GENERAL SPECIFICATION

gazex®

Warsaw

FLAMEPROOF GAS DETECTORS/ TRANSMITTERS

DEX® /P

models: **DEX-P*n*,**
DEX-P*n*E/N,
DEX-P*n*R/N

series U2

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

GENERAL PURPOUSE

Detector **DEX®/P** can be used for continuous monitoring of premises for combustible and toxic gases. Process of monitoring is based on on-line measurement of gas concentration in the air and transmitting measured value as 4-20mA standard (*passive output*).

Detector **DEX®/P** can be used in all places specified as:

Ex **II 2 G** (according to Directive 94/9/EC - ATEX).

All detectors are made according to European Standards:
EN 60079-0:2012 + A11:2013, EN 60079-1:2007, EN 60079-1:2014**.**

All DEX/P are equipped with individual production certificate and calibration certificate.

DEX®/P can operate only with control units type MDP made by GAZEX.

CERTIFICATE Ex**:** No. KDB 04ATEX133X, issued by GIG KD "Barbara" Notified Body No.1453,

Body type (make)	mark	Body type (make)	mark
P6-B, P6-BM	Ex db IIB T6	**P4-B**, P4-BM, P4-HT-B, P4-HT-BM	Ex db IIB T4
P6-C, P6-CM	Ex db IIC T6	**P4-C**, P4-CM, P4-S-C, P4-S-CM, P4-HT-C, P4-HT-CM	Ex db IIC T4

***bold** font = standard make*

OPERATIONAL FEATURES

- 4-20mA standard analog output (passive)
- easily exchangeable sensor unit and easy maintenance
- easy change of detected gas or calibration of the detector
- built-in temperature compensation
- catalytic or infra-red sensor for combustible gases or electrochemical sensor for toxic gases or oxygen
- sensor unit with "zero" and "span" regulation (calibration outside the detector)
- low-cost operation
- easy fit to existing systems with 4-20mA standard inputs (*using MDPL1 limiter*)
- high temperature (up to +80°C) version available (*P4-HT… body type*)

