MST Satellite XT R

The MST Satellite XT R is a generic gas monitoring instrument for the detection of a wide range of hazardous gases. Power is supplied by a local 12 to 24 VDC power supply. The MST Satellite XT R provides 3 single-pole single-throw relays for activation of external alarm devices. If the gas concentration exceeds the alarm levels, the instrument will activate the appropriate alarm relay and display an according message. A relay will also be activated in case of an instrument fault.

Target gas and measuring range depend on the type of sensor choosen (see technical specifications of the sensor). The sensor comes with the specific data in its internal data memory. The instrument performs an automatic sensor selftest every 24 hours. In case the quality of the sensor is out of specification a fault / maintenance signal is triggered.

Technical Specifications

Power Requirements		
voltage	12 ... 24 VDC	
consumption	max. 1.4 W	
Wiring		
power	2-wire shielded cable 2x0.5 mm^2 / 20.4 AWG (approx. 2 m delivered with instrument)	
relay contacts	6-wire shielded cable 6x0.25 mm^2 / 23 AWG (approx. 3 m delivered with instrument)	
Relay Outputs		
contacts	3 x SPST (single-pole single-throw)	
max. ratings	250 VAC / 30 VDC, 2 A	
Graphic Display	122 x 32 dots with backlight	
Status LED	green	
Keypad	6 touch-sensitive membrane function keys	
Physical Dimensions		
size	145 x 95 x 50 mm 5.7" x 3.7" x 2.0"	(L x W x H) (L x W x H)
weight	620 grams 22 ounces	
Mounting	special mounting plate (delivered with instrument)	
Housing Protection Class	IP 52 option: IP 65	
RFI / EMC	EN 55022 EN 50082-2	
Operating Conditions		
temperature	-20 °C ... +40 °C -4 °F ... +104 °F	
pressure	700 ... 1300 hPa	
humidity	20 ... 90 % r.h.	
Part Number	9602-0505	

MST Technology GmbH
82069 Hohenschäftlarn, Germany

MST Satellite XT FTT/R

The MST Satellite XT FTT/R is a generic gas monitoring instrument for the detection of a wide range of hazardous gases and is designed to interface with LONWORKS™ free topology systems. A free topology architecture allows the user to wire gas monitoring instruments and control devices with virtually no topology restrictions. Power is supplied by a local 12 to 24 VDC power supply. The MST Satellite XT FTT/R provides 3 single-pole single-throw relays for activation of external alarm devices. If the gas concentration exceeds the alarm levels, the instrument will activate the appropriate alarm relay and display an according message. A relay will also be activated in case of an instrument fault.

Target gas and measuring range depend on the type of sensor choosen (see technical specifications of the sensor). The sensor comes with the specific data in its internal data memory. The instrument performs an automatic sensor selftest every 24 hours. In case the quality of the sensor is out of specification a fault / maintenance signal is triggered.

Technical Specifications

Power Requirements	
voltage	12 ... 24 VDC
consumption	max. 1.4 W
Network	Standardized LonTalk™ protocol
data transmission	78 kBit per second
wiring topologies	free, e.g. Bus, Star, Loop, or mixed
Wiring	
network	4-wire shielded cable 2x2x1.0 mm^2 / 17 AWG (approx. 2 m delivered with instrument)
relay contacts	6-wire shielded cable 6x0.25 mm^2 / 23 AWG (approx. 3 m delivered with instrument)
Relay Outputs	
contacts	3 x SPST (single-pole single-throw)
max. ratings	250 VAC / 30 VDC, 2 A
Graphic Display	122 x 32 dots with backlight
Status LED	green
Keypad	6 touch-sensitive membrane function keys
Physical Dimensions	
size	145 x 95 x 50 mm (L x W x H) 5.7" x 3.7" x 2.0" (L x W x H)
weight	650 grams 23 ounces
Mounting	special mounting plate (delivered with instrument)
Housing Protection Class	IP 52 option: IP 65
RFI / EMC	EN 55022 EN 50082-2
Operating Conditions	
temperature	-20 °C ... +40 °C -4 °F ... +104 °F
pressure	700 ... 1300 hPa
humidity	20 ... 90 % r.h.
Part Number	9602-0405

MST Technology GmbH
82069 Hohenschäftlarn, Germany

MST Satellite XT FTT/C

The MST Satellite XT FTT/C is a gas monitoring instrument for the detection of a wide range of combustible gases and vapours and is designed to interface with LONWORKS™free topology systems. A free topology architecture allows the user to wire gas monitoring instruments and control devices with virtually no topology restrictions. Power is supplied by a local 12 to 24 VDC power supply.

The MST Satellite XT FTT/C is factory calibrated for the detection of methane in air mixtures with concentrations up to 5 %-vol. (100 % LEL Lower Explosion Limit). A correction K-factor can be entered to allow detection of a variety of other combustible gases.

The sensor comes with the specific data in its internal data memory. The instrument performs an automatic sensor selftest every 24 hours. In case the quality of the sensor is out of specification a fault / maintenance signal is triggered.

Technical Specifications

Power Requirements	
voltage	12 ... 24 VDC
consumption	max. 0.9 W
Network	Standardized LonTalk™ protocol
data transmission	78 kBit per second
wiring topologies	free, e.g. Bus, Star, Loop, or mixed
Wiring	4-wire shielded cable 2x2x1.0 mm^2 / 17 AWG (approx. 2m delivered with instrument)
Graphic Display	122 x 32 dots with backlight
Status LED	green
Keypad	6 touch-sensitive membrane function keys
Physical Dimensions	
size	145 x 95 x 50 mm (L x W x H) 5.7" x 3.7" x 2.0" (L x W x H)
weight	520 grams 18 ounces
Mounting	special mounting plate (delivered with instrument)
Housing Protection Class	IP 52 option: IP 65
RFI / EMC	EN 55022 EN 50082-2
Operating Conditions	
temperature	-20 °C ... +40 °C -4 °F ... +104 °F
pressure	700 ... 1300 hPa
humidity	20 ... 90 % r.h.
Part Number	9602-0450

MST Satellite XT 4-20 mA/C

The MST Satellite XT 4-20/C is a generic gas monitoring instrument for the detection of a wide range of combustible gases and vapours and is designed to interface with standard (0) 4 to 20 mA alarm or control systems.

The MST Satellite XT 4-20/C is factory calibrated for the detection of methane in air mixtures with concentrations up to 5 %-vol. (100 % LEL Lower Explosion Limit). A correction K-factor can be entered to allow detection of a variety of other combustible gases.

The sensor comes with the specific data in its internal data memory. The instrument performs an automatic sensor selftest every 24 hours. In case the quality of the sensor is out of specification a fault / maintenance signal is triggered.

Technical Specifications

Power Requirements			
voltage	12 ... 24 VDC		
consumption	max. 1.4 W		
Analog Signal Output	Monitoring mode	4 ... 20 mA	
	Warning condition	2.8 ... 4 mA	0.1 Hz
	Maintenance mode	2.4 ... 4 mA	1 Hz
	Fault range	0 ... 2 mA	
Wiring	3-wire shielded cable 3x1.0 mm^2 / 17 AWG (approx. 2m delivered with instrument)		
Graphic Display	122 x 32 dots with backlight		
Status LED	green		
Keypad	6 touch-sensitive membrane function keys		
Physical Dimensions			
size	145 x 95 x 50 mm	(L x W x H)	
	5.7" x 3.7" x 2.0"	(L x W x H)	
weight	520 grams 18 ounces		
Mounting	special mounting plate (delivered with instrument)		
Housing Protection Class	IP 52 option: IP 65		
RFI / EMC	EN 55011 EN 50082-2		
Operating Conditions			
temperature	-20 °C ... +40 °C		
	-4 °F ... +104 °F		
pressure	700 ... 1300 hPa		
humidity	20 ... 90 % r.h.		
Part Number	9602-0250		

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MST Satellite XT 4-20 mA

The MST Satellite XT 4-20 is a generic gas monitoring instrument for the detection of a wide range of hazardous gases and is designed to interface with standard (0) 4 to 20 mA alarm or control systems.

Target gas and measuring range depend on the type of sensor choosen (see technical specifications of the sensor). The sensor comes with the specific data in its internal data memory. The instrument performs an automatic sensor selftest every 24 hours. In case the quality of the sensor is out of specification a fault / maintenance signal is triggered.

Technical Specifications

Power Requirements			
voltage	12 ... 24 VDC		
consumption	max. 1 W		
Analog Signal Output	Monitoring mode	4 ... 20 mA	
	Warning condition	2.8 ... 4 mA	0.1 Hz
	Maintenance mode	2.4 ... 4 mA	1 Hz
	Fault range	0 ... 2 mA	
Wiring	3-wire shielded cable 3x1.0 mm^2 / 17 AWG (approx. 2m delivered with instrument)		
Graphic Display	122 x 32 dots with backlight		
Status LED	green		
Keypad	6 touch-sensitive membrane function keys		
Physical Dimensions			
size	145 x 95 x 50 mm	(L x W x H)	
	5.7" x 3.7" x 2.0"	(L x W x H)	
weight	480 grams 17 ounces		
Mounting	special mounting plate (delivered with instrument)		
Housing Protection Class	IP 52 option: IP 65		
RFI / EMC	EN 55011 EN 50082-2		
Operating Conditions			
temperature	-20 °C ... +40 °C		
	-4 °F ... +104 °F		
pressure	700 ... 1300 hPa		
humidity	20 ... 90 % r.h.		
Part Number	9602-0200		

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MST Satellite XT FTT

The MST Satellite XT FTT is a generic gas monitoring instrument for the detection of a wide range of hazardous gases and is designed to interface with LONWORKS™ free topology systems.

A free topology architecture allows the user to wire gas monitoring instruments and control devices with virtually no topology restrictions. Power is supplied by a local 12 to 24 VDC power supply.

Target gas and measuring range depend on the type of sensor choosen (see technical specifications of the sensor). The sensor comes with the specific data in its internal data memory. The instrument performs an automatic sensor selftest every 24 hours. In case the quality of the sensor is out of specification a fault / maintenance signal is triggered.

Technical Specifications

Power Requirements	
voltage	12 ... 24 VDC
consumption	max. 0.6 W
Network	Standardized LonTalk™ protocol
data transmission	78 kBit per second
wiring topologies	free, e.g. Bus, Star, Loop, or mixed
Wiring	4-wire shielded cable 2x2x1.0 mm^2 / 17 AWG (approx. 2m delivered with instrument)
Graphic Display	122 x 32 dots with backlight
Status LED	green
Keypad	6 touch-sensitive membrane function keys
Physical Dimensions	
size	145 x 95 x 50 mm (L x W x H) 5.7" x 3.7" x 2.0" (L x W x H)
weight	480 grams 17 ounces
Mounting	special mounting plate (delivered with instrument)
Housing Protection Class	IP 52 option: IP 65
RFI / EMC	EN 55022 EN 50082-2
Operating Conditions	
temperature	-20 °C ... +40 °C -4 °F ... +104 °F
pressure	700 ... 1300 hPa
humidity	20 ... 90 % r.h.
Part Number	9602-0400

MST Technology GmbH
82069 Hohenschäftlarn, Germany

MST Gas Sensor 9602

Honeywell

Oxygen (O_2)

9602-5501

Oxygen (O_2)
9602-5501

MST Gas Sensors 9602-5501 is only intended for use with the following Honeywell Analytics gas detectors:

Satellite Series

Sat-Ex

Satellite PGD

Please refer to the specific gas detector's Operational Manual for further details.

Oxygen O_2	
Sensor Type	O_2 Oxygen
Part Number	9602-5501
Measuring Principle	Amperometric 2-electrode sensor
Colour of Sensor Cap	Grey
Specific Sensor Data	Programmed on PROM inside the sensor
Standard Range	1 to 25.0% v/v
Lower Detectable Limit (LDL)	1% v/v
Maximum Range	30% v/v
Sensitivity Decay	<2% signal/month (typically <5% over Operating Life)
Sensitivity	80-120µA @ 20.9 v/v
Response Time	Constant within standard range
t_{50}	n/d
t_{90}	< 15 s
Sensor Warm-up Time	5 s
Operating Conditions	Continuous: 5 - 95 % r.h. -20°C to +50°C Short term: 0 - 99 % r.h. non-condensing
Storage Conditions	0°C to 20°C
Temperature Dependence	Compensated with microprocessor
Sensor Life Expectancy	> 24 months
Sensor Dimensions	
Height	44mm (1.69")
Diameter	21.5mm (0.84")
Weight	27g (0.95oz)

Note:
All response data given are typical values and related to the sensor being used under normal conditions, i.e. temperature 20°C, r.h. 40-60%, 1013mbar.

General Specification

Cross-sensitivities

Toxic gases at TLV levels will have no cross-sensitivity effect on Oxygen. At very high levels (i.e. percent levels), highly oxidising gases (e.g. Ozone and Chlorine) will interfere to the extent of their Oxygen equivalent, but most other commonly occuring gases will have no effect.

Acid Gases

IMPORTANT NOTE:
Acid gases such as CO_2 and SO_2 will be absorbed by the electrolyte and tend to increase the flux of Oxygen to the electrode. This gives an enhanced Oxygen signal of approximately 0.3% of signal per 1% CO_2. MST Oxygen gas sensors are not suitable for continuous operation in concentrations of CO_2 above 25%.

Our Product Range

Honeywell

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 four 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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We Save Lives

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MST Satellite XT 4-20 mA/R

The MST Satellite XT 4-20 mA/R is a generic gas monitoring instrument for the detection of a wide range of hazardous gases and is designed to interface with standard (0) 4 to 20 mA alarm or control systems.

The MST Satellite XT 4-20 mA/R provides 3 single-pole single-throw relays for activation of external alarm devices. If the gas concentration exceeds the alarm levels, the instrument will activate the appropriate alarm relay and display an according message. A relay will also be activated in case of an instrument fault.

Target gas and measuring range depend on the type of sensor choosen (see technical specifications of the sensor). The sensor comes with the specific data in its internal data memory. The instrument performs an automatic sensor selftest every 24 hours. In case the quality of the sensor is out of specification a fault / maintenance signal is triggered.

Technical Specifications

Power Requirements			
voltage	12 ... 24 VDC		
consumption	max. 1.8 W		
Analog Signal Output	Monitoring mode	4 ... 20 mA	
	Warning condition	2.8 ... 4 mA	0.1 Hz
	Maintenance mode	2.4 ... 4 mA	1 Hz
	Fault range	0 ... 2 mA	
Wiring			
analog interface	3-wire shielded cable 3x1.0 mm^2 / 17 AWG (approx. 2 m delivered with instrument)		
relay contacts	6-wire shielded cable 6x0.25 mm^2 / 23 AWG (approx. 3 m delivered with instrument)		
Relay Outputs			
contacts	3 x SPST (single-pole single-throw)		
max. ratings	250 VAC / 30 VDC, 2 A		
Graphic Display	122 x 32 dots with backlight		
Status LED	green		
Keypad	6 touch-sensitive membrane function keys		
Physical Dimensions			
size	145 x 95 x 50 mm	(L x W x H)	
	5.7" x 3.7" x 2.0"	(L x W x H)	
weight	650 grams		
	23 ounces		
Mounting	special mounting plate (delivered with instrument)		
Housing Protection Class	IP 52 option: IP 65		
RFI / EMC	EN 55022 EN 50082-2		
Operating Conditions			
temperature	-20 °C ... +40 °C		
	-4 °F ... +104 °F		
pressure	700 ... 1300 hPa		
humidity	20 ... 90 % r.h.		
Part Number	9602-0205		

MST Technology GmbH
82069 Hohenschäftlarn, Germany

MST Gas Sensors 9602

Technical Specifications

Specification Sheet Ammonia 0-100 ppm

Sensor Type	NH_3 Ammonia 0-100 ppm
Part Number	9602-6704
Other detectable gases	DMA, TDMAT
Measuring Principle	amperometric 3-electrode sensor
Color of Sensor Cap	dark brown
Specific Sensor Data	programmed on PROM inside the sensor
Standard Range	0... 100 ppm
Lower Detectable Limit (LDL)	5 ppm
Maximum Range	200 ppm
MAK/TLV	20 ppm / 25 ppm
Sensitivity Decay	< 5 % / 6 months
Deviation from Linearity (within standard range)	<10 % FS
Zero Current at normal conditions	< ±100 nA
Sensitivity	140 nA/ppm ± 40 nA/ppm
Response Time	constant within standard range
t_{50}	< 20 s (based on 5 min exposure time)
t_{90}	< 60 s (based on 5 min exposure time)
Sensor warm-up time	5 s
Operating conditions	-20 ... +40 °C; 10 ... 90 % r.h. non-condensing
Storage conditions	0 ... +4 °C; 40 ... 60 % r.h. non-condensing
Temperature dependence	compensated with microprocessor
Sensor life	>2 years

Sensor dimensions

• Height	43 mm (1.69 ")
• Diameter	20.5 mm (0.80 ")
• Weight	9 g (0.31 oz)

Note:

3) All response data given are typical values and related to the sensor being used under normal conditions, i.e. temperature 20 °C, r.h. 40 ... 60 %, normal air pressure.
4) 90% r.h. may only be tolerated short term (average over several days should not exceed 80% r.h.)

MST Gas Sensors 9602

Cross Sensitivity

Specification Sheet Ammonia 0-100 ppm

Gas		Test Gas Concentration	Reading in ppm
Arsine	AsH_3	1 ppm	0
Carbon Dioxide	CO_2	5000 ppm	0
Carbon Monoxide	CO	1000 ppm	0
Chlorine	Cl_2	1 ppm	0
Ethanol	C_2H_5OH	1000 ppm	0
Hydrocarbons (saturated)	-	1%	0
Hydrocarbons (unsaturated)	-	1%	0
Hydrogen	H_2	1%	0
Hydrogen Chloride	HCl	5 ppm	0
Hydrogen Cyanide	HCN	10 ppm	0
Hydrogen Fluoride	HF	4 ppm	0
Hydrogen Sulphide	H_2S	10 ppm (short term)	0
Isopropanol	C_3H_7OH	1000 ppm	0
Methanol	CH_3OH	1000 ppm	0
Phosphine	PH_3	0.30 ppm	0
Sulphur Dioxide	SO_2	2 ppm	0

1) Short gas exposure in minute range.

Test Conditions: T=20^{O}C, P=1013 hPa, Flow Rate = 30 l/h

Please note that the values stated above are approximate values. Negative values are not displayed on the Satellite LCD Display; they will be shown as 0.

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MST Gas Sensors 9602

Technical Specifications

Specification Sheet Sulfur Hexafluoride

Only in combination with Pyrolyzer Unit!

Sensor Type	SF6 Sulfur Hexafluoride
Part Number	9602-9710
Measuring Principle	amperometric 3-electrode sensor
Color of Sensor Cap	white
Specific Sensor Data	programmed on PROM inside the sensor
Standard Range	0.000...0.500 % vol.
Lower Detectable Limit (LDL)	0.010 % vol.
Maximum Range	1.000 % vol.
MAK/TLV	1000 ppm / 1000 ppm
Sensitivity Decay	< 10 % / month
Deviation from Linearity (within standard range)	< 5 % FS
Zero Current at normal conditions	below LDL
Sensitivity	0.8…5.0 nA/ppm
Response Time	constant within standard range
t_{50}	< 40 s (based on 5 min exposure time)
t_{90}	< 90 s (based on 5 min exposure time)
Sensor warm-up time	5 s
Operating conditions	-20 ... +35 °C; 20 ... 80 % r.h. non-condensing
Storage conditions	0 ... +4 °C; 40 ... 60 % r.h. non-condensing
Temperature dependence	compensated with microprocessor
Sensor life	15 months
Storage conditions	0 ... +4 °C; 40 ... 60 % r.h. non-condensing

Sensor dimensions

• Height	43 mm (1.69 ")
• Diameter	20.5 mm (0.80 ")
• Weight	9 g (0.31 oz)

Note:
All response data given are typical values and related to the sensor being used under normal conditions, i.e. temperature 20 °C, r.h. 40 ... 60 %, normal air pressure.

