# - MSR ELECTRONIC

#### PolyGard®2

## Sensor Cartridge SC2 for combustible gases

Exchangeable sensor including digital value processing, temperature compensation and self control for the continuous monitoring of the ambient air.

The sensor cartridge SC2 includes a Pellistor or infrared sensor element and an amplifier as well as a  $\mu Controller$  for measured values processing. All important data and measured values of the sensor element are stored fail-safe in the  $\mu Controller$  and transmitted digitally via the local bus to the sensor board SB2 or MSB2. The calibration management is also integrated in the  $\mu Controller$  of the sensor cartridge.

Calibration is done either by simply replacing the sensor cartridge or by using the comfortable, integrated calibration routine directly at the system.



#### **APPLICATION**

The PolyGard®2 Sensor Cartridge is used for the detection of combustible gases in non-Ex zones.

#### **FEATURES**

- Digital measurement value processing incl. temperature compensation
- Internal functional control with integrated Hardware Watchdog
- Data / measured values in μC Sensor Cartridge, therefore simple exchange of SC uncalibrated <> calibrated
- High accuracy, selectivity and reliability
- Low zero point drift
- Sensor with long life expectancy
- Hardware & software according to SIL2 compliant development process
- Modular technology (plug-in and replaceable)
- · Easy maintenance and calibration by exchange of the sensor cartridge or by comfortable on-site calibration
- Reverse polarity protected, overload and short-circuit proof
- IP 65 version
- Conformity to
  - o EN 50271
  - o EN 61010-1
  - o ANSI/UL 61010 1
  - o CAN/CSA-C22.2 No. 61010-1
- Duct mounting kit (accessory)











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# **Sensor Cartridge SC2 for combustible gases**

