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GAS ANALYSIS






APPLICATION:	GMH 5690	GMH 5695	GMH 3692 +Sensor	GMH 3695 +Sensor	ResOx	GOX 100	GOX 100T	GCO 100	HD21-ABE-17
Measurement of atmospheric oxygen	•	•	•	•	•	•	•		
O_2-concentration (oxygen)	•		•	•	•	•	•		•
Temperature, atmospheric pressure, relative humidity									•
O_2-partial pressure	•	•	•	•	•				
CO-concentration (carbon monoxide)								•	•
Protective gases	•	•	•	•	•				
Diving *	•		•				•	•	
Exhaust gas monitoring								•	•
EQUIPMENT:									
Measuring ranges									
O_2-concentration	0 ... 100 %		0 ... 100 %		0 ... 100 %	0 ... 100 %		CO-concentration 0 ... 1000 ppm 0 ... 1250 mg/m³ 0 ... 60 % COHb	CO_2: 0 … 5.000 ppm CO: 0 ... 500 ppm Atmospheric pressure (Patm): 750 ... 1.100 hPa Rel. humidity (RH): 0 ... 100 % RH T: -20 ... +60 °C
O_2-partial pressure	0 ... 1100 hPa		0 ... 1100 hPa		0 ... 1100 hPa				
Temperature	-5 ... +50 °C		-5 ... +50 °C		-5 ... +50 °C				
Ambient pressure	10 ... 1200 hPa	300 ... 5000 hPa	10 ... 1200 hPa	300 ... 5000 hPa	300 ... 5000 hPa				
Electrode / sensor	external sensor, order separately		external sensor, order separately		complete set	in external sensor housing		Internal sensor	Internal sensor
Sensor connection	7-pol. Bajonett		6-pole mini-DIN socket		7-pol. Bajonett	0.7 m cable with jack plug		-	-
General functions					Set with gas pump				
Min/Max, Hold, Auto-Off	•		•		•	•	•	Max, Hold, Auto-Off	•
Background illumination	•				•		MOD display		•
Alarm / Interface	•	•	•	•	•			•	•
Logger		•		•	•				•
DEVICE INFORMATION:									
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* not suited for „under water"-applications (rebreather, etc.)

WATERPROOF HANDHELD MEASURING DEVICE

HIGHLIGHTS

- High display resolution (0.01 % O2 concentration)
- Waterproof and durable (protective silicone case)
- Large double display with background lighting
- Multi-point calibration for precision measurements
- Environmental pressure compensation with integrated barometer
- Alarm function

ADDITIONAL HIGHLIGHTS GHM 5695

- Data logger
- Analogue output
- Pressure connection

ADDITIONAL FUNCTIONS GHM 5695:

LOGG

SUITABLE SENSORS SEE PAGE 77

THE DEVICE IS ONLY INTENDED FOR CONTROL. IT IS NOT A REPLACEMENT FOR A MONITORING DEVICE SUBJECT TO AUTHORISATION!

GMH 5690

Art. no. 607466

Waterproof air oxygen measuring device without sensor

GMH 5695

Art. no. 607468

Waterproof air oxygen measuring device without sensor with data logger and alarm

Application:

Protective gas measurements for
- Welding and soldering
- Food production/packaging technology (MAP, see also the Resox 5695-H / -L)
- For storage of foods, semiconductor components, etc.
- Immersion gas testing: Checking of oxygen concentration in nitrox, trimix or similar gas compositions