MST Gas Sensors 9602

Cross Sensitivity

Specification Sheet Sulfur Hexafluoride

Gas	Test Gas Concentration	Reading in ppm
No Data Presently Available		

Test Conditions: T=20^{O}C, P=1013 hPa, Flow Rate = 30 l/h

Please note that the values stated above are approximate values. Negative values are not displayed on the Satellite LCD Display; they will be shown as 0.

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MST Gas Sensors 9602

Technical Specifications

Specification Sheet Ozone – Exhaust Monitoring

Sensor Type	O_3 Ozone
Part Number	9602-7101
Measuring Principle	amperometric 3-electrode sensor
Color of Sensor Cap	grey
Specific Sensor Data	programmed on PROM inside the sensor
Standard Range	0.00 ... 1.00 ppm
Lower Detectable Limit (LDL)	0.05 ppm
Maximum Range	10.00 ppm
MAK/TLV	0.10 ppm*/0.10 ppm *TRK
Sensitivity Decay	< 5 % / 6 months
Deviation from Linearity (within standard range)	< 10 % FS
Zero Current at normal conditions	below LDL
Sensitivity	300…800 nA/ppm
Response Time	constant within standard range
t_{50}	< 30 s (based on 4 min exposure time)
t_{90}	< 60 s (based on 4 min exposure time)
Sensor warm-up time	5 s
Operating conditions	-10 ... +40 °C; 10 ... 95 % r.h. non-condensing
Storage conditions	0 ... +4 °C; 40 ... 60 % r.h. non-condensing
Temperature dependence	compensated with microprocessor
Sensor life	2 years
Sensor dimensions	
• Height	43 mm (1.69 ")
• Diameter	20.5 mm (0.80 ")
• Weight	9 g (0.31 oz)

Note:
All response data given are typical values and related to the sensor being used under normal conditions, i.e. temperature 20 °C, r.h. 40 ... 60 %, normal air pressure.

MST Gas Sensors 9602

Cross Sensitivity

Specification Sheet Ozone – Exhaust Monitoring

Gas		Test Gas Concentration	Reading in ppm
Arsine	AsH3	200 ppb	0
Ammonia	NH_3	100 ppm	0.00
Carbon Dioxide	CO_2	5000 ppm	0.00
Carbon Monoxide	CO	100 ppm	0.00
Chlorine	Cl_2	1 ppm	1.40
Chlorine Dioxide	ClO_2	0.1 ppm	0.12
Diborane	B_2H_6	250 ppb	0
Fluorine	F_2	0.1 ppm	0.07
Germane	GeH_4	1.1 ppm	0.00
Hydrocarbons	-	% - range	0.00
Hydrogen	H_2	1000 ppm	0.00
Hydrogen Cyanide	HCN	20 ppm	0.00
Hydrogen Fluoride	HF	5 ppm	0.00
Hydrogen Selenide	H_2Se	0.4 ppm	0.00
Hydrogen Sulphide	H_2S	1 ppm	0.00
Nitric Oxide	NO	30 ppm	0.00
Nitrogen Dioxide	NO_2	10 ppm	1.40
Silane	SiH_4	1 ppm	0.00
Sulphur Dioxide	SO_2	30 ppm	0.00
Tert-Butylmercaptame	TBM	10 mg/m³	0

Test Conditions: T=20^{O}C, P=1013 hPa, Flow Rate = 30 l/h

Please note that the values stated above are approximate values. Negative values are not displayed on the Satellite LCD Display; they will be shown as 0.

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MST Gas Sensors 9602

Technical Specifications

Specification Sheet Sulfur Dioxide

Sensor Type	SO_2 Sulfur Dioxide
Part Number	9602-5900
Measuring Principle	amperometric 3-electrode sensor
Color of Sensor Cap	green
Specific Sensor Data	programmed on PROM inside the sensor
Standard Range	0.0 ... 25.0 ppm
Lower Detectable Limit (LDL)	0.5 ppm
Maximum Range	100.0 ppm
MAK/TLV	0.5 ppm / 2.0 ppm
Sensitivity Decay	< 2 % / month
Deviation from Linearity (within standard range)	< 5 % FS
Zero Current at normal conditions	below LDL
Sensitivity	400…600 nA/ppm
Response Time	constant within standard range
t_{50}	< 10 s (based on 1 min exposure time)
t_{90}	< 30 s (based on 1 min exposure time)
Sensor warm-up time	5 s
Operating conditions	-20 ... +50 °C; 15 ... 90 % r.h. non-condensing
Storage conditions	0 ... +4 °C; 40 ... 60 % r.h. non-condensing
Temperature dependence	compensated with microprocessor
Sensor life	3 years
Sensor dimensions	
• Height	43 mm (1.69 ")
• Diameter	21.5 mm (0.84 ")
• Weight	12 g (0.42 oz)

Note:
All response data given are typical values and related to the sensor being used under normal conditions, i.e. temperature 20 °C, r.h. 40 ... 60 %, normal air pressure.

MST Gas Sensors 9602

Cross Sensitivity

Specification Sheet Sulfur Dioxide

Gas		Test Gas Concentration	Reading in ppm
Ammonia	NH_3	100 ppm	0.0
Carbon Monoxide	CO	300 ppm	3.0
Hydrogen	H_2	4000 ppm	5.0
Hydrogen Cyanide	HCN	10 ppm	0.0
Hydrogen Fluoride	HF	7 ppm	0.0
Hydrogen Sulphide	H_2S	15 ppm	0.0
Nitric Oxide	NO	35 ppm	0.0
Nitrogen Dioxide	NO_2	5 ppm	0.0
Ozone	O_3	1 ppm	0.0

Test Conditions: T=20^{O}C, P=1013 hPa, Flow Rate = 30 l/h

Please note that the values stated above are approximate values. Negative values are not displayed on the Satellite LCD Display; they will be shown as 0.

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MST Gas Sensors 9602

Technical Specifications

Specification Sheet Trimethylphosphite

Sensor Type	TMP Trimethylphosphite
Part Number	9602-7800
Measuring Principle	amperometric 3-electrode sensor
Color of Sensor Cap	black
Specific Sensor Data	programmed on PROM inside the sensor
Standard Range	0.0 ... 30.0 ppm
Lower Detectable Limit (LDL)	1.0 ppm
Maximum Range	50.0 ppm
MAK/TLV	- / 2.0 ppm
Sensitivity Decay	< 3 % / month
Deviation from Linearity (within standard range)	< 5 % FS
Zero Current at normal conditions	below LDL
Sensitivity	100…200 nA/ppm
Response Time	constant within standard range
t_{50}	< 30 s (based on 4 min exposure time)
t_{90}	< 70 s (based on 4 min exposure time)
Sensor warm-up time	5 min
Operating conditions	-20 ... +40 °C; 10 ... 95 % r.h. non-condensing
Storage conditions	0 ... +4 °C; 40 ... 60 % r.h. non-condensing
Temperature dependence	compensated with microprocessor
Sensor life	3 years
Sensor dimensions	
• Height	43 mm (1.69 ")
• Diameter	20.5 mm (0.80 ")
• Weight	9 g (0.31 oz)

Note:
All response data given are typical values and related to the sensor being used under normal conditions, i.e. temperature 20 °C, r.h. 40 ... 60 %, normal air pressure.

MST Gas Sensors 9602

Cross Sensitivity

Specification Sheet Trimethylphosphite

Gas		Test Gas Concentration	Reading in ppm
Ammonia	NH_3	300 ppm	0.0
Arsine	AsH_3	0.3 ppm	1.0
Carbon Dioxide	CO_2	5000 ppm	0.0
Carbon Monoxide	CO	300 ppm	0.0
Chlorine	Cl_2	5 ppm	1.0
Ethanol	C_2H_5OH	6.6%	6.0
Hydrocarbons	-	% - range	0.0
Hydrocarbons (chlorinated)	-	% - range	0.0
Hydrogen	H_2	1000 ppm	0.0
Hydrogen Bromide	HBr	5 ppm	5.0
Hydrogen Chloride	HCl	5 ppm	5.0
Hydrogen Sulphide	H_2S	14 ppm	30.0
Nitric Oxide	NO	10 ppm	2.0
Phosgene	$COCl_2$	0.5 ppm	0.0
Silane	SiH_4	10 ppm	0.0
Sulphur Dioxide	SO_2	5 ppm	2.5

Test Conditions: T=20^{O}C, P=1013 hPa, Flow Rate = 30 l/h

Please note that the values stated above are approximate values. Negative values are not displayed on the Satellite LCD Display; they will be shown as 0.

Update: 08-08-2006

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MST Gas Sensors 9602

Technical Specifications

Specification Sheet Tetraethylorthasilicate

Sensor Type	TEOS Tetraethylorthosilicate
Part Number	9602-7500
Measuring Principle	amperometric 2-electrode sensor
Color of Sensor Cap	green
Specific Sensor Data	programmed on PROM inside the sensor
Standard Range	0 ... 100 ppm
Lower Detectable Limit (LDL)	5 ppm
Maximum Range	500 ppm
MAK/TLV	10 ppm / 10 ppm
Sensitivity Decay	< 5 % / month
Deviation from Linearity (within standard range)	< 10 % FS
Zero Current at normal conditions	below LDL
Sensitivity	200…600 nA/ppm
Response Time	constant within standard range
t_{50}	< 60 s (based on 4 min exposure time)
t_{90}	< 140 s (based on 4 min exposure time)
Sensor warm-up time	5 s
Operating conditions	-20 ... +40 °C; 10 ... 90 % r.h. non-condensing
Storage conditions	0 ... +4 °C; 40 ... 60 % r.h. non-condensing
Temperature dependence	compensated with microprocessor
Sensor life	2 years

Sensor dimensions

• Height	43 mm (1.69 ")
• Diameter	20.5 mm (0.80 ")
• Weight	9 g (0.31 oz)

Note:
All response data given are typical values and related to the sensor being used under normal conditions, i.e. temperature 20 °C, r.h. 40 ... 60 %, normal air pressure.

MST Gas Sensors 9602

Cross Sensitivity

Specification Sheet Tetraethylorthasilicate

Gas		Test Gas Concentration	Reading in ppm
Ammonia	NH_3	65 ppm	0
Carbon Dioxide	CO_2	5000 ppm	0
Carbon Monoxide	CO	100 ppm	20
Chlorine	Cl_2	5 ppm	0
Diborane	B_2H_6	0.6 ppm	3
Ethylene	C_2H_4	500 ppm	5
Hydrogen	H_2	350 ppm	5
Hydrogen Cyanide	HCN	10 ppm	0
Hydrogen Sulphide	H_2S	11 ppm	0
Methane	CH_4	10 000 ppm	0
Nitrogen Dioxide	NO_2	50 ppm	1
Nitrogen Oxide	NO	100 ppm	7
Sulphur Dioxide	SO_2	30 ppm	2

Test Conditions: T=20^{O}C, P=1013 hPa, Flow Rate = 30 l/h

Please note that the values stated above are approximate values. Negative values are not displayed on the Satellite LCD Display; they will be shown as 0.

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MST Gas Sensors 9602

Technical Specifications

Specification Sheet Trimethylborate

Sensor Type	TMB Trimethylborate
Part Number	9602-7510
Measuring Principle	amperometric 2-electrode sensor
Color of Sensor Cap	green
Specific Sensor Data	programmed on PROM inside the sensor
Standard Range	0 ... 500 ppm
Lower Detectable Limit (LDL)	5 ppm
Maximum Range	1000 ppm
MAK/TLV	- / -
Sensitivity Decay	< 5 % / month
Deviation from Linearity (within standard range)	< 10 % FS
Zero Current at normal conditions	below LDL
Sensitivity	30…60 nA/ppm
Response Time	constant within standard range
t_{50}	< 60 s (based on 4 min exposure time)
t_{90}	< 140 s (based on 4 min exposure time)
Sensor warm-up time	5 s
Operating conditions	-20 ... +40 °C; 10 ... 90 % r.h. non-condensing
Storage conditions	0 ... +4 °C; 40 ... 60 % r.h. non-condensing
Temperature dependence	compensated with microprocessor
Sensor life	2 years

Sensor dimensions

• Height	43 mm (1.69 ")
• Diameter	20.5 mm (0.80 ")
• Weight	9 g (0.31 oz)

Note:
All response data given are typical values and related to the sensor being used under normal conditions, i.e. temperature 20 °C, r.h. 40 ... 60 %, normal air pressure.

MST Gas Sensors 9602

Cross Sensitivity

Specification Sheet Trimethylborate

Gas		Test Gas Concentration	Reading in ppm
Ammonia	NH_3	65 ppm	0
Carbon Dioxide	CO_2	5000 ppm	0
Carbon Monoxide	CO	100 ppm	60
Chlorine	Cl_2	5 ppm	0
Diborane	B_2H_6	0.6 ppm	9
Ethylene	C_2H_4	500 ppm	15
Hydrogen	H_2	350 ppm	15
Hydrogen Cyanide	HCN	10 ppm	0
Hydrogen Sulphide	H_2S	11 ppm	0
Methane	CH_4	10 000 ppm	0
Nitrogen Dioxide	NO_2	50 ppm	0
Nitrogen Oxide	NO	100 ppm	20
Sulphur Dioxide	SO_2	30 ppm	0
Tetraethylsilicate	TEOS	10 ppm	30

Test Conditions: T=20^{O}C, P=1013 hPa, Flow Rate = 30 l/h

Please note that the values stated above are approximate values. Negative values are not displayed on the Satellite LCD Display; they will be shown as 0.

Update: 08-08-2006

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MST Gas Sensor 9602

Honeywell

Arsine (AsH_3)

9602-6004

Arsine (AsH_3)
9602-6004

MST Gas Sensors 9602 are only intended for use with the following Honeywell Analytics gas detectors:

Satellite Series

Sat-Ex

Satellite Portable Gas Detector

Please refer to the specific gas detector's Operational Manual for further details.

Arsine (AsH_3)	
Sensor Type	AsH3, Arsine (with H_2S Filter)
Part Number	9602-6004
Measuring Principle	Amperometric 3-electrode sensor
Color of Sensor Cap	Grey beige
Specific Sensor Data	Programmed on PROM inside the sensor
Standard Range	0.00 to 1.00ppm
Lower Detectable Limit (LDL)	0.03ppm
Maximum Range	10.00ppm
Long-term Sensitivity Drift	< 5% / 6 months
Deviation from Linearity (within Standard Range)	< 10% FS
Zero Current at Normal Conditions	Below LDL
Sensitivity	950 to 1850 nA/ppm
Response Time	Constant within standard range
t_{50}	< 10 s (based on 2 min exposure time)
t_{90}	< 30 s (based on 2 min exposure time)
Sensor Warm-up Time	5 s
Operating Temperature	-20°C to +40°C continuous; -40°C to +50°C intermittent
Operating Humidity	10% to 95% r.h. non condensing
Storage Conditions	0°C to +4°C; 40% to 60% r.h. non-condensing
Temperature Dependence	Compensated with microprocessor
Sensor Life Expectancy	≥ 24 months under typical application conditions
Sensor Dimensions	
Height	43mm (1.69")
Diameter	20.5mm (0.80")
Weight	9g (0.31oz)

Note:
All response data given are typical values and related to the sensor being used under normal conditions, i.e. temperature 20°C, r.h. 40-60%, 1013 hPa.

General Specification

As with all electrochemical sensor cells, dramatic output changes in reported concentrations can be expected under rapidly changing environmental conditions. Please ensure sensors are located in areas not prone to sudden changes in humidity and temperature.

Actual readings may be affected by flow rates and absorption on tubing and other gas path surfaces.

All sensors are shipped pre-calibrated to traceable national standards. Dependent on actual operating conditions and overall exposure to gases, checking, calibration or exchange is subject to local regulations or site practices.

1. How do electrochemical sensors work?

All Honeywell Analytics electrochemical sensor cells are amperometric type i.e. are fuel cell type acting like batteries, where one component, in order to generate a current, is missing: the gas that should be detected (target gas).

The target gas diffuses through a gas permeable membrane into the sensor where an electrochemical reaction results in a low current that is direct proportional to the measured gas concentration (generally in nA/ppm reading).

2. How does the electrochemical sensor work with the detection instrument?

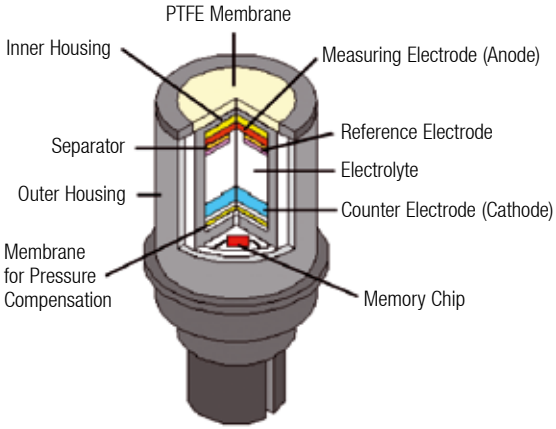
The current is amplified to a signal that is processed through an electronic circuit in order to display the real-time gas concentration.

The zero current of the electrochemical cell is always present and is monitored and suppressed by the electronics.

There are different ways to adjust the correct amplification factor of the electronics. Honeywell Analytics has created the “intelligent sensor” which features a built-in PROM. All relevant sensor data such as sensitivity, target gas, date of first calibration, calibration data, zero current, and alarm levels are programmed onto this chip. Our detectors can read this data and adjust the amplifying factor automatically.

3. How does a sensor self-test work?

All relevant sensor data (ref. Pos 2) are programmed onto the PROM inside the electrochemical sensor. Our detectors can read this data. Every 24 hours an automatic sensor self-test is performed, which compares an electronically initiated sensor signal with the stored calibration curve. This makes sure that the sensors are always within specification that is set during the first calibration. If the sensor is out of specification the instrument will indicate that the sensor either needs to be checked or needs to be replaced.



Cross Sensitivities

Each MST Gas Sensor 9602 is potentially cross sensitive to other gases and this may cause a gas reading when exposed to other gases than those originally designated. The table to the right presents typical readings that will be observed when a new sensor is exposed to the cross sensitive gas (or a mixture of gases containing the cross sensitive species).

Notes:

1. Test Conditions: T=20°C, P=1013 hPa, Flow Rate = 30 l/h
2. Please note that the values stated are approximate values.
3. Interference factors may differ from sensor to sensor and with lifetime.
4. This table does not claim to be complete. The sensor might also be sensitive to other gases.
5. The Satellite, Satex and Satellite PGD products do not display negative readings. The display will show zero for any negative readings.
6. It is not recommended to use cross sensitivity factors to enable cross calibration. The target gas should be used for calibration.

