Gas Detection.

Technical Datasheet

PolyGard®2

Sensor SC2

with Semiconductor Sensor Element
for Freon Gases and Refrigerants

All Products
Made
in Germany

DESCRIPTION

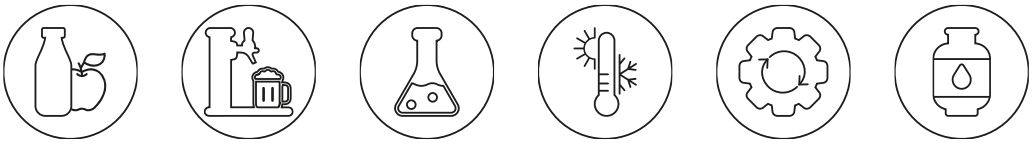
Semiconductor sensor including digital value processing and integrated self-diagnosis, for the continuous monitoring of the ambient air to detect refrigerants.

The intelligent SC2 Sensor for detection of refrigerants includes a semiconductor sensor element and electronics with a measuring amplifier and a µController for the digital processing of the measured values. All relevant data and measured values of the sensor are stored fail-safe in the internal memory of the µProcessor and are transmitted digitally to the Board (SB2, WSB2, MSC2, MSB2) via the MSR local bus.

The maintenance of a device can be done either by simply exchanging the sensor or by using the integrated, comfortable calibration routine directly at the system.

APPLICATION

The PolyGard®2 Sensor SC2 is used to detect a leakage of refrigerants in a variety of applications.



Food | Beverage dispensing | Laboratory | Climate | Process | Gas storage

FEATURES

- Digital measurement value processing
- Internal functional control with integrated Watchdog
- Easy maintenance and calibration by exchange of the sensor or by comfortable on-site calibration
- Low zero-point drift
- Sensor with long life expectancy
- Hardware and software according to SIL compliant development process
- Reverse polarity protected, overload and short-circuit proof
- IP65 protection (when installed)

SPECIFICATIONS

ELECTRICAL		
Power supply	5 V DC from Board (SB2/WSB2/MSC2/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	
Measuring principle	Semiconductor	
Measuring range	2000 ppm	
Repeatability	< ± 20 % signal	
t_{90} time	t_{90} ≤ 150 s (for R 1234yf, R1234ze, R134a in plastic housing) t_{90} ≤ 180 s (for R 1234yf, R134a in stainless steel housing)	
Reaction time	≤ 30 s (plastic housing) ≤ 60 s (stainless steel housing)	
Temperature range	-30 °C to +60 °C (-22 °F to +140 °F)	
Humidity range	15–90 % RH non-condensing	
Pressure range	90–110 kPa	
Life time[1] in air	> 5 years	
Calibration interval[2]	12 months	
Poisoning	Semiconductor sensors can be poisoned by silicone-containing substances or other catalyst poisons, up to complete loss of sensitivity. Their sensitivity is irreversibly impaired by halogen-containing compounds.	
RECOMMENDED STORAGE CONDITIONS		
Storage temperature range[3]	0 °C to +50 °C (32 °F to 140 °F)	
Storage time[4]	Ca. 12 months	
Humidity range	15–90 % RH non-condensing	
Pressure range	90–110 kPa	
PHYSICAL		
Housing	**Plastic**	**Stainless steel**
Material	Polycarbonate	CrNi steel: 1.4404
Flammability classification	UL 94 V2	-
Housing colour	Similar to RAL 7035 (light grey)	Natural
Dimensions (Ø x H)	Type P: 24 x 22 mm (0.94 x 0.87 in.) Type L: 24 x 30 mm (0.94 x 1.18 in.)	Type S: 30 x 61 mm (1.18 x 2.40 in.)
Weight	Ca. 30 g	Ca. 150 g
Protection class	IP65	IP64
Mounting	Screw mounting, external thread M25 x 1.5 mm	Screw mounting, external thread NPT ¾" ANSI/ B1.20.1 / M30 x 1,5 mm
Connection type	3-pin connector	
Cable length	Standard: Ca. 150 mm (5.91 in.) Cable extension (5, 10 and 15 m)	Cable extension (5, 10 and 15 m)
REGULATIONS		
Directives (only in connection with the Boards from MSR)	EMC Directives 2014/30/EU CE UKCA Conformity to: EN 378 EN 14624 EN 45544-1, -3 EN 50271 EN 61010-1:2010 ANSI/UL 61010-1 CAN/CSA-C22.2 No. 61010-1	
Warranty	1 year on sensors (not if poisoned or overloaded)	

[1] Expected service life for normal ambient conditions.
[2] Manufacturer-recommended calibration intervals for normal environmental conditions
[3] A deviating storage temperature can have a negative effect on sensitivity and service life.
[4] If stocked for a longer period, we recommend checking the zero point and recalibrating if necessary.

