GENERAL SPECIFICATION

Warsaw

STANDARD GAS DETECTORS

TWO-THRESHOLD, with EXCHANGEABLE SENSOR

DG/F

models: **DG-*nn***
DG-*nn*/N
DG-*n*E/N
series U4

where "n" is a natural number coding type of gas

GENERAL PURPOUSE

Detector **DG/F** can be used for perpetual monitoring of premises for combustion and toxic gases. Process of monitoring is based on on-line measurement of gas concentration in air. At the moment when the concentration exceeds two precisely determined thresholds, alarms go on and the control outputs are activated.

Detector **DG/F** can **not** be used in hazardous locations (according ATEX Directive).

FEATURES

- two thresholds set at manufacture site
- semiconductor sensor for combustible gases or electrochemical sensor for toxic gases or oxygen
- easy exchangeable sensor unit and easy maintenance
- easy change of detected gas and easy detector's calibration (one-body system = all sensor units ready to operate in each body)
- i-N-telligent sensors with build-in TWA and STEL measurement, alarm history, recommended calibration time mark signal
- built-in temperature compensation
- low cost operation
- long time operation (typically 10 years for semiconductor sensors)

PRODUCER:
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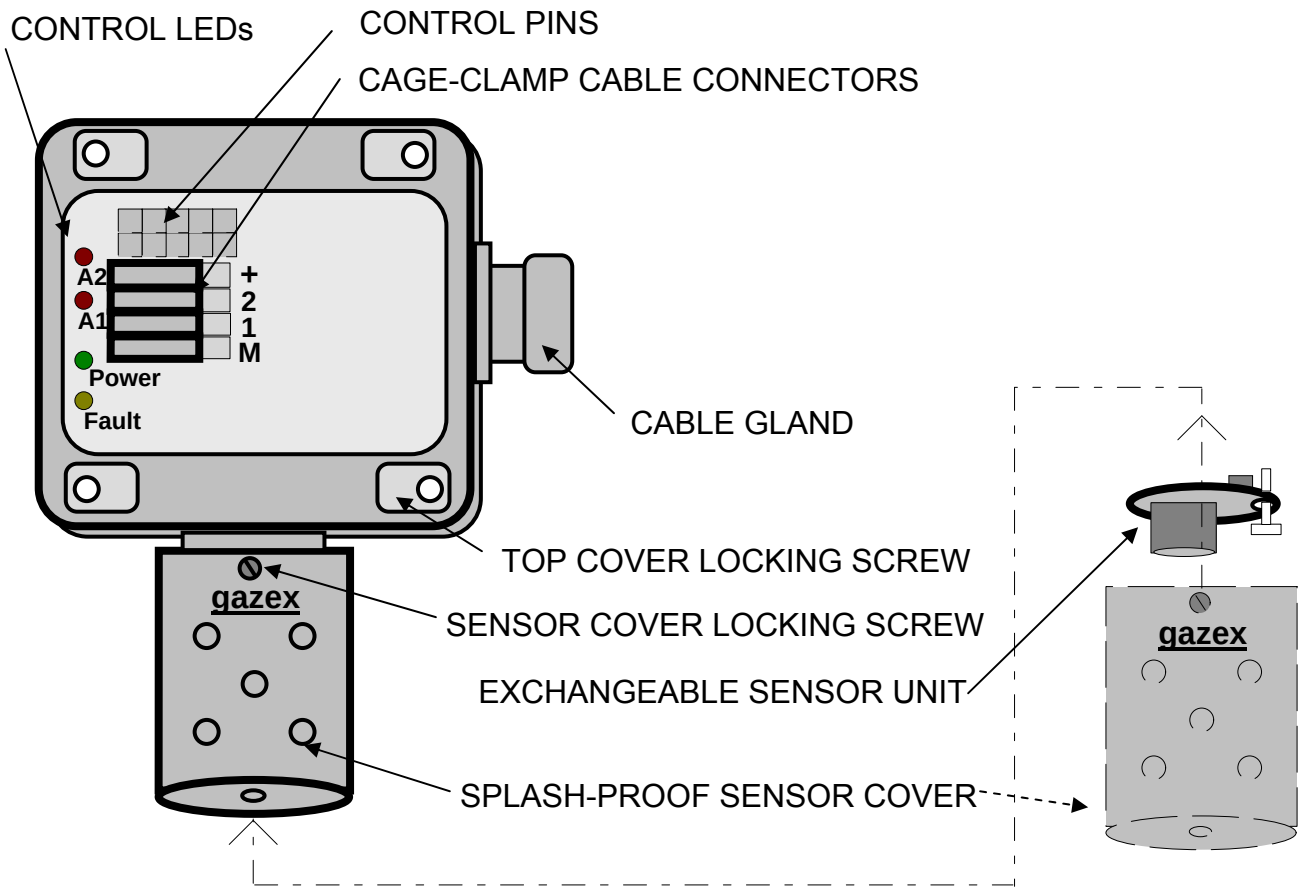
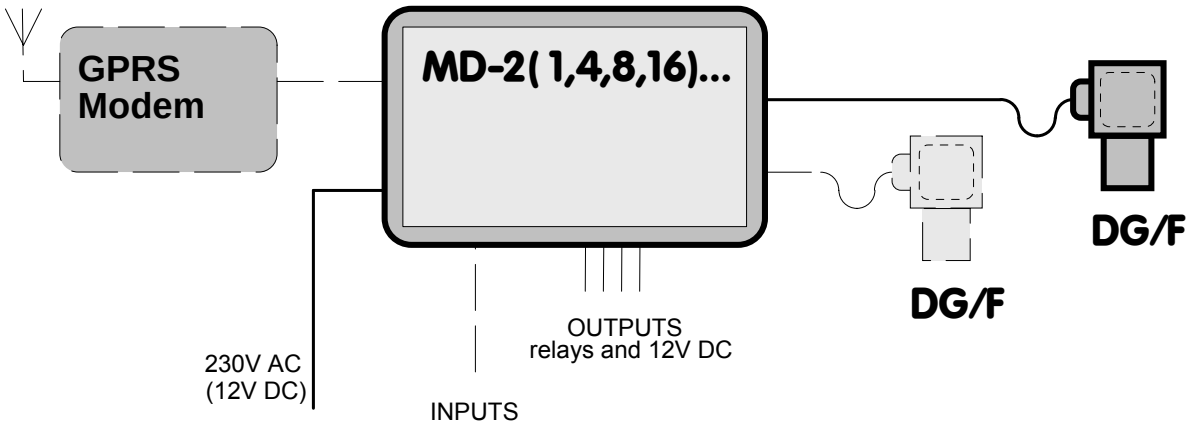
DETECTORS ELEMENTS



