

## 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

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

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

<b>Response time:</b>	≤ 15 seconds (T <sub>50</sub> ) ≤ 25 seconds (T <sub>90</sub> )
<b>Measurement accuracy</b>	
Sensitivity:	≤ ± 2.5% of measured value
<b>Linearity error:</b>	≤ ± 2% LEL (0–40% LEL) ≤ ± 5% of measured value (40–100% LEL)
<b>Long-term drift</b>	
Zero point:	≤ ± 1% LEL/month
Sensitivity:	≤ ± 2% LEL/month typ. values for X-am 7000 ≤ ± 1% LEL/month
<b>Influence of temperature</b>	
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
<b>Influence of humidity</b>	
Zero point:	≤ ± 0.03% LEL/% RH
Sensitivity:	≤ ± 0.1% of measured value/% RH
<b>Effect of sensor poisons:</b>	Hydrogen sulphide H <sub>2</sub> S 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 sensitivity loss is less than 50 %. Halogenated hydrocarbons, heavy metals, substances containing silicone or sulfur, or substances that can polymerize → potential poisoning.
<b>Test gas:</b>	approx. 2 Vol.-% CH <sub>4</sub> test gas

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

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

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

<b>Response time, rising:</b>	≤ 60 seconds ( $T_{50}$ ) ≤ 320 seconds ( $T_{90}$ )
<b>Response time, declining:</b>	≤ 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 sulphide, siloxane and other sensor poisons. These sensors have been tested according to EN 61779-1 and EN 61779-4 for methane, propane, and nonane for a range of 0–100% LEL. 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<sub>4</sub>) 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 <sub>3</sub> COCH <sub>3</sub>	1.25	31
1,3-butadiene	CH <sub>2</sub> CHCHCH <sub>2</sub>	0.70	26
Acetic acid	CH <sub>3</sub> COOH	3.00	23
Ammonia	NH <sub>3</sub>	7.70	58
Benzene	C <sub>6</sub> H <sub>6</sub>	0.60	22
Butane	C <sub>4</sub> H <sub>10</sub>	0.70	27
Butanone	CH <sub>3</sub> COC <sub>2</sub> H <sub>5</sub>	0.75	22
Carbon monoxide	CO	5.45	41
Cyclohexane	C <sub>6</sub> H <sub>12</sub>	0.50	21
Cyclopentane	C <sub>5</sub> H <sub>10</sub>	0.70	27
Diethyl ether	(C <sub>2</sub> H <sub>5</sub> ) <sub>2</sub> O	0.85	24
Diethylamine	(C <sub>2</sub> H <sub>5</sub> ) <sub>2</sub> NH	0.85	26
Ethane	C <sub>2</sub> H <sub>6</sub>	1.20	34
Ethanol	C <sub>2</sub> H <sub>5</sub> OH	1.55	31
Ethene	C <sub>2</sub> H <sub>4</sub>	1.20	36
Ethyl acetate	CH <sub>3</sub> COOC <sub>2</sub> H <sub>5</sub>	1.00	24
Ethine	C <sub>2</sub> H <sub>2</sub>	1.15	34
Heptane	C <sub>7</sub> H <sub>16</sub>	0.40	18
Hexane	C <sub>6</sub> H <sub>14</sub>	0.50	21
Hydrogen	H <sub>2</sub>	2.00	48
1-Methoxy-Propanol-2	C <sub>4</sub> H <sub>10</sub> O <sub>2</sub>	0.90	22
Methane	CH <sub>4</sub>	2.20	50
Methanol	CH <sub>3</sub> OH	3.00	39
Methyl tert-butyl ether (MTBE)	CH <sub>3</sub> OC(CH <sub>3</sub> ) <sub>3</sub>	0.80	27
n-butanol	C <sub>4</sub> H <sub>9</sub> OH	0.70	19

Gas/vapor	Chem. symbol	Test gas concentration in Vol.-%	Displayed reading in % LEL
n-butyl acetate	$\text{CH}_3\text{COOC}_4\text{H}_9$	0.60	17
Nonane	$\text{C}_9\text{H}_{20}$	0.35	13
Octane	$\text{C}_8\text{H}_{18}$	0.40	17
Pentane	$\text{C}_5\text{H}_{12}$	0.55	21
Pentanol	$\text{C}_5\text{H}_{11}\text{OH}$	0.60	19
Propane	$\text{C}_3\text{H}_8$	0.85	28
Propanol	$\text{C}_3\text{H}_7\text{OH}$	0.60	19
Propene	$\text{C}_3\text{H}_6$	1.00	32
Propylene oxide	$\text{C}_3\text{H}_6\text{O}$	0.95	23
Styrol	$\text{C}_6\text{H}_5\text{CHCH}_2$	0.50	15
Toluene	$\text{C}_6\text{H}_5\text{CH}_3$	0.50	19
Xylene	$\text{C}_6\text{H}_4(\text{CH}_3)_2$	0.55	19