Note: *Not suitable for use in 'underwater applications' (rebreather, etc.)*

Specifications:	GMH 5690	GMH 5695
Measuring channels:	O_2, T, air pressure (integrated)	O_2, T, air pressure (integrated, with external connection)
Measuring ranges		
O_2 concentration:	0.0 ... 100.0 % O_2 Vol. or 0.00 ... 100.00 % O_2 Vol. (resolution can be selected in menu)	
O_2 partial pressure:	0 ... 1100 hPa O_2 / 0 ... 825 mmHg O_2. 0.0 ... 1100.0 hPa O_2 / 0.0 ... 825.0 mmHg O_2 (resolution can be selected in menu)	
Temperature:	-5.0 ... +50.0 °C	
Air pressure:	10 ... 1200 hPa abs	300 ... 5000 hPa abs *)
Accuracy: (device at nominal temperature = 25 °C)		
O_2 concentration:	±0.1 % ±1 digit	
Temperature:	±0.1 °C ±1 digit	
Air pressure:	±3 hPa or 0.1 % of m.w. (higher applies)	
Compatible sensors:	GGO5 / GOO5 with elements GOEL 370, 381 etc.	GGA5 / GGO5 / GOO5 with elements GOEL 370, 381 etc.
Connections		
Sensor:	7-pin bayonet connection	7-pin bayonet connection Port for pressure connection *)
Output / ext. Power supply:	OUT jack: - 38400 baud interface - 5 V external supply	OUT jack: - 38400 baud interface - Analogue output 0 ... 1 V, adjustable - 5 V external supply
Display:	4 ½ digit, 7-segment, illuminated (white)	
Operating conditions:	-25 ... +50 °C; 0 ... 95 % RH (non-condensing, sensor min. -5 °C)	
Power supply:	2 x AAA battery, power consumption: 0.9 mA	
Battery life:	approx. 1000 h (without lighting)	

Ingress protection:	IP65 / IP67
Housing:	Impact-resistant ABS, with stand/hanging bracket
Dimensions:	160 x 86 x 37 mm (H x W x D) including protective silicone case
Weight:	approx. 250 g, including battery and protective case
Scope of supply:	Handheld measuring device incl. batteries (2xAAA), protective silicone case, manual, quick guide

*) Optimal air pressure compensation with GGA 570 /GGA 580

Additional functions:

Backlighting: Adjustable light duration (off, 5 s ... 2 min.)

Calibration: 1 point air, 2 point or 3 point (air and zero point and 100 % O_2)

GLP: Calibration interval
GMH 5695 only: Calibration history

Data logger (GMH 5695 only): Cyclical: 10,000, Single: 1000
Single value logger with measuring point input

Alarm: 2 alarm channels (O_2 and temperature) with separate alarm thresholds
Alarm notification horn / visual / interface

Accessories and spare parts:

See page 77 / 78 for matching sensors

GKK 3600
Art. no. 601062
Case with napped foam for universal application (394 x 294 x 106 mm)

USB 5100
Art. no. 601095
Interface converter GMH 5xxx <=> PC

GSOFT 3050
Art. no. 601336
Windows software for GMBH 3000 and GMH 5000 handheld measuring devices with logger function

AIR OXYGEN MEASURING DEVICE

ISO
ALARM
AUTOOFF
HOLD
MIN MAX

WIDE RANGE OF APPLICATION

HIGHLIGHTS:

- Alarm detector with integrated horn
- Automatic compensation of ambient air via integrated barometer

ADDITIONAL FUNCTIONS GMH 3695:

- pressure connection

LOGG

SUITABLE SENSORS SEE PAGE 77

THE DEVICE IS ONLY INTENDED FOR CONTROL. IT IS NOT A REPLACEMENT FOR A MONITORING DEVICE SUBJECT TO AUTHORISATION!

GMH 3692

Art. no. 605919

Air oxygen measuring device w/o sensor

GMH 3695

Art. no. 605921

Air oxygen measuring device w/o sensor with data logger

Application:

Bio chemistry:
Oxygen monitoring in breeding chambers for cell cultures. Monitoring of fermenting process of fruits in fermentation plants etc.
Medicine:
Monitoring of oxygen concentration in respirators; checking of breathing, monitoring of oxygen concentration in incubators, oxygen tents etc.
Food technology:
Monitoring of residual oxygen in packages (e.g. coffee, tea, etc.).
Monitoring of oxygen content during production processes.
Air conditioning and ventilation technology:
Oxygen measurements, air quality monitoring, measuring of oxygen concentration in enclosed air conditioning systems, etc.
Sport:
Checking of oxygen content in compressed air bottles (diving, etc.).
Note:
not suited for „under water"-applications (rebreather, etc.)