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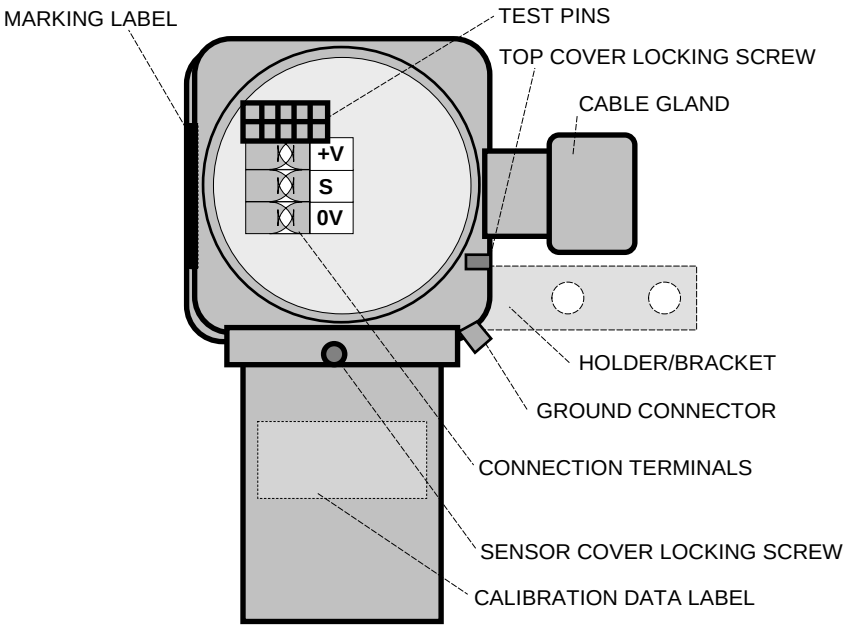
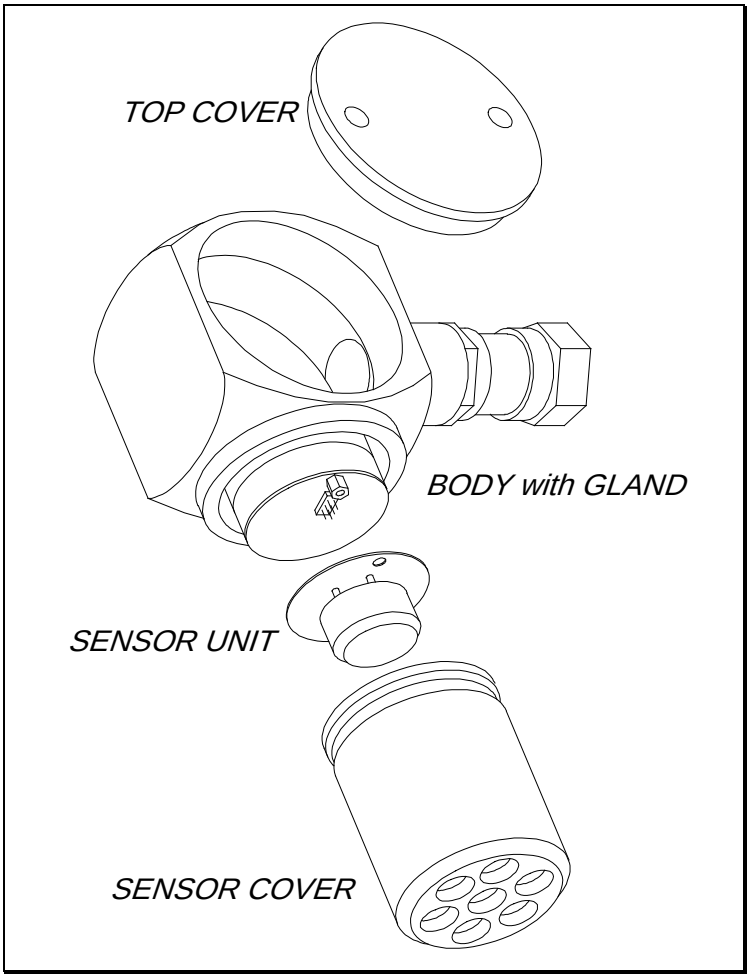
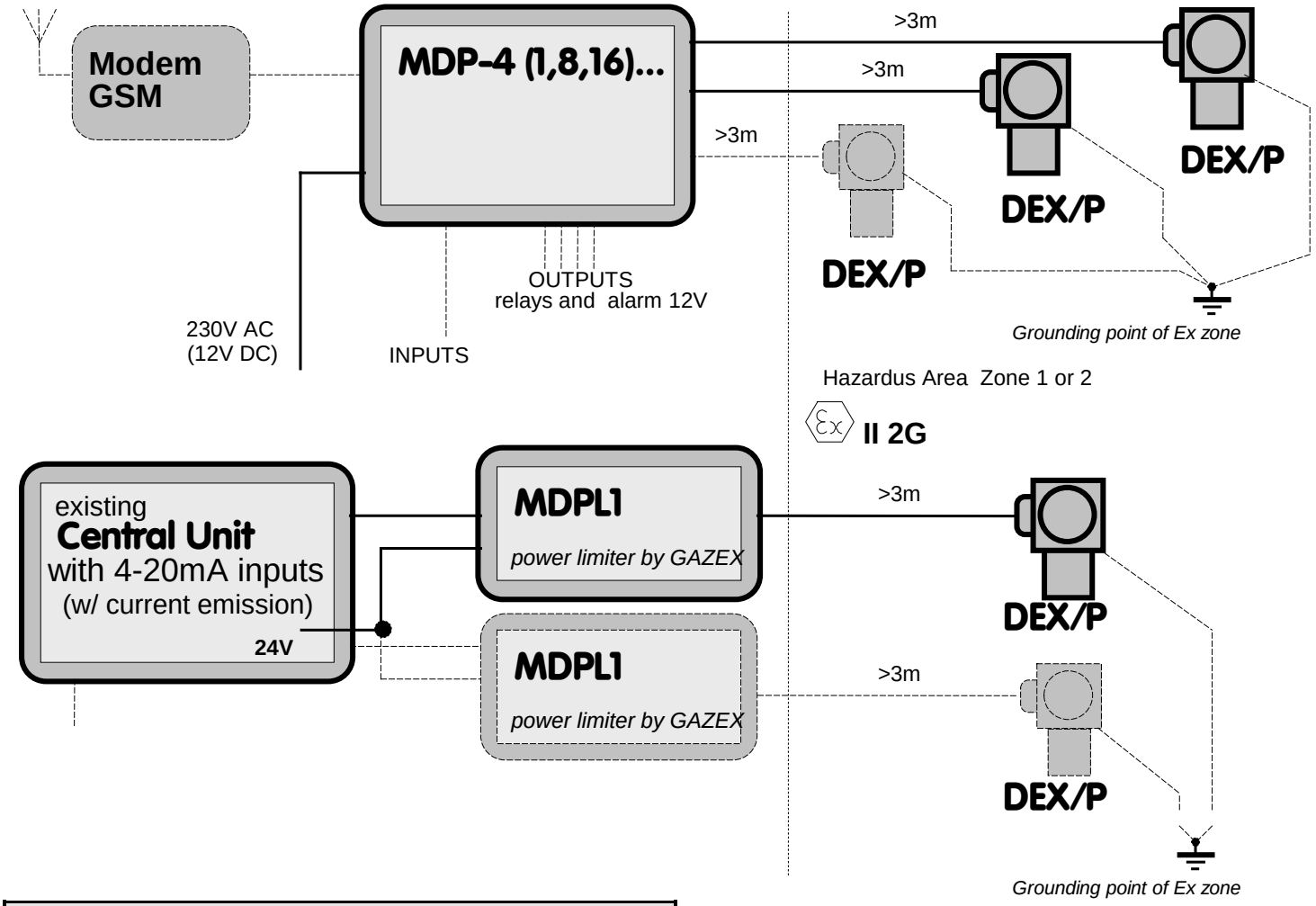
DETECTORS ELEMENTS