#### **SPECIFICATIONS**

Power consumption:         200 mA, max. (1.0 VA)           Serial interface local bus         1-wire / 19200 Baud           Sensor element         Tombustible gases, see Ordering Information           Sensor element         See Ordering Information           Sensor element         Pellistor (catalytic bead) sensor P34XX         Infrared sensor I34XX           Accuracy         ± 1 % LEL (CH <sub>4</sub> )         +/- 3 % for <50 % of range           Respondation         0.2 % (CH4)         0.04 % of range           Respolution         0.2 % (CH4)         0.04 % of range           Response time t <sub>90</sub> < 15 sec (CH <sub>4</sub> )         < 30 sec           Zero point variation         0.5 % (CH <sub>4</sub> )         < 30 sec           Long-term zero-point drift         < 0.5 % (EH <sub>4</sub> )         -           Long-term sensitivity drift         < 1 % LEL / month (CH <sub>4</sub> )         -           Temperature range         A tmospheric ± 20 %         700 - 1300 hPa           Humidity range         5 - 95 % RH not condensing         0 - 95 % RH           Pressure range         Atmospheric ± 20 %         700 - 1300 hPa           Storage time         6 months         12 months (verification pending)           Storage time         6 months         12 months (verification pending)           Storage time         6 months	Electrical					
Serial interface local bus   1-wire / 19200 Baud	Power supply	5 V DC from SB/MSB2, reverse polarity prote	5 V DC from SB/MSB2, reverse polarity protected			
Sensor element         Combustible gases, see Ordering Information           Gas type         See Ordering Information           Sensor element         Pellistor (catalytic bead) sensor P34XX         Infrared sensor I34XX           Accuracy         ± 1 % LEL (Ch4)         +/- 3 % for < 50 % of range	Power consumption:	200 mA, max. (1.0 VA)				
Gas type  Combustible gases, see Ordering Information  See Ordering Information  See Sordering Information  See Sordering Information  See Sordering Information  See Sordering Information  Infrared sensor I34XX  Accuracy  \$\frac{\frac{1}{2}\text{ LEL (CH_a)}}{\frac{1}{2}\text{ Sig. (CH_a)}}\$  \$\frac{1}{2}\text{ Sig. (CH_a)}\$  \$\frac{1}{2}	Serial interface local bus					
Measuring range         See Ordering Information           Sensor element         Pellistor (ctatlytic bead) sensor P34XX         Infrared sensor I34XX           Accuracy         ± 1 % LEL (CH₂)         +/- 3 % for < 50 % of range	Sensor element					
Measuring range         See Ordering Information           Sensor element         Pellistor (ctatlytic bead) sensor P34XX         Infrared sensor I34XX           Accuracy         ± 1 % LEL (CH₂)         +/- 3 % for < 50 % of range	Gas type	Combustible gases, see Ordering Information	1			
Accuracy	Measuring range					
Accuracy	Sensor element	Pellistor (catalytic bead) sensor P34XX	Infrared sensor I34XX			
Resolution  0.2 % (CH4) 0.1 % of range Repeatability 1 % sig. (CH <sub>4</sub> ) 0.1 % of range Response time t <sub>50</sub> 2 ro point variation 0.5 % (CH <sub>4</sub> ) 2 ro point variation 0.5 % (CH <sub>4</sub> ) 2 ro point variation 1 0.5 % LEL / month (CH <sub>4</sub> ) 2 ro point variation 2 ro point drift 3	Accuracy	± 1 % LEL (CH <sub>4</sub> )	,			
Repeatability       < 1 % sig. (CH <sub>4</sub> )       0.1 % of range         Response time t <sub>90</sub> < 15 sec (CH <sub>4</sub> )       < 30 sec	Resolution	0.2 % (CH4)				
Response time t <sub>90</sub> < 15 sec (CH <sub>4</sub> ) < 30 sec Zero point variation	Repeatability		ŭ .			
Zero point variation  O.5 % (CH <sub>4</sub> )  Long-term zero-point drift <o.5 %="" (ch<sub="" lel="" month="">4)  -Temperature range  -20 °C to +50 °C (-4 to 122 °F)  Humidity range  5 - 95 % RH not condensing  0 - 95 % RH  Pressure range  Atmospheric ± 20 %  Sensor life time  336 months / normal ambient conditions  Calibration interval 1  6 months  Storage temperature range  4 + 5 °C to +30 °C (41 °F to 86 °F)  Avo °C to +80 °C (-40 °F to 176 °F)  Storage time  6 months  Conditions  Conjumentation of Pellistor  sensors and even poison and destroy them.  Physical  Housing type P  Combustion  UL 94 V2  Housing tolour  Dimensions: Housing type P  (D x H) 24 x 22 mm (0.94 x 0.87 in.)  Weight  Ca. 30 g (0.07 lb)  Protection class  Mounting  Connection type  Cable length  Directives  EMC directives 2014/30/EU  CE  Conformity to:  EN 50271</o.5>	. ,	O 1 4	<u> </u>			