Specifications:

Measuring ranges	
Oxygen concentration:	0.0 ... 100.0 % O_2 (gaseous) 0 ... 1100 hPa O_2
Temperature:	-5.0 ... +50.0 °C
Air pressure:	GMH 3692: 10 ... 1200 hPa GMH 3695: 300 ... 5000 hPa
Accuracy: (device) (at nominal temperature = 25 °C)	
Oxygen concentration:	±0.1 % ±1 digit
Temperature:	±0.1 °C ±1 digit
Air pressure:	±3 hPa or 0.1 % v. m.w. (whichever is higher)
Oxygen sensor:	for suitable sensores p.r.t. page 77 Observe permissible operating pressure of oxygen sensor e.g. GOEL 370/381: 500 ... 2000 hPa abs.
Sensor connection:	6-pin screened Mini-DIN-socket. GMH 3695: additional pressure ports
Display:	two 4 digit LCDs (12.4 mm or 7 mm high), as well as additional arrows.
Pushbuttons:	6 membrane keys for ON/OFF-switch, selection of meas. range, min- and max- value memory, hold-function, calibration etc.
Working temperature:	0 ... +50 °C
Relative humidity:	0 ... +95 % RH (non condensing)
Storage temperature:	-20 ... +70 °C
Interface:	serial interface, direct connection to RS232 or USB interface of a PC via electrically isolated interface converter GRS 3100 or GRS 3105 resp. USB 3100 N (p.r.t. accessories).
Power supply:	9 V battery as well as additional d.c. connector for external 10.5 ... 12 V direct voltage supply. (suitable power supply: GNG10/3000)
Battery life:	approx. 300 h
Housing:	Impact-resistant ABS plastic housing, membrane keyboard, transparent panel, integrated pop-up clip
Dimensions:	142 x 71 x 26 mm (H x W x D)
Weight:	approx. 160 g (incl. battery)
Scope of supply:	Device, battery, calibration protocol, manual

Additional functions:

Temperature compensation: automatic via temperature sensor, integrated in probe housing

Air pressure compensation: The O_2 concentration will be compensated according to the absolute atmospheric pressure set.

Calibration:
1-point calibration: extremely simple quick calibration in atmospheric air. (press button to compensate unit to 20.9 %).
2-/3-point calibration: first point at atmospheric air (20.9 %), second and third point 0 or 100 %.
Calibration interval: The device asks for a recalibration after a selectable time period (1 ... 365 days or inactive). GMH 3695: additional calibration history

Analog output (GMH 3695 only): 0 ... 1 V, freely scalable

Pressure nozzles (GMH 3695 only): for pressure compensation

Data logger (GMH 3695 only):
cyclic: 8000 data sets, adjustable cycle time: 1 s ... 60 min
manual: 1000 data sets, with measuring point input

Accessories and spare parts:

Suitable sensors p.r.t. next page

GKK 3000
Art. no. 601048
Case (275 x 229 x 83 mm) with punched lining suitable for GMH3xxx

USB 3100 N
Art. no. 601092
Interface converter, electrical isolated

GRS 3105
Art. no. 601099
Interface converter with 5 connection points, electrical isolated, for the connection of 5 devices to one PC (RS232).

GSOFT 3050
Art. no. 601336
Windows software for GMH 3000 and GMH 5000 handheld measuring devices with logger function

ST-R1
Art. no. 601066
Device protection bag with cut-out for probe connection

ATMOSPHERIC OXYGEN SENSORES FOR GMH 569X AND GMH 369X

CLOSED SENSOR TYPE GGO

CLOSED

GGO 581
Art. no. 610029
For low oxygen concentrations, suitable for GMH 569x

GGO 570
Art. no. 607480
Universal application, diving gas, longlife, suitable for GMH 569x

GGO 381
Art. no. 610030
For low oxygen concentrations, suitable for GMH 369x

GGO 370
Art. no. 601224
Universal applications, diving, longlife, suitable for GMH 369x

General:

- suitable for under and over pressure
- for using in gas-tight systems

Application:

Suitable for measuring in normal atmosphere and in systems without or with slight under or over pressure. The sensor type features a screw thread and can be built in gas-tight in almost every system directly resp. with tube-adapter.