OPEN TOP COVER VIEW
(recommended installation position)



DRAWING OF TYPICAL SYSTEM CONFIGURATION



SELECTING TABLES

TABLE 1.1.Pn. Detectors **DEX-P*n*** with catalytic sensors:

SYMBOL			Concentration RANGE							calibration period		
Model	Body type (make)	Sensor module MS-...	gas	Selectivity**	range*	short term stability	max overload (<1min / 8h)	STANDARD CALIBRATION GAS *	unit	max **[months]**	optimum **[months]**	Live time in clean air **[years]**
1	2	3	4	5	6	7	8	8A	9	10	11	12
DEX-P1	P4-C	11K	HC, general purpose	W	0 ÷ 100	± 2	110	Methane, Propane	%LEL	6	3	5
DEX-P3	P4-B	31K	solvents, petrol	W+SL	0 ÷ 100	± 2	110	x	%LEL	6	3	5
DEX-P4	P4-C	41K	Ammonia	W+SL	0 ÷ 20	± 1	50	x	%LEL	6	3	5
DEX-P7	P4-C	72K	Hydrogen	W+SL	0 ÷ 20	± 1	50	x	%LEL	6	3	5
DEX-P8	P4-C	80K	Argon, Helium, CO_2)***	W	5 ÷ 100	± 2	100	x	% v/v	6	3	5

*) - Non-standard calibration is available (other range or media)
**) – Cross-sensitivity data for catalytic sensors are available on request; (W= wide range, SL= higher selectivity, lower sensitivity for methane, less poison-proof)
***) – detector with thermal conductivity type sensor

TABLE 1.1.PnE. Detectors **DEX-P*n*E/N** with iNtelligent electrochemical sensors:

SYMBOL			Concentration RANGE							calibration period		
MODEL	Body type (make)	sensor module	gas	Selectivity**	range*	resolution	max overload (<1min / 8h)	STANDARD CALIBRATION GAS *	unit	max **[months]**	optimum **[months]**	Live time in clean air. **[years]**
1	2	3	4	5	6	7	8	8A	9	10	11	12***
DEX-P2E/N	P4-C	P2E/N	Carbon monoxide	N + SLK	0 ÷ 500	5	1500	200,CO	ppm	12	6	2
DEX-P4E/N1	P4-C	P4E/N1	Ammonia (from -40˚C)	N + SLK	0 ÷ 100	1	200	30, NH_3	ppm	6	3	2
DEX-P4E/N2	P4-C	P4E/N2	Ammonia	N + SLK	0 ÷ 100	1	200	30, NH_3	ppm	6	3	2
DEX-P5E/N	P4-C	P5EN	Hydrogen sulfide	N + SLK	0 ÷ 100	1	500	20, H_2S	ppm	6	3	2
DEX-P7E/N	P4-C	P7E/N	Hydrogen	N + SLK	0 ÷ 1000	10	2000	x	ppm	6	3	2
DEX-P9E/N	P4-C	P9E/N	Oxygen	W + SLK	0 ÷ 25	0,2	30****	20,9, O_2	% v/v	24	24	2