Long-term zero-point drift  Long-term sensitivity drift  < 1 % LEL / month (CH <sub>4</sub> )  - Temperature range  -20 °C to +50 °C (-4 to 122 °F)  -30 °C to +65 °C (-22 °F to 149 °F)  Humidity range  5 - 95 % RH not condensing  0 - 95 % RH  Pressure range  Atmospheric ± 20 %  700 – 1300 hPa  Sensor life time  > 36 months / normal ambient conditions  5 years  Calibration interval 1  6 months  Storage temperature range  4 5 °C to +30 °C (41 °F to 86 °F)  -40 °C to +80 °C (-40 °F to 176 °F)  Storage time  6 months  6 months  6 months  Poisoning  Substances containing silicon compounds can influence the sensitivity of Pellistor sensors and even poison and destroy them.  Physical  Housing type P  Polycarbonate  Combustion  UL 94 V2  Housing colour  Dimensions: Housing type P  (D x H) 24 x 22 mm (0.94 x 0.87 in.)  Weight  ca. 30 g (0.07 lb)  Protection class  P 65  Mounting  Connection type  Cable length  Directives  EMC directives 2014/30/EU  CE  Conformity to: EN 50271	,		-			
Long-term sensitivity drift  Temperature range  -20 °C to +50 °C (-4 to 122 °F) -30 °C to +65 °C (-22 °F to 149 °F)  Humidity range  5 - 95 % RH not condensing  0 - 95 % RH  Pressure range  Atmospheric ± 20 % 700 – 1300 hPa  Sensor life time > 36 months / normal ambient conditions > 5 years  Calibration interval 1 6 months 6 months Storage temperature range + 5 °C to +30 °C (41 °F to 86 °F) Storage time 6 months Substances containing silicon compounds can influence the sensitivity of Pellistor sensors and even poison and destroy them.  Physical  Housing type P  Combustion UL 94 V2  Housing colour Dimensions: Housing type P  (D x H) 24 x 22 mm (0.94 x 0.87 in.)  Weight ca. 30 g (0.07 lb)  Protection class Mounting Connection type Cable length 110 mm (4.33 in.)  Directives  EMC directives 2014/30/EU  CE Conformity to: EN 50271	Long-term zero-point drift	• • • • • • • • • • • • • • • • • • • •	-			
Temperature range	•		-			
Humidity range 5 - 95 % RH not condensing 0 - 95 % RH  Pressure range Atmospheric ± 20 % 700 – 1300 hPa  Sensor life time > 36 months / normal ambient conditions > 5 years  Calibration interval 6 6 months 12 months (verification pending)  Storage temperature range + 5 °C to + 30 °C (41 °F to 86 °F) -40 °C to +80 °C (-40 °F to 176 °F)  Storage time 6 months 6 months 6 months  Poisoning Substances containing silicon compounds can influence the sensitivity of Pellistor sensors and even poison and destroy them.  Physical  Housing type P Polycarbonate  Combustion UL 94 V2  Housing colour RAL 7032 (light grey)  Dimensions: Housing type P (D x H) 24 x 22 mm (0.94 x 0.87 in.)  Weight ca. 30 g (0.07 lb)  Protection class IP 65  Mounting Screw mounting  Connection type 3-pin connector  Cable length 110 mm (4.33 in.)  Directives  EMC directives 2014/30/EU  CE  Conformity to:  EN 50271	Temperature range		-30 °C to +65 °C (-22 °F to 149 °F)			
Pressure range  Atmospheric ± 20 %  Sensor life time  > 36 months / normal ambient conditions > 5 years  Calibration interval 6 months 12 months (verification pending)  Storage temperature range + 5 °C to + 30 °C (41 °F to 86 °F) 5torage time 6 months Poisoning Substances containing silicon compounds can influence the sensitivity of Pellistor sensors and even poison and destroy them.  Physical  Housing type P Polycarbonate Combustion UL 94 V2 Housing colour Dimensions: Housing type P (D x H) 24 x 22 mm (0.94 x 0.87 in.)  Weight Ca. 30 g (0.07 lb)  Protection class Mounting Screw mounting Connection type Cable length 110 mm (4.33 in.)  Directives  EMC directives 2014/30/EU  CE Conformity to: EN 50271	, ,	,	,			
Sensor life time > 36 months / normal ambient conditions > 5 years Calibration interval		Ţ.	700 – 1300 hPa			
