



PolyGard®2

## Sensor Cartridge SC2 for Freon gases and refrigerants

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

The sensor cartridge SC2 includes a semiconductor sensor element and an amplifier as well as a  $\mu$ Controller for processing of the measured values. All relevant data and measured values of the sensor element are stored fail-safe in the  $\mu$ Controller and digitally transmitted 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 SC2 is used for the detection of Freon gases and refrigerants in chiller systems.

### FEATURES

- Digital measurement value processing
- Internal functional control with integrated Hardware Watchdog
- Data / measured values in  $\mu$ C Sensor Cartridge, therefore simple exchange of SC uncalibrated <> calibrated
- Low zero point drift
- Sensor with long life expectancy
- 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
  - EN 61508-1-3
  - EN 61010-1
  - ANSI/UL 61010 1
  - CAN/CSA-C22.2 Nr. 61010-1
  - EN 378
  - EN 45544-1
  - EN 14624
- Duct mounting kit (accessory)



Sensor Cartridge in plastic housing without cable extension



Sensor Cartridge in plastic housing with cable extension





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## SPECIFICATIONS

### General sensor data

Gas type	See Ordering Information
Sensor element	Semiconductor sensor
Measuring range	20 - 2000 ppm
Repeatability	± 20 %
Response time	t <sub>90</sub> ≥ 120 s
Oxygen concentration	21 % (standard) 18 % minimum level
Humidity range	5 – 95 % RH non-condensing
Temperature - operation	-35 °C to 50 °C (-31 °F to 122 °F) w/o heating
- storage	0 °C to 50 °C (32 °F to 122 °F)
Pressure range	Atmospheric ± 10 %
Storage time	Max. 12 months
Calibration interval	12 months
Life expectancy	> 5 years/ normal operating environment
Recommended mounting height	Depending on gas type
Poisoning	The sensitivity of semiconductor sensors can be affected by substances containing silicone and they may even lead to the complete poisoning.

### Electrical

Power supply	5 V DC from SB/MSB2, reverse polarity protected
Power consumption	160 mA, max. (0.8 VA)
Serial interface local bus	1-wire / 19200 Baud

### 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 378	
EN 61508-1-3	
EN 61010-1:2010	
ANSI/UL 61010-1	
CAN/CSA-C22.2 No. 61010-1	
EN 45544-1	
EN 14624	

### Warranty

1 year on sensor (not if poisoned or overloaded),	
2 years on device	

All specifications were collected under optimal test conditions.

We confirm compliance with the minimum requirements of the applicable standard.



MSR-Electronic GmbH ::: Würdinger Str. 27 & 27A ::: 94060 Pocking ::: Germany

Specifications subject to change without notice.

Up-to-date data sheets and user manuals can be found in the download area on [www.msr-24.com](http://www.msr-24.com).