Gas / Vapour	Chemical Formula	Concentration Applied (ppm)	Reading (ppm AsH_3)
Ammonia	NH_3	108	<0.1
Carbon Dioxide	CO_2	5000	0
Carbon Monoxide	CO	85	0
Chlorine	Cl_2	0.85	<-0.05
Diborane	B_2H_6	0.2	0.25
Disilane	Si_2H_6	0.27	0.12
Germane	GeH_4	1.39	0.25
Hydrocarbons	CH_4	18000	0
Hydrogen	H_2	3100	<0.05
Hydrogen Chloride	HCl	7.9	0
Hydrogen Cyanide	HCN	12.6	0.7
Hydrogen Fluoride	HF	7.2	0
Hydrogen Selenide	H_2Se	0.85	0
Hydrogen Sulphide	H_2S	18.2	0
Nitrogen Dioxide	NO_2	10.1	-2.2
Phosphine	PH_3	0.18	0.3
Propan-2-ol	C_3H_5OH	20000	<0.05
Silane	SiH_4	4.4	0.7
Sulphur Dioxide	SO_2	17.8	0

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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MST Gas Sensor 9602

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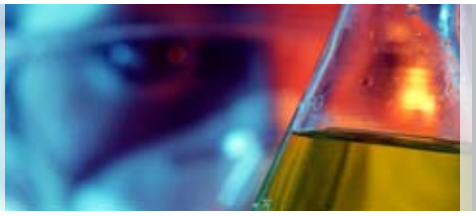
Chlorine Dioxide (ClO_2)

9602-7400

Chlorine Dioxide (ClO_2) 9602-7400



MST Gas Sensors 9602 are only intended for use with the following Honeywell Analytics gas detectors:

Satellite Series

Sat-Ex

Satellite Portable Gas Detector

Comet

Please refer to the specific gas detector's Operational Manual for further details.

Chlorine Dioxide ClO_2	
Sensor Type	ClO_2 Chlorine Dioxide (without chemical filter)
Part Number	9602-7400
Measuring Principle	Amperometric 3-electrode sensor
Color of Sensor Cap	Black
Specific Sensor Data	Programmed on PROM inside the sensor
Standard Range	0.00 to 1.00ppm
Lower Detectable Limit (LDL)	0.03ppm
Maximum Range	5.00ppm
Long Term Sensitivity Drift	< 10% / 6 months
Deviation from Linearity (within Standard Range)	< 10% FS
Zero Current at Normal Conditions	Below LDL
Sensitivity	400 to 800 nA/ppm
Response Time	Constant within standard range
t_{50}	< 20 s (based on 2 min exposure time)
t_{90}	< 90 s (based on 2 min exposure time)
Sensor Warm-up Time	5 s
Operating Conditions	-20°C to +40°C; 10% to 95% r.h. non-condensing
Storage Conditions	0°C to +4°C; 40% to 60% r.h. non-condensing
Temperature Dependence	Compensated with microprocessor
Sensor Life Expectancy	≥ 24 months under typical application conditions
Sensor Dimensions	
Height	43mm (1.69")
Diameter	20.5mm (0.80")
Weight	9g (0.31oz)

Note:
All response data given are typical values and related to the sensor being used under normal conditions, i.e. temperature 20°C, r.h. 40-60%, 1013mbar.

General Specification

As with all electrochemical sensor cells, dramatic output changes in reported concentrations can be expected under rapidly changing environmental conditions. Please ensure sensors are located in areas not prone to sudden changes in humidity and temperature.

Actual readings may be affected by flow rates and absorption on tubing and other gas path surfaces.

All sensors are shipped pre-calibrated to traceable national standards. Dependent on actual operating conditions and overall exposure to gases, checking, calibration or exchange is subject to local regulations or site practices.

1. How do electrochemical sensors work?

All Honeywell Analytics electrochemical sensor cells are amperometric type i.e. are fuel cell type acting like batteries, where one component, in order to generate a current, is missing: the gas that should be detected (target gas).

The target gas diffuses through a gas permeable membrane into the sensor where an electrochemical reaction results in a low current that is direct proportional to the measured gas concentration (generally in nA/ppm reading).

2. How does the electrochemical sensor work with the detection instrument?

The current is amplified to a signal that is processed through an electronic circuit in order to display the real-time gas concentration.

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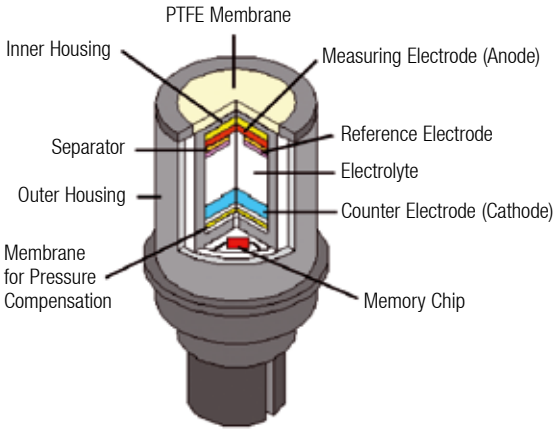
There are different ways to adjust the correct amplification factor of the electronics. Honeywell Analytics has created the “intelligent sensor” which features a built-in PROM. All relevant sensor data such as sensitivity, target gas, date of first calibration, calibration data, zero current, and alarm levels are programmed onto this chip. Our detectors can read this data and adjust the amplifying factor automatically.

3. How does a sensor self test work?

All relevant sensor data (ref. Pos 2) are programmed onto the PROM inside the electrochemical sensor. Our detectors can read this data. Every 24 hours an automatic sensor self-test is performed, which compares an electronically initiated sensor signal with the stored calibration curve. This makes sure that the sensors are always within specification that is set during the first calibration. If the sensor is out of specification the instrument will indicate that the sensor either needs to be checked or needs to be replaced.



Cross Sensitivities

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Gas / Vapour	Chemical Formula	Concentration Applied (ppm)	Reading (ppm ClO_2)
Alcohols	n/a	1000	0
Carbon Monoxide	CO	100	0
Chlorine	Cl_2	1	0.6
Ozone	O_3	0.25	0.7
Hydrogen	H_2	3000	0
Hydrogen Sulphide	H_2S	20	-5

Test Conditions: T=20°C, P=1013 hPa, Flow Rate = 30 l/h

Please note that the values stated above are approximate values. Negative values are not displayed on the gas detector’s LCD Display, they will be shown as 0.

Notes:
1. Interference factors may differ from sensor to sensor and with life time.
2. This table does not claim to be complete. The sensor might also be sensitive to other gases.
3. It is recommended to use 1-5ppm Cl_2 for cross calibration.

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)
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- 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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MST Gas Sensor 9602

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Germane (GeH_4)

9602-6902

Germane (GeH_4)
9602-6902

MST Gas Sensors 9602 are only intended for use with the following Honeywell Analytics gas detectors:

Satellite Series

Sat-Ex

Satellite Portable Gas Detector

Please refer to the specific gas detector's Operational Manual for further details.

Germane (GeH_4)	
Sensor Type	GeH_4, Germane (with H_2S Filter)
Part Number	9602-6902
Measuring Principle	Amperometric 3-electrode sensor
Color of Sensor Cap	Grey beige
Specific Sensor Data	Programmed on PROM inside the sensor
Standard Range	0.0 to 5.0ppm
Lower Detectable Limit (LDL)	0.2ppm
Maximum Range	10.0ppm
Long-term Sensitivity Drift	< 5% / 6 months
Deviation from Linearity (within Standard Range)	< 10% FS
Zero Current at Normal Conditions	Below LDL
Sensitivity	150 to 500 nA/ppm
Response Time	Constant within standard range
t_{50}	< 10 s (based on 2 min exposure time)
t_{90}	< 30 s (based on 2 min exposure time)
Sensor Warm-up Time	5 s
Operating Temperature	-20°C to +40°C continuous; -40°C to +50°C intermittent
Operating Humidity	10% to 95% r.h. non condensing
Storage Conditions	0°C to +4°C; 40% to 60% r.h. non-condensing
Temperature Dependence	Compensated with microprocessor
Sensor Life Expectancy	≥ 24 months under typical application conditions
Sensor Dimensions	
Height	43mm (1.69")
Diameter	20.5mm (0.80")
Weight	9g (0.31oz)

Note:
All response data given are typical values and related to the sensor being used under normal conditions, i.e. temperature 20°C, r.h. 40-60%, 1013 hPa. H_2S filter capacity 20 ppmh.

General Specification

As with all electrochemical sensor cells, dramatic output changes in reported concentrations can be expected under rapidly changing environmental conditions. Please ensure sensors are located in areas not prone to sudden changes in humidity and temperature.

Actual readings may be affected by flow rates and absorption on tubing and other gas path surfaces.

All sensors are shipped pre-calibrated to traceable national standards. Dependent on actual operating conditions and overall exposure to gases, checking, calibration or exchange is subject to local regulations or site practices.

1. How do electrochemical sensors work?

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The target gas diffuses through a gas permeable membrane into the sensor where an electrochemical reaction results in a low current that is direct proportional to the measured gas concentration (generally in nA/ppm reading).

2. How does the electrochemical sensor work with the detection instrument?

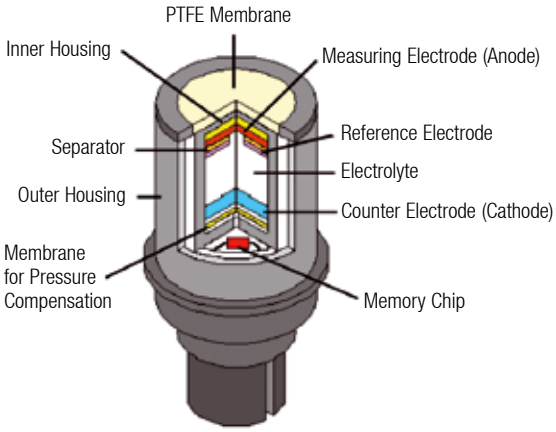
The current is amplified to a signal that is processed through an electronic circuit in order to display the real-time gas concentration.

The zero current of the electrochemical cell is always present and is monitored and suppressed by the electronics.

There are different ways to adjust the correct amplification factor of the electronics. Honeywell Analytics has created the “intelligent sensor” which features a built-in PROM. All relevant sensor data such as sensitivity, target gas, date of first calibration, calibration data, zero current, and alarm levels are programmed onto this chip. Our detectors can read this data and adjust the amplifying factor automatically.

3. How does a sensor self-test work?

All relevant sensor data (ref. Pos 2) are programmed onto the PROM inside the electrochemical sensor. Our detectors can read this data. Every 24 hours an automatic sensor self-test is performed, which compares an electronically initiated sensor signal with the stored calibration curve. This makes sure that the sensors are always within specification that is set during the first calibration. If the sensor is out of specification the instrument will indicate that the sensor either needs to be checked or needs to be replaced.



Cross Sensitivities

Each MST Gas Sensor 9602 is potentially cross sensitive to other gases and this may cause a gas reading when exposed to other gases than those originally designated. The table to the right presents typical readings that will be observed when a new sensor is exposed to the cross sensitive gas (or a mixture of gases containing the cross sensitive species).

Notes:

1. Test Conditions: T=20°C, P=1013 hPa, Flow Rate = 30 l/h
2. Please note that the values stated are approximate values.
3. Interference factors may differ from sensor to sensor and with lifetime.
4. This table does not claim to be complete. The sensor might also be sensitive to other gases.
5. The Satellite, Satex and Satellite PGD products do not display negative readings. The display will show zero for any negative readings.
6. It is not recommended to use cross sensitivity factors to enable cross calibration. The target gas should be used for calibration.

Gas / Vapour	Chemical Formula	Concentration Applied (ppm)	Reading (ppm GeH_4)
Ammonia	NH_3	108	<1
Arsine	AsH_3	0.15	0.85
Carbon Dioxide	CO_2	5000	0
Carbon Monoxide	CO	85	0
Chlorine	Cl_2	0.85	-0.2
Diborane	B_2H_6	0.2	1.5
Disilane	Si_2H_6	0.27	0.7
Hydrocarbons	CH_4	18000	<0.01
Hydrogen	H_2	3100	<0.15
Hydrogen Chloride	HCl	7.9	0
Hydrogen Cyanide	HCN	12.6	4
Hydrogen Fluoride	HF	7.2	0
Hydrogen Selenide	H_2Se	0.85	0
Hydrogen Sulphide	H_2S	18.1	0
Nitrogen Dioxide	NO_2	10.1	-12.5
Phosphine	PH_3	0.18	1.6
Propan-2-ol	C_3H_5OH	20000	<0.15
Silane	SiH_4	4.4	3.7
Sulphur Dioxide	SO_2	17.8	0

Our Product Range

Fixed Gas Monitoring

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- 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

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MST Gas Sensor 9602

Honeywell

Methane (CH_4)

9602-9900
9602-9902

Methane (CH_4)
9602-9900
9602-9902

MST Gas Sensors 9602-9900 and 9602-9902 are only intended for use with the following Honeywell Analytics gas detectors:

Satellite Series

Sat-Ex

Please refer to the specific gas detector's Operational Manual for further details.

Methane CH_4	
Sensor Type	CH_4 Methane
Part Numbers	9602-9900 (Satellite), 9602-9902 (Sat-Ex)
Direct Use For	Combustible gases
Measuring Principle	Catalytic sensor (poison resistant) Silicones and Hydrogen Sulphide*
Color of Sensor Cap	Stainless steel
Specific Sensor Data	Programmed on PROM inside the sensor
Standard Range	0 to 100% LEL
Lower Detectable Limit (LDL)	5% LEL
Maximum Range	100 % LEL
Sensitivity Decay	< 5% / month
Deviation from Linearity (within Standard Range)	< 3% FS
Zero Current at Normal Conditions	Below LDL
Response Time	Constant within standard range
t_{50}	< 10 s (based on 1 min exposure time)
t_{90}	< 20 s (based on 1 min exposure time)
Sensor Warm-up Time	5 s
Operating Conditions	-40°C to +55°C; 10% to 95% r.h. non-condensing
Storage Conditions	-40°C to +55°C; 0% to 80% r.h. non-condensing (in original container)
Temperature Dependence	Compensated with microprocessor
Sensor Life Expectancy	3-5 years typical
Sensor Dimensions	
Height	43mm (1.69")
Diameter	21.5mm (0.84")
Weight	28g (1oz)

*The use of a poison resistant device enables the sensor to operate in all environments with a better resistance to degredation by substance such as Silicone and Sulphur compounds.

Note:
1. All response data given are typical values and related to the sensor being used under normal conditions, i.e. temperature 20°C, r.h. 40-60%, 1013mbar.
2. From S/N 31803-004 onwards

General Specification

Catalytic sensors

Nearly all modern, low-cost, combustible gas detection sensors are of the electro-catalytic type. They consist of a very small sensing element sometimes called a 'bead', a 'Pellistor', or a 'Siegistor'- the last two being registered trade names for commercial devices. They are made of an electrically heated platinum wire coil, covered first with a ceramic base such as alumina and then with a final outer coating of palladium or rhodium catalyst dispersed in a substrate of thoria.

This type of sensor operates on the principle that when a combustible gas/air mixture passes over the hot catalyst surface, combustion occurs and the heat evolved increases the temperature of the 'bead'. This in turn alters the resistance of the platinum coil and can be measured by using the coil as a temperature thermometer in a standard electrical bridge circuit. The resistance change is then directly related to the gas concentration in the surrounding atmosphere and can be displayed on a meter or some similar indicating device.

Gas	Theoretical K-Factor	Reading in % LEL for Test Gas Concentration of 50% LEL*	Gas	Tested K-Factor	Reading in % LEL for Test Gas Concentration of 50% LEL*
Acetone	1.67	30	Methylethyl ketone	2.31	30
Acetylene	1.59	33	n-heptane	2.37	21
1, 3-butadiene	2.24	22.5	Hydrogen	1.241	40.5
Carbon Monoxide	1.26	39.5	n-pentane	2.10	24
Cyclohexane	2.19	23	n-hexane	2.48	20
Ethyl acetate	2.15	23	n-octane	3.14	16
Ethyl alcohol	1.58	31.5	Toluene	2.37	21
Ethylene	1.59	31.5			
Methanol	1.28	39			

* Reference calibration gas 50% LEL Methane (CH_4)

Test Conditions: T=20ºC, P=1013 hPa, Flow Rate = 30 l/h

Please note that the values stated above are approximate values. Negative values are not displayed on the Satellite LCD Display, they will be shown as 0.

Update: 16/02/2010

Our Product Range

Fixed Gas Monitoring

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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:

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MST Gas Sensor 9602

Honeywell

Hydrogen Selenide (H_2Se)

9602-5601

Hydrogen Selenide (H_2Se) 9602-5601

MST Gas Sensors 9602 are only intended for use with the following Honeywell Analytics gas detectors:

Satellite Series

Sat-Ex

Satellite Portable Gas Detector

Please refer to the specific gas detector's Operational Manual for further details.

Hydrogen Selenide (H_2Se)	
Sensor Type	H_2Se Hydrogen Selenide (without chemical filter)
Part Number	9602-5601
Measuring Principle	Amperometric 3-electrode sensor
Color of Sensor Cap	Grey beige
Specific Sensor Data	Programmed on PROM inside the sensor
Standard Range	0.0 to 5.0ppm
Lower Detectable Limit (LDL)	0.05ppm
Maximum Range	10.0ppm
Long-term Sensitivity Drift	< 5% / 6 months
Deviation from Linearity (within Standard Range)	< 10% FS
Zero Current at Normal Conditions	Below LDL
Sensitivity	600 to 1600 nA/ppm
Response Time	Constant within standard range
t_{50}	< 10 s (based on 2 min exposure time)
t_{90}	< 30 s (based on 2 min exposure time)
Sensor Warm-up Time	5 s
Operating Temperature	-20°C to +40°C continuous; -40°C to +50°C intermittent
Operating Humidity	10% to 95% r.h. non condensing
Storage Conditions	0°C to +4°C; 40% to 60% r.h. non-condensing
Temperature Dependence	Compensated with microprocessor
Sensor Life Expectancy	≥ 24 months under typical application conditions
Sensor Dimensions	
Height	43mm (1.69")
Diameter	20.5mm (0.80")
Weight	9g (0.31oz)

Note:
All response data given are typical values and related to the sensor being used under normal conditions, i.e. temperature 20°C, r.h. 40-60%, 1013 hPa.

General Specification

As with all electrochemical sensor cells, dramatic output changes in reported concentrations can be expected under rapidly changing environmental conditions. Please ensure sensors are located in areas not prone to sudden changes in humidity and temperature.

Actual readings may be affected by flow rates and absorption on tubing and other gas path surfaces.

All sensors are shipped pre-calibrated to traceable national standards. Dependent on actual operating conditions and overall exposure to gases, checking, calibration or exchange is subject to local regulations or site practices.

1. How do electrochemical sensors work?

All Honeywell Analytics electrochemical sensor cells are amperometric type i.e. are fuel cell type acting like batteries, where one component, in order to generate a current, is missing: the gas that should be detected (target gas).

The target gas diffuses through a gas permeable membrane into the sensor where an electrochemical reaction results in a low current that is direct proportional to the measured gas concentration (generally in nA/ppm reading).

