PERFECT SOLUTIONS FOR **GAS ALARM** SYSTEMS

Technical Datasheet

PolyGard®2

Sensor SC2

with Semiconductor Sensor Element
for Freon Gases and Refrigerants

DESCRIPTION

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

The SC2 includes a semiconductor sensor element and an amplifier as well as a µController for processing of the measured values. All relevant data and measured values of the sensor element are stored fail-safe in the µController and digitally transmitted via the local bus to the sensor board (e.g. SB2 or MSB2). The calibration management is also integrated in the µController of the Sensor.

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

APPLICATION

The PolyGard®2 Sensor 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 µC of the sensor, therefore simple exchange of sensor 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 or by comfortable on-site calibration
- Reverse polarity protected, overload and short-circuit proof
- IP65 version
- Conformity to:
  - EN 378
  - EN 45544-1, -3
  - EN 14624
  - EN 61010-1
  - ANSI/UL 61010 1
  - CAN/CSA-C22.2 No. 61010-1
- Duct mounting kit (accessory)

Option: SC2 in plastic housing L with cable extension (fig. w/o laser engraving)

SPECIFICATIONS

ELECTRICAL	
Power supply	5 V DC from Sensor Board (e.g. SB2/MSB2), reverse polarity protected
Power consumption:	160 mA, max. (0.8 VA)
Serial interface local bus	1-wire / 19200 Baud
SENSOR ELEMENT	
Gas type	See Ordering Information
Sensor element	Semiconductor sensor
Measuring range	20–2000 ppm
Repeatability	± 20 %
Response time	t_{90} ≤ 150 s (R134a)
Oxygen concentration	21 % (standard) 18 % minimum level
Humidity range	15–90 % RH non-condensing
Temperature operation	-30 °C to +60 °C (-22 °F to +140 °F) w/o heating
Temperature storage	0 °C to +50 °C (32 °F to +122 °F)
Pressure range	90–110 kPa
Storage time[1]	Ca. 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. The sensors are also susceptible to poisoning by organic solvents.
PHYSICAL	
Housing in plastic	Polycarbonate
Combustion	UL 94 V2
Housing colour	RAL 7032 (light grey)
Dimensions: Housing type P Housing type L	(D x H) 24 x 22 mm (0.94 x 0.87 in.) (D x H) 24 x 30 mm (0.94 x 1.18 in.)
Weight	Ca. 30 g (0.07 lb)
Protection class	IP65
Mounting	Screw mounting
Connection type	3-pin connector
Cable length	Ca. 150 mm (5.91 in.) standard version w/o cable extension
REGULATIONS	
Directives (only in connection with the Sensor-Boards from MSR)	EMC Directives 2014/30/EU CE Conformity to: EN 378 EN 14624 EN 45544-1, -3 EN 61010-1:2010 ANSI/UL 61010-1 CAN/CSA-C22.2 No. 61010-1
Warranty	1 year on sensor (not if poisoned or overloaded), 2 years on device

[1] If stocked for a longer period, we recommend checking the zero point and recalibrating if necessary.

All specifications were collected under optimal test conditions.
We confirm compliance with the minimum requirements of the applicable standard.