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## OVERVIEW FREON GAS TYPES

MSR Freon group	MSR code	Freon type	Calibration gas	Group	Measuring range	Relative gas density (air =1)
<b>FR02</b>	2061-01	R23	R23	HFC	2000 ppm	2.4
	2061-02	R508b	R23	HFC	2000 ppm	> Air
<b>FR03</b>	2063-01	R1234yf	R1234yf	HFO	2000 ppm	> Air
	2063-02	R452a	R1234yf	HFO	2000 ppm	> 1
	2063-03	R513a	R1234yf	HCFC	2000 ppm	> Air
	2063-04	R454c	R1234yf	HFO	2000 ppm	> Air
	2063-05	R454a	R1234yf	HFO	2000 ppm	> Air
	2063-06	R454b	R1234yf	HFO	2000 ppm	> Air
	2063-07	R1234ze	R1234yf	HFO	2000 ppm	> Air
<b>FR04</b>	2064-01	R123	R123	HCFC	2000 ppm	> Air
	2064-02	1233zd	R123	HCFC	2000 ppm	> Air
<b>FR06</b>	2070-01	R22	R22	HCFC	2000 ppm	3
	2070-02	R401a	R22	HCFC	2000 ppm	> Air
	2070-03	R401b	R22	HCFC	2000 ppm	> Air
	2070-04	R402a	R22	HCFC	2000 ppm	> Air
	2070-05	R402b	R22	HCFC	2000 ppm	> Air
	2070-06	R403a	R22	HCFC	2000 ppm	> Air
	2070-07	R408a	R22	HCFC	2000 ppm	> Air
	2070-08	R409a	R22	HCFC	2000 ppm	> Air
	2070-09	R411a	R22	HFC	2000 ppm	> Air
<b>FR07</b>	2077-01	R134a	R134a	HFC	2000 ppm	> Air
	2077-02	R407a	R134a	HFC	2000 ppm	> Air
	2077-03	R416a	R134a	HFC	2000 ppm	> Air
	2077-04	R417a	R134a	HFC	2000 ppm	> Air
	2077-05	R422a	R134a	HFC	2000 ppm	> Air
	2077-06	R422d	R134a	HFC	2000 ppm	> Air
	2077-07	R427a	R134a	HFC	2000 ppm	> Air
	2077-08	R437a	R134a	HFC	2000 ppm	> Air
	2077-09	R438a	R134a	HFC	2000 ppm	> Air
	2077-10	R449a	R134a	HFC	2000 ppm	> Air
	2077-11	R407f	R134a	HFC	2000 ppm	> Air
	2077-12	R450a	R134a	HFO	2000 ppm	> Air
<b>FR08</b>	2080-01	R125	R407c	HFC	2000 ppm	4.2
	2080-02	R32	R407c	CFC	2000 ppm	1.8
	2080-03	R404a	R407c	HFC	2000 ppm	3.45
	2080-04	R407c	R407c	HFC	2000 ppm	> 1
	2080-05	R410a	R407c	HFC	2000 ppm	2.3
	2080-06	R434a	R407c	HFC	2000 ppm	> Air
	2080-07	R507a	R407c	HFC	2000 ppm	3.45
	2080-08	R448a	R407c	HFO	2000 ppm	1.55
	2080-09	R452b	R407c	HFO	2000 ppm	> Air
	2080-10	R143b	R407c	HFO	2000 ppm	> Air

No cross-sensitivity data is available for these sensors. It is well known that all semiconductor sensors are also sensitive to combustible gases, e.g. alcohols, etc.



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## ORDERING INFORMATION

SC2-	S20XX-XX-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
			<b>Gas type</b>	<b>Sensor type</b>
				<b>Measuring range</b>
	S2061-01-A		R23	Semiconductor
	S2061-02-A		R508b	Semiconductor
	S2063-01-A		R1234yf	Semiconductor
	S2063-02-A		R452a	Semiconductor
	S2063-03-A		R513a	Semiconductor
	S2063-04-A		R454c	Semiconductor
	S2063-05-A		R454a	Semiconductor
	S2063-06-A		R454b	Semiconductor
	S2063-07-A		R1234ze	Semiconductor
	S2064-01-A		R123	Semiconductor
	S2064-02-A		R1233zd	Semiconductor
	S2070-01-A		R22	Semiconductor
	S2070-02-A		R401a	Semiconductor
	S2070-03-A		R401b	Semiconductor
	S2070-04-A		R402a	Semiconductor
	S2070-05-A		R402b	Semiconductor
	S2070-06-A		R403a	Semiconductor
	S2070-07-A		R408a	Semiconductor
	S2070-08-A		R409a	Semiconductor
	S2070-09-A		R411a	Semiconductor
	S2077-01-A		R134a	Semiconductor
	S2077-02-A		R407a	Semiconductor
	S2077-03-A		R416a	Semiconductor
	S2077-04-A		R417a	Semiconductor
	S2077-05-A		R422a	Semiconductor
	S2077-06-A		R422d	Semiconductor
	S2077-07-A		R427a	Semiconductor
	S2077-08-A		R437a	Semiconductor
	S2077-09-A		R438a	Semiconductor
	S2077-10-A		R449a	Semiconductor
	S2077-11-A		R407f	Semiconductor
	S2077-12-A		R450a	Semiconductor
	S2080-01-A		R125	Semiconductor
	S2080-02-A		R32	Semiconductor
	S2080-03-A		R404a	Semiconductor
	S2080-04-A		R407c	Semiconductor
	S2080-05-A		R410a	Semiconductor
	S2080-06-A		R434a	Semiconductor
	S2080-07-A		R507a	Semiconductor
	S2080-08-A		R448a	Semiconductor
	S2080-09-A		R452b	Semiconductor
	S2080-10-A		R143b	Semiconductor

### EXAMPLE

R1234yf Sensor Cartridge, plastic housing without cable extension, measuring range 2000 ppm

Order number: SC2-S2063-01-A-P-00

### ACCESSORY

Duct mounting kit

Order number: C2-Z2



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