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## Operation Manual

# Microtector II – G450

1 to 4-Gas Detector



# Introduction

## For your safety

According to § 3 of the law about technical working media and consumer products, device and production safety law (GPSG), this manual points out the proper use of the product and serves to prevent dangers. It must be read and adhered to by all persons who use, service, maintain and check this product. This device can do the job designed to do only, if it is used, serviced, maintained and checked according to the instructions given by GfG Gesellschaft für Gerätebau. The warranties made by GfG with respect to the product are voided, if the product is not used, serviced, maintained and checked in accordance with GfG's instructions. The above does not alter statements regarding warranties and liabilities in GfG's general conditions of sale and delivery. Repairs must only be done by skilled personnel resp. by trained persons. Modifications and changes of the product require GfG's permission. Unauthorized modification of the product result in the exclusion of any liability for possible damage. Make sure that only genuine GfG accessories are used with the product. Repairs require the use of spare parts released by GfG.

Bump test must be performed before each day's use, and calibration at least every 6 months.

## Application and purpose

The G450 is a handheld detector for personal protection from hazards occurring by toxic or explosive gases and vapours as well as by lack or surplus of oxygen. The G450 measures permanently in diffusion mode and gives a visual and audible alarm, if a gas-induced danger builds up.

The G450 is approved for the use in explosion endangered areas and is subject to an EC-Type Examination Certificate issued by Dekra EXAM GmbH, according to directive 2014/34/EU:

Certificate: BVS 06 ATEX E 017 X  
Labelling: Ⓢ II 2G Ex ia d IIC T4 -20°C ≤ Ta ≤ +55°C (NiMH-II)  
Ex ia d IIC T3 -20°C ≤ Ta ≤ +55°C (NiMH)  
Ex ia d IIC T4/T3 -20°C ≤ Ta ≤ +45°/+55°C (Alkaline)

The temperature class of the detector depends on the supply module used. When using the „NiMH-II“ accumulator, temperature class T4 is valid for ambient temperatures of -20°C to +50°C, while temperature class T3 is valid when using the „NiMH“ accumulator. Both supply modules are identified by a black enclosure with an inside label showing the type and temperature class. When using the Alkaline batteries (grey housing), temperature class T4 is valid for ambient temperatures from -20°C to +45°C resp. temperature class T3 for ambient temperatures of -20°C to +55°C.

For the use in explosion endangered areas with a measurement function for the explosion protection there is a supplement for the G450 to the above mentioned EC-Type Examination Certificate of DEKRA EXAM GmbH according to guideline 2014/34/EU. Basis of the test were the standards DIN EN 60079-29-1 „Gas detection instruments – requirements to the operational behavior of instruments for the measurement of combustible gases“ and DIN EN 50271 “Electronic instruments for the detection and measurement of combustible gases, toxic gases or oxygen – requirements and testing for warning instruments, that use software and/or digital technology”.

Furthermore the G450 was examined on its measurement ability by DEKRA EXAM GmbH on the basis of the standards DIN EN 50104 “Electronic instruments for the detection and measurement of oxygen – requirements to the operational behavior and testing method” and DIN EN 45544-1/-2 “Electronic instruments for the direct detection and direct measurement of the concentration of toxic gases and vapours part 1: common requirements and testing methods” and part 2: requirements to the operational behavior of instruments for the measurement of concentration in threshold ranges”. This is approved by the relevant Type Examination Certificate with the number PFG 09 G 001.

<b>The tests of the measuring function contain followed sensors and detection ranges:</b>			
EC-Type Examination Certificate BVS 06 ATEX E 017 X (4. supplement)	MK221-0, MK221-1 for 0..100% LEL CH <sub>4</sub> , C <sub>3</sub> H <sub>8</sub> , C <sub>6</sub> H <sub>14</sub>		(CC)
Type Examination Certificate PFG 09 G 001	MK369-0	for	5..500 ppm CO (EC)
	MK427-0	for	0..25 %-Vol. O <sub>2</sub> (EC)
	MK429-0	for	0,2..100 ppm H <sub>2</sub> S (EC)

The functions being marked with [#] were not subject of the test of the measurement function.

## Accessories and spare parts

	Description	Part No.
1.	Alkaline battery pack (without batteries)	1450200
2.	Alkaline battery pack with vibrator (without batteries)	1450202
3.	Alkaline battery (pack of 10)	1450204
4.	Rechargeable NiMH A21 battery pack	1450206
5.	Rechargeable NiMH A21 battery pack with vibrator	1450207
6.	Rechargeable NiMH A21 battery pack with lights	1450208
7.	Rechargeable NiMH A21 battery pack with vibrator and lights	1450209
8.	Rechargeable NiMH F25 battery pack	1460206
9.	Rechargeable NiMH F25 battery pack with vibrator	1460207
10.	Rechargeable NiMH F25 battery pack with lights	1460208
11.	Rechargeable NiMH F25 battery pack with vibrator and lights	1460209
12.	Smart Charger Cap (charge, calibrate, data transfer)	1450215
13.	Plug-in charger 100-240VAC	1450216
14.	Charging cable for cars	1450218
15.	Drop-in charger G400-DIC1 / Drop-in charger G400-DIC2 <sup>[#]</sup>	1450219 / 23
16.	Drop-in charger G400-DIC1S / Drop-in charger G400-DIC2S (with strap) <sup>[#]</sup>	1450220 / 24
17.	Calibration cap "Smart Cap" (calibration)	1450225
18.	Transportation and storing case (plastic) <sup>[#]</sup>	1450229
19.	USB Interface cable for PC	1450232
20.	Data logger set 1 with GfG-Interface software for Microtector II	1450233
21.	Docking station DS400 with DIC1D / with DIC2D <sup>[#]</sup>	1450401 /02
22.	MK221-0 Sensor for 100% LEL combustible gases and vapours	1450703
23.	MK221-1 Sensor for 100% LEL combustible gases (with increased intoxication resistance)	1450704
24.	MK380-0 Dual sensor for carbon monoxide CO and hydrogen sulphide H <sub>2</sub> S <sup>[#]</sup>	1450706
25.	MK383-0 Oxygen sensor O <sub>2</sub> , (2 years)	1450708
26.	MK427-0 Oxygen sensor O <sub>2</sub> , (3 years)	1450707
27.	MK443-0 Carbon monoxide, CO	1450709
28.	MK445-0 Hydrogen sulfide H <sub>2</sub> S	1450710

The spare parts and the accessories should be stored at ambient temperatures of 0...30°C. Storage time should not be longer than 5 years. Electrochemical sensors should not be stored for more than ½ year. When you store oxygen sensors be aware of the fact that storage reduces the expected lifetime of the sensor. When storing spare sensors, make sure that the ambient atmosphere is free from corrosive media and sensor poisons. For NiMH battery packs a storing time of only one year is valid. Before storing the battery pack has to be charged completely. In case of storing lasts more than ½ year the battery pack has to be demounted.

## Hints for a non-polluting disposal of old parts

According to §11 of the general conditions the customer of the instrument is committed for a non-polluting disposal of the instrument and its components according to §§11, 12 of the ElektroG. On request the parts can be adequately disposed by the GfG in Dortmund.



## Sensor type and detection range

Slot	Sensor type (ID)	Detection range	Gas	Resolution	T-Band (*1)
EC1	MK 445-0	0 .. 100 ppm	H <sub>2</sub> S Hydrogen sulfide	0.1 ppm	±0.5 ppm
EC1	MK 380-0	0 .. 500 ppm 0 .. 100(200) ppm	CO Carbon monoxide H <sub>2</sub> S Hydrogen sulfide	1 ppm 0.5 ppm	±3.0 ppm ±1.5 ppm
EC2	MK 369-0	0 .. 500(1000) ppm	CO Carbon monoxide	1 ppm	±3 ppm
EC2	MK 443-0	0 .. 500 ppm	CO Carbon monoxide	1 ppm	±3 ppm
EC3	MK 383-0 MK 427-0	0 .. 25 %Vol 0 .. 25 %Vol	O <sub>2</sub> Oxygen O <sub>2</sub> Oxygen	0.1 %Vol 0.1 %Vol	±0.3 %Vol ±0.3 %Vol
PL	MK 221-0	0 .. 100% LEL	CH <sub>4</sub> Methane (*2)	0.02 %LEL	±0.14 %LEL
PL	MK 221-1	0 .. 100% LEL	CH <sub>4</sub> Methane (*2)	0.5 %LEL	±2.5 %LEL

at (\*1): T-Band = Tolerance bandat (\*2): or one of the following combustible gases and vapours

MK221-0	CH <sub>4</sub> (Methane), C <sub>3</sub> H <sub>8</sub> (Propane), C <sub>4</sub> H <sub>10</sub> (Butane), C <sub>5</sub> H <sub>12</sub> (Pentane), C <sub>6</sub> H <sub>14</sub> (n-Hexane), H <sub>2</sub> (Hydrogen), CH <sub>4</sub> O (Methanol), C <sub>2</sub> H <sub>2</sub> (Acetylene), C <sub>2</sub> H <sub>6</sub> O (Ethanol), C <sub>3</sub> H <sub>8</sub> O (Isopropanol), C <sub>4</sub> H <sub>10</sub> O (n-Butanol), C <sub>3</sub> H <sub>6</sub> O (Acetone), C <sub>3</sub> H <sub>6</sub> O <sub>2</sub> (Methylacetate), C <sub>4</sub> H <sub>8</sub> O <sub>2</sub> (Ethylacetate), C <sub>4</sub> H <sub>8</sub> O (Methylethylketone MEK), C <sub>7</sub> H <sub>8</sub> (Toluene), C <sub>6</sub> H <sub>12</sub> O (Methylisobutylketone MIBK), C <sub>7</sub> H <sub>16</sub> (Heptane), C <sub>9</sub> H <sub>20</sub> (n-Nonane)
MK221-1	CH <sub>4</sub> (Methane), C <sub>3</sub> H <sub>8</sub> (Propane), C <sub>4</sub> H <sub>10</sub> (Butane), C <sub>5</sub> H <sub>12</sub> (Pentane), C <sub>6</sub> H <sub>14</sub> (n-Hexane), H <sub>2</sub> (Hydrogen), C <sub>2</sub> H <sub>2</sub> (Acetylene), C <sub>2</sub> H <sub>4</sub> (Ethylene)

## Sensor specification

<b>MK221-0 Catalytic combustion sensor for combustible gases and vapours</b>				
Detection range:	0,0 .. 100 %LEL			
Response time:	t <sub>50</sub> : ≤10 s	t <sub>90</sub> : <20 s	for CH <sub>4</sub> t <sub>50</sub> : ≤12 s	t <sub>90</sub> : <30 s
		for C <sub>3</sub> H <sub>8</sub>		
		t <sub>50</sub> : ≤25 s	t <sub>90</sub> : <65 s	for C <sub>6</sub> H <sub>14</sub>
Pressure (70)80...110 kPa:	max. ±5(7)% LEL or ±10% of display (referred to 100 kPa)			
Humidity 0%...95% r.h.:	max. ±3% LEL or ±10% of C <sub>3</sub> H <sub>8</sub> display (referred to 0% r.h. @ 40°C) or ±30% of CH <sub>4</sub> display (referred to 0% r.h. @ 40°C)			
Temperature-20(-10)...+40(55)°C:	max. ±5% LEL or ±10(15)% of display (referred to 20°C)			
Flow velocity 0 .. 6 m/s:	max. ±1% LEL or ±15% of display @ flow velocity ≥ 1.5 m/s			
Cross sensitivities [#] at 50%LEL:	<u>Gas supply</u>	<u>CH<sub>4</sub> display</u>	<u>C<sub>3</sub>H<sub>8</sub> display</u>	<u>n-Hexane display</u>
	2,00%Vol H <sub>2</sub>	ca.65%LEL	ca.100% LEL	ca.135% LEL (theor.)
	2,20%Vol CH <sub>4</sub>	= 50% LEL	ca.75% LEL	ca.100% LEL
	0,85%Vol C <sub>3</sub> H <sub>8</sub>	ca.33% LEL	= 50% LEL	ca.65% LEL
	0,70%Vol C <sub>5</sub> H <sub>12</sub>	ca.32% LEL	ca.48% LEL	ca.63% LEL
	0,70%Vol C <sub>4</sub> H <sub>10</sub>	ca.31% LEL	ca.47% LEL	ca.62% LEL
	0,50%Vol C <sub>6</sub> H <sub>14</sub>	ca.27% LEL	ca.38% LEL	= 50% LEL
	0,55%Vol C <sub>7</sub> H <sub>16</sub>	ca.22% LEL	ca.32% LEL	ca.41% LEL
	0,55%Vol C <sub>8</sub> H <sub>18</sub>	ca.17% LEL	ca.25% LEL	ca.32% LEL
	May vary from sensor to sensor and depend on the gas concentration and on the age of the sensor.			
Expected lifetime:	3 years in clean air			
<b>MK221-1 Catalytic combustion sensor for combustible gases and vapours (with increased poison resistance)</b>				
Detection range:	0,0 .. 100 %LEL			
Response time:	t <sub>50</sub> : ≤10 s	t <sub>90</sub> : <20 s	for CH <sub>4</sub>	
	t <sub>50</sub> : ≤12 s	t <sub>90</sub> : <30 s	for C <sub>3</sub> H <sub>8</sub>	
	t <sub>50</sub> : ≤40 s	t <sub>90</sub> : <105 s	for C <sub>6</sub> H <sub>14</sub>	
Pressure (70)80...120(130) kPa:	max. ±5(7)% LEL or ±10% of display (referred to 100 kPa)			
Humidity 0%...95% r.h.:	max. ±3% LEL or ±10% of C <sub>3</sub> H <sub>8</sub> display (referred to 0% r.h. @ 40°C) or ±20% of CH <sub>4</sub> display (referred to 0% r.h. @ 40°C)			
Temperature-20(-10)...+40(55)°C:	max. ±5% LEL or ±10(15)% of display (referred to 20°C)			
Flow velocity 0 .. 6 m/s:	max. ±1% LEL or ±20% of display @ flow velocity ≥ 1.5 m/s			
Cross sensitivities [#] at 50%LEL:	<u>Gas supply</u>	<u>CH<sub>4</sub> display</u>	<u>C<sub>3</sub>H<sub>8</sub> display</u>	<u>n-Hexane display</u>
	2,00%Vol H <sub>2</sub>	ca.65%LEL	ca.100% LEL	ca.135% LEL (theor.)
	2,20%Vol CH <sub>4</sub>	= 50% LEL	ca.75% LEL	ca.100% LEL
	0,85%Vol C <sub>3</sub> H <sub>8</sub>	ca.33% LEL	= 50% LEL	ca.65% LEL
	0,70%Vol C <sub>5</sub> H <sub>12</sub>	ca.31% LEL	ca.48% LEL	ca.63% LEL
	0,70%Vol C <sub>4</sub> H <sub>10</sub>	ca.30% LEL	ca.47% LEL	ca.62% LEL
	0,50%Vol C <sub>6</sub> H <sub>14</sub>	ca.25% LEL	ca.38% LEL	= 50% LEL
	May vary from sensor to sensor and depend on the gas concentration and on the age of the sensor.			
Expected lifetime:	3 years in clean air			

<b>MK369-0 Electrochemical sensor for carbon monoxide CO</b>		
Detection range:	5 .. 500 ppm (1000 ppm <sup>[#]</sup> )	Zero point drift ≤ 10 ppm
Response time:	t <sub>50</sub> : ≤20 s      t <sub>90</sub> : <50 s	t <sub>10</sub> : <50 s (decay time)
Sensor being exposed too high concentrations beyond upper detection range for several minutes, reckon with massive delays in zero point return in CO free air.		
Pressure (70)90...110(130) kPa:	max. ±1 ppm	or ±2(8)% of display (referred to 100 kPa)
Humidity 5%...95% r.h.:	max. ±1 ppm	or ±2% of display (referred to 50% r.h. @ 20°C)
Temperature -20...+40(55)°C:	max. ±3(6) ppm	or ±10% of display (referred to 20°C)
Long term stability per month:	max. ±1 ppm	or ±1% of display (referred to laboratory conditions)
Cross sensitivities <sup>[#]</sup> :	H <sub>2</sub> S<±3%; C <sub>2</sub> H <sub>4</sub> :60%; NO:35%; NO <sub>2</sub> <10%; H <sub>2</sub> <7%; SO <sub>2</sub> :0%; (*1)	
Expected lifetime:	2 .. 3 years	

<b>MK380-0 Electrochemical sensor for carbon monoxide CO and hydrogen sulphide H<sub>2</sub>S</b>		
Detection range:	0 .. 500 ppm CO and	0 .. 200/200 ppm H <sub>2</sub> S
Response time:	t <sub>50</sub> : ≤20 s	t <sub>90</sub> : <50 s
Pressure 80...120 kPa:	max. ±3 (1) ppm	or ±7 (10)% of CO (H <sub>2</sub> S) display (referred to 100 kPa)
Humidity 15%...90% r.h.:	max. ±3 (1) ppm	or ±7 (10)% of CO (H <sub>2</sub> S) display (referred to 50 r.h.)
Temperature -20...+50°C:	max. ±3 (1) ppm	or ±15 (10)% of CO (H <sub>2</sub> S) display (referred to 20°C)
Cross sensitivities CO display:	H <sub>2</sub> S:0...40%; H <sub>2</sub> ≈20%; SO <sub>2</sub> <20%; NO <sub>2</sub> <2%; NO<0,3%; Cl <sub>2</sub> :0%; (*1)	
Cross sensitivities H <sub>2</sub> S display:	CO<2%; NO <sub>2</sub> ≈-20%; SO <sub>2</sub> :8...20%; NO<3%; H <sub>2</sub> :0,03%; Cl <sub>2</sub> :0%; (*1)	
Expected lifetime:	3 years	

<b>MK383-0 Electrochemical sensor for oxygen O<sub>2</sub> <sup>[#]</sup></b>		
Detection range:	0 .. 25 %Vol	
Response time:	t <sub>20</sub> : ≤6 s	t <sub>90</sub> : <20 s
Pressure 80...120 kPa:	max. ±0,2%Vol	or ±2,5% of the detection range (referred to 100kPa)
Humidity 10%...90% r.h.:	max. ±0,2%Vol	or ±2,5% of the detection range (referred to 50 r.h.)
Temperature -20...+55°C:	max. ±0,5%Vol	or ±2,5% of the detection range (referred to 20°C)
Expected lifetime:	2 years in air	

<b>MK427-0 Electrochemical sensor for oxygen O<sub>2</sub></b>		
Detection range:	0 .. 25 %Vol	
Response time:	t <sub>20</sub> : ≤8 s	t <sub>90</sub> : <25 s
Pressure (70)80...120(130) kPa:	max. ±0,4(0,6)%Vol	or ±2(3)% of the detection range (referred to 100kPa)
Humidity 0...95% r.h.:	max. ±0,5%Vol	or ±2,5% of the detection range (referred to 50 r.h. @40°C)
Temperature (-20)-10...+55°C:	max. ±0,5(0,8)%Vol	or ±2,5(4,0)% of the detection range (referred to 20°C)
Expected lifetime:	3 years in air	

<b>MK429-0 Electrochemical sensor for hydrogen sulfide H<sub>2</sub>S</b>		
Detection range:	0,2 .. 100 ppm (200 ppm <sup>[#]</sup> )	zero point deviation < 0,4 ppm
Response time:	T <sub>50</sub> : ≤15 s	t <sub>90</sub> : <30 s
Pressure 70...130 kPa:	max. ±0,2%Vol	or ±5% of the display (referred to 100kPa)
Humidity 5%...95% r.h.:	max. ±0,2%Vol	or ±2% of the display (referred to 50 r.h. @20°C)
Temperature -20...+40(55)°C:	max. ±0,2%Vol	or ±5(16)% of the display (referred to 20°C)
Long term stability per month:	max. ±0,2%Vol	or ±2% of the display (referred to laboratory conditions)
Cross sensitivities	SO <sub>2</sub> ≈20%; NO <sub>2</sub> ≈-20%; CO<1%; NO<0,2%; H <sub>2</sub> <0,1%; (*1)	
Expected lifetime:	3 years	

<b>MK443-0 Electrochemical sensor for carbon monoxide CO</b>		
Detection range:	3 .. 500 ppm	
Response time:	t <sub>50</sub> : <10 s	t <sub>90</sub> : <30 s      t <sub>10</sub> : <30 s (decay time)
Pressure (70)90...110(130) kPa:	max. ±3 ppm	or ± 10% of display (referred to 100 kPa)
Humidity 5%...95% r.h.:	max. ±3 ppm	or ± 5% of display (referred to 50% r.h. @ 20°C)
Temperature -20...+40(55)°C:	max. ±3 ppm	or ±5(10)% of display (referred to 20°C)
Cross sensitivities <sup>[#]</sup> :	C <sub>2</sub> H <sub>4</sub> ≈96%; C <sub>2</sub> H <sub>2</sub> ≈90%; H <sub>2</sub> <30% (typ.15%); NO<20% Cl <sub>2</sub> <7%; C <sub>2</sub> H <sub>6</sub> O<0,5% SO <sub>2</sub> =NH <sub>3</sub> =H <sub>2</sub> S=0% (*1)	
Expected lifetime:	3 years	

<b>MK445-0 Electrochemical sensor for hydrogen sulfide H<sub>2</sub>S</b>		
Detection range:	0,2 .. 100 ppm	
Response time:	T <sub>50</sub> : <10 s	t <sub>90</sub> : <30 s      t <sub>10</sub> : <30 s (decay time)
Pressure 70...130 kPa:	max. ±0,2%Vol	or ±5% of the display (referred to 100kPa)
Humidity 5%...95% r.h.:	max. ±0,2%Vol	or ±2% of the display (referred to 50 r.h. @20°C)
Temperature -20...+40(55)°C:	max. ±0,2%Vol	or ±5(10)% of the display (referred to 20°C)
Cross sensitivities	NO <sub>2</sub> <10%; CO<2%; NO<1%; CO <sub>2</sub> =SO <sub>2</sub> =Cl <sub>2</sub> =NH <sub>3</sub> =C <sub>2</sub> H <sub>4</sub> =0% low methanol across delicacy (*1)	
Expected lifetime:	3 years	

(\*1) Displayed value with reference to the supplied gas concentration

## Alarm thresholds – Standard setpoints

### Standard setting of alarm thresholds for toxic gases without exposition alarm

Detection range	Alarm 1	Alarm 2	STEL	TWA
0...100/200 ppm H <sub>2</sub> S	10 ppm	20 ppm	-	-
0...300/500/1000 ppm CO	30 ppm	60 ppm	-	-

### Standard setting of alarm thresholds for toxic gases with exposition alarm following to TRGS900

Detection range	Alarm 1	Alarm 2	STEL (15')	TWA (8h)
0...100/200 ppm H <sub>2</sub> S	10 ppm	20 ppm	10 ppm	10 ppm
0...300/500/1000 ppm CO	30 ppm	180 ppm	120 ppm	30 ppm



### Standard setpoints of alarm thresholds for combustible gases and oxygen

Detection range	Alarm 1	Alarm 2	Alarm 3
0...25.0 Vol% O <sub>2</sub>	19.0 Vol% (↓)	17.0 Vol% (↓)	23.0 Vol% (↑)
0...5.0 Vol% CH <sub>4</sub>	1.00 Vol%	2.00 Vol%	3.00 Vol%
0...100 %LEL CH <sub>4</sub> *1	20.0 %LEL	40.0 %LEL	100.0 %LEL

zu (\*1): oder ein anderes der nachfolgend aufgeführten brennbaren Gase und Dämpfe

LEL-values according to IEC 79-20 resp. data base CHEMSAFE	
4,0Vol.% H <sub>2</sub> (Hydrogen)	5,5Vol.% CH <sub>4</sub> O (Methanol)
4,4Vol.% CH <sub>4</sub> (Methane)	3,1Vol.% C <sub>2</sub> H <sub>6</sub> O (Ethanol)
2,3Vol.% C <sub>2</sub> H <sub>2</sub> (Acetylene)	2,5Vol.% C <sub>3</sub> H <sub>6</sub> O (Acetone)
2,3Vol.% C <sub>2</sub> H <sub>4</sub> (Ethylene)	3,2Vol.% C <sub>3</sub> H <sub>6</sub> O <sub>2</sub> (Methylacetate)
2,5Vol.% C <sub>2</sub> H <sub>6</sub> (Ethan)	2,7Vol.% C <sub>3</sub> H <sub>6</sub> O <sub>2</sub> (Ethylformiat ETF)
1,7Vol.% C <sub>3</sub> H <sub>8</sub> (Propane)	2,0Vol.% C <sub>3</sub> H <sub>8</sub> O (Isopropyl)
1,4Vol.% C <sub>4</sub> H <sub>10</sub> (Butane)	1,8Vol.% C <sub>4</sub> H <sub>8</sub> O (Methylethylketon MEK)
1,4Vol.% C <sub>5</sub> H <sub>12</sub> (Pentane)	2,2Vol.% C <sub>4</sub> H <sub>8</sub> O <sub>2</sub> (Ethylacetate)
1,0Vol.% C <sub>6</sub> H <sub>14</sub> (n-Hexane)	1,7Vol.% C <sub>4</sub> H <sub>10</sub> O (n-Butanol)
1,1Vol.% C <sub>7</sub> H <sub>16</sub> (Heptane)	1,2Vol.% C <sub>6</sub> H <sub>12</sub> O (Methylisobutylketon MIBK)

## Technical Data

<b>Type:</b>	G450
<b>Detection principle:</b>	Electrochemical (EC): for toxic gases and oxygen Catalytic combustion (CC): for combustible gases and vapours (up to 100 %LEL)
<b>Detection range:</b>	See section „Sensor type and Detection range“
<b>Response time:</b>	See section „Sensor specification“
<b>Expected sensor lifetime:</b>	2...3 years - see section „Sensor specification“
<b>Gas supply:</b>	Diffusion with flow velocity of 0 .. 6 m/s or Pump by means of attachable electrical sampling pump G400-MP1 <sup>[#]</sup>
<b>Display:</b>	Illuminated full-graphic LCD, automatical size adjustment for optimal read out, display of battery capacity, gas concentration as instantaneous and peak value
<b>Alarm:</b>	Depending on gas type 3 or 2 instantaneous and 2 dosimeter alarms, battery alarm. visual and audible warning and display indication, colouring of display depending on alarm status (orange/red) Buzzer: 103 dB (reduceable to 90 dB)
<b>Zero point and sensitivity calibration:</b>	Manually or automatically with calibration program by “Smart Cap” or “Smart Charger Cap” test gas supply with 0.5..0.6 l/min.
<b>Power supply:</b>	1. NiMH battery module A21 (colour: black), 2100mAh, rechargeable 2. NiMH battery module F25 (colour: black), 2500mAh, rechargeable Im=600mA (max. charging current) Um=6V DC (max. voltage) <span style="float: right;">or</span> 3. Alkaline battery module (colour: grey), non-rechargeable with 2x mignon 1.5V Type: DURACELL PROCELL MN1500 LR6 AA or INDUSRTIAL BY DURACELL ID1500 AA (LR6)
<b>Operational time(*1)</b>	NiMH-II A21: approx. 25h (EC+WT <sub>CH4</sub> ); approx. 13h (EC+WT); approx. 120h (EC) NiMH F25: approx. 30h (EC+WT <sub>CH4</sub> ); approx. 15h (EC+WT); approx. 130h (EC) Alkaline: approx. 25h (EC+WT <sub>CH4</sub> ); approx. 14h (EC+WT); approx. 170h (EC)
<b>Climate conditions:</b>	for operation: -20...+55°C   5...95% r. h.   700...1300hPa for storage: -25...+60°C   5...95% r. h.   700...1300hPa (recommended 0...+30°C)
<b>Casing:</b>	Material: Rubberized plastic Dimensions: 75 x 110 x 55 mm (WxHxD) Weight: 290 g Protection: IP 67
<b>Approvals and tests:</b>	Labelling and ignition protection:  II2G Ex ia d IIC T4 -20°C≤Ta≤+55°C for NiMH-II (black) Ex ia d IIC T3 -20°C≤Ta≤+55°C for NiMH (black) Ex ia d IIC T4/T3 -20°C≤Ta≤+45°C/+55°C for Alkaline (grey)  I M2 Ex ia d I Mb -20°C≤Ta≤+55°C EC-Type Examination Certificate: BVS 06 ATEX E 017 X (for measuring function and electronic Ex-protection see chapter “application and purpose”) Examination Certificate: PFG 09 G 001 (for measuring function see chapter “application and purpose”) EMC Test: DIN EN 50270 : 2006 Radio shielding: Type class I Interference resistance: Type class II

(\*1): The operational time will be decreased by hitting keys (display illumination and lights) and triggered gas alarms.

### Worldwide Supplier of Gas Detection Solutions



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205-000.34\_OM\_G450.doc, 16. August 2016,  
Firmware Version 3.44, We reserve the right of modification



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