DrägerSensor® Smart CatEx (HC PR)

Order no. 68 12 970

Used in	Plug & Play	Replaceable	Guaranty	Expected sensor life	Selective filter
Dräger X-am 7000	yes	yes	2 years	> 3 years	–

MARKET SEGMENTS

Telecommunications, shipping, sewage, gas supply companies, refineries, chemical industry, mining, landfills, biogas plants, tunneling.

TECHNICAL SPECIFICATIONS

Detection limit:	2% LEL
Resolution:	1.0% LEL for the measuring range 0 to 100% LEL 0.02 Vol.-% for the measuring range 0 to 5 Vol.-% CH_4 (methane) 1 Vol.-% for the measuring range 5 to 100 Vol.-% CH_4 (methane)
Measurement range:	0 to 100% LEL or 0 to 100 Vol.-% CH_4 (methane)
General technical specifications	
Ambient conditions	
Temperature:	(–20 to 55)°C (–4 to 131)°F
Humidity:	(10 to 95)% RH
Pressure:	(700 to 1,300) hPa
Warm-up time:	≤ 5 minutes

FOR THE MEASUREMENT RANGE 0 TO 100% LEL WHEN CALIBRATED WITH METHANE IN AIR:

Response time:	≤ 15 seconds (T_{50}) ≤ 25 seconds (T_{90})
Measurement accuracy	
Sensitivity:	≤ ± 2.5% of measured value
Linearity error	≤ ± 2% LEL (0–40% LEL) ≤ ± 5% of measured value (40–100% LEL)
Long-term drift	
Zero point:	≤ ± 1% LEL/month
Sensitivity:	≤ ± 2% LEL/month typ. values for X-am 7000 ≤ ± 1% LEL/month
Influence of temperature	
Zero point:	≤ ± 0.1% LEL/K at (–20 to 40)°C (–4 to 104)°F
Sensitivity:	≤ ± 0.3% of measured value/K at (–20 to 40)°C (–4 to 104)°F
Influence of humidity	
Zero point:	≤ ± 0.03% LEL/% RH
Sensitivity:	≤ ± 0.1% of measured value/% RH
Effect of sensor poisons:	Hydrogen sulphide H_2S 1000 ppmh ≤ ± 5 % of measured value Hexamethyldisiloxane HMDS 10 ppmh ≤ ± 5 % of measured value Hexamethyldisiloxane HMDS 30 ppmh ≤ ± 20 % of measured value After an exposure of 10 ppm HDMS for 5 hours, the sensivity loss is less than 50 %. Halogenated hydrocarbons, heavy metals, substances containing silicone or sulfur, or substances that can polymerize → potential poisoning.
Test gas:	approx. 2 Vol.-% or 50 Vol.-% CH_4 test gas

FOR THE MEASUREMENT RANGE 0 TO 100% LEL WHEN CALIBRATED WITH PROPANE IN AIR:

Response time:	≤ 20 seconds (T_{50})
	≤ 40 seconds (T_{90})
Measurement accuracy	
Sensitivity:	≤ ± 2.5% of measured value
Linearity error:	≤ ± 4% LEL (0–40% LEL)
	≤ ± 10% of measured value (40–100% LEL)
Long-term drift	
Zero point:	≤ ± 4% LEL/month
Sensitivity:	≤ ± 1% LEL/month
	typ. values for X-am 7000 ≤ ± 1% LEL/month
Influence of temperature	
Zero point:	≤ ± 0.1% LEL/K at (–20 to 40)°C (–4 to 104)°F
Sensitivity:	≤ ± 0.3% of measured value/K at (–20 to 40)°C (–4 to 104)°F
Influence of humidity	
Zero point:	≤ ± 0.04% LEL/% RH
Sensitivity:	≤ ± 0.1% of measured value/% RH

FOR THE MEASUREMENT RANGE 0 TO 100 VOL.-% CH_4:

Response time:	≤ 35 seconds at 0 to 5 Vol.-% (T_{90})
Measurement accuracy	1 Vol.-% CH4
Linearity error:	
0 to 50 Vol.-%	≤ ± 5 Vol.-%
50 to 100 Vol.-%	≤ ± 10% of measured value
Long-term drift	
Zero point:	≤ ± 3 Vol.-%/month
Sensitivity:	≤ ± 3 Vol.-%/month
Influence of temperature	
Sensitivity 0 to 50 Vol.-%	≤ ± 0.2 Vol.-%/K at (–20 to 40)°C (–4 to 104)°F
Sensitivity 50 to 100 Vol.-%	≤ ± 0.3% of measured value/K at (–20 to 40)°C (–4 to 104)°F
Influence of humidity	
Sensitivity 0 to 50 Vol.-%	≤ ± 0.15 Vol.-%/% RH
Sensitivity 50 to 100 Vol.-%	≤ ± 0.2% of measured value/% RH

TECHNICAL SPECIFICATIONS

FOR THE MEASUREMENT RANGE 0 TO 100% LEL WHEN CALIBRATED WITH NONANE IN AIR:

Response time, rising:	≤ 60 seconds (T_{50})
	≤ 320 seconds (T_{90})
Response time, declining:	≤ 130 seconds (T_{50})
	≤ 1000 seconds (T_{90})

SPECIAL CHARACTERISTICS

The DrägerSensor® Smart CatEx (HC PR) is used to detect flammable gases and vapors in the ambient air: LEL monitoring or, in the case of methane, also Vol.-% monitoring. It has an excellent poison resistance against hydrogen sulphide, siloxiane and other sensor poisons. These sensors have been tested according to EN 61779-1 and EN 61779-4 for methane, propane, and nonane for 0–100% LEL, and for 0–100 Vol.-% for methane in accordance with EN 61779-1 and EN 61779-5. Substance-specific data is stored in the data memory for 35 different gases and vapors.

DETECTING OTHER GASES AND VAPORS

Through the use of cross sensitivities for the measurement range of 0 to 100% LEL. The figures given are typical readings when calibrated with methane (CH_4) and apply to new sensors without additional diffusion barriers. A LEL of 4.4 Vol.-% was used for methane. If an LEL of 5.0 Vol.-% is used, then the figures in the table must be multiplied by a factor of 0.88. The table does not claim to be complete. The sensor may also be sensitive to other gases and vapors.

Gas/vapor	Chem. symbol	Test gas concentration in Vol.-%	Displayed reading in % LEL
Acetone	CH_3COCH_3	1.25	31
1,3-butadiene	$CH_2CHCHCH_2$	0.70	26
Acetic acid	CH_3COOH	3.00	23
Ammonia	NH_3	7.70	58
Benzene	C_6H_6	0.60	22
Butane	C_4H_{10}	0.70	27
Butanone	$CH_3COC_2H_5$	0.75	22
Carbon monoxide	CO	5.45	41
Cyclohexane	C_6H_{12}	0.50	21
Cyclopentane	C_5H_{10}	0.70	27

Gas/vapor	Chem. symbol	Test gas concentration in Vol.-%	Displayed reading in % LEL
Diethyl ether	$(C_2H_5)_2O$	0.85	24
Diethylamine	$(C_2H_5)_2NH$	0.85	26
Ethane	C_2H_6	1.20	34
Ethanol	C_2H_5OH	1.55	31
Ethene	C_2H_4	1.20	36
Ethyl acetate	$CH_3COOC_2H_5$	1.00	24
Ethine	C_2H_2	1.15	34
Heptane	C_7H_{16}	0.40	18
Hexane	C_6H_{14}	0.50	21
Hydrogen	H_2	2.00	48
1-Methoxy-Propanol-2	$C_4H_{10}O_2$	0.90	22
Methane	CH_4	2.20	50
Methanol	CH_3OH	3.00	39
Methyl tert-butyl ether (MTBE)	$CH_3OC(CH_3)_3$	0.80	27
n-butanol	$C4H_9OH$	0.70	19
n-butyl acetate	$CH_3COOC_4H_9$	0.60	17
Nonane	C_9H_{20}	0.35	13
Octane	C_8H_{18}	0.40	17
Pentane	C_5H_{12}	0.55	21
Pentanol	$C_5H_{11}OH$	0.60	19
Propane	C_3H_8	0.85	28
Propanol	C_3H_7OH	0.60	19
Propene	C_3H_6	1.00	32
Propylene oxide	C_3H_6O	0.95	23
Styrol	$C_6H_5CHCH_2$	0.50	15
Toluene	$C_6H_5CH_3$	0.50	19
Xylene	$C_6H4(CH_3)_2$	0.55	19