longer cable length 4 m and 10 m on demand

OPEN SENSOR TYPE GOO

OPEN

GOO 581
Art. no. 610033
For low oxygen concentrations, suitable for GMH 569x

GOO 570
Art. no. 607482
Universal application, diving gas, longlife, suitable for GMH 569x

GOO 381
Art. no. 610034
for low oxigen-concentration, suitable for GMH 369x

GOO 370
Art. no. 601228
universal applications, diving, longlife, suitable for GMH 369x

General:

- suitable for air- or gas-stream
- quick temperature compensation

Application:

Because of the special sensor construction the measuring gas streams optimally around the sensor and escapes through holes in the housing into the air. No pressure build-up at slight streaming of the probe, that falsify the result of measurement. Particularly suitable for measuring of gas out of gas-bottle etc. Even measuring indoor-gas concentration is possible.

longer cable length 4 m and 10 m on demand

CLOSED SENSOR TYPE WITH PRESSURE CONNECTION GGA

FOR DEVICES WITH PRESSURE CONNECTION

GGA 581
Art. no. 610031
For low oxygen concentrations, with pressure connection, suitable for GMH 569x

GGA 570
Art. no. 607486
Universal application, diving gas, longlife, with pressure connection, suitable for GMH 569x

GGA 381
Art. no. 610032
For low oxygen concentrations, with pressure connection, suitable for GMH 369x

GGA 370
Art. no. 607484
Universal application, diving gas, longlife, with pressure connection, suitable for GMH 369x

General:

For devices with external pressure port (GMH 5695 / 3695) is this housing optimal. Especially for systems with high or low pressure or with existing back pressure by flow.

Application:

It can be screwed airtight (Attention: Observe permissible operating pressure!). The device-pressure port is connected to the sensor pressure port. The device measures and compensates for the actual pressure at the sensor.

longer cable length 4 m and 10 m on demand

Specifications:	GGA/GGO/GOO 570/370	GGA/GGO/GOO 581/381
Sensor element:	GOEL 370	GOEL 381
	Oxygen-partial pressure probe, mounted in external sensor housing replaceable (temperature sensor mounted in housing)	
Specific features:	Long service life For protective gases with a high O_2 concentration and oxygen content <35 vol.% O_2	for the lowest O_2 concentrations For protective gases, in general, precise and very small measurements and above 35 vol.% O_2
Measuring range:		
Partial oxygen pressure:	0 ... 1100 hPa O_2	0 ... 1100 hPa O_2
Oxygen concentration:	0.0 ... 100.0 % O_2	0.0 ... 100.0 % O_2
Response time: T_{90}	<10 s	<10 s
Accuracy (at 25 °C, 1013 hPa)		<1.5 % O_2
<2 % O_2	±0.2 % O_2	±0.1 % O_2
<25 % O_2	±0.5 % O_2	±0.5 % O_2
>25 % O_2	±0.5 % O_2	no information
Operating conditions:	0 ... 45 °C 0 ... 95 % RH (non condensing)	0 ... 45 °C 0 ... 95 % RH (non condensing)
Ambient pressure:	0.6 ... 1.75 bar abs.	
Over-/under-pressure:	max. 0.25 bar (pressure difference sensor membrane to ambient - sensor screwed-in)	
Storage temperature:	-15 ... +60 °C	
Operation life:	on air: >4 years (warranty for sensor element: 12 months)	on air: >2 years (warranty for sensor element: 12 months)
Connection:	**GGA/GGO/GOO 3...:** approx. 1.2 m cable with Mini-DIN-plug. **GGA/GGO/GOO 5...:** approx. 1 m cable with 7-pole bayonet connector	
Dimensions of housing:	GGA...: approx. Ø 36 mm x 95 mm (150 mm incl. anti-buckl. glanding), GGO...: approx. Ø 36 mm x 95 mm (150 mm incl. anti-buckl. glanding), GOO...: approx. Ø 40 mm x 105 mm (160 mm incl. anti-buckl. glanding) Housing with M16 x 1-screw thread (sensor can be connected to line tubes by means of an additional adapter)	
Weight:	approx. 135 g (GGO...) or approx. 145 g (GOO.../GGA...)	
Scope of supply:	GGA... / GGO...: sensor, flow diverter, T-piece GOO...: sensor, flow diverter	

Note: not suited for „under water"-applications (rebreather, etc.)

