum in clean air @ STP		
Storage life:	5 years minimum in MSA container @ STP		
Storage temperature:	–20 °C to +40 °C		
Operating temperature range:	ST & PRP: –25 °C to +55 °C [extended range]: –40 °C to +90 °C HT: –20 °C to +160 °C		
Operating humidity range:	5% to 95% RH non-condensing		
Operating pressure range:	100 ± 20 kPa		
Air velocity:	0–6 m/s [with duct mount flange 0.5–20 m/s]		
Poison resistance:	PRP sensor only: 10 ppm HMDS for 40 min. [max. signal loss 5% of reading]		
Weight:	ca. 230 g [St. St. sensor]		
Dimension:	Ø 36 x 56 mm		
Material:	Stainless steel		
Accessory thread:	M 36 x 1.5 mm		
Sensor to junction box:	3/4" NPT or M 25 x 1.5 mm		
Approvals:	EC Type Certificate:	EEx d IIC T6 –40 °C +40 °C	
	Ⓢ II 2G INERIS 03 ATEX 0208	EEx d IIC T4 –40 °C +90 °C	
		EEx d IIC T3 –20 °C +160 °C	

Extended range: The sensor extended temperature range is greater than the maximum specified in EN 61779-1-4. It is therefore strongly recommended that if used above +55 °C the sensor is calibrated at the operating temperature.

Junction Box

	Flameproof [EExd]	Increased safety [EExe]
Weight:	400 g	490 g
Dimension:	100 x 100 x 100 mm [H x L x D]	90 x 90 x 75 mm [H x L x D]
Material:	Aluminium	Aluminium
Cable gland thread:	3/4" NPT	M 25 x 1.5 mm
Terminals:	5 x 2.5 mm ²	5 x 2.5 mm ²
Temperature ranges:	–40 °C +60 °C T5 –40 °C +40 °C T6	–20 °C +55 °C T5 –20 °C +40 °C T6
Approvals:	CESI 02 ATEX 091	KEMA 99 ATEX 3853



Flow-through adapter



Calibration cap



Weather protection cap



Duct mount flange

[Ordering Information]

Gas Detector [Sensor & Junction Box]

Part-No.	Description	Sensor Material	Junction Box Thread	Type
10048830	47K-ST	V2A	M 25 x 1.5	EExe
10048852	47K-ST	V4A	M 25 x 1.5	EExe
10048853	47K-PRP	V4A	M 25 x 1.5	EExe
10048857	47K-ST	V2A	3/4" NPT	EExd
10048858	47K-ST	V4A	3/4" NPT	EExd
10048862	47K-PRP	V4A	3/4" NPT	EExd

Sensor

Part-No.	Description	Material	Thread
10063114	47K-ST	V2A	M 25 x 1.5
10048117	47K-ST	V4A	M 25 x 1.5
10048118	47K-PRP	V4A	M 25 x 1.5
10063115	47K-ST	V2A	3/4" NPT
10048271	47K-ST	V4A	3/4" NPT
10048272	47K-PRP	V4A	3/4" NPT
10048825	47K-HT	V4A	3/4" NPT
10048199	47K-HT	V4A	M 25 x 1.5

V4A = St. St. 316, V2A = St. St. 304

Junction Box & Wall Mount Bracket

Part-No.	Description	Material
10051091	EExe, 2 x M 25 x 1.5	Alu.
10051080	EExd, 2 x 3/4" NPT	Alu.
10048829	Wall mount bracket Ø 25 mm	V4A
10062674	HT junction box 100 °C	Alu.

Accessories

Part-No.	Description	Material
10049316	Calibration cap	PVC
10051623	Weather protection cap hose	V4A
10051731	Weather prot. cap 1/8" NPT pipe	V4A
10063145	Weather protection cap hose	V2A
10051625	Flow-through adapter	V4A
10051626	Flow-through adapter	Alu.
10051627	Duct mount flange	Alu.
10063146	Weather prot. cap 1/8" NPT pipe	V2A

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