DrägerSensor® Smart CatEx (PR)

Order no. 68 12 980

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)
Measurement range:	0 to 100% LEL
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})
Precision:	≤ ± 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
Precision:	≤ ± 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
Precision:	≤ ± 0.3% of measured value/K at (–20 to 40)°C (–4 to 104)°F
Influence of humidity	
Zero point:	≤ ± 0.03% LEL/% RH
Precision:	≤ ± 0.1% of measured value/% RH
Effect of sensor poisons:	Hydrogen sulfide 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 or volatile silicon, sulphur, heavy metal compounds or substances that can polymerize → potential poisoning.
Test gas:	approx. 2 Vol.-% CH_4

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

Response time:	≤ 20 seconds (t_{50}) ≤ 40 seconds (t_{90})
Precision:	≤ ± 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
Precision:	≤ ± 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
Precision:	≤ ± 0.3% of measured value/K at (–20 to 40)°C (–4 to 104)°F
Influence of humidity	
Zero point:	≤ ± 0.04% LEL/% RH
Precision:	≤ ± 0.1% of measured value/% RH

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 (PR) is used to detect flammable gases and vapors around the LEL in the ambient air. It has an excellent poison resistance against hydrogen sulfide, siloxiane and other sensor poisons. 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 a 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
Acetylene	C_2H_2	1.15	34
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
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
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

Gas/vapor	Chem. symbol	Test gas concentration in Vol.-%	Displayed reading in % LEL
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	1.00	26
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
o-Xylene	$C_6H4(CH_3)_2$	0.55	19

The given values may fluctuate by ±30 %.

The table does not claim to be complete. The sensor may also be sensitive to other gases and vapours. Poisoning of the sensor may also alter the relative sensitivities for certain gases and vapours. The specified test gas concentrations correspond to 50 % of the lower explosion limit of each test gas (source: E. Brandes, W. Möller: Sicherheitstechnische Kenngrößen, PTB, ISBN 978-3-86509-811-5, edition 2008).