ACCESSORIES

GOEL 370

Art. no. 601490

Sensor element (acidic electrolyte)

General:

Integrated into GGO 370, GGA 370, GOO 370 (for GMH 3690 / 91 / 92 / 95) or GGO 570, GGA 570, GOO 570 (for GMH 5690 / 95); Universal sensor element with special precautions particularly for diving gas and protective gases from 0,2 ... 35 % O_2, even for applications with elevated CO_2 concentration.

Note: not suited for „under water"-applications (rebreather, etc.)

GOEL 381

Art. no. 610035

Sensor element (alkaline electrolyte)

General:

Integrated into GGO 381, GGA 381, GOO 381 (for GMH 3690 / 91 / 92 / 95) or GGO 581, GGA 581, GOO 581 (for GMH 5690 / 95); Fast sensor element especially for diving gas and protective gases from 0.0 ... 100 % O_2. For application without permanently higher CO_2 concentration

Note: not suited for „under water"-applications (rebreather, etc.)

Accessories and spare parts:

GZ-11

Art. no. 603144

Flow rate adapter to measure the oxygen concentration with 6/4 mm tube

ESA 369

Art. no. 603058

Spare tube-adapter M16x1, for tubes with a inner-diameter of 15 mm

ZOT 369

Art. no. 603094

T-piece

SUPPLEMENT FOR GAS ANALYSIS AND AIR QUALITY MEASURING DEVICES

HIGHLIGHTS:

- Easy to use
- Durable membrane pump
- Quiet
- Low quantity of conveyed gas
- Mobile operation with battery
- Battery charge indicator

GS 150

Art. no. 610005

Gas pump for gas sampling

Application:

E.g. in combination with residual oxygen measuring devices for protective gas applications, etc.

Specifications:

Functional principle:	Motorised membrane pump with input/output ports, battery-operated
Max. negative pressure:	approx. -360 mbar
Delivery rate:	open: approx. 380 ml / min, with GDZ 29: approx. 80 ml / min
Connection:	Universal pressure port for 6/4 mm hoses (inside Ø 4 mm)
Range of application:	10 ... 50 °C
Applicable gases:	Non-corrosive, dust-free gases, a condensate trap is recommended for gases with high humidity
Operation:	On / Off slide switch
Environmental conditions:	10 ... 50 °C, 0 ... 95 % RH
Battery / service life:	9 V block battery, approx. 10 h
Battery charge indicator:	2 LEDs: full / low
Scope of supply:	Device, battery, manuals

Accessories and spare parts:

GDZ-29

Art. no. 601599

Filter-Membrane incl. Luer-Locks (GDZ-32 und GDZ-33), prevents contamination with even the finest particles or liquids

COMPACT AIR OXYGEN MEASURING DEVICE

ISO

AUTOOFF

FOR DIVING APPLICATIONS

GOX 100

Art. no. 600142

Air oxygen measuring device for universal applications

General:

- 1-button calibration
- Automatic power-off
- Min-/max- value memory
- Incl. sensor GOEL 370

Note: not suited for „under water"-applications (rebreather, etc.)

GOX 100T

Art. no. 600157

Air oxygen measuring device for diving applications

General:

- 1-button calibration
- MOD-Display (Maximum Operating Depth)
- HOLD function
- Incl. sensor GOEL 370

Note: not suited for „under water"-applications (rebreather, etc.)

Specifications:

Measuring range:	0.0 ... 100.0 % O_2
Accuracy typ.:	±0.1 % O_2 ±1 digit, calibrated device (range from 15 ... 40 % O_2)
MOD (GOX 100T):	0 ... 100 m / 0 ... 199 ft
Sensor connection:	0.7 m jack-connector cable
Sensor:	Electrochemical oxygen-partial pressure probe, mounted in external sensor housing, M16x1 connection thread.
Warranty:	12 months
Working pressure:	0.5 ... 2.0 bar abs.
Over- /under-pressure:	max. 0.25 bar (pressure difference)
Working temperature:	0 ... 45 °C (sensor), -20 ... +50 °C (device)
Relative humidity:	0 ... 95 % RH
Power supply:	9 V battery
Power consumption:	approx. 120 µA (over 2500 h)
Display:	3½-digit, 13 mm high LCD-display
Housing:	ABS enclosure
Dimensions:	approx. 106 x 67 x 30 mm (H x W x D)
Weight:	approx. 185 g
Scope of supply:	Device incl. sensor, tube-adaper, t-piece, battery, manual