OPEN TOP COVER VIEW
(recommended installation position)

DROWING OF TYPICAL SYSTEM CONFIGURATION



SELECTING TABLES

TABLE 1.1.DGF.nn. Detectors **DG-*nn…*** with semiconductor sensors:

SYMBOL		Measuring range							Calibration period		
MODEL	Sensor unit	gas	Range and selectivity	Minimum A1 threshold*	Maximum A2 threshold	Max over load (<1min /30min)	Standard calibration *** A1/A2	units	Max recommended **[months]**	optimum **[months]**	Expected live time in fresh air. **[years]**
1	3	4	5	6	7	8	8A	9	10	11**	12
DG-12/N	12N	Methane	W + SL	0,01	40	100	10/30 (p2) or 20/40 (p2)	%LEL	36	12	10
DG-15/N	15N	Propane, Butane	W + SL	0,01	40	100	10/30 (p2) or 20/40 (p2)	%LEL	36	12	10
DG-31	31	solvents	W	0,01	40	50	x	%LEL	36	12	10
DG-32	32	Alcohols	S + SL	10	1000	3000	x	ppm	36	12	10
DG-41	41	Ammonia	W	300	5000	10000	x	ppm	36	12	10
DG-61	61	HFC (Freon)	W	100	3000	10000	x	ppm	36	12	10
DG-71	71	Hydrogen, Acetylene	W	0,01	40	100	x	%LEL	36	12	10
DG-TF	TF	temperature	x	-20	60	80	x	°C	36	12	10