2. How does the electrochemical sensor work with the detection instrument?

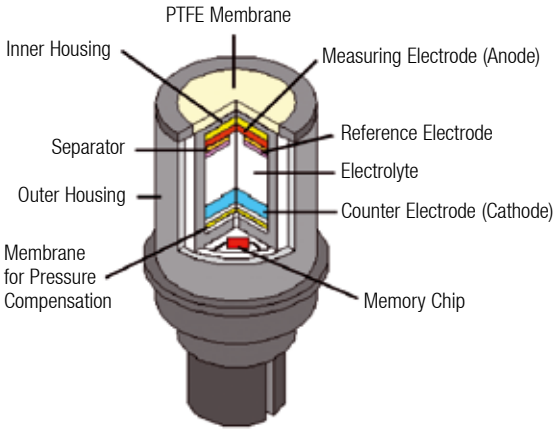
The current is amplified to a signal that is processed through an electronic circuit in order to display the real-time gas concentration.

The zero current of the electrochemical cell is always present and is monitored and suppressed by the electronics.

There are different ways to adjust the correct amplification factor of the electronics. Honeywell Analytics has created the “intelligent sensor” which features a built-in PROM. All relevant sensor data such as sensitivity, target gas, date of first calibration, calibration data, zero current, and alarm levels are programmed onto this chip. Our detectors can read this data and adjust the amplifying factor automatically.

3. How does a sensor self-test work?

All relevant sensor data (ref. Pos 2) are programmed onto the PROM inside the electrochemical sensor. Our detectors can read this data. Every 24 hours an automatic sensor self-test is performed, which compares an electronically initiated sensor signal with the stored calibration curve. This makes sure that the sensors are always within specification that is set during the first calibration. If the sensor is out of specification the instrument will indicate that the sensor either needs to be checked or needs to be replaced.



Cross Sensitivities

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Notes:

1. Test Conditions: T=20°C, P=1013 hPa, Flow Rate = 30 l/h
2. Please note that the values stated are approximate values.
3. Interference factors may differ from sensor to sensor and with lifetime.
4. This table does not claim to be complete. The sensor might also be sensitive to other gases.
5. The Satellite, Satex and Satellite PGD products do not display negative readings. The display will show zero for any negative readings.
6. It is not recommended to use cross sensitivity factors to enable cross calibration. The target gas should be used for calibration.

Gas / Vapour	Chemical Formula	Concentration Applied (ppm)	Reading (ppm H_2Se)
Ammonia	NH_3	108	<0.1
Arsine	AsH_3	0.15	0.25
Carbon Dioxide	CO_2	5000	0
Carbon Monoxide	CO	85	0
Chlorine	Cl_2	0.85	-0.3
Diborane	B_2H_6	0.2	0.6
Disilane	Si_2H_6	0.27	0.15
Germane	GeH_4	1.39	0.3
Hydrocarbons	CH_4	18000	0
Hydrogen	H_2	3100	<0.05
Hydrogen Chloride	HCl	6.8	2.3
Hydrogen Cyanide	HCN	12.6	1
Hydrogen Sulphide	H_2S	18.1	22.5
Nitrogen Dioxide	NO_2	10.1	-4
Phosphine	PH_3	0.18	0.5
Propan-2-ol	C_3H_5OH	20000	<0.05
Silane	SiH_4	4.4	0.8
Sulphur Dioxide	SO_2	17.8	7

Our Product Range

Fixed Gas Monitoring

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MST Gas Sensor 9602

Honeywell

Silane (SiH_4)

9602-6301

Silane (SiH_4)
9602-6301

MST Gas Sensors 9602 are only intended for use with the following Honeywell Analytics gas detectors:

Satellite Series

Sat-Ex

Satellite Portable Gas Detector

Please refer to the specific gas detector's Operational Manual for further details.

Silane (SiH_4)	
Sensor Type	SiH_4, Silane (without chemical filter)
Part Number	9602-6301
Measuring Principle	Amperometric 3-electrode sensor
Color of Sensor Cap	Grey beige
Specific Sensor Data	Programmed on PROM inside the sensor
Standard Range	0.0 to 50.0ppm
Lower Detectable Limit (LDL)	1.0ppm
Maximum Range	100.0ppm
Long-term Sensitivity Drift	< 5% / 6 months
Deviation from Linearity (within Standard Range)	< 10% FS
Zero Current at Normal Conditions	Below LDL
Sensitivity	60 to 200 nA/ppm
Response Time	Constant within standard range
t_{50}	< 10 s (based on 2 min exposure time)
t_{90}	< 60 s (based on 2 min exposure time)
Sensor Warm-up Time	5 s
Operating Temperature	-20°C to +40°C continuous; -40°C to +50°C intermittent
Operating Humidity	10% to 95% r.h. non condensing
Storage Conditions	0°C to +4°C; 40% to 60% r.h. non-condensing
Temperature Dependence	Compensated with microprocessor
Sensor Life Expectancy	≥ 24 months under typical application conditions
Sensor Dimensions	
Height	43mm (1.69")
Diameter	20.5mm (0.80")
Weight	9g (0.31oz)

Note:
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All sensors are shipped pre-calibrated to traceable national standards. Dependent on actual operating conditions and overall exposure to gases, checking, calibration or exchange is subject to local regulations or site practices.

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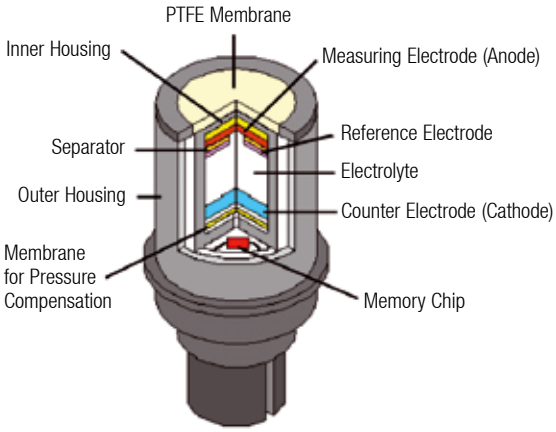

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Notes:

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Gas / Vapour	Chemical Formula	Concentration Applied (ppm)	Reading (ppm SiH_4)
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Carbon Dioxide	CO_2	5000	0
Carbon Monoxide	CO	85	0
Chlorine	Cl_2	0.85	-0.1
Diborane	B_2H_6	0.2	0.3
Disilane	Si_2H_6	1.27	2.5
Germane	GeH_4	1.39	1.6
Hydrocarbons	CH_4	18000	0
Hydrogen	H_2	3100	<0.5
Hydrogen Chloride	HCl	6.8	0.3
Hydrogen Cyanide	HCN	12	1
Hydrogen Fluoride	HF	7.2	0
Hydrogen Selenide	H_2Se	0.85	0.2
Hydrogen Sulphide	H_2S	18.1	10
Methylsilane	CH_3SiH_3	1.29	1.3
Nitrogen Dioxide	NO_2	9.6	-3
Phosphine	PH_3	0.18	0.4
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MST Gas Sensors 9602

Technical Specifications

Specification Sheet Hydrogen Cyanide

Sensor Type	HCN Hydrogen Cyanide
Part Number	9602-5700
Measuring Principle	amperometric 2-electrode sensor
Color of Sensor Cap	orange
Specific Sensor Data	programmed on PROM inside the sensor
Standard Range	0.0 ... 30.0 ppm
Lower Detectable Limit (LDL)	1.0 ppm
Maximum Range	50.0 ppm
MAK/TLV	1.9 ppm / 4.7 ppm
Sensitivity Decay	< 5 % / month
Deviation from Linearity (within standard range)	< 5 % FS
Zero Current at normal conditions	below LDL
Sensitivity	20…60 nA/ppm
Response Time	constant within standard range
t_{50}	< 20 s (based on 4 min exposure time)
t_{90}	< 30 s (based on 4 min exposure time)
Sensor warm-up time	5 s
Operating conditions	-40 ... +40 °C; 10 ... 95 % r.h. non-condensing
Storage conditions	0 ... +4 °C; 40 ... 60 % r.h. non-condensing
Temperature dependence	compensated with microprocessor
Sensor life	2 years
Sensor dimensions	
• Height	43 mm (1.69 ")
• Diameter	20.5 mm (0.80 ")
• Weight	9 g (0.31 oz)

Note:
All response data given are typical values and related to the sensor being used under normal conditions, i.e. temperature 20 °C, r.h. 40 ... 60 %, normal air pressure.

MST Gas Sensors 9602

Cross Sensitivity

Specification Sheet Hydrogen Cyanide

Gas		Test Gas Concentration	Reading in ppm
Carbon Dioxide	CO_2	10%	0.0
Carbon Monoxide	CO	300 ppm	0.0
Chlorine	Cl_2	5 ppm	0.0
Freon 12	-	5000 ppm	0.0
Hydrocarbons	-	% - range	0.0
Hydrocarbons (chlorinated)	-	200 ppm	0.0
Hydrogen Chloride	HCl	10 ppm	0.0*
Hydrogen Sulphide	H_2S	10 ppm	40.0
Methane	CH_4	2000 ppm	0.0
Nitrogen Dioxide	NO_2	100 ppm	0.0*
Sulphur Dioxide	SO_2	50 ppm	0.0*
* Long Term Exposure will destroy sensor			

Test Conditions: T=20^{O}C, P=1013 hPa, Flow Rate = 30 l/h

Please note that the values stated above are approximate values. Negative values are not displayed on the Satellite LCD Display; they will be shown as 0.

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MST Gas Sensors 9602

Technical Specifications

Specification Sheet Nitrogen Trifluoride

Only in combination with Pyrolyzer Unit!

Sensor Type	NF3 Nitrogen Trifluoride
Part Number	9602-9700
Measuring Principle	amperometric 3-electrode sensor
Color of Sensor Cap	white
Specific Sensor Data	programmed on PROM inside the sensor
Standard Range	0.0...50.0 ppm
Lower Detectable Limit (LDL)	1.0 ppm
Maximum Range	100.0 ppm
MAK/TLV	- / 10 ppm
Sensitivity Decay	< 10 % / month
Deviation from Linearity (within standard range)	< 5 % FS
Zero Current at normal conditions	below LDL
Sensitivity	80…500 nA/ppm
Response Time	constant within standard range
t_{50}	< 40 s (based on 5 min exposure time)
t_{90}	< 90 s (based on 5 min exposure time)
Sensor warm-up time	5 s
Operating conditions	-20 ... +35 °C; 20 ... 80 % r.h. non-condensing
Storage conditions	0 ... +4 °C; 40 ... 60 % r.h. non-condensing
Temperature dependence	compensated with microprocessor
Sensor life	15 months
Storage conditions	0 ... +4 °C; 40 ... 60 % r.h. non-condensing

Sensor dimensions

- Height 43 mm (1.69 ")
- Diameter 20.5 mm (0.80 ")
- Weight 9 g (0.31 oz)

Note:
All response data given are typical values and related to the sensor being used under normal conditions, i.e. temperature 20 °C, r.h. 40 ... 60 %, normal air pressure.

MST Gas Sensors 9602

Cross Sensitivity

Specification Sheet Nitrogen Trifluoride

Gas	Test Gas Concentration	Reading in ppm
No Data Presently Available		

Test Conditions: T=20^{O}C, P=1013 hPa, Flow Rate = 30 l/h

Please note that the values stated above are approximate values. Negative values are not displayed on the Satellite LCD Display; they will be shown as 0.

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MST Gas Sensors 9602

Technical Specifications

Specification Sheet Hydrogen Fluoride

Sensor Type	HF Hydrogen Fluoride
Part Number	9602-6500
Detectable Gases	WF_6, BF_3, SiF_4, CH_3COOH
Measuring Principle	Amperometric 3-electrode sensor
Color of Sensor Cap	White
Specific Sensor Data	Programmed on PROM inside the sensor
Standard Range	0.0 ... 10.0
Lower Detectable Limit (LDL)	0.5 ppm
Maximum Range	50.0 ppm
MAK/TLV	2.0 ppm / 3.0 ppm
Sensitivity Decay	< 10 % / month
Deviation from Linearity (within standard range)	< 5 % FS
Zero Current at normal conditions	below LDL
Sensitivity	160…800 nA/ppm
Response Time	constant within standard range
t_{50}	< 40 s (based on 5 min exposure time)
t_{90}	< 90 s (based on 5 min exposure time)
Sensor warm-up time	5 s
Operating conditions	-20 ... +40 °C; 10 ... 80 % r.h. non-condensing
Storage conditions	0 ... +4 °C; 40 ... 60 % r.h. non-condensing
Temperature dependence	Compensated with microprocessor
Sensor life	15 months

Sensor dimensions

- Height 43 mm (1.69 ")
- Diameter 20.5 mm (0.80 ")
- Weight 9 g (0.31 oz)

Note:
All response data given are typical values and related to the sensor being used under normal conditions, i.e. temperature 20 °C, r.h. 40 ... 60 %, normal air pressure.

MST Gas Sensors 9602

Cross Sensitivity

Specification Sheet Hydrogen Fluoride

Gas		Test Gas Concentration	Reading in ppm
Acedic Acid	CH_3COOH	10 ppm	10.0
Ammonia	NH_3	100 ppm	0.0
Arsine	AsH_3	0.5 ppm	0.0
Boron Trifluoride	BF_3	10 ppm	4.1
Carbon Dioxide	CO_2	5000 ppm	0.0
Carbon Monoxide	CO	1000 ppm	0.0
Chlorine	Cl_2	1.0 ppm	0.7
Diborane	B_2H_6	0.6 ppm	0.0
Fluorine	F_2	10 ppm	0.7 n.d.
Hydrocarbons (unsaturated)	-	1%	0.0
Hydrogen	H_2	1000 ppm	0.0
Hydrogen Chloride	HCl	5 ppm	3.3
Hydrogen Sulphide	H_2S	10 ppm	0.0
Isopropanol	C_3H_7OH	1000 ppm	0.0
Nitric Oxide	NO	20 ppm	13.0
Nitrogen Dioxide	NO_2	10 ppm	6.0
Ozone	O_3	0.5 ppm	0.0
Silane	SiH_4	10 ppm	0.0
Sulphur Dioxide	SO_2	20 ppm	5.5

Test Conditions: T=20^{O}C, P=1013 hPa, Flow Rate = 30 l/h

Please note that the values stated above are approximate values. Negative values are not displayed on the Satellite LCD Display; they will be shown as 0.

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MST Gas Sensors 9602

Technical Specifications

Specification Sheet Hydrazine

Sensor Type	N_2H_4 Hydrazine
Part Number	9602-7600
Detectable Gases	UDMH, MMH
Measuring Principle	Amperometric 2-electrode sensor
Color of Sensor Cap	Translucent
Specific Sensor Data	Programmed on PROM inside the sensor
Standard Range	0.00 ... 1.00 ppm
Lower Detectable Limit (LDL)	0.02 ppm
Maximum Range	10.00 ppm
MAK/TLV	0.10 ppm*/0.01 ppm *TRK
Sensitivity Decay	< 10 % / 6 months
Deviation from Linearity (within standard range)	< 10 % FS
Zero Current at normal conditions	Below LDL
Sensitivity	1000…1500 nA/ppm
Response Time	constant within standard range
t_{50}	< 30 s (based on 4 min exposure time)
t_{90}	< 120 s (based on 4 min exposure time)
Sensor warm-up time	5 s
Operating conditions	-10 ... +40 °C; 10 ... 95 % r.h. non-condensing
Storage conditions	0 ... +4 °C; 40 ... 60 % r.h. non-condensing
Temperature dependence	compensated with microprocessor
Sensor life	15 months

Sensor dimensions

• Height	43 mm (1.69 ")
• Diameter	20.5 mm (0.80 ")
• Weight	9 g (0.31 oz)

Note:
All response data given are typical values and related to the sensor being used under normal conditions, i.e. temperature 20 °C, r.h. 40 ... 60 %, normal air pressure.

MST Gas Sensors 9602

Cross Sensitivity

Specification Sheet Hydrazine

Gas		Test Gas Concentration	Reading in ppm
Ammonia	NH_3	200 ppm	0.00
Arsine	AsH_3	0.1 ppm	0.12
Carbon Dioxide	CO_2	5000 ppm	0.00
Carbon Monoxide	CO	1000 ppm	0.00
Chlorine	Cl_2	5 ppm	0.00
Ethanol	C_2H_5OH	1000 ppm	0.00
Hydrocarbons (saturated)	-	% - range	0.00
Hydrogen	H_2	1000 ppm	0.00
Hydrogen Chloride	HCl	5 ppm	0.10
Hydrogen Cyanide	HCN	10 ppm	0.20
Hydrogen Sulphide	H_2S	1 ppm	0.10
Isopropanol	C_3H_7OH	450 ppm	0.00
Methanol	CH_3OH	1200 ppm	0.00
MMH	CH_6N_2	1 ppm	0.72
Sulphur Dioxide	SO_2	2 ppm	0.00
UDMH	$C_2H_8N_2$	1 ppm	0.58

Test Conditions: T=20^{O}C, P=1013 hPa, Flow Rate = 30 l/h

Please note that the values stated above are approximate values. Negative values are not displayed on the Satellite LCD Display; they will be shown as 0.

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MST Gas Sensors 9602

Technical Specifications

Specification Sheet Phosphine (2 electrode)

Sensor Type	PH_3 Phosphine
Part Number	9602-6100
Detectable Gases	TBP
Measuring Principle	amperometric 2-electrode sensor
Color of Sensor Cap	dark red
Specific Sensor Data	programmed on PROM inside the sensor
Standard Range	0.00 ... 1.00 ppm
Lower Detectable Limit (LDL)	0.05 ppm
Maximum Range	10.00 ppm
MAK/TLV	0.10 ppm / 0.30 ppm
Sensitivity Decay	< 5 % / month
Deviation from Linearity (within standard range)	< 10% FS
Zero Current at normal conditions	below LDL
Sensitivity	350…800 nA/ppm
Response Time	constant within standard range
t_{50}	< 20 s (based on 2 min exposure time)
t_{90}	< 60 s (based on 2 min exposure time)
Sensor warm-up time	5 s
Operating conditions	-20 ... +40 °C; 20 ... 95 % r.h. non-condensing
Storage conditions	0 ... +4 °C; 40 ... 60 % r.h. non-condensing
Temperature dependence	compensated with microprocessor
Sensor life	2 years

Sensor dimensions

• Height	43 mm (1.69 ")
• Diameter	20.5 mm (0.80 ")
• Weight	9 g (0.31 oz)

Note:
All response data given are typical values and related to the sensor being used under normal conditions, i.e. temperature 20 °C, r.h. 40 ... 60 %, normal air pressure.

MST Gas Sensors 9602

Cross Sensitivity

Specification Sheet Phosphine (2 electrode)

Gas		Test Gas Concentration	Reading in ppm
Ammonia	NH_3	100 ppm	0.00
Arsine	AsH_3	0.1 ppm	0.10
Carbon Dioxide	CO_2	5000 ppm	0.00
Carbon Monoxide	CO	300 ppm	0.00
Chlorine	Cl_2	5 ppm	0.00
Diborane	B_2H_6	0.1 ppm	0.06
Germane	GeH_4	1 ppm	0.00
Hydrocarbons	-	% - range	0.00
Hydrogen	H_2	10%	0.00
Hydrogen Chloride	HCl	5 ppm	0.11
Hydrogen Cyanide	HCN	5 ppm	0.55
Hydrogen Fluoride	HF	4 ppm	0.00
Hydrogen Selenide	H_2Se	0.5 ppm	0.05
Hydrogen Sulphide	H_2S	10 ppm	0.00
Nitric Oxide	NO	100 ppm	0.00
Nitrogen Dioxide	NO_2	2 ppm	0.00
Silane	SiH_4	10 ppm	0.00
Sulphur Dioxide	SO_2	2 ppm	0.00

Test Conditions: T=20^{O}C, P=1013 hPa, Flow Rate = 30 l/h

Please note that the values stated above are approximate values. Negative values are not displayed on the Satellite LCD Display; they will be shown as 0.