Variants:

GOX 100-LACK

Art. no. 602047

Air oxygen measuring device with encapsulated PC board
(for applications where condensation is possible)

GOX 100-T-LACK

Art. no. 604660

Air oxygen measuring device with encapsulated PC board
(for applications where condensation is possible)

RESIDUAL OXYGEN MEASURING SYSTEM RESOX

ResOx 5695-H

Art. no. 610040

Residual oxygen measuring system (for gases with elevated CO_2 percentage GOEL 370)

ResOx 5695-L

Art. no. 610041

Residual oxygen measuring system (with recommended sensor element GOEL 381)

General:

New measuring system with gas pump for more measuring comfort - can now also be used in rigid packages and packages with low quantities of gas.

Application:

Quality control for MAP food packaging and comparable applications

Specifications:

Measuring channels:	O_2, T, air pressure
Measurement ranges	
O_2:	0.0 ... 100.0 % O_2 or displayed in hPa O_2 / mmHg O_2
Temperature:	0.0 ... 50.0 °C
Air pressure:	300 ... 5000 hPa (sensor: 500 ... 2000 hPa)
Additional functions:	Min / max function – for comfortable measurement of the limit value; Pressure compensation in the gas path – negative pressure in the package/on the sensor is compensated for
Applicable sensors:	GOEL 370, 381 etc.
Connections on the device	
Sensor:	7-pin bayonet Pressure port for hoses with inside Ø 4 mm
Output / ext. power supply:	OUT socket: - 38400 baud interface - Analogue output 0 ... 1 V, adjustable - External 5 V power supply
Calibration:	Quick calibration on air at the push of a button or 2-point / 3-point (air +0 % and 100 %)
GLP:	Calibrating interval, calibration history
Data logger:	Cyclical: 10000, Single: 1000 Single value logger with measuring point entry
Pump:	Motorised membrane pump with input/output ports, battery-operated
Max. negative pressure:	approx. -360 mbar
Delivery rate:	with GDZ 29 Filter: approx. 80 ml / min
Connection:	Pressure port for hoses with inside Ø 4 mm
Additional features:	Waterproof device and sensor (IP65, IP67), protective armouring, backlighting

Scope of supply:	Ready-to-operate system: Display GMH 5695, incl. battery, sensor housing with pressure connection incl. sensor, gas pump GS 150 incl. battery, connection lines, hoses/T-piece, 2 GDZ 29 filters, 2 GOG-N puncture needles Ø 0.9 mm, 1 GOG-B: 45 pcs. adhesive seal, carry case GKK 1420

QUICK MEASUREMENT:
- Apply adhesive seal
- Puncture with needle
- Switch on the pump
- Read the minimum value after approx. 20 s

Accessories and spare parts:

GOG-A
Art. no. 603043
Adhesive cellular foam (40 pcs.)

GOG-B
Art. no. 610013
Adhesive seal (45 pcs.)

GOG-N
Art. no. 603047
Puncture needle, Ø 0.9 mm (5 pcs.)

GDZ-29
Art. no. 601599
Filter membrane, including Luer locks (GDZ-32 and GDZ-33)

GS 150
Art. no. 610005
Gas pump

GOEL 370
Art. no. 601490
Spare sensor element, universal range, immersion gas, long-life

GOEL 381
Art. no. 610035
Spare sensor

USB 5100
Art. no. 601095
Interface adapter

GSOFT 3050
Art. no. 601336
Logger operating software

COMPACT CO-MEASURING DEVICE

AUTOOFF
HOLD
MAXALARM
MIN MAX

HIGHLIGHTS:

- 3 display units selectable (ppm, mg/m³ and % CO Hb)
- Alert at exceeding the maximum concentration at work (MAK/AGW)
- incl. interface
- incl. calibration protocol

THE DEVICE IS ONLY INTENDED FOR CONTROL. IT IS NOT A REPLACEMENT FOR A MONITORING DEVICE SUBJECT TO AUTHORISATION!