***** - parameters may depend on the selection of the sensor for particular application;
******- calibration is also recommended before each measurement/event which is important for the User
DESIGNATIONS:
N –concentrations considered in metrological practice as low, S – considered as medium, W – considered as high
SL – increased selectivity

ATTENTION: *detection of media in other ranges or detection of other media is also possible = special version, requires consultation with GAZEX; in particular cases it is possible to select detector parameters for a specific application*

ANALYSIS OF OPERATING CONDITIONS OF THE DEVICE IS REQUIRED

CAUTION - IMPORTANT:

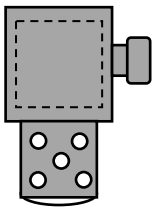
- The sensor used in the detector is resistant to **momentary** increase of the concentration of gas or the substances listed in Table 1.1.DGF.nn row 7. However, any extended operation of the detector (of any type) with gas concentrations exceeding the values given in row 7 is PROHIBITED for all media indicated in the table! It may cause permanent change of measuring parameters of the detector or destruction of the gas sensor!
- It is not recommended to operate the detector in conditions where the concentrations exceed LEL by 3...5% for explosive gases or exceed A1 threshold concentration level of the detector calibrated for the toxic gas. Such an operation may result in consequences described above.
- Gas of uncontrolled concentration MUST NOT be used for testing the detector operation!

TABLE 1.1.DGF.nE. Detectors DG/F with iNtelligent electrochemical sensors:

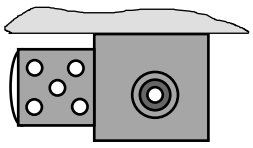
Name code		Measuring range							Calibration period		Live time in fresh air. **[years]**
MODEL	Sensor unit	gas	Range and selectivity**	Minimum A1 threshold	Maximum A2 threshold	Max over load (<1min / 8h)	Standard calibration* A1/A2	units	Max recommended **[months]**	optimum **[months]**	
1	3	4	5	6	7	8	8A	9	10	11	12
DG-2E/N	2E/N	Carbon monoxide	low + SLK	20	500	1500	TWA//STEL	ppm	12	6	2
DG-4E/N1	4E/N1	Ammonia (from -40˚C)	low + SLK	5	100	200	TWA//STEL	ppm	6	3	2
DG-4E/N2	4E/N2	Ammonia	low + SLK	5	100	200	TWA//STEL	ppm	6	3	2
DG-5E/N	5EN	Hydrogen sulfide	low + SLK	5	100	500	TWA//STEL	ppm	6	3	2
DG-7E/N	7E/N	Hydrogen	low + SLK	50	1000	2000	x	ppm	6	3	2
DG-9E/N	9E/N	Oxygen	high + SLK	0,5	25	30	19 / 18	% v/v	24	12	2
DG-0E.SO2/N	SO2/N	Sulphur dioxide	low + SLK	2	20	150	TWA//STEL	ppm	6	3	2
DG-0E.NO/N	NO/N	Nitric oxide	low + SLK	5	100	1000	TWA//STEL	ppm	6	3	2
DG-0E.NO2/N	NO2/N	Nitric dioxide	low + SLK	2	20	150	TWA//STEL	ppm	6	3	2
DG-0E.CL2/N	CL2/N	Chlorine	low + SLK	1	10	100	TWA//STEL	ppm	6	3	2
DG-0E.ETO/N	ETO/N	Ethylene oxide	low + SLK	1	20	100	1 / 5 #	ppm	6	3	2
DG-0E.PH3/N	PH3/N	Phosphine	low + SLK	0,1	5	20	0,5 / 1 #	ppm	6	3	2