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MST Gas Sensors 9602

Technical Specifications

Specification Sheet Ozone

Sensor Type	O_3 Ozone
Part Number	9602-7100
Measuring Principle	amperometric 3-electrode sensor
Color of Sensor Cap	grey
Specific Sensor Data	programmed on PROM inside the sensor
Standard Range	0.00 ... 1.00 ppm
Lower Detectable Limit (LDL)	0.05 ppm
Maximum Range	10.00 ppm
MAK/TLV	0.10 ppm*/0.10 ppm *TRK
Sensitivity Decay	< 5 % / 6 months
Deviation from Linearity (within standard range)	< 10 % FS
Zero Current at normal conditions	below LDL
Sensitivity	800…1600 nA/ppm
Response Time	constant within standard range
t_{50}	< 30 s (based on 4 min exposure time)
t_{90}	< 60 s (based on 4 min exposure time)
Sensor warm-up time	5 s
Operating conditions	-10 ... +40 °C; 10 ... 95 % r.h. non-condensing
Storage conditions	0 ... +4 °C; 40 ... 60 % r.h. non-condensing
Temperature dependence	compensated with microprocessor
Sensor life	2 years
Sensor dimensions	
• Height	43 mm (1.69 ")
• Diameter	20.5 mm (0.80 ")
• Weight	9 g (0.31 oz)

Note:
All response data given are typical values and related to the sensor being used under normal conditions, i.e. temperature 20 °C, r.h. 40 ... 60 %, normal air pressure.

MST Gas Sensors 9602

Cross Sensitivity

Specification Sheet Ozone

Gas		Test Gas Concentration	Reading in ppm
Ammonia	NH_3	10 ppm	0.00
Carbon Dioxide	CO_2	5000 ppm	0.00
Carbon Monoxide	CO	300 ppm	0.00
Chlorine	Cl_2	1 ppm	1.40
Chlorine Dioxide	ClO_2	0.1 ppm	0.12
Diborane	B_2H_6	0.5 ppm	0.00
Fluorine	F_2	0.1 ppm	0.07
Germane	GeH_4	1.1 ppm	0.00
Hydrocarbons	-	% - range	0.00
Hydrogen	H_2	1000 ppm	0.00
Hydrogen Cyanide	HCN	10 ppm	0.00
Hydrogen Fluoride	HF	5 ppm	0.00
Hydrogen Selenide	H_2Se	0.4 ppm	0.00
Hydrogen Sulphide	H_2S	1 ppm	0.00
Nitric Oxide	NO	30 ppm	0.00
Nitrogen Dioxide	NO_2	1 ppm	0.70
Silane	SiH_4	1 ppm	0.00
Sulphur Dioxide	SO_2	30 ppm	0.00

Test Conditions: T=20^{O}C, P=1013 hPa, Flow Rate = 30 l/h

Please note that the values stated above are approximate values. Negative values are not displayed on the Satellite LCD Display; they will be shown as 0.

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MST Gas Sensors 9602

Technical Specifications

Specification Sheet Hydrogen Chloride

Sensor Type	HCl Hydrogen Chloride
Part Number	9602-5800
Detectable Gases	SiH3Cl, SiH_2Cl_2, $SiHCl_3$ BCl_3, $SiCl_4$, $POCl_3$
Measuring Principle	amperometric 3-electrode sensor
Color of Sensor Cap	pink
Specific Sensor Data	programmed on PROM inside the sensor
Standard Range	0.0 ... 30.0 ppm
Lower Detectable Limit (LDL)	1.0 ppm
Maximum Range	50.0 ppm
MAK/TLV	5.0 ppm / 5.0 ppm
Sensitivity Decay	< 3 % / month
Deviation from Linearity (within standard range)	< 5 % FS
Zero Current at normal conditions	below LDL
Sensitivity	80…200 nA/ppm
Response Time	constant within standard range
t_{50}	< 30 s (based on 4 min exposure time)
t_{90}	< 70 s (based on 4 min exposure time)
Sensor warm-up time	5 min
Operating conditions	-20 ... +40 °C; 10 ... 95 % r.h. non-condensing
Storage conditions	0 ... +4 °C; 40 ... 60 % r.h. non-condensing
Temperature dependence	compensated with microprocessor
Sensor life	3 years
Sensor dimensions	
• Height	43 mm (1.69 ")
• Diameter	20.5 mm (0.80 ")
• Weight	9 g (0.31 oz)

Note:
All response data given are typical values and related to the sensor being used under normal conditions, i.e. temperature 20 °C, r.h. 40 ... 60 %, normal air pressure.

MST Gas Sensors 9602

Cross Sensitivity

Specification Sheet Hydrogen Chloride

Gas		Test Gas Concentration	Reading in ppm
Ammonia	NH_3	300 ppm	0.0
Arsine	AsH_3	0.3 ppm	1.0
Carbon Dioxide	CO_2	5000 ppm	0.0
Carbon Monoxide	CO	1000 ppm	11.0
Chlorine	Cl_2	5 ppm	0
Ethanol	C_2H_5OH	6.6%	6.0
Hydrocarbons	-	% - range	0.0
Hydrocarbons (chlorinated)	-	% - range	0.0
Hydrogen	H_2	1 %	1.0
Hydrogen Bromide	HBr	5 ppm	5.0
Hydrogen Cyanide	HCN	15 ppm	1.0
Hydrogen Sulphide	H_2S	10 ppm	2.8
Nitric Oxide	NO	10 ppm	2.0
Phosphine	PH_3	0.3 ppm	1.0
Phosgene	$COCl_2$	0.5 ppm	0.0
Silane	SiH_4	10 ppm	0.0
Sulphur Dioxide	SO_2	5 ppm	1.9

Test Conditions: T=20^{O}C, P=1013 hPa, Flow Rate = 30 l/h

Please note that the values stated above are approximate values. Negative values are not displayed on the Satellite LCD Display; they will be shown as 0.

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MST Gas Sensors 9602

Technical Specifications

Specification Sheet Hexamethyldisilazane 500 ppm

Sensor Type	HMDS Hexamethyldisilazane 500 ppm
Part Number	9602-6714
Measuring Principle	amperometric 3-electrode sensor
Color of Sensor Cap	dark brown
Specific Sensor Data	programmed on PROM inside the sensor
Standard Range	0 ... 500 ppm
Lower Detectable Limit (LDL)	5 ppm
Maximum Range	1000 ppm
MAK/TLV	- / -
Sensitivity Decay	< 5 % / 6 months
Deviation from Linearity (within standard range)	< 10 % FS
Zero Current at normal conditions	below LDL
Sensitivity	20…60 nA/ppm
Response Time	constant within standard range
t_{50}	< 20 s (based on 5 min exposure time)
t_{90}	< 60 s (based on 5 min exposure time)
Sensor warm-up time	5 s
Operating conditions	-20 ... +40 °C; 10 ... 95 % r.h. non-condensing
Storage conditions	0 ... +4 °C; 40 ... 60 % r.h. non-condensing
Temperature dependence	compensated with microprocessor
Sensor life	3 years
Sensor dimensions	
• Height	43 mm (1.69 ")
• Diameter	20.5 mm (0.80 ")
• Weight	9 g (0.31 oz)

Note:
All response data given are typical values and related to the sensor being used under normal conditions, i.e. temperature 20 °C, r.h. 40 ... 60 %, normal air pressure.

MST Gas Sensors 9602

Cross Sensitivity

Specification Sheet Hexamethyldisilazane (500 ppm)

Gas		Test Gas Concentration	Reading in ppm
Ammonia	NH_3	10 ppm	25
Arsine	AsH_3	1 ppm	0
Carbon Dioxide	CO_2	5000 ppm	0
Carbon Monoxide	CO	1000 ppm	0
Chlorine	Cl_2	1 ppm	0
Ethanol	C_2H_5OH	1000 ppm	0
Hydrocarbons (saturated)	-	1%	0
Hydrocarbons (unsaturated)	-	1%	0
Hydrogen	H_2	1%	0
Hydrogen Chloride	HCl	5 ppm	0
Hydrogen Cyanide	HCN	10 ppm	0
Hydrogen Fluoride	HF	4 ppm	0
Hydrogen Sulphide	H_2S	10 ppm (short term)	0
Isopropanol	C_3H_7OH	10 %	0
Methanol	CH_3OH	1000 ppm	0
Phosphine	PH_3	0.30 ppm	0
Sulphur Dioxide	SO_2	2 ppm	0

Test Conditions: T=20^{O}C, P=1013 hPa, Flow Rate = 30 l/h

Please note that the values stated above are approximate values. Negative values are not displayed on the Satellite LCD Display; they will be shown as 0.

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MST Gas Sensors 9602

Technical Specifications

Specification Sheet Ammonia 0-1000 ppm

Sensor Type	NH_3 Ammonia 0-1000 ppm
Part Number	9602-6705
Measuring Principle	amperometric 3-electrode sensor
Color of Sensor Cap	dark brown
Specific Sensor Data	programmed on PROM inside the sensor
Standard Range	0 ... 1000 ppm
Lower Detectable Limit (LDL)	15 ppm
Maximum Range	1000 ppm
MAK/TLV	20 ppm / 25 ppm
Sensitivity Decay	< 5 % / 6 months
Deviation from Linearity (within standard range)	< 10 % FS
Zero Current at normal conditions	<± 40 nA
Sensitivity	8 nA/ppm ± 4 nA/ppm
Response Time	constant within standard range
t_{50}	< 20 s (based on 5 min exposure time)
t_{90}	< 90 s (based on 5 min exposure time)
Sensor warm-up time	5 s
Operating conditions	-20 °C ... +40 °C; 10 ... 90 % r.h. non-condensing
Storage conditions	0 ... +4 °C; 40 ... 60 % r.h. non-condensing (2)
Temperature dependence	compensated with microprocessor
Sensor life	>2 years

Sensor dimensions

• Height	43 mm (1.69 ")
• Diameter	20.5 mm (0.80 ")
• Weight	9 g (0.31 oz)

Note:

1) All response data given are typical values and related to the sensor being used under normal conditions, i.e. temperature 20 °C, r.h. 40 ... 60 %, normal air pressure.
2) 90% r.h. may only be tolerated short term (average over several days should not exceed 80% r.h.)

MST Gas Sensors 9602

Cross Sensitivity

Specification Sheet Ammonia 0-1000 ppm

Gas		Test Gas Concentration	Reading in ppm
Arsine	AsH3	0.2 ppm	0
Carbon Dioxide	CO_2	5000 ppm	0
Carbon Monoxide	CO	100 ppm	0
Chlorine	Cl_2	1 ppm	0
Ethanol	C_2H_5OH	1000 ppm	0
Hydrocarbons	-	% - range	0
Hydrochlorid Acid	HCl	5ppm	0
Hydrogen	H_2	10000 ppm	0
Hydrogen Sulphide	H_2S	20 ppm	0[1]
Isopropanol	C_3H_7OH	1000 ppm	0
Methanol	CH_3OH	1000 ppm	0
Nitrogen Dioxide	NO_2	10 ppm	0
Phosphine	PH3	0.3 ppm	0
Sulphur Dioxide	SO_2	20 ppm	0

1) Short gas exposure in minute range.

Test Conditions: T=20^{O}C, P=1013 hPa, Flow Rate = 30 l/h

Please note that the values stated above are approximate values. Negative values are not displayed on the Satellite LCD Display; they will be shown as 0.

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MST Gas Sensors 9602

Technical Specifications

Specification Sheet Hexamethyldisilazane 0.5%

Sensor Type	HMDS Hexamethyldisilazane 0.5 %
Part Number	9602-6715
Measuring Principle	amperometric 3-electrode sensor
Color of Sensor Cap	dark brown
Specific Sensor Data	programmed on PROM inside the sensor
Standard Range	0 ... 0.500 % vol.
Lower Detectable Limit (LDL)	0.010 % vol.
Maximum Range	1.000 % vol.
MAK/TLV	- / -
Sensitivity Decay	< 10 % / 6 months
Deviation from Linearity (within standard range)	< 5 % FS
Zero Current at normal conditions	below LDL
Sensitivity	1.0…4.0 nA/ppm
Response Time	constant within standard range
t_{50}	< 20 s (based on 5 min exposure time)
t_{90}	< 120 s (based on 5 min exposure time)
Sensor warm-up time	5 s
Operating conditions	-40 ... +40 °C; 10 ... 95 % r.h. non-condensing
Storage conditions	0 ... +4 °C; 40 ... 60 % r.h. non-condensing
Temperature dependence	compensated with microprocessor
Sensor life	2 years
Sensor dimensions	
• Height	43 mm (1.69 ")
• Diameter	20.5 mm (0.80 ")
• Weight	9 g (0.31 oz)

Note:
All response data given are typical values and related to the sensor being used under normal conditions, i.e. temperature 20 °C, r.h. 40 ... 60 %, normal air pressure.

MST Gas Sensors 9602

Cross Sensitivity

Specification Sheet Hexamethyldisilazane 0.5%

Gas		Test Gas Concentration	Reading in % vol.
Ammonia	NH_3	50 ppm	0.015
Carbon Dioxide	CO_2	1%	0.000
Carbon Monoxide	CO	300 ppm	0.000
Chlorine	Cl_2	5 ppm	0.000
Ethanol	C_2H_5OH	2 %	0.010
Hydrocarbons	-	% - range	0.000
Hydrogen	H_2	200 ppm	0.000
Hydrogen Sulphide	H_2S	14 ppm	0.000
Isopropanol	C_3H_7OH	2 %	0.010
Methanol	CH_3OH	2 %	0.010
Nitrogen Dioxide	NO_2	50 ppm	0.000
Sulphur Dioxide	SO_2	25 ppm	0.000

Test Conditions: T=20^{O}C, P=1013 hPa, Flow Rate = 30 l/h

Please note that the values stated above are approximate values. Negative values are not displayed on the Satellite LCD Display; they will be shown as 0.

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MST Gas Sensors 9602

Technical Specifications

Specification Sheet Oxygen

Sensor Type	O_2 Oxygen
Part Number	9602-5500
Measuring Principle	amperometric 2-electrode sensor
Color of Sensor Cap	black
Specific Sensor Data	programmed on PROM inside the sensor
Standard Range	0.0 ... 25.0 %
Lower Detectable Limit (LDL)	0.0 %
Maximum Range	30 %
Sensitivity Decay	<2% signal/month (typically <5% over Operating Life)
Sensitivity	375…575 µV/%
Response Time	constant within standard range
t_{50}	n/d
t_{90}	< 15 s
Sensor warm-up time	5 s
Operating conditions	-20 ... +50 °C; 0 ... 99 % r.h. non-condensing
Storage conditions	0 ... +4 °C; 40 ... 60 % r.h. non-condensing
Temperature dependence	compensated with microprocessor
Sensor life	12 months
Sensor dimensions	
• Height	43 mm (1.69 ")
• Diameter	21.5 mm (0.84 ")
• Weight	27 g (0.95 oz)

Note:
All response data given are typical values and related to the sensor being used under normal conditions, i.e. temperature 20 °C, r.h. 40 ... 60 %, normal air pressure.

MST Gas Sensors 9602

Cross Sensitivity

Specification Sheet Oxygen

Gas	Test Gas Concentration	Reading in ppm
• Cross Sensitivities of the O_2 Sensor may occur with such strongly oxidising gases as for instance NO_X or Cl_2. Normally, these gases do not influence the oxygen reading (% range), as their concentration in work place environment is to low (ppm range). • Acid Gases (e.g. CO_2, SO_2) lead to an enhanced oxygen signal. • The sensor should not be used at constant CO_2 concentrations above 25%. • Extended exposure to organic solvents will poison the sensor.		

Test Conditions: T=20^{O}C, P=1013 hPa, Flow Rate = 30 l/h

Please note that the values stated above are approximate values. Negative values are not displayed on the Satellite LCD Display, they will be shown as 0.

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MST Gas Sensors 9602

Technical Specifications

Specification Sheet Nitrogen Dioxide

Sensor Type	NO_2 Nitrogen Dioxide
Part Number	9602-7300
Measuring Principle	amperometric 3-electrode sensor
Color of Sensor Cap	black
Specific Sensor Data	programmed on PROM inside the sensor
Standard Range	0.0 ... 25.0 ppm
Lower Detectable Limit (LDL)	0.5 ppm
Maximum Range	100.0 ppm
MAK/TLV	5.0 ppm / 3.0 ppm
Sensitivity Decay	< 2 % / month
Deviation from Linearity (within standard range)	< 5 % FS
Zero Current at normal conditions	below LDL
Sensitivity	450…750 nA/ppm
Response Time	constant within standard range
t_{50}	< 15 s (based on 5 min exposure time)
t_{90}	< 35 s (based on 5 min exposure time)
Sensor warm-up time	10 s
Operating conditions	-20 ... +50 °C; 15 ... 90 % r.h. non-condensing
Storage conditions	0 ... +4 °C; 40 ... 60 % r.h. non-condensing
Temperature dependence	compensated with microprocessor
Sensor life	3 years

Sensor dimensions

• Height	43 mm (1.69 ")
• Diameter	21.5 mm (0.84 ")
• Weight	12 g (0.42 oz)

Note:
All response data given are typical values and related to the sensor being used under normal conditions, i.e. temperature 20 °C, r.h. 40 ... 60 %, normal air pressure.

MST Gas Sensors 9602

Cross Sensitivity

Specification Sheet Nitrogen Dioxide

Gas		Test Gas Concentration	Reading in ppm
Ammonia	NH_3	100 ppm	0.0
Carbon Monoxide	CO	300 ppm	0.0
Chlorine	Cl_2	1 ppm	1.0
Hydrogen	H_2	3000 ppm	0.0
Hydrogen Cyanide	HCN	10 ppm	0.0
Hydrogen Sulphide	H_2S	15 ppm	0.0
Nitric Oxide	NO	35 ppm	0.0
Ozone	O_3	0.5 ppm	0.5
Sulphur Dioxide	SO_2	5 ppm	0.0

Test Conditions: T=20^{O}C, P=1013 hPa, Flow Rate = 30 l/h

Please note that the values stated above are approximate values. Negative values are not displayed on the Satellite LCD Display; they will be shown as 0.

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MST Gas Sensors 9602

Technical Specifications

Specification Sheet Hydrogen Bromide

Sensor Type	HBr Hydrogen Bromide
Part Number	9602-7000
Detectable Gases	BBr_3
Measuring Principle	amperometric 3-electrode sensor
Color of Sensor Cap	pink
Specific Sensor Data	programmed on PROM inside the sensor
Standard Range	0.0 ... 30.0 ppm
Lower Detectable Limit (LDL)	1.0 ppm
Maximum Range	50.0 ppm
MAK/TLV	2.0 ppm / 3.0 ppm
Sensitivity Decay	< 3 % / month
Deviation from Linearity (within standard range)	< 5 % FS
Zero Current at normal conditions	below LDL
Sensitivity	80…200 nA/ppm
Response Time	constant within standard range
t_{50}	< 30 s (based on 4 min exposure time)
t_{90}	< 70 s (based on 4 min exposure time)
Sensor warm-up time	5 min
Operating conditions	-20 ... +40 °C; 10 ... 95 % r.h. non-condensing
Storage conditions	0 ... +4 °C; 40 ... 60 % r.h. non-condensing
Temperature dependence	compensated with microprocessor
Sensor life	3 years

Sensor dimensions

• Height	43 mm (1.69 ")
• Diameter	20.5 mm (0.80 ")
• Weight	9 g (0.31 oz)

Note:
All response data given are typical values and related to the sensor being used under normal conditions, i.e. temperature 20 °C, r.h. 40 ... 60 %, normal air pressure.