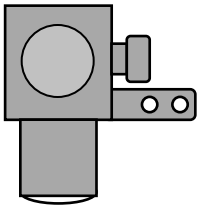
*) - other ranges or calibration on request
**) - cross-sensitivity data for electrochemical sensors are available on request (SLK = factors on request; N= low range; W= wide range)
***) – depending of gas concentration “history” around the sensor unit
****) – metrological factor only (*non-ATEX*)

TABLE 1.1.PnR. Detectors **DEX-P*n*R/N** with iNtelligent Infra-Red sensor:

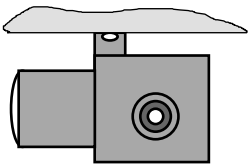
SYMBOL			Concentration RANGE							calibration period		
MODEL	Body type (make)	sensor module	gas	Selectivity**	range*	resolution	max overload (<1min / 8h)	STANDARD CALIBRATION GAS	unit	max **[months]**	optimum **[months]**	Live time in clean air **[years]**
1	2	3	4	5	6	7	8	8A	9	10	11	12
DEX-P1R2/N	P4-C	P1R2/N	Methane	W + SL	0 ÷ 100	1	no limits	50, Methane	% LEL	36	12	>5
DEX-P1R5/N	P4-C	P1R5/N	LPG	W + SL	0 ÷ 100	1	no limits	50, Propane	% LEL	36	12	>5
DEX-P3R/N	P4-B	P3R/N	solvents	W + SL	0 ÷ 100	1	no limits	x	% LEL	36	12	>5
DEX-P8R/N	P4-C	P8R/N	CO_2	W + SL	0 ÷ 5	0,05	100	x	%v/v	36	12	>5

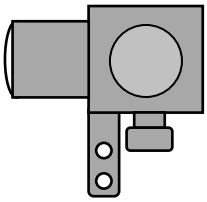
*) - other ranges on request
**) - cross-sensitivity data for Infra-Red sensors are available on request (SL = factors on request, W= wide range)

INSTALLATION POSITION



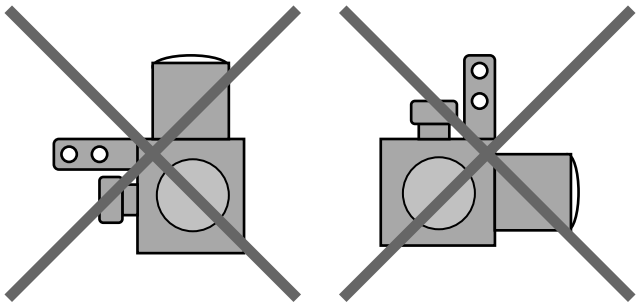
recommended – vertically





models …P*n*E/N, P*n*R/N: allowed – horizontally
models …P*n*: not recommended

NOT ALLOWED:



TECHNICAL SPECIFICATIONS

COMMON SPECIFICATIONS for all models **TABLE 2.1.**

Supply voltage	9V DC nominal, range: 6.0 ÷ 9.0V, shortly (<30s/1h): 6.0 ÷15.0V DC
Supply current	model DEX-P*n* typical: 150mA (max 190mA), model DEX-P*n*E/N typical: 30mA model DEX-P*n*R/N typical: 90mA
Allowed operating temperature	absolute allowed ratings (according to ATEX Certificate, non-metrological conditions): -30°C ÷ +50°C for all types of body except P4-HT…; -30°C ÷ +80°C for body type P4-HT…; -30°C ÷ +45°C for body type P…-B, P…-C in additional AP-1 case
Gas sensor	model DEX-P*n* – catalytic type, (for DEX-P8: thermal conductivity type), model DEX-P*n*E/N – electrochemical type, model DEX-P*n*R/N – Infra-Red type; all models with exchangeable sensor unit
Detected gases	see Table 1.1…
Signal outputs	pin „S" = 4-20 mA (passive, $U_o \leq 10V$)
Electronic circuit	SMT, with over range control (Is >25mA), fault state control (Is <2mA)
Dimensions	103 x 105 x 54 mm (H x W x T) – in installation position
Body material, weight	brass CW617N (EN12164), nickel plated (aprox.1.2kg) or steel 316L (ANSI), make P4-S-C…, (aprox.1.1kg)
Ex marking	Ex db IIB T6 for body/make P6-B, P6-BM; Ex db IIB T4 for body/make P4-B, P4-BM, P4-HT-B, P4-HT-BM; Ex db IIC T6 for body/make P6-C, P6-CM; Ex db IIC T4 for body/make P4-C, P4-CM, P4-S-C, P4-S-CM, P4-HT-C, P4-HT-CM
Certificate No.	KDB 04ATEX133X (*issued by Notified Body No. 1453*)