Calibration interval 1 6 months 12 months (verification pending) Storage temperature range +5 °C to +30 °C (41 °F to 86 °F) -40 °C to +80 °C (-40 °F to 176 °F) Storage time 6 months 6 months Poisoning Substances containing silicon compounds can influence the sensitivity of Pellistor sensors and even poison and destroy them.  Physical Housing type P Polycarbonate Combustion UL 94 V2 Housing colour RAL 7032 (light grey) Dimensions: Housing type P (D x H) 24 x 22 mm (0.94 x 0.87 in.) Weight ca. 30 g (0.07 lb) Protection class IP 65 Mounting Screw mounting Connection type Connection type Cable length 110 mm (4.33 in.) Directives  EMC directives 2014/30/EU CE Conformity to: EN 50271	Sensor life time	·	> 5 years			
Storage temperature range	Calibration interval <sup>1</sup>	•				
Storage time 6 months 6 months Polymerizing substances, e.g. Substances containing silicon compounds can influence the sensitivity of Pellistor sensors and even poison and destroy them.  Physical  Housing type P Polycarbonate  Combustion UL 94 V2 Housing colour RAL 7032 (light grey) Dimensions: Housing type P (D x H) 24 x 22 mm (0.94 x 0.87 in.)  Weight ca. 30 g (0.07 lb) Protection class IP 65  Mounting Screw mounting  Connection type 3-pin connector  Cable length 110 mm (4.33 in.)  Directives EMC directives 2014/30/EU  CE  Conformity to: EN 50271	Storage temperature range	+ 5 °C to + 30 °C (41 °F to 86 °F)				
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Physical Housing type P Polycarbonate Combustion UL 94 V2 Housing colour RAL 7032 (light grey) Dimensions: Housing type P (D x H) 24 x 22 mm (0.94 x 0.87 in.) Weight ca. 30 g (0.07 lb) Protection class IP 65 Mounting Screw mounting Connection type 3-pin connector Cable length 110 mm (4.33 in.)  Directives EMC directives 2014/30/EU CE Conformity to: EN 50271	Poisoning	can influence the sensitivity of Pellistor	-			
Housing type P Combustion UL 94 V2 Housing colour RAL 7032 (light grey) Dimensions: Housing type P (D x H) 24 x 22 mm (0.94 x 0.87 in.) Weight ca. 30 g (0.07 lb) Protection class IP 65 Mounting Screw mounting Connection type 3-pin connector Cable length 110 mm (4.33 in.) Directives EMC directives 2014/30/EU CE Conformity to: EN 50271	Physical	,				
Combustion  UL 94 V2  Housing colour  RAL 7032 (light grey)  Dimensions: Housing type P  (D x H) 24 x 22 mm (0.94 x 0.87 in.)  Weight  ca. 30 g (0.07 lb)  Protection class  IP 65  Mounting  Screw mounting  Connection type  3-pin connector  Cable length  110 mm (4.33 in.)  Directives  EMC directives 2014/30/EU  CE  Conformity to: EN 50271	•	Polycarbonate				
Dimensions: Housing type P  (D x H) 24 x 22 mm (0.94 x 0.87 in.)  Weight  ca. 30 g (0.07 lb)  Protection class  IP 65  Mounting  Screw mounting  Connection type  3-pin connector  Cable length  110 mm (4.33 in.)  Directives  EMC directives 2014/30/EU  CE  Conformity to: EN 50271	Combustion	•				
Dimensions: Housing type P  (D x H) 24 x 22 mm (0.94 x 0.87 in.)  Weight  ca. 30 g (0.07 lb)  Protection class  IP 65  Mounting  Screw mounting  Connection type  3-pin connector  Cable length  110 mm (4.33 in.)  Directives  EMC directives 2014/30/EU  CE  Conformity to: EN 50271	Housing colour	RAL 7032 (light grey)				
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Protection class  IP 65  Mounting  Connection type  Cable length  Directives  EMC directives 2014/30/EU  CE  Conformity to:  EN 50271	Weight					
Connection type  3-pin connector  Cable length  110 mm (4.33 in.)  Directives  EMC directives 2014/30/EU  CE  Conformity to: EN 50271	Protection class	- · · · · · · · · · · · · · · · · · · ·				
Cable length 110 mm (4.33 in.)  Directives EMC directives 2014/30/EU  CE  Conformity to: EN 50271	Mounting	Screw mounting				
Cable length 110 mm (4.33 in.)  Directives EMC directives 2014/30/EU  CE  Conformity to: EN 50271	Connection type	3-pin connector				
Directives  EMC directives 2014/30/EU  CE  Conformity to: EN 50271	Cable length	110 mm (4.33 in.)				
ANSI/UL 61010-1 CAN/CSA-C22.2 No. 61010-1	Directives	EMC directives 2014/30/EU CE Conformity to: EN 50271 EN 61010-1:2010 ANSI/UL 61010-1				
, and the second	Warranty	•				