GCO 100

Art. no. 600062

CO-measuring device with alarm

General:

Carbon monoxide (CO) is created by the combustion of carbon. Depending on the effectiveness of the combustion (oxygen supply) and the temperature of the combustion more or less CO gas is created. The gas is inflammable and highly toxic. It is invisible, tasteless and scentless.
Even smallest concentrations are dangerous for humans!
Therefore a directive exists in Germany, which limits the maximum concentration of CO gas at work (MAK / AGW) to 30 ppm.

Application:

- Control of the air quality (e.g. at work place)
- Checking of heating systems, gas central-heating, fireplace
- Control of the air at maintenance work (tunnel, flue gas tract, ...)
- Detection of CO in the breath of smoker (% CO Hb)
- Cognition of CO poisoning i.e. at burnt offering (fire fighters, ...)

Specifications:

Measuring principle:	electrochemical CO measuring cell
Measuring range:	0 ... 1000 ppm CO concentration
Display ranges:	0 ... 1000 ppm CO concentration 0 ... 1250 mg/m³ CO concentration 0 ... 60.0 % CO Hb (estimation via exhaled breath gas)
Resolution:	1 ppm, 1 mg/m³ or 0.1 % CO Hb
Sensor element:	integrated in device, measuring inlet at front plate, with inner thread for accessories screw in
Life time:	>5 years at proper usage at air suggested test interval: every 6 months (depending on precision requirements)
Accuracy: (at range 0 ... 500 ppm)	
Linearity:	< ±5 % of measured value ±1 digit
Repeatability:	< ±5 % of measured value ±1 digit

Interference (extract)

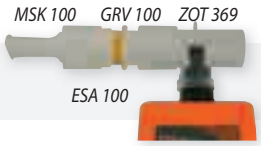
	Concentration (ppm)	Residence time (min.)	Display (ppm)
Sulphur dioxide	50	600	<1
Nitrogen dioxide	50	900	-1
Nitric oxide	50	5	8
Hydrogen	100	5	20
Carbon dioxide	5000	5	0

Display:	approx. 11 mm high, 4½-digit LCD-display
Pushbuttons:	3 membrane keys
Nominal temperature:	25 °C
Operating conditions:	-10 ... +50 °C, 15 ... 90 % RH (non condensing)
Storage temperature:	-10 ... +50 °C
Interface:	Serial interface, direct connection to RS232 or USB interface of a PC via electrically isolated interface adapter
Power supply:	9 V battery as well as additional d.c. connector for external 10.5 ... 12 V direct voltage supply. (suitable power supply: GNG 10 / 3000)
Battery life:	>1000 h
Housing:	Impact-resistant ABS plastic housing, membrane keyboard, transparent panel, integrated pop-up clip
Dimensions:	142 x 71 x 26 mm (H x W x D)
Weight:	approx. 155 g
Scope of supply:	Device, battery, calibration protocol, manual

Accessories and spare parts:

ESA 100
Art. no. 603013
Tube-adapter/flow diverter to screw in front plates.

ZOT 369
Art. no. 603094
T-piece



GRV 100
Art. no. 603093
Non return valve

MSK 100
Art. no. 603012
Mouth peace of plastic

GAS 100
Art. no. 603587
Extension set for exhaled air control
(consisting of ESA 100, ZOT 369, GRV 100 and 5 x MSK 100)

GZ-10
Art. no. 603133
Test gas cap GCO (for controlled flow with test gas)

GZ-02
Art. no. 606710
Gas bottle with 12l test gas: 30 ppm CO

GZ-03
Art. no. 606711
Gas bottle with 12l test gas: 300 ppm CO

GZ-04
Art. no. 603570
Gas valve unit MiniFlo for gas bottles with 12l

GB 9 V
Art. no. 601115
spare battery 9 V / approx. 30 0mA / h

GKK 3000
Art. no. 601048
Case (275 x 229 x 83 mm) with punched lining

USB 3100 N
Art. no. 601092
Interface converter to USB, electrical isolated

GAM 3000
Art. no. 601132