TABLE 2.1.Pn. Selected specifications for models **DEX-P*n***

Operating temperature	-20°C …+40°C recommended; -30°C …+50°C allowed periodically (<1h/24h); 10% …90% RH (non-condensing)
Interfering gases *	halogen and sulfur compounds, oxygen deficiency (<10% vol.); fast air flow near the sensor
Poisoning gases *	silicone and organo-metalic compounds , organic phosphate esters; high concentration of reduction gases
Response time	t_{90} = 30 ÷ 120 sec (model dependent)
Full specification warm-up 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 power supply
Thermal stability of signal	± 10% measured value but not less than ± 5% of range (0°C …40°C)
Long-term stability	≤ ±3% of range per 6 months, at calibration conditions

**- without DEX-P8*

TABLE 2.1.PnE. Selected specifications for models **DEX-P*n*E/N**

Operating temperature	for DEX-P2E/N, -P5E/N, -P9E/N, -P4E/N2: -20°C...+40°C recommended, for DEX-P4E/N1: -40°C …+40°C recommended (metrological conditions only); all models: -25°C …+50°C allowed periodically (<1h/24h); 35 …90% RH (non-condensing)
Interfering gases	list on request; oxygen deficiency (<0,5% vol.); fast humidity rise
Poisoning	overload, see Table 1.1.PnE column 8
Response time	t_{90} = ~ 30sec. for DEX-P9E/N; t_{90} = 30 ÷ 90 sec. for DEX-P2E/N , -P5E/N, -P7E/N-CY, t_{90}= 90 ÷120 sec. for DEX-P4E/N…; full spec. time after supply start ~ 5 min.
Accuracy	± 10% 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 power supply
Long term drift	~ 3% signal loss/ month; < ±5% / 2 years for -P9E/N, < ±5% / year for -P2E/N; environment dependent

TABLE 2.1.PnR. Selected specifications for models **DEX-P*n*R/N**

Operating temperature	-20°C …+40°C recommended; -30°C …+50°C allowed (over compensation range); 0…90% RH (non-condensing)
Response gases	Hydrocarbons; for DEX-P8R/N: CO_2 (only)
Low response gases *(except model –P8R/N)*	Methanol, Cyclohexanol, Cresol, Acetic acid, Chloromethane, Benzotrifluoride, Acetaldehyde, Cyclohexanone, Methyl formate, Chloromethane, Allyl Chloride, Chloroethylene, Dichloromethane, Chlorethanol, Acetyl chloride, Chloroethanol, THT, Acetonitrile, Methylamine, Ethylene, Cyclopropane, Ethylene oxide, Furan, Nitromethane
Gases no response	Hydrogen, Acetylene, Carbon Monoxide, Phenol, Dichloroethylene, Ammonia, Dichlorobenzene, Aniline, Acrylonitrile, Hydrogen cyjanide, Carbon disulfide
Durability influences	vibrations, strong mechanical shock, highly dusty atmosphere
Response time	t_{90} = 40 ÷120 s; full specification time after power supply start ~ 15 min.
Accuracy	± 10% measured value but ≥ ±2% of range, at calibration conditions: 20(-2/+5)°C, 65(±10)% RH, 1013(±30)hPa minimum 72h non-interrupt power supply
Thermal stability	± 15 % at temp. range 0°C …+40°C
Long term drift	< ±2% LEL/month; (model ...P8R/N: <0,05%v/v /month); ≤ ±5% LEL/year (model ...P8R/N: <0,10%v/v /year)