Semiconductor sensors that have been exposed to an increased gas concentration (> ½ full scale value) during normal measuring operation must be replaced without fail.

All specifications were collected under optimal test conditions.
We confirm compliance with the minimum requirements of the applicable standard.
The T 021 (DGVU-I-213-056) and T 023 (DGVU-I-213-057) as well as T 055 leaflets must be observed.

OVERVIEW FREON GASES

MSR Freon Group	MSR Code	Freon Type	Calibration Gas	Group	Relative Gas Density[1] Air =1
FR02	2061-01	R23	R23	HFC	2.44
	2061-02	R508b	R23	HFC	3.69
FR03	2063-01	R1234yf	R1234yf	HFO	4.00
	2063-02	R452a	R1234yf	HFO	2.11
	2063-03	R513a	R1234yf	HFO/HFC	3.80
	2063-04	R454c	R1234yf	HFO	3.51
	2063-05	R455a	R1234yf	HFO	3.46
	2063-06	R454b	R1234yf	HFO	2.50
	2063-07	R1234ze	R1234yf	HFO	4.00
FR04	2064-01	R123	R123	HCFC	5.28
FR06	2070-01	R22	R22	HCFC	3.03
	2070-02	R401a	R22	HCFC	3.50
	2070-03	R401b	R22	HCFC	3.42
	2070-04	R402a	R22	HCFC	1.91
	2070-05	R402b	R22	HCFC	2.31
	2070-06	R403a	R22	HCFC	3.65
	2070-07	R408a	R22	HCFC	2.87
	2070-08	R409a	R22	HCFC	3.52
	2070-09	R411a	R22	HFC	2.92
FR07	2077-01	R134a	R134a	HFC	3.59
	2077-02	R407a	R134a	HFC	2.28
	2077-03	R416a	R134a	HFC	4.01
	2077-04	R417a	R134a	HFC	2.43
	2077-05	R422a	R134a	HFC	1.51
	2077-06	R422d	R134a	HFC	1.99
	2077-07	R427a	R134a	HFC	2.67
	2077-08	R437a	R134a	HFC	3.10
	2077-09	R438a	R134a	HFC	2.34
	2077-10	R449a	R134a	HFC	2.68
	2077-11	R407f	R134a	HFC	2.61
	2077-12	R450a	R134a	HFO	3.83
FR08	2080-01	R125	R407c	FC	1.21
	2080-02	R32	R407c	FC	1.82
	2080-03	R404a	R407c	HFC	3.45
	2080-04	R407c	R407c	HFC	2.59
	2080-05	R410a	R407c	HFC	1.52
	2080-06	R434a	R407c	HFC	1.65
	2080-07	R507a	R407c	HFC	2.10
	2080-08	R448a	R407c	HFC	2.62
	2080-09	R452b	R407c	HFO	2.34
	2080-10	R143a	R407c	FC	2.96

[1] The recommended mounting height depends on the relative gas density of the type of gas to be monitored. Depending on the relative gas density (d), the following recommendation therefore applies:

d ≤ 0.85:	Mounting 0.3–0.5 m below the ceiling
0.85 < d < 1.15:	Mounting at 1.2–1.8 m height
d ≥ 1.15:	Mounting 0.3–0.5 m above the floor

ORDERING INFORMATION

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

[1] Cable extension only in combination with sensor housing plastic type L or sensor housing stainless steel type S
[2] Not in combination with stainless steel sensor housing

EXAMPLE

R32 sensor, measuring range 2000 ppm, plastic housing without cable extension (order number: SC2-S2063-01-A-P-00)

ACCESSORY

Sensor protection cap (order number: C2-Z1)
Duct mounting kit (order number: C2-Z2)
Calibration adapter (order number: C2-Z4, C2-Z4-A, C2-Z4-B, C2-Z4-C)
Splash protection SplashGuard (order number: C2-Z5)

FURTHER MEASURING PRINCIPLES

Infrared:
R32
➔ See data sheet DB_SC2_IR_Premium

MPS™:
R32, R1234ze
➔ See data sheet DB_SC2_MPS

Semiconductor/Freon_LFL:
R32, R455a, R454b, R1234yf, R1234ze
➔ See data sheet DB_SC2_Freon_LFL

Further information in the catalog: