Data Sheet

Gas detecting sensor Type **DGS**

Refrigerant gas detection for safeguarding commercial buildings.

DGS sensors can be used in stand-alone or integrated systems, where continuous real-time, automatic monitoring with Danfoss ADAP-KOOL® Refrigeration Control & Monitoring System and/or Building Management Systems is applied.

DGS supports our customers in complying with environmental F-Gas Regulations and Health & Safety requirements on new or existing systems in:

- supermarkets
- process refrigeration plants
- refrigerated storage and warehousing
- special application areas/zones

Typical refrigerant gas applications include:
- halocarbons: HFCs, HCFCs, CFCs
- carbon dioxide (CO_2/R744)
- hydrocarbons (e.g. R290)
- other special application gases to customer request

Sensing technology varies to make the best detection for a given gas, in terms of performance and cost. DGS-IR is based on infra-red sensor technology, DGS-SC is based on semi-conductor and DGS-PE is based on pellistor.

Product specification

Technical Data

Table 1: Technical data

Power supply	24 V DC ± 20 % ; reverse polarity protected 24 V AC - 10 % / + 15 %		
Power Consumption (24 V DC)	Max. 250 mA (6 VA)		
Digital output	Alarm acknowledge and test alarm: Potential-free contact Alarm relay /fault relay: 40 V AC/DC, 0.5 A, change-over contact (SPDT) Critical relay: normally closed (SIL II compliant), warning relay: normally open		
Analogue output signal	Proportional, overload and short-circuit proof, load ≤ 500 Ohm Measuring range: 0 – 10 V / 2 – 10 V / 0 – 20 mA / 4 – 20 mA		
MODBUS Physical	5 V DC, 250 mA max. overload, short-circuit and reverse-polarity protected		
Enclosure rate	IP 65		
Humidity range	15 – 90 % RH not-condensing		
Burning behaviour	UL 94 V2		
Housing colour	Black		
Dimensions (W x H x D in mm)	94 x 130 x 57		
Installation	Wall mounting		
Cable entry	2 x M12 / 3 x M20		
Wire connection:	Power supply, MODBUS: Screw-type terminals 0.25 – 2.5 mm² Analogue output, Digital input: Screw-type terminals 0.25 – 1.3 mm² Sensor head: 3-pin plug connector		
Sensor information	DGS-IR (CO_2)	DGS-SC (HFC)	DGS-PE (Propane)
Temperature range	-35 – 50 ℃	-30 – 60 ℃	-30 – 60 ℃
Response time T90	<90 sec.	≤ 150 sec.	<15 sec.
Recovery time, T0	90 sec.	180 sec.	120 sec.
Maximum calibration interval	60 months	12 months	6 months
Measuring range	0 – 20000 ppm	0 – 2000 ppm	0 – 5000 ppm
Lowest threshold	10% of the measuring range	10% of the measuring range	10% of the measuring range
Default alarm threshold	5000 ppm	500 ppm	800 ppm
Compliance	CE EN61010-1 ETL Intertek No61010-1		
B&L - Buzzer and Light (option by product selection)	Light (LED): Red / yellow /green (alarm - fault - operation - service) Buzzer: >85 dB (A) (0.1 distance) 2300 Hz ± 300 Hz		

Ordering

Table 2: Ordering

DGS Sensors			Spares and Accessories			
Product Description	**Code no.**		**Product Description**		**Code no.**	
DGS-SC HFC grp 1[1]	080Z2803		Spare sensor HFC grp 1[1]	Spare	080Z2815	
DGS-SC HFC grp 2[1]	080Z2804		Spare sensor HFC grp 2[1]	Spare	080Z2816	
DGS-SC HFC grp 3[1]	080Z2805		Spare sensor HFC grp 3[1]	Spare	080Z2817	
DGS-PE propane	080Z2806		Spare sensor propane	Spare	080Z2818	
DGS-IR CO_2	080Z2800		Spare sensor CO_2	Spare	080Z2813	
DGS-IR CO_2 5 m	080Z2801		Spare sensor CO_2 - 5 m	Spare	080Z2814	
DGS-IR 2 CO_2 - 5 m	080Z2802		Hand-held Service Tool	Accessory	080Z2820	
DGS-SC HFC grp 1[1] + B&L	080Z2809		Strobe & Horn	Accessory	080Z2822	
DGS-SC HFC grp 2[1] + B&L	080Z2810		Splash guard	Accessory	148H6226	
DGS-SC HFC grp 3[1] + B&L	080Z2811		Duct set	Accessory	148H6236	
DGS-PE propane + B&L	080Z2812		Calibration adaptor	Accessory	148H6232	
DGS-IR CO_2 + B&L	080Z2807		Remote kit	Accessory	148H6238	
DGS-IR CO_2 5 m + B&L	080Z2808		Power Supply AK-PS 063	Accessory	080Z0057	

[1] HFC grp 1: R1234ze, R454C, **R1234yf**, R452A, R454A, R455A, R454B, R513A
  HFC grp 2: R407F, R416A, R417A, R407A, R422A, R427A, R449A, R437A, **R134A**, R438A, R422D
  HFC grp 3: R448A, R125, R404A, R32, R507A, R434A, R410A, R452B, **R407C**, R143B

Bold = calibration gas

ⓘ **NOTE:**
DGS is also available for alternative refrigerant gases on request. Please contact your local Danfoss Sales Office for details.

Accessories

Hand-held Service tool

Figure 1: Hand-held Service tool

Hand-held device for display, calibration, addressing and parameters changes.

Communication and power supply will be ensured via a cable that is plugged into the respective devices.

Features:
• User-friendly design
• Simple menu structure
• Two-line display / 16 characters
• Six operating buttons
• Three LEDs for status display
• Communication / power supply via a cable

Table 3: Specifications

Features	Description
Electrial	
Power supply	5 V DC from device, reverse-polarity protected
Power consumption	50 mA, max. (0.25 VA)
Serial interface local bus	5 V level / 19200 Baud
Ambient Conditions	
Temprature range	-10 – +40 °C (14 – 104 °F)
Humidity range	0 – 90% RH non-condensing
Physical	
Housing	Polycarbonate
Dimensions	117 x 78 x 25 mm
Weight	Ca. 200g
Protection Class	IP65
Cable Length	1.50 m
Regulations	
Directives	EMC directives 2014/30/EU CE Conformity to: EN 61010-1:2010 ANSI/UL 61010-1 CAN/CS-C22.2 No. 61010-1

Strobe & Horn

Figure 2: Strobe & Horn

Electronic sounder that allows two levels of alarm (warning, critical) controllable via independent electric contacts.

Features:
- Selectabletones
- Separate electric control for strobe and horn

Table 4: Specifications

Alarm Sounder	Description
Operating voltage	12 – 24 V DC
Operating temperature	-40 – +55 °C
Number of user-selectable tones	32
Lens colour	Red
IP rating	IP 65

Sensor head protection

Figure 3: Sensor head protection

Plastic protective cap with non-slip, knurled rim, for covering sensors of the DGS series.

The elastic protective cap is placed on the sensor to protect it from contamination during installation, cleaning and painting work and to protect the sensor element from poisoning, e.g. by silicone vapours.

When commissioning, it is essential to remove the tight-fitting cap to ensure the proper functioning of the sensor.

Features:
- Easy to use
- Perfect coverage of the sensor head
- Protection against pollution/poisoning

Table 5: Specifications

CAP	Description
Material	Plastic TPE
Colour	Red (RAL 3000)
Dimensions inside	Ca. 24 mm x 18 mm (D x G) see figure below
Temperature range cap	-50 °C to +120 °C (-58 °F to 248 °F)

Splash guard

Figure 4: Splash guard

Cap for protecting the DGS sensor against splash water.

The cap is placed over the sensor head and secured by means of a detachable zip tie. It protects the sensor against rain and splash water coming from all directions.

The splash guard is used in gas warning systems, which are mounted outside unprotected from the weather. It can also be used to protect the sensor during cleaning work.

Features:
- Protection against rain, splash water and other weather conditions.
- Easy installation. Assembly and disassembly possible at any time due to detachable zip tie.

Table 6: Specifications

REDCAP	Description
Material	LDPE+PC
Dimensions	25 x 37 mm (D x H)
Protection class	IP66

Duct set

The duct mounting set consists of a sampling tube with hose and adapter for DGS sensors.

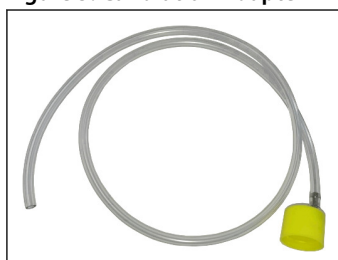Duct mounting set for sampling from air ducts.

Features:
- Easy to use
- Perfect coverage of the sensor head
- Double pipe can be cut to length for adaptation to the duct diameter

Table 7: Specifications

Sampling SET	Description
Gas sampling	Via sampling tube / connecting hose
Flow rate	Min. 5000 m/h (3.1 mph), max. 20,000 m/h (12.4 mph)
Air duct diameter	Min. 0.1 m (3.94 in.), max. 1.0 m (39.37 in.)
Length of sampling tube	250 mm (9.84 in.), adaptable to the duct diameter by cutting to length: 192 mm (7.56 in.), 133 mm (5.24 in.) or 77 mm (3.03 in.)
Hose length	2 x 1000 mm (39.37 in.)
Assembly	• Arrow at the sampling set in flow direction • Always install in the center of the duct • Keep a minimum distance of at least 1000 mm to duct bends etc.

Calibration Adapter

Figure 5: Calibration Adapter

Calibration adapter for comfortable gas supply to DGS sensors.

The calibration adapter is used for the targeted supply of zero and test gases to the sensor head.

Features:
- Easy to use
- Perfect coverage of the sensor head
- Double pipe can be cut to length for adaptation to the duct diameter

Table 8: Specifications

Item	Description
Cap	
Material	PE-LD
Dimensions (D x G)	25 x 20 mm (0.98 x 0.79 in)
Hose	
Material	PVC-P polyvinyl chloride
Temperature range	-20 – +60 °C (-4 – +140 °F)
Diameter	OD = 7 mm, ID = 4 mm
Length	1 m (39.37 in)

Remote kit

Figure 6: Remote kit

Cable extension with housing for remote mounting of DGS sensors.

The remote kit is used as a cable extension for the remote installation of sensors.

Features:
- Easy to use
- Perfect coverage of the sensor head
- Double pipe can be cut to length for adaptation to the duct diameter

Table 9: Specifications

Features	Description
Physical	
Material	Polycarbonate
Flammability classification	UL 94 V2
Dimensions (W x H x D)	94 x 65 x 57 mm
Weight	0.2 kg (0.66 lb)
Protection class	NEMA 4X (IP65)
Mounting	Wall mounting
Knockouts for cable entry	2x M25
Regulations	
Directives	EMC Directives 2014/30/EU CE, UKCA

Certificates, declarations, and approvals

The list contains all certificates, declarations, and approvals for this product type. Individual code number may have some or all of these approvals, and certain local approvals may not appear on the list.

Some approvals may change over time. You can check the most current status at danfoss.com or contact your local Danfoss representative if you have any questions.

Table 10: Certificates, declarations, and approvals

File name	Document type	Document topic	Approval authority
Intertek 4000518	Electrical - Safety Certificate	-	Intertek
080R1223.AB	EU Declaration	EMCD/LVD	Danfoss

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