MST Gas Sensors 9602

Cross Sensitivity

Specification Sheet Hydrogen Bromide

Gas		Test Gas Concentration	Reading in ppm
Ammonia	NH_3	300 ppm	0.0
Arsine	AsH_3	0.3 ppm	1.0
Carbon Dioxide	CO_2	5000 ppm	0.0
Carbon Monoxide	CO	1000 ppm	11.0
Chlorine	Cl_2	5 ppm	1.0
Ethanol	C_2H_5OH	6.6%	6.0
Hydrocarbons	-	% - range	0.0
Hydrocarbons (chlorinated)	-	% - range	0.0
Hydrogen	H_2	1 %	1.0
Hydrogen Chloride	HCl	5 ppm	5.0
Hydrogen Cyanide	HCN	15 ppm	1.0
Hydrogen Sulphide	H_2S	10 ppm	2.8
Nitric Oxide	NO	10 ppm	2.0
Phosphine	PH_3	0.3 ppm	1.0
Phosgene	$COCl_2$	0.5 ppm	0.0
Silane	SiH_4	10 ppm	0.0
Sulphur Dioxide	SO_2	5 ppm	1.9

Test Conditions: T=20^{O}C, P=1013 hPa, Flow Rate = 30 l/h

Please note that the values stated above are approximate values. Negative values are not displayed on the Satellite LCD Display; they will be shown as 0.

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MST Gas Sensors 9602

Technical Specifications

Specification Sheet Nitric Oxide

Sensor Type	NO Nitric Oxide
Part Number	9602-7200
Measuring Principle	amperometric 3-electrode sensor
Color of Sensor Cap	orange
Specific Sensor Data	programmed on PROM inside the sensor
Standard Range	0 ... 250 ppm
Lower Detectable Limit (LDL)	5 ppm
Maximum Range	1000 ppm
MAK/TLV	- / 25 ppm
Sensitivity Decay	< 2 % / month
Deviation from Linearity (within standard range)	< 5 % FS
Zero Current at normal conditions	below LDL
Sensitivity	320…480 nA/ppm
Response Time	constant within standard range
t_{50}	< 5 s (based on 1 min exposure time)
t_{90}	< 20 s (based on 1 min exposure time)
Sensor warm-up time	30 min
Operating conditions	-20 ... +50 °C; 15 ... 90 % r.h. non-condensing
Storage conditions	0 ... +4 °C; 40 ... 60 % r.h. non-condensing
Temperature dependence	compensated with microprocessor
Sensor life	3 years
Sensor dimensions	
• Height	43 mm (1.69 ")
• Diameter	21.5 mm (0.84 ")
• Weight	12 g (0.42 oz)

Note:
All response data given are typical values and related to the sensor being used under normal conditions, i.e. temperature 20 °C, r.h. 40 ... 60 %, normal air pressure.

MST Gas Sensors 9602

Cross Sensitivity

Specification Sheet Nitric Oxide

Gas		Test Gas Concentration	Reading in ppm
Ammonia	NH_3	100 ppm	0
Carbon Monoxide	CO	300 ppm	0
Hydrogen	H_2	3000 ppm	0
Nitrogen Dioxide	NO_2	50 ppm	5
Ozone	O_3	0.5 ppm	0
Sulphur Dioxide	SO_2	2 ppm	0

Test Conditions: T=20^{O}C, P=1013 hPa, Flow Rate = 30 l/h

Please note that the values stated above are approximate values. Negative values are not displayed on the Satellite LCD Display; they will be shown as 0.

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MST Gas Sensors 9602

Technical Specifications

Specification Sheet Hydrogen Sulfide

Sensor Type	H_2S Hydrogen Sulfide
Part Number	9602-5200
Detectable Gases	Mercaptanes
Measuring Principle	amperometric 3-electrode sensor
Color of Sensor Cap	light blue
Specific Sensor Data	programmed on PROM inside the sensor
Standard Range	0 ... 100 ppm
Lower Detectable Limit (LDL)	2 ppm
Maximum Range	500 ppm
MAK/TLV	10 ppm / 10 ppm
Sensitivity Decay	< 10 % / 6 months
Deviation from Linearity (within standard range)	< 5 % FS
Zero Current at normal conditions	below LDL
Sensitivity	300…900 nA/ppm
Response Time	constant within standard range
t_{50}	< 15 s (based on 2 min exposure time)
t_{90}	< 30 s (based on 2 min exposure time)
Sensor warm-up time	5 s
Operating conditions	-40 ... +40 °C; 15 ... 90 % r.h. non-condensing
Storage conditions	0 ... +4 °C; 40 ... 60 % r.h. non-condensing
Temperature dependence	compensated with microprocessor
Sensor life	4 years

Sensor dimensions

• Height	43 mm (1.69 ")
• Diameter	20.5 mm (0.80 ")
• Weight	9 g (0.31 oz)

Note:
All response data given are typical values and related to the sensor being used under normal conditions, i.e. temperature 20 °C, r.h. 40 ... 60 %, normal air pressure.

MST Gas Sensors 9602

Cross Sensitivity

Specification Sheet Hydrogen Sulfide

Gas		Test Gas Concentration	Reading in ppm
Ammonia	NH_3	100 ppm	0
Carbon Dioxide	CO_2	5000 ppm	0
Carbon Monoxide	CO	100 ppm	6
Chlorine	Cl_2	20 ppm	0
Diborane	B_2H_6	0.6 ppm	15
Ethylene	C_2H_4	500 ppm	2
Hydrogen	H_2	100 ppm	5
Hydrogen	H_2	2%	100
Hydrogen Cyanide	HCN	20 ppm	2
Methane	CH_4	1%	0
Nitrogen Dioxide	NO_2	10 ppm	0
Silane	SiH_4	10 ppm	7
Sulphur Dioxide	SO_2	20 ppm	2

Test Conditions: T=20^{O}C, P=1013 hPa, Flow Rate = 30 l/h

Please note that the values stated above are approximate values. Negative values are not displayed on the Satellite LCD Display; they will be shown as 0.

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MST Gas Sensors 9602

Technical Specifications

Specification Sheet Phosgene

Sensor Type	$COCl_2$ Phosgene
Part Number	9602-6600
Detectable Gases	MCF
Measuring Principle	amperometric 3-electrode sensor
Color of Sensor Cap	white
Specific Sensor Data	programmed on PROM inside the sensor
Standard Range	0.00 ... 1.00 ppm
Lower Detectable Limit (LDL)	0.02 ppm
Maximum Range	10.00 ppm
MAK/TLV	0.02 ppm / 0.10 ppm
Sensitivity Decay	< 5 % / month
Deviation from Linearity (within standard range)	< 10 % FS
Zero Current at normal conditions	below LDL
Sensitivity	500…1200 nA/ppm
Response Time	constant within standard range
t_{50}	< 60 s (based on 4 min exposure time)
t_{90}	< 120 s (based on 4 min exposure time)
Sensor warm-up time	5 s
Operating conditions	-20 ... +40 °C; 10 ... 95 % r.h. non-condensing
Storage conditions	0 ... +4 °C; 40 ... 60 % r.h. non-condensing
Temperature dependence	compensated with microprocessor
Sensor life	18 months

Sensor dimensions

- Height 43 mm (1.69 ")
- Diameter 20.5 mm (0.80 ")
- Weight 9 g (0.31 oz)

Note:
All response data given are typical values and related to the sensor being used under normal conditions, i.e. temperature 20 °C, r.h. 40 ... 60 %, normal air pressure.

MST Gas Sensors 9602

Cross Sensitivity

Specification Sheet Phosgene

Gas		Test Gas Concentration	Reading in ppm
Alcohols	ROH	1000 ppm	0.00
Ammonia	NH_3	50 ppm	0.50
Carbon Dioxide	CO_2	5000 ppm	0.00
Carbon Monoxide	CO	300 ppm	0.00
Chlorine	Cl_2	1 ppm	0.00
Hydrocarbons	-	% - range	0.00
Hydrogen	H_2	1000 ppm	0.00
Hydrogen Chloride	HCl	5 ppm	0.00*
Hydrogen Cyanide	HCN	5 ppm	0.00*
Hydrogen Fluoride	HF	3 ppm	0.00
Hydrogen Sulphide	H_2S	1 ppm	0.00*
Sulphur Dioxide	SO_2	2 ppm	0.00
Abrupt change in humidity			Yes
* Short Term Exposure			

Test Conditions: T=20^{O}C, P=1013 hPa, Flow Rate = 30 l/h

Please note that the values stated above are approximate values. Negative values are not displayed on the Satellite LCD Display; they will be shown as 0.

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MST Gas Sensors 9602

Technical Specifications

Specification Sheet Fluorine

Sensor Type	F_2 Fluorine
Part Number	9602-6400
Measuring Principle	amperometric 3-electrode sensor
Color of Sensor Cap	yellow
Specific Sensor Data	programmed on PROM inside the sensor
Standard Range	0.00 ... 5.00 ppm
Lower Detectable Limit (LDL)	0.03 ppm
Maximum Range	10.00 ppm
MAK/TLV	0.10 ppm / 0.10 ppm
Sensitivity Decay	< 3 % / month
Deviation from Linearity (within standard range)	< 5 % FS
Zero Current at normal conditions	below LDL
Sensitivity	1000…1800 nA/ppm
Response Time	constant within standard range
t_{50}	< 10 s (based on 2 min exposure time)
t_{90}	< 30 s (based on 2 min exposure time)
Sensor warm-up time	5 s
Operating conditions	-20 ... +40 °C; 10 ... 95 % r.h. non-condensing
Storage conditions	0 ... +4 °C; 40 ... 60 % r.h. non-condensing
Temperature dependence	compensated with microprocessor
Sensor life	3 years

Sensor dimensions

• Height	43 mm (1.69 ")
• Diameter	20.5 mm (0.80 ")
• Weight	9 g (0.31 oz)

Note:
All response data given are typical values and related to the sensor being used under normal conditions, i.e. temperature 20 °C, r.h. 40 ... 60 %, normal air pressure.

MST Gas Sensors 9602

Cross Sensitivity

Specification Sheet Fluorine

Gas		Test Gas Concentration	Reading in ppm
Ammonia	NH_3	65 ppm	0.00
Ammonia	NH_3	1000 ppm	0.00
Bromine	Br_2	1 ppm	0.67
Carbon Dioxide	CO_2	10%	0.00
Carbon Monoxide	CO	300 ppm	0.00
Chlorine	Cl_2	1 ppm	0.67
Chlorine Dioxide	ClO_2	0.5 ppm	0.20
Ethanol	C_2H_6OH	6.6%	0.00
Hydrocarbons	-	% - range	0.00
Hydrogen	H_2	1000 ppm	0.00
Hydrogen Chloride	HCl	20 ppm	0.00
Hydrogen Cyanide	HCN	10 ppm	0.00
Hydrogen Fluoride	HF	10 ppm	0.00
Hydrogen Sulphide	H_2S	10 ppm	0.00
Nitrogen Dioxide	NO_2	2 ppm	0.20
Ozone	O_3	0.5 ppm	0.11
Sulphur Dioxide	SO_2	5 ppm	1.00

Test Conditions: T=20^{O}C, P=1013 hPa, Flow Rate = 30 l/h

Please note that the values stated above are approximate values. Negative values are not displayed on the Satellite LCD Display; they will be shown as 0

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MST Gas Sensors 9602

Technical Specifications

Specification Sheet Hydrogen 4%

Sensor Type	H_2 Hydrogen 4%
Part Number	9602-5101
Measuring Principle	amperometric 3-electrode sensor
Color of Sensor Cap	red
Specific Sensor Data	programmed on PROM inside the sensor
Standard Range	0.00 ... 4.00 % vol.
Lower Detectable Limit (LDL)	0.05 % vol.
Maximum Range	10.00 % vol.
MAK/TLV	- / -
Sensitivity Decay	< 10 % / 6 months
Deviation from Linearity (within standard range)	< 10 % FS
Zero Current at normal conditions	below LDL
Sensitivity	0.5…2.0 nA/ppm
Response Time	constant within standard range
t_{50}	< 40 s (based on 2 min exposure time)
t_{90}	< 70 s (based on 2 min exposure time)
Sensor warm-up time	5 s
Operating conditions	-20 ... +40 °C; 10 ... 95 % r.h. non-condensing
Storage conditions	0 ... +4 °C; 40 ... 60 % r.h. non-condensing
Temperature dependence	compensated with microprocessor
Sensor life	4 years
Sensor dimensions	
• Height	43 mm (1.69 ")
• Diameter	20.5 mm (0.80 ")
• Weight	9 g (0.31 oz)

Note:
All response data given are typical values and related to the sensor being used under normal conditions, i.e. temperature 20 °C, r.h. 40 ... 60 %, normal air pressure.

MST Gas Sensors 9602

Cross Sensitivity

Specification Sheet Hydrogen 4%

Gas		Test Gas Concentration	Reading in % Volume
Ammonia	NH_3	100 ppm	0.00
Carbon Dioxide	CO_2	1000 ppm	0.00
Carbon Monoxide	CO	250 ppm	0.00
Chlorine	Cl_2	5 ppm	0.00
Ethylene	C_2H_4	1000 ppm	0.06
Hydrogen Chloride	HCl	20 ppm	0.00
Hydrogen Cyanide	HCN	10 ppm	0.00
Hydrogen Fluoride	HF	3 ppm	0.00
Hydrogen Sulphide	H_2S	10 ppm	0.00
Isopropanol	C_3H_7OH	1000 ppm	0.00
Methane	CH_4	10000 ppm	0.00
Nitric Oxide	NO	100 ppm	0.11
Nitrogen Dioxide	NO_2	10 ppm	0.00
Refrigerants	-	% - range	0.00
Silane	SiH_4	50 ppm	0.05
Sulphur Dioxide	SO_2	25 ppm	0.00

Test Conditions: T=20^{O}C, P=1013 hPa, Flow Rate = 30 l/h

Please note that the values stated above are approximate values. Negative values are not displayed on the Satellite LCD Display; they will be shown as 0.

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MST Gas Sensors 9602

Technical Specifications

Specification Sheet Hydrogen 1%

Sensor Type	H_2 Hydrogen 1%
Part Number	9602-5100
Measuring Principle	amperometric 3-electrode sensor
Color of Sensor Cap	red
Specific Sensor Data	programmed on PROM inside the sensor
Standard Range	0.000 ... 1.000 % vol.
Lower Detectable Limit (LDL)	0.010 % vol.
Maximum Range	1.000 % vol.
MAK/TLV	- / -
Sensitivity Decay	< 10 % / 6 months
Deviation from Linearity (within standard range)	< 5 % FS
Zero Current at normal conditions	below LDL
Sensitivity	3…15 nA/ppm
Response Time	constant within standard range
t_{50}	< 40 s (based on 2 min exposure time)
t_{90}	< 70 s (based on 2 min exposure time)
Sensor warm-up time	5 s
Operating conditions	-20 ... +40 °C; 10 ... 90 % r.h. non-condensing
Storage conditions	0 ... +4 °C; 40 ... 60 % r.h. non-condensing
Temperature dependence	compensated with microprocessor
Sensor life	4 years
Sensor dimensions	
• Height	43 mm (1.69 ")
• Diameter	20.5 mm (0.80 ")
• Weight	9 g (0.31 oz)

Note:
All response data given are typical values and related to the sensor being used under normal conditions, i.e. temperature 20 °C, r.h. 40 ... 60 %, normal air pressure.

MST Gas Sensors 9602

Cross Sensitivity

Specification Sheet Hydrogen 1%

Gas		Test Gas Concentration	Reading in % Volume
Ammonia	NH_3	100 ppm	0.000
Carbon Dioxide	CO_2	1000 ppm	0.000
Carbon Monoxide	CO	100 ppm	0.012
Chlorine	Cl_2	5 ppm	0.000
Ethylene	C_2H_4	500 ppm	0.028
Hydrogen Chloride	HCl	20 ppm	0.000
Hydrogen Cyanide	HCN	10 ppm	0.000
Hydrogen Fluoride	HF	3 ppm	0.000
Hydrogen Sulphide	H_2S	10 ppm	0.000
Isopropanol	C_3H_7OH	1000 ppm	0.018
Methane	CH_4	10000 ppm	0.000
Nitric Oxide	NO	100 ppm	0.000
Nitrogen Dioxide	NO_2	10 ppm	0.000
Refrigerants	-	% - range	0.000
Silane	SiH_4	20 ppm	0.010
Sulphur Dioxide	SO_2	10 ppm	0.000

Test Conditions: T=20^{O}C, P=1013 hPa, Flow Rate = 30 l/h

Please note that the values stated above are approximate values. Negative values are not displayed on the Satellite LCD Display; they will be shown as 0.

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MST Gas Sensors 9602

Technical Specifications

Specification Sheet Methyl Fluoride

Only in combination with Pyrolyzer Unit!

Sensor Type	CH3F Methyl Fluoride
Part Number	9602-9720
Measuring Principle	amperometric 3-electrode sensor
Color of Sensor Cap	white
Specific Sensor Data	programmed on PROM inside the sensor
Standard Range	0.000...0.500 % vol
Lower Detectable Limit (LDL)	0.010 % vol
Maximum Range	1.000 % vol
MAK/TLV	- / -
Sensitivity Decay	< 10 % / month
Deviation from Linearity (within standard range)	< 5 % FS
Zero Current at normal conditions	below LDL
Sensitivity	0.60…5.00 nA/ppm
Response Time	constant within standard range
t_{50}	< 40 s (based on 5 min exposure time)
t_{90}	< 90 s (based on 5 min exposure time)
Sensor warm-up time	5 s
Operating conditions	-20 ... +35 °C; 20 ... 80 % r.h. non-condensing
Storage conditions	0 ... +4 °C; 40 ... 60 % r.h. non-condensing
Temperature dependence	compensated with microprocessor
Sensor life	15 months
Sensor dimensions	
• Height	43 mm (1.69 ")
• Diameter	20.5 mm (0.80 ")
• Weight	9 g (0.31 oz)

Note:
All response data given are typical values and related to the sensor being used under normal conditions, i.e. temperature 20 °C, r.h. 40 ... 60 %, normal air pressure.

MST Gas Sensors 9602

Cross Sensitivity

Specification Sheet Methyl Fluoride

Gas	Test Gas Concentration	Reading in ppm
No Data Presently Available		

Test Conditions: T=20^{O}C, P=1013 hPa, Flow Rate = 30 l/h

Please note that the values stated above are approximate values. Negative values are not displayed on the Satellite LCD Display; they will be shown as 0.

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MST Gas Sensors 9602

Technical Specifications

Specification Sheet Octafluorocyclopentene

Only in combination with Pyrolyzer Unit!