 $<sup>^{\</sup>rm 1}$  Manufacturer-recommended calibration interval for normal environmental conditions.

2 years on device











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#### **ORDERING INFORMATION**

### SC2-**P34XX-X** X- XX

**00** Without cable extension (standard)

**XX** With cable extension: 01, 02, 03, 04, 05 ... 15 max. (length in m)

P Sensor housing plastic

**S** Sensor housing stainless steel

	Gas type	Measuring range	Gas density	Mounting height
			(Air = 1)	
P3485-A	Acetone, C <sub>3</sub> H <sub>6</sub> O	0 – 100 % LEL	2.00	Floor
P3408-A	Ammonia, NH <sub>3</sub>	0 – 100 % LEL	0.60	Ceiling
P3430-A	Benzene, C <sub>6</sub> H <sub>6</sub>	0 – 100 % LEL	2.70	Floor
P3448-A	Butyl acetate, C <sub>6</sub> H <sub>12</sub> O <sub>2</sub>	0 – 100 % LEL	4.01	Floor
P3415-A	Cyclohexane, C <sub>6</sub> H <sub>12</sub>	0 – 100 % LEL	2.90	Floor
P3472-A	Cyclopentane, C <sub>5</sub> H <sub>10</sub>	0 – 100 % LEL	2.42	Floor
P3420-A	Ethane, C <sub>2</sub> H <sub>6</sub>	0 – 100 % LEL	1.05	1.5 – 1.8 m
P3427-A	Ethyl acetate, C <sub>4</sub> H <sub>8</sub> O <sub>2</sub>	0 – 100 % LEL	3.04	Floor
P3425-A	Ethyl alcohol, C₂H₅OH	0 – 100 % LEL	1.59	Floor
P3410-A	Ethylene, C <sub>2</sub> H <sub>4</sub>	0 – 100 % LEL	0.98	Ceiling!
P3440-A	Hydrogen, H <sub>2</sub>	0 – 100 % LEL	0.07	Ceiling
P3468-A	Isobutyl alcohol, C <sub>4</sub> H <sub>10</sub> O	0 – 100 % LEL	2.56	Floor
P3482-A	Isopropyl alcohol, C <sub>3</sub> H <sub>8</sub> O	0 – 100 % LEL	2.08	Floor
P3460-A	Iso/n-Butane, C <sub>4</sub> H <sub>10</sub>	0 – 100 % LEL	2.11	Floor
P3475-A	Iso/n-Pentane, C <sub>5</sub> H <sub>12</sub>	0 – 100 % LEL	2.49	Floor
P3402-A	LPG	0 – 100 % LEL	-	-
P3400-A	Methane, CH <sub>4</sub>	0 – 100 % LEL	0.55	Ceiling
P3450-A	Methanol, CH <sub>3</sub> OH	0 – 100 % LEL	1.11	Floor
P3473-A	Methyl acetate, C <sub>3</sub> H <sub>6</sub> O <sub>2</sub>	0 – 100 % LEL	2.56	Floor
P3458-A	Methyl ethyl ketone, C <sub>4</sub> H <sub>8</sub> O	0 – 100 % LEL	1.15	Floor
P3491-A	n-Heptane, C <sub>7</sub> H <sub>16</sub>	0 – 100 % LEL	3.46	Floor
P3435-A	n-Hexane, C <sub>6</sub> H <sub>14</sub>	0 – 100 % LEL	2.98	Floor
P3496-A	Petrol Vapours	0 – 100 % LEL	-	-
P3480-A	Propane, C₃H <sub>8</sub>	0 – 100 % LEL	1.55	Floor
Р3480-В	Propane, C₃H <sub>8</sub>	0 – 30 % LEL	1.55	Floor
P3484-A	Propyl alcohol, C <sub>3</sub> H <sub>8</sub> O	0 – 100 % LEL	2.08	Floor
P3490-A	Toluene, C <sub>7</sub> H <sub>8</sub>	0 – 100 % LEL	3.18	Floor
13400-A	Methane, CH <sub>4</sub>	0 – 100 % LEL	0.55	Ceiling
13480-A	Propane, C₃H <sub>8</sub>	0 – 100 % LEL	1.55	Floor

#### **EXAMPLE**

 $\mathrm{CH_{3}OH}$  Sensor Cartridge, plastic housing without cable extension, measuring range 0-100 % LEL

Order number: SC2-P3450-A-P-00

#### **ACCESSORY**

Duct mounting kit

Order number: C2-Z2