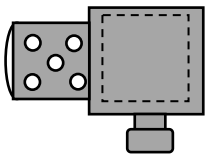
* - other ranges on request
**- cross-sensitivity data (SLK)for electrochemical sensors are available on request
#- - calibration according to cross-sensitivity data

INSTALLATION POSITION



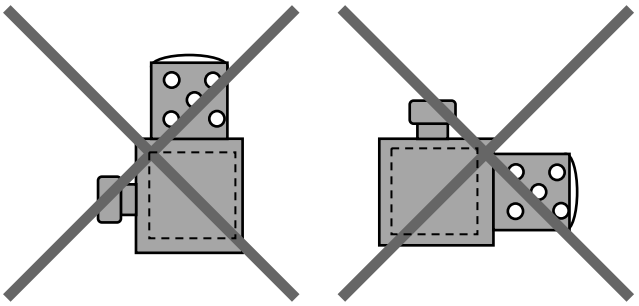
recommended - vertically





allowed but not recommended (no splash-proof)

NOT ALLOWED:



TECHNICAL SPECIFICATIONS

TABLE 2.1. COMMON SPECIFICATIONS for all models

Supply voltage	9V DC nominal, range: 6.0 ÷ 9V, shortly (<30s/1h): 6.0 ÷15.0V DC
Supply current	models DG-*nn...* typically: 90mA (max 180mA), models DG-*n*E/N typically: 30mA
Gas sensor	models DG-*nn…* – semiconductor type, on exchangeable sensor unit, models DG-*n*E/N – electrochemical type, on exchangeable sensor unit
Detected gases	see Table 1.1…
Signal outputs	pin „1", "2" (OC passive) for MD… connections
Dimensions	140 x 110 x 55 mm (H x W x T) – in installation position
Body material, weight	ABS, IP44 *(IP33 for model DG-0E../N),* / approx.0.3kg

TABLE 2.1.nn. Selected specification for model **DG-*nn…***

Operating temperature	-10°C …+40°C recommended; -20°C …+45°C allowed periodically (<1h/24h); 35% …90% RH (non-condensing)
Interfering gases	Cl_2, NO_x, oxygen deficiency (<18% vol.); fast humidity rise
Poisoning gases	silicone and halogen compounds, high concentration of reduction gases
Response time	t_{90} = 15 ÷ 120 sec (model dependent)
Full specification time	approx. 20 min.
Accuracy	± 5% measured value but not less than ± 2% of range; at calibration conditions: 20(-2/+5)°C, 65(±10)% RH, 1013(±30)hPa minimum 72h non-interrupt supply
Thermal stability of thresholds	± 15% measured value but not less than ± 5% of range (0°C …40°C)
Long-term stability	≤ ±20% of range per 36 months, at calibration conditions

TABLE 2.1.nE. Selected specifications for model **DG-*n*E/N**

Operating temperature	-20°C...+40°C recommended, for DG-4E/N1: -40°C …+40°C recommended; all: -25°C …+50°C allowed periodically (<1h/24h); 15 …90% RH (non-condensing)
Interfering gases	list on request; oxygen deficiency (<0,5% vol.); fast humidity rise
Poisoning	overload, see Table 1.1.B column 8
Response time	t_{90} = 30 ÷ 120 sec. for DG-2E/N , -5E/N, -7E/N; exceptions: t_{90} = ~ 20sec. for DG-9E/N; t_{90}= 100 ÷ 300 sec. for DG-4E/N1(2), -0E.ETO/N full spec. time after supply start ~ 5 min. (DG-4E, -0E.NO: ~3h; DG-0E.ETO: >24h)
Accuracy	± 15% measured value but not less than ± 2% of range; (± 30 % for DG-0E...); at calibration conditions: 20(-2/+5)°C, 65(±10)% RH, 1013(±30)hPa minimum 72h non-interrupt supply
Long-term threshold drift	~ 3% signal loss/ month; < ±5% / 2 years for DG-9E/N, ~10% / year for -0E.ETO/N; (increasing alarm thresholds tendency), environment dependent