Sensor Type	C5F8 Octafluorocyclopentene
Part Number	9602-9730
Measuring Principle	amperometric 3-electrode sensor
Color of Sensor Cap	white
Specific Sensor Data	programmed on PROM inside the sensor
Standard Range	0.0...20.0 ppm
Lower Detectable Limit (LDL)	0.5 ppm
Maximum Range	50.0 ppm
MAK/TLV	- / -
Sensitivity Decay	< 10 % / month
Deviation from Linearity (within standard range)	< 5 % FS
Zero Current at normal conditions	below LDL
Sensitivity	60…300 nA/ppm
Response Time	constant within standard range
t_{50}	< 40 s (based on 5 min exposure time)
t_{90}	< 90 s (based on 5 min exposure time)
Sensor warm-up time	5 s
Operating conditions	-20 ... +35 °C; 20 ... 80 % r.h. non-condensing
Storage conditions	0 ... +4 °C; 40 ... 60 % r.h. non-condensing
Temperature dependence	compensated with microprocessor
Sensor life	15 months
Sensor dimensions	
• Height	43 mm (1.69 ")
• Diameter	20.5 mm (0.80 ")
• Weight	9 g (0.31 oz)

Note:
All response data given are typical values and related to the sensor being used under normal conditions, i.e. temperature 20 °C, r.h. 40 ... 60 %, normal air pressure.

MST Gas Sensors 9602

Cross Sensitivity

Specification Sheet Octafluorocyclopentene

Gas	Test Gas Concentration	Reading in ppm
No Data Presently Available		

Test Conditions: T=20^{O}C, P=1013 hPa, Flow Rate = 30 l/h

Please note that the values stated above are approximate values. Negative values are not displayed on the Satellite LCD Display; they will be shown as 0.

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MST Gas Sensors 9602

Technical Specifications

Specification Sheet Chlorine

Sensor Type	Cl_2 Chlorine
Part Number	9602-5300
Measuring Principle	amperometric 3-electrode sensor
Color of Sensor Cap	yellow
Specific Sensor Data	programmed on PROM inside the sensor
Standard Range	0.00 ... 5.00 ppm
Lower Detectable Limit (LDL)	0.15 ppm
Maximum Range	10.00 ppm
MAK/TLV	0.50 ppm / 0.50 ppm
Sensitivity Decay	< 10 % / 6 months
Deviation from Linearity (within standard range)	< 5 % FS
Zero Current at normal conditions	below LDL
Sensitivity	200…500 nA/ppm
Response Time	constant within standard range
t_{50}	< 10 s (based on 2 min exposure time)
t_{90}	< 30 s (based on 2 min exposure time)
Sensor warm-up time	5 s
Operating conditions	-20 ... +40 °C; 10 ... 95 % r.h. non-condensing
Storage conditions	0 ... +4 °C; 40 ... 60 % r.h. non-condensing
Temperature dependence	compensated with microprocessor
Sensor life	3 years
Sensor dimensions	
• Height	43 mm (1.69 ")
• Diameter	20.5 mm (0.80 ")
• Weight	9 g (0.31 oz)

Note:
All response data given are typical values and related to the sensor being used under normal conditions, i.e. temperature 20 °C, r.h. 40 ... 60 %, normal air pressure.

MST Gas Sensors 9602

Cross Sensitivity

Specification Sheet Chlorine

Gas		Test Gas Concentration	Reading in ppm
Ammonia	NH_3	65 ppm	0.00
Ammonia	NH_3	1,000 ppm	0.00
Bromine	Br_2	1 ppm	1.00
Carbon Dioxide	CO_2	10%	0.00
Carbon Monoxide	CO	300 ppm	0.00
Chlorine Dioxide	ClO_2	0.25 ppm	0.05
Diborane	B_2H_6	0.6 ppm	0.30
Ethanol	C_2H_6OH	6.6%	0.00
Fluorine	F_2	1 ppm	0.50
Hydrocarbons	-	% - range	0.00
Hydrogen	H_2	1,000 ppm	0.00
Hydrogen Chloride	HCl	20 ppm	0.00
Hydrogen Cyanide	HCN	10 ppm	0.00
Hydrogen Fluoride	HF	3 ppm	0.00
Hydrogen Sulphide	H_2S	10 ppm	0.00
Nitrogen Dioxide	NO_2	2 ppm	0.20
Ozone	O_3	0.5 ppm	0.15
Sulphur Dioxide	SO_2	5 ppm	1.00

Test Conditions: T=20^{O}C, P=1013 hPa, Flow Rate = 30 l/h

Please note that the values stated above are approximate values. Negative values are not displayed on the Satellite LCD Display; they will be shown as 0.

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MST Gas Sensors 9602

Technical Specifications

Specification Sheet Carbon Monoxide

Sensor Type	CO Carbon Monoxide
Part Number	9602-5400
Measuring Principle	amperometric 2-electrode sensor
Color of Sensor Cap	green
Specific Sensor Data	programmed on PROM inside the sensor
Standard Range	0 ... 500 ppm
Lower Detectable Limit (LDL)	10 ppm
Maximum Range	1000 ppm
MAK/TLV	30 ppm / 25 ppm
Sensitivity Decay	< 10 % / 6 months
Deviation from Linearity (within standard range)	< 5 % FS
Zero Current at normal conditions	below LDL
Sensitivity	12…40 nA/ppm
Response Time	constant within standard range
t_{50}	< 10 s (based on 2 min exposure time)
t_{90}	< 35 s (based on 2 min exposure time)
Sensor warm-up time	5 s
Operating conditions	-40 ... +50 °C; 15 ... 90 % r.h. non-condensing
Storage conditions	0 ... +4 °C; 40 ... 60 % r.h. non-condensing
Temperature dependence	compensated with microprocessor
Sensor life	3 years
Sensor dimensions	
• Height	43 mm (1.69 ")
• Diameter	20.5 mm (0.80 ")
• Weight	9 g (0.31 oz)

Note:
All response data given are typical values and related to the sensor being used under normal conditions, i.e. temperature 20 °C, r.h. 40 ... 60 %, normal air pressure.

MST Gas Sensors 9602

Cross Sensitivity

Specification Sheet Carbon Monoxide

Gas		Test Gas Concentration	Reading in ppm
Alcohols	R-OH	1000 ppm	0
Ammonia	NH_3	100 ppm	0
Carbon Dioxide	CO_2	5000 ppm	0
Chlorine	Cl_2	5 ppm	0
Ethylene	C_2H_4	500 ppm	0
Hydrogen	H_2	1000 ppm	250
Hydrogen Cyanide	HCN	10 ppm	0
Hydrogen Sulphide	H_2S	10 ppm	0
Methane	CH_4	1%	0
Nitrogen Dioxide	NO_2	10 ppm	0
Nitrogen Oxide	NO	100 ppm	25
Sulphur Dioxide	SO_2	10 ppm	0

Test Conditions: T=20^{O}C, P=1013 hPa, Flow Rate = 30 l/h

Please note that the values stated above are approximate values. Negative values are not displayed on the Satellite LCD Display; they will be shown as 0.

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MST Gas Sensors 9602

Technical Specifications

Specification Sheet Ethylene Oxide

Sensor Type	ETO Ethylene Oxide
Part Number	9602-8000
Measuring Principle	amperometric 3-electrode sensor
Color of Sensor Cap	turquoise
Specific Sensor Data	programmed on PROM inside the sensor
Standard Range	0 ... 20.0 ppm
Lower Detectable Limit (LDL)	2.0 ppm
Maximum Range	50.0 ppm
MAK/TLV	- / 1 ppm
Sensitivity Decay	< 0.5 % / month
Deviation from Linearity (within standard range)	< 2 % FS
Zero Current at normal conditions	below LDL
Sensitivity	1650…2250 nA/ppm
Response Time	constant within standard range
t_{50}	< 15 s (based on 5 min exposure time)
t_{90}	< 120 s (based on 5 min exposure time)
Sensor warm-up time	120 min
Operating conditions	-20 ... +50 °C; 15 ... 90 % r.h. non-condensing
Storage conditions	0 ... +4 °C; 40 ... 60 % r.h. non-condensing
Temperature dependence	compensated with microprocessor
Sensor life	2 years
Sensor dimensions	
• Height	43 mm (1.69 ")
• Diameter	21.5 mm (0.84 ")
• Weight	12 g (0.42 oz)

Note:
All response data given are typical values and related to the sensor being used under normal conditions, i.e. temperature 20 °C, r.h. 40 ... 60 %, normal air pressure.

MST Gas Sensors 9602

Cross Sensitivity

Specification Sheet Ethylene Oxide

Gas		Test Gas Concentration	Reading in ppm
Hydrogen Sulphide	H_2S	1 ppm	5.5
Carbon Monoxide	CO	30 ppm	15.0
Ethanol	C_2H_6O	10 ppm	5.5
Nitric Oxide	NO	5 ppm	10.5
Nitrogen Dioxide	NO_2	20 ppm	5.0
Ozone	O_3	1 ppm	0.0
Sulphur Dioxide	SO_2	10 ppm	10.0

Test Conditions: T=20^{O}C, P=1013 hPa, Flow Rate = 30 l/h

Please note that the values stated above are approximate values. Negative values are not displayed on the Satellite LCD Display; they will be shown as 0.

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MST Gas Sensors 9602

Technical Specifications

Specification Sheet Hexafluoro-1,3-butadiene

Only in combination with Pyrolyzer Unit!

Sensor Type	C4F6 Hexafluoro-1,3-butadiene
Part Number	9602-9732
Measuring Principle	amperometric 3-electrode sensor
Color of Sensor Cap	white
Specific Sensor Data	programmed on PROM inside the sensor
Standard Range	0.0...50.0 ppm
Lower Detectable Limit (LDL)	2.0 ppm
Maximum Range	100.0 ppm
MAK/TLV	- / -
Sensitivity Decay	< 10 % / month
Deviation from Linearity (within standard range)	< 5 % FS
Zero Current at normal conditions	below LDL
Sensitivity	40…200 nA/ppm
Response Time	constant within standard range
t_{50}	< 40 s (based on 5 min exposure time)
t_{90}	< 90 s (based on 5 min exposure time)
Sensor warm-up time	5 s
Operating conditions	-20 ... +35 °C; 20 ... 80 % r.h. non-condensing
Storage conditions	0 ... +4 °C; 40 ... 60 % r.h. non-condensing
Temperature dependence	compensated with microprocessor
Sensor life	15 months

Sensor dimensions

• Height	43 mm (1.69 ")
• Diameter	20.5 mm (0.80 ")
• Weight	9 g (0.31 oz)

Note:
All response data given are typical values and related to the sensor being used under normal conditions, i.e. temperature 20 °C, r.h. 40 ... 60 %, normal air pressure.

MST Gas Sensors 9602

Cross Sensitivity

Specification Sheet Hexafluoro-1,3-butadiene

Gas	Test Gas Concentration	Reading in ppm
No Data Presently Available		

Test Conditions: T=20^{O}C, P=1013 hPa, Flow Rate = 30 l/h

Please note that the values stated above are approximate values. Negative values are not displayed on the Satellite LCD Display; they will be shown as 0.

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MST Gas Sensors 9602

Technical Specifications

Specification Sheet Arsine (Scrubber Application)

Sensor Type	AsH_3 Arsine
Part Number	9602-6002
Measuring Principle	amperometric 2-electrode sensor
Color of Sensor Cap	dark red
Specific Sensor Data	programmed on PROM inside the sensor
Standard Range	0.0 ... 10.0 ppm
Lower Detectable Limit (LDL)	0.5 ppm
Maximum Range	10.0 ppm
MAK/TLV	- / 0.05 ppm
Sensitivity Decay	< 3 % / month
Deviation from Linearity (within standard range)	< 10% FS
Zero Current at normal conditions	Below LDL
Sensitivity	35…80 nA/ppm
Response Time	constant within standard range
t_{50}	< 20 s (based on 2 min exposure time)
t_{90}	< 60 s (based on 2 min exposure time)
Sensor warm-up time	5 s
Operating conditions	-20 ... +40 °C; 5 ... 95 % r.h. non-condensing
Storage conditions	0 ... +4 °C; 40 ... 60 % r.h. non-condensing
Temperature dependence	compensated with microprocessor
Sensor life	2 years
Sensor dimensions	
• Height	43 mm (1.69 ")
• Diameter	20.5 mm (0.80 ")
• Weight	9 g (0.31 oz)

Note:
All response data given are typical values and related to the sensor being used under normal conditions, i.e. temperature 20 °C, r.h. 40 ... 60 %, normal air pressure.

MST Gas Sensors 9602

Cross Sensitivity

Specification Sheet Arsine (Scrubber Application)

Gas		Test Gas Concentration	Reading in ppm
Ammonia	NH_3	100 ppm	0.0
Carbon Dioxide	CO_2	5000 ppm	0.0
Carbon Monoxide	CO	300 ppm	0.0
Chlorine	Cl_2	5 ppm	0.0
Diborane	B_2H_6	0.1 ppm	0.0
Germane	GeH_4	1 ppm	0.0
Hydrocarbons	-	% - range	0.0
Hydrogen	H_2	10 %	0.0
Hydrogen Chloride	HCl	5 ppm	0.0
Hydrogen Cyanide	HCN	10 ppm	0.0
Hydrogen Fluoride	HF	4 ppm	0.0
Hydrogen Selenide	H_2Se	0.3 ppm	0.0
Hydrogen Sulphide	H_2S	10 ppm	0.0
Nitric Oxide	NO	100 ppm	0.0
Nitrogen Dioxide	NO_2	2 ppm	0.0
Phosphine	PH_3	1.0 ppm	0.8
Silane	SiH_4	10 ppm	0.0
Sulphur Dioxide	SO_2	2 ppm	0.0

Test Conditions: T=20^{O}C, P=1013 hPa, Flow Rate = 30 l/h

Please note that the values stated above are approximate values. Negative values are not displayed on the Satellite LCD Display; they will be shown as 0.

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MST Gas Sensors 9602

Technical Specifications

Specification Sheet Bromine

Sensor Type	Br_2 Bromine
Part Number	9602-6800
Measuring Principle	amperometric 3-electrode sensor
Color of Sensor Cap	yellow
Specific Sensor Data	programmed on PROM inside the sensor
Standard Range	0.00 ... 5.00 ppm
Lower Detectable Limit (LDL)	0.05 ppm
Maximum Range	10.00 ppm
MAK/TLV	0.10 ppm / 0.10 ppm
Sensitivity Decay	< 10 % / 6 months
Deviation from Linearity (within standard range)	< 5 % FS
Zero Current at normal conditions	below LDL
Sensitivity	200…500 nA/ppm
Response Time	constant within standard range
t_{50}	< 10 s (based on 2 min exposure time)
t_{90}	< 30 s (based on 2 min exposure time)
Sensor warm-up time	5 s
Operating conditions	-20 ... +40 °C; 10 ... 95 % r.h. non-condensing
Storage conditions	0 ... +4 °C; 40 ... 60 % r.h. non-condensing
Temperature dependence	compensated with microprocessor
Sensor life	3 years

Sensor dimensions

• Height	43 mm (1.69 ")
• Diameter	20.5 mm (0.80 ")
• Weight	9 g (0.31 oz)

Note:
All response data given are typical values and related to the sensor being used under normal conditions, i.e. temperature 20 °C, r.h. 40 ... 60 %, normal air pressure.

MST Gas Sensors 9602

Cross Sensitivity

Specification Sheet Bromine

Gas		Test Gas Concentration	Reading in ppm
Ammonia	NH_3	65 ppm	0.00
Ammonia	NH_3	1000 ppm	0.00
Carbon Dioxide	CO_2	10%	0.00
Carbon Monoxide	CO	300 ppm	0.00
Chlorine	Cl_2	1 ppm	1.00
Chlorine Dioxide	ClO_2	0.25 ppm	0.05
Diborane	B_2H_6	0.6 ppm	0.30
Ethanol	C_2H_5OH	6.6%	0.00
Fluorine	F_2	1 ppm	0.50
Hydrocarbons	-	% - range	0.00
Hydrogen	H_2	1000 ppm	0.00
Hydrogen Chloride	HCl	20 ppm	0.00
Hydrogen Cyanide	HCN	10 ppm	0.00
Hydrogen Fluoride	HF	3 ppm	0.00
Hydrogen Sulphide	H_2S	10 ppm	0.00
Nitrogen Dioxide	NO_2	2 ppm	0.20
Ozone	O_3	0.5 ppm	0.15
Sulphur Dioxide	SO_2	5 ppm	1.00

Test Conditions: T=20^{O}C, P=1013 hPa, Flow Rate = 30 l/h

Please note that the values stated above are approximate values. Negative values are not displayed on the Satellite LCD Display; they will be shown as 0.

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MST Gas Sensors 9602

Technical Specifications

Specification Sheet trans-1,2-Dichloroethylene

Only in combination with Pyrolyzer Unit!

Sensor Type	1,2-trans-DCE
Part Number	9602-9600
Measuring Principle	amperometric 3-electrode sensor
Color of Sensor Cap	pink
Specific Sensor Data	programmed on PROM inside the sensor
Standard Range	1...1000 ppm
Lower Detectable Limit (LDL)	10 ppm
Maximum Range	1000 ppm
MAK/TLV	200 ppm / 200 ppm
Sensitivity Decay	< 3 % / month
Deviation from Linearity (within standard range)	< 5 % FS
Zero Current at normal conditions	below LDL
Sensitivity	20…60 nA/ppm
Response Time	constant within standard range
t_{50}	< 40 s (based on 4 min exposure time)
t_{90}	< 80 s (based on 4 min exposure time)
Sensor warm-up time	5 min
Operating conditions	-20 ... +40 °C; 20 ... 95 % r.h. non-condensing (
Storage conditions	0 ... +4 °C; 40 ... 60 % r.h. non-condensing
Temperature dependence	compensated with microprocessor
Sensor life	3 years

Sensor dimensions

• Height	43 mm (1.69 ")
• Diameter	20.5 mm (0.80 ")
• Weight	9 g (0.31 oz)

Note:
All response data given are typical values and related to the sensor being used under normal conditions, i.e. temperature 20 °C, r.h. 40 ... 60 %, normal air pressure.

MST Gas Sensors 9602

Cross Sensitivity

Specification Sheet trans-1,2-Dichloroethylene

Gas	Test Gas Concentration	Reading in ppm
No Data Presently Available		

Test Conditions: T=20^{O}C, P=1013 hPa, Flow Rate = 30 l/h

Please note that the values stated above are approximate values. Negative values are not displayed on the Satellite LCD Display; they will be shown as 0

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MST Gas Sensor 9602

Honeywell

Chlorine Trifluoride (ClF_3)

9602-7410

Chlorine Trifluoride (ClF_3) 9602-7410

MST Gas Sensors 9602 are only intended for use with the following Honeywell Analytics gas detectors:

Satellite Series

Sat-Ex

Satellite Portable Gas Detector

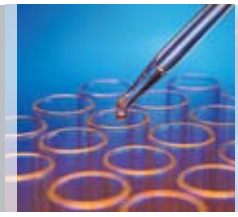
Comet

Please refer to the specific gas detector's Operational Manual for further details.