OVERVIEW FREON GASES

MSR FREON GROUP	MSR CODE	FREON TYPE	CALIBRATION GAS	GROUP	MEASURING RANGE	RELATIVE GAS DENSITY AIR =1
FR02	2061-01	R23	R23	HFC	2000 ppm	2.44
	2061-02	R508b	R23	HFC	2000 ppm	> 1
FR03	2063-01	R1234yf	R1234yf	HFO	2000 ppm	4
	2063-02	R452a	R1234yf	HFO	2000 ppm	> 1
	2063-03	R513a	R1234yf	HFO/HFC	2000 ppm	> 1
	2063-04	R454c	R1234yf	HFO	2000 ppm	> 1
	2063-05	R455a	R1234yf	HFO	2000 ppm	> 1
	2063-06	R454b	R1234yf	HFO	2000 ppm	> 1
	2063-07	R1234ze	R1234yf	HFO	2000 ppm	4
FR04	2064-01	R123	R123	HCFC	2000 ppm	5.28
FR06	2070-01	R22	R22	HCFC	2000 ppm	3.03
	2070-02	R401a	R22	HCFC	2000 ppm	> 1
	2070-03	R401b	R22	HCFC	2000 ppm	> 1
	2070-04	R402a	R22	HCFC	2000 ppm	> 1
	2070-05	R402b	R22	HCFC	2000 ppm	> 1
	2070-06	R403a	R22	HCFC	2000 ppm	> 1
	2070-07	R408a	R22	HCFC	2000 ppm	> 1
	2070-08	R409a	R22	HCFC	2000 ppm	> 1
	2070-09	R411a	R22	HFC	2000 ppm	> 1
FR07	2077-01	R134a	R134a	HFC	2000 ppm	3.59
	2077-02	R407a	R134a	HFC	2000 ppm	> 1
	2077-03	R416a	R134a	HFC	2000 ppm	> 1
	2077-04	R417a	R134a	HFC	2000 ppm	> 1
	2077-05	R422a	R134a	HFC	2000 ppm	> 1
	2077-06	R422d	R134a	HFC	2000 ppm	> 1
	2077-07	R427a	R134a	HFC	2000 ppm	> 1
	2077-08	R437a	R134a	HFC	2000 ppm	> 1
	2077-09	R438a	R134a	HFC	2000 ppm	> 1
	2077-10	R449a	R134a	HFC	2000 ppm	> 1
	2077-11	R407f	R134a	HFC	2000 ppm	> 1
	2077-12	R450a	R134a	HFO	2000 ppm	> 1
FR08	2080-01	R125	R407c	FC	2000 ppm	1.21
	2080-02	R32	R407c	FC	2000 ppm	1.82
	2080-03	R404a	R407c	HFC	2000 ppm	3.45
	2080-04	R407c	R407c	HFC	2000 ppm	> 1
	2080-05	R410a	R407c	HFC	2000 ppm	> 1
	2080-06	R434a	R407c	HFC	2000 ppm	> 1
	2080-07	R507a	R407c	HFC	2000 ppm	> 1
	2080-08	R448a	R407c	HFC	2000 ppm	> 1
	2080-09	R452b	R407c	HFO	2000 ppm	> 1
	2080-10	R143a	R407c	FC	2000 ppm	2.96

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.

ORDERING INFORMATION

SC2-	**S20XX-XX-A-**	**X-**	**XX**	
			00 Without cable extension (standard) (Standard) **XX**[1] With cable extension: 01, 02, 03, 04, 05 ... 15 max. (length in m)	**Cable**
		P	Sensor housing plastic (standard)	
		L	Sensor housing plastic long (only with cable extension)	
		S	Sensor housing stainless steel (only with cable extension)	**Sensor housing**
			Gas type	**Measuring range**
	S2061-01-A		R23	20–2000 ppm
	S2061-02-A		R508b	20–2000 ppm
	S2063-01-A		R1234yf	20–2000 ppm
	S2063-02-A		R452a	20–2000 ppm
	S2063-03-A[2]		R513a	20–2000 ppm
	S2063-04-A[2]		R454c	20–2000 ppm
	S2063-05-A		R455a	20–2000 ppm
	S2063-06-A		R454b	20–2000 ppm
	S2063-07-A[2]		R1234ze	20–2000 ppm
	S2064-01-A		R123	20–2000 ppm
	S2070-01-A		R22	20–2000 ppm
	S2070-02-A		R401a	20–2000 ppm
	S2070-03-A		R401b	20–2000 ppm
	S2070-04-A		R402a	20–2000 ppm
	S2070-05-A		R402b	20–2000 ppm
	S2070-06-A		R403a	20–2000 ppm
	S2070-07-A		R408a	20–2000 ppm
	S2070-08-A		R409a	20–2000 ppm
	S2070-09-A		R411a	20–2000 ppm
	S2077-01-A		R134a	20–2000 ppm
	S2077-02-A		R407a	20–2000 ppm
	S2077-03-A		R416a	20–2000 ppm
	S2077-04-A		R417a	20–2000 ppm
	S2077-05-A		R422a	20–2000 ppm
	S2077-06-A		R422d	20–2000 ppm
	S2077-07-A		R427a	20–2000 ppm
	S2077-08-A		R437a	20–2000 ppm
	S2077-09-A		R438a	20–2000 ppm
	S2077-10-A		R449a	20–2000 ppm
	S2077-11-A		R407f	20–2000 ppm
	S2077-12-A[2]		R450a	20–2000 ppm
	S2080-01-A		R125	20–2000 ppm
	S2080-02-A		R32	20–2000 ppm
	S2080-03-A		R404a	20–2000 ppm
	S2080-04-A		R407c	20–2000 ppm
	S2080-05-A		R410a	20–2000 ppm
	S2080-06-A		R434a	20–2000 ppm
	S2080-07-A		R507a	20–2000 ppm
	S2080-08-A		R448a	20–2000 ppm
	S2080-09-A		R452b	20–2000 ppm
	S2080-10-A		R143a	20–2000 ppm

Gas type/ Measuring range

[1] Sensor housing plastic in combination with cable extension only type L
[2] Not in combination with stainless steel sensor housing

EXAMPLE
R1234yf Sensor, 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**