Chlorine Trifluoride ClF_3	
Sensor Type	ClF_3 Chlorine Trifluoride (without chemical Filter)
Part Number	9602-7410
Measuring Principle	Amperometric 3-electrode sensor
Color of Sensor Cap	Black
Specific Sensor Data	Programmed on PROM inside the sensor
Standard Range	0.00 to 1.00ppm
Lower Detectable Limit (LDL)	0.03ppm
Maximum Range	5.00ppm
Sensitivity Decay	< 10% / 6 months
Deviation from Linearity (within Standard Range)	< 10% FS
Zero Current at Normal Conditions	Below LDL
Sensitivity	400 to 800 nA/ppm
Response Time	Constant within standard range
t_{50}	< 20 s (based on 2 min exposure time)
t_{90}	< 90 s (based on 2 min exposure time)
Sensor Warm-up Time	5 s
Operating Conditions	-20°C to +40°C; 10% to 95% r.h. non-condensing
Storage Conditions	0°C to +4°C; 40% to 60% r.h. non-condensing
Temperature Dependence	Compensated with microprocessor
Sensor Life Expectancy	≥ 24 months under typical application conditions
Sensor Dimensions	
Height	43mm (1.69")
Diameter	20.5mm (0.80")
Weight	9g (0.31oz)

Note:
All response data given are typical values and related to the sensor being used under normal conditions, i.e. temperature 20°C, r.h. 40-60%, 1013mbar.

General Specification



As with all electrochemical sensor cells, dramatic output changes in reported concentrations can be expected under rapidly changing environmental conditions. Please ensure sensors are located in areas not prone to sudden changes in humidity and temperature.

Actual readings may be affected by flow rates and absorption on tubing and other gas path surfaces.

All sensors are shipped pre-calibrated to traceable national standards. Dependent on actual operating conditions and overall exposure to gases, checking, calibration or exchange is subject to local regulations or site practices.

1. How do electrochemical sensors work?

All Honeywell Analytics electrochemical sensor cells are amperometric type i.e. are fuel cell type acting like batteries, where one component, in order to generate a current, is missing: the gas that should be detected (target gas).

The target gas diffuses through a gas permeable membrane into the sensor where an electrochemical reaction results in a low current that is direct proportional to the measured gas concentration (generally in nA/ppm reading).

2. How does the electrochemical sensor work with the detection instrument?

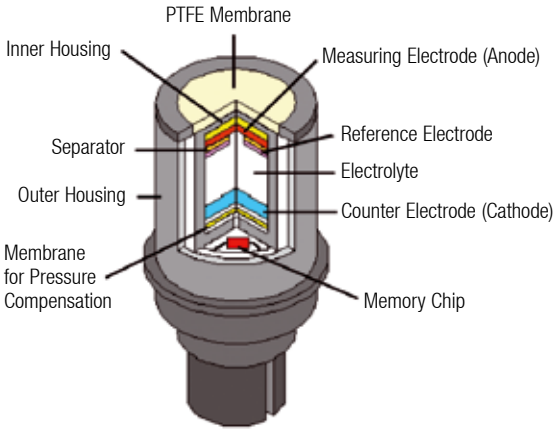
The current is amplified to a signal that is processed through an electronic circuit in order to display the real-time gas concentration.

The zero current of the electrochemical cell is always present and is monitored and suppressed by the electronics.

There are different ways to adjust the correct amplification factor of the electronics. Honeywell Analytics has created the “intelligent sensor” which features a built-in PROM. All relevant sensor data such as sensitivity, target gas, date of first calibration, calibration data, zero current, and alarm levels are programmed onto this chip. Our detectors can read this data and adjust the amplifying factor automatically.

3. How does a sensor self test work?

All relevant sensor data (ref. Pos 2) are programmed onto the PROM inside the electrochemical sensor. Our detectors can read this data. Every 24 hours an automatic sensor self-test is performed, which compares an electronically initiated sensor signal with the stored calibration curve. This makes sure that the sensors are always within specification that is set during the first calibration. If the sensor is out of specification the instrument will indicate that the sensor either needs to be checked or needs to be replaced.



Cross Sensitivities

Each MST Gas Sensor 9602 is potentially cross sensitive to other gases and this may cause a gas reading when exposed to other gases than those originally designated. The table to the right presents typical readings that will be observed when a new sensor is exposed to the cross sensitive gas (or a mixture of gases containing the cross sensitive species).

Gas / Vapour	Chemical Formula	Concentration Applied (ppm)	Reading (ppm ClF_3)
Alcohols	n/a	1000	0
Carbon Monoxide	CO	100	0
Chlorine	Cl_2	1	0.6
Ozone	O_3	0.25	0.7
Hydrogen	H_2	3000	0
Hydrogen Sulphide	H_2S	20	-5

Test Conditions: T=20OC, P=1013 hPa, Flow Rate = 30 l/h

Please note that the values stated above are approximate values. Negative values are not displayed on the gas detector’s LCD Display, they will be shown as 0.

Notes:
1. Interference factors may differ from sensor to sensor and with life time.
2. This table does not claim to be complete. The sensor might also be sensitive to other gases.
3. It is recommended to use 1–5ppm Cl_2 for cross calibration.
4. It is not advisable to use sensors to detect cross sensitive gases; unless it is advice by our technical department.

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

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Honeywell

11096

MST Gas Sensors 9602

Technical Specifications

Specification Sheet Arsine (2 electrode)

Sensor Type	AsH_3 Arsine
Part Number	9602-6000
Other Detectable Gases	TBA
Measuring Principle	amperometric 2-electrode sensor
Color of Sensor Cap	dark red
Specific Sensor Data	programmed on PROM inside the sensor
Standard Range	0.00 ... 1.00 ppm
Lower Detectable Limit (LDL)	0.03 ppm
Maximum Range	10.00 ppm
MAK/TLV	- / 0.05 ppm
Sensitivity Decay	< 5 % / month
Deviation from Linearity (within standard range)	< 10% FS
Zero Current at normal conditions	below LDL
Sensitivity	350…800 nA/ppm
Response Time	constant within standard range
t_{50}	< 20 s (based on 2 min exposure time)
t_{90}	< 60 s (based on 2 min exposure time)
Sensor warm-up time	5 s
Operating conditions	-20 ... +40 °C; 20 ... 95 % r.h. non-condensing
Storage conditions	0 ... +4 °C; 40 ... 60 % r.h. non-condensing
Temperature dependence	compensated with microprocessor
Sensor life	2 years
Sensor dimensions	
• Height	43 mm (1.69 ")
• Diameter	20.5 mm (0.80 ")
• Weight	9 g (0.31 oz)

Note:
All response data given are typical values and related to the sensor being used under normal conditions, i.e. temperature 20 °C, r.h. 40 ... 60 %, normal air pressure.

MST Gas Sensors 9602

Cross Sensitivity

Specification Sheet Arsine (2 electrode)

Gas		Test Gas Concentration	Reading in ppm
Ammonia	NH_3	100 ppm	0.00
Carbon Dioxide	CO_2	5000 ppm	0.00
Carbon Monoxide	CO	300 ppm	0.00
Chlorine	Cl_2	5 ppm	0.00
Diborane	B_2H_6	0.1 ppm	0.05
Germane	GeH_4	1 ppm	0.00
Hydrocarbons	-	% - range	0.00
Hydrogen	H_2	10 %	0.00
Hydrogen Chloride	HCl	5 ppm	0.10
Hydrogen Cyanide	HCN	10 ppm	1.00
Hydrogen Fluoride	HF	4 ppm	0.00
Hydrogen Selenide	H_2Se	0.3 ppm	0.03
Hydrogen Sulphide	H_2S	10 ppm	0.00
Nitric Oxide	NO	100 ppm	0.00
Nitrogen Dioxide	NO_2	2 ppm	0.00
Phosphine	PH_3	0.1 ppm	0.10
Silane	SiH_4	10 ppm	0.00
Sulphur Dioxide	SO_2	2 ppm	0.00

Test Conditions: T=20^{O}C, P=1013 hPa, Flow Rate = 30 l/h

Please note that the values stated above are approximate values. Negative values are not displayed on the Satellite LCD Display; they will be shown as 0.

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MST Gas Sensor 9602

Honeywell

Phosphine (PH_3)

9602-6102

Phosphine (PH_3)
9602-6102

MST Gas Sensors 9602 are only intended for use with the following Honeywell Analytics gas detectors:

Satellite Series

Sat-Ex

Satellite Portable Gas Detector

Please refer to the specific gas detector's Operational Manual for further details.

Phosphine (PH_3)	
Sensor Type	PH_3 Phosphine (with H_2S Filter)
Part Number	9602-6102
Measuring Principle	Amperometric 3-electrode sensor
Color of Sensor Cap	Grey beige
Specific Sensor Data	Programmed on PROM inside the sensor
Standard Range	0.00 to 1.00ppm
Lower Detectable Limit (LDL)	0.03ppm
Maximum Range	10.00ppm
Long-term Sensitivity Drift	< 5% / 6 months
Deviation from Linearity (within Standard Range)	< 10% FS
Zero Current at Normal Conditions	Below LDL
Sensitivity	1700 to 2700 nA/ppm
Response Time	Constant within standard range
t_{50}	< 10 s (based on 2 min exposure time)
t_{90}	< 30 s (based on 2 min exposure time)
Sensor Warm-up Time	5 s
Operating Temperature	-20°C to +40°C continuous; -40°C to +50°C intermittent
Operating Humidity	10% to 95% r.h. non condensing
Storage Conditions	0°C to +4°C; 40% to 60% r.h. non-condensing
Temperature Dependence	Compensated with microprocessor
Sensor Life Expectancy	≥ 24 months under typical application conditions
Sensor Dimensions	
Height	43mm (1.69")
Diameter	20.5mm (0.80")
Weight	9g (0.31oz)

Note:
All response data given are typical values and related to the sensor being used under normal conditions, i.e. temperature 20°C, r.h. 40-60%, 1013 hPa. H_2S filter capacity 20 ppmh.

General Specification

As with all electrochemical sensor cells, dramatic output changes in reported concentrations can be expected under rapidly changing environmental conditions. Please ensure sensors are located in areas not prone to sudden changes in humidity and temperature.

Actual readings may be affected by flow rates and absorption on tubing and other gas path surfaces.

All sensors are shipped pre-calibrated to traceable national standards. Dependent on actual operating conditions and overall exposure to gases, checking, calibration or exchange is subject to local regulations or site practices.

1. How do electrochemical sensors work?

All Honeywell Analytics electrochemical sensor cells are amperometric type i.e. are fuel cell type acting like batteries, where one component, in order to generate a current, is missing: the gas that should be detected (target gas).

The target gas diffuses through a gas permeable membrane into the sensor where an electrochemical reaction results in a low current that is direct proportional to the measured gas concentration (generally in nA/ppm reading).

2. How does the electrochemical sensor work with the detection instrument?

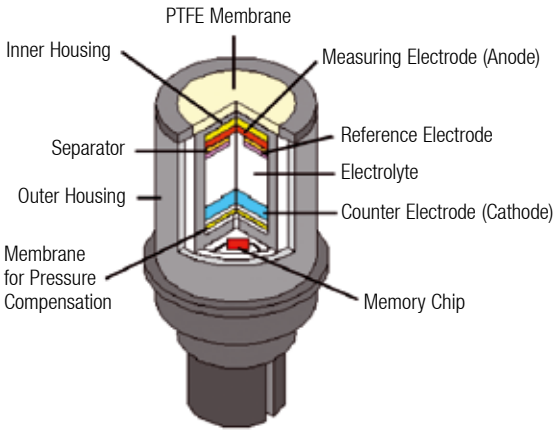
The current is amplified to a signal that is processed through an electronic circuit in order to display the real-time gas concentration.

The zero current of the electrochemical cell is always present and is monitored and suppressed by the electronics.

There are different ways to adjust the correct amplification factor of the electronics. Honeywell Analytics has created the “intelligent sensor” which features a built-in PROM. All relevant sensor data such as sensitivity, target gas, date of first calibration, calibration data, zero current, and alarm levels are programmed onto this chip. Our detectors can read this data and adjust the amplifying factor automatically.

3. How does a sensor self-test work?

All relevant sensor data (ref. Pos 2) are programmed onto the PROM inside the electrochemical sensor. Our detectors can read this data. Every 24 hours an automatic sensor self-test is performed, which compares an electronically initiated sensor signal with the stored calibration curve. This makes sure that the sensors are always within specification that is set during the first calibration. If the sensor is out of specification the instrument will indicate that the sensor either needs to be checked or needs to be replaced.



Cross Sensitivities

Each MST Gas Sensor 9602 is potentially cross sensitive to other gases and this may cause a gas reading when exposed to other gases than those originally designated. The table to the right presents typical readings that will be observed when a new sensor is exposed to the cross sensitive gas (or a mixture of gases containing the cross sensitive species).

Notes:

1. Test Conditions: T=20°C, P=1013 hPa, Flow Rate = 30 l/h
2. Please note that the values stated are approximate values.
3. Interference factors may differ from sensor to sensor and with lifetime.
4. This table does not claim to be complete. The sensor might also be sensitive to other gases.
5. The Satellite, Satex and Satellite PGD products do not display negative readings. The display will show zero for any negative readings.
6. It is not recommended to use cross sensitivity factors to enable cross calibration. The target gas should be used for calibration.

Gas / Vapour	Chemical Formula	Concentration Applied (ppm)	Reading (ppm PH_3)
Ammonia	NH_3	108	<0.1
Arsine	AsH_3	0.15	0.1
Carbon Dioxide	CO_2	5000	0
Carbon Monoxide	CO	85	0
Chlorine	Cl_2	0.85	-0.02
Diborane	B_2H_6	0.2	0.2
Disilane	Si_2H_6	0.27	0.1
Germane	GeH_4	1.39	0.15
Hydrocarbons	CH_4	18000	0
Hydrogen	H_2	3100	<0.05
Hydrogen Chloride	HCl	7.9	0
Hydrogen Cyanide	HCN	12.6	0.5
Hydrogen Fluoride	HF	7.2	0
Hydrogen Selenide	H_2Se	0.85	0
Hydrogen Sulphide	H_2S	18.1	0
Nitrogen Dioxide	NO_2	10.1	-1.5
Propan-2-ol	C_3H_5OH	20000	<0.03
Silane	SiH_4	4.4	0.45
Sulphur Dioxide	SO_2	17.8	0

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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MST Gas Sensors 9602

Technical Specifications

Specification Sheet Hydrogen Sulfide (organic)

Sensor Type	H_2S Hydrogen Sulfide (organic sensor)
Part Number	9602-5201
Detectable Gases	Monoalkylmercaptanes
Measuring Principle	amperometric 3-electrode sensor
Color of Sensor Cap	dark blue
Specific Sensor Data	programmed on PROM inside the sensor
Standard Range	0.0 ... 30.0 ppm
Lower Detectable Limit (LDL)	0.5 ppm
Maximum Range	50.0 ppm
MAK/TLV	10.0 ppm / 10.0 ppm
Sensitivity Decay	< 10 % / 6 months
Deviation from Linearity (within standard range)	< 5 % FS
Zero Current at normal conditions	below LDL
Sensitivity	50…120 nA/ppm
Response Time	constant within standard range
t_{50}	< 15 s (based on 2 min exposure time)
t_{90}	< 30 s (based on 2 min exposure time)
Sensor warm-up time	5 s
Operating conditions	-40 ... +40 °C; 5 ... 90 % r.h. non-condensing
Storage conditions	0 ... +4 °C; 40 ... 60 % r.h. non-condensing
Temperature dependence	compensated with microprocessor
Sensor life	2 years

Sensor dimensions

• Height	43 mm (1.69 ")
• Diameter	20.5 mm (0.80 ")
• Weight	9 g (0.31 oz)

Note:
All response data given are typical values and related to the sensor being used under normal conditions, i.e. temperature 20 °C, r.h. 40 ... 60 %, normal air pressure.

MST Gas Sensors 9602

Cross Sensitivity

Specification Sheet Hydrogen Sulfide (organic)

Gas		Test Gas Concentration	Reading in ppm
Ammonia	NH_3	65 ppm	0.0
Carbon Dioxide	CO_2	5000 ppm	0.0
Carbon Monoxide	CO	1000 ppm	0.0
Chlorinated Hydrocarbons	-	200 ppm	0.0
Chlorine	Cl_2	5 ppm	0.0
Diborane	B_2H_6	1 ppm	0.6
Hydrocarbons	-	% - range	0.0
Hydrogen	H_2	2%	0.0
Hydrogen	H_2	100%	14.0
Hydrogen Chloride	HCl	10 ppm	0.0
Hydrogen Cyanide	HCN	10 ppm	4.0
Methane	CH_4	100%	0.0
Nitric Oxide	NO	100 ppm	0.0
Nitrogen Dioxide	NO_2	100 ppm	0.0
Silane	SiH_4	10 ppm	0.0
Sulphur Dioxide	SO_2	20 ppm	2.0

Test Conditions: T=20^{O}C, P=1013 hPa, Flow Rate = 30 l/h

Please note that the values stated above are approximate values. Negative values are not displayed on the Satellite LCD Display; they will be shown as 0

Update: 26-10-2006

Rev. 10/2007

info@mst-technology.com
www.mst-technology.com

MST Gas Sensor 9602

Honeywell

Diborane (B_2H_6)

9602-6202

Diborane (B_2H_6)
9602-6202

MST Gas Sensors 9602 are only intended for use with the following Honeywell Analytics gas detectors:

Satellite Series

Sat-Ex

Satellite Portable Gas Detector

Please refer to the specific gas detector's Operational Manual for further details.

Diborane (B_2H_6)	
Sensor Type	B_2H_6 Diborane (without chemical filter)
Part Number	9602-6202
Measuring Principle	Amperometric 3-electrode sensor
Color of Sensor Cap	Grey beige
Specific Sensor Data	Programmed on PROM inside the sensor
Standard Range	0.00 to 1.00ppm
Lower Detectable Limit (LDL)	0.05ppm
Maximum Range	10.00ppm
Long-term Sensitivity Drift	< 5% / 6 months
Deviation from Linearity (within Standard Range)	< 10% FS
Zero Current at Normal Conditions	Below LDL
Sensitivity	1700 to 2700 nA/ppm
Response Time	Constant within standard range
t_{50}	< 10 s (based on 2 min exposure time)
t_{90}	< 30 s (based on 2 min exposure time)
Sensor Warm-up Time	5 s
Operating Temperature	-20°C to +40°C continuous; -40°C to +50°C intermittent
Operating Humidity	10% to 95% r.h. non condensing
Storage Conditions	0°C to +4°C; 40% to 60% r.h. non-condensing
Temperature Dependence	Compensated with microprocessor
Sensor Life Expectancy	≥ 24 months under typical application conditions
Sensor Dimensions	
Height	43mm (1.69")
Diameter	20.5mm (0.80")
Weight	9g (0.31oz)

Note:
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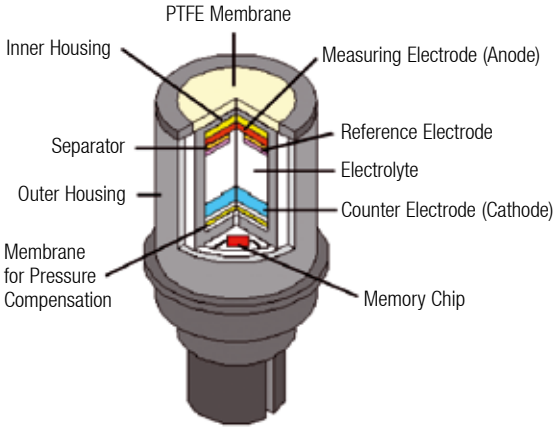

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Hydrogen Sulphide	H_2S	18.1	7.5
Nitrogen Dioxide	NO_2	10.1	-1.5
Phosphine	PH_3	0.18	0.18
Propan-2-ol	C_3H_5OH	20000	<0.05
Silane	SiH_4	4.4	0.45
Sulphur Dioxide	SO_2	17.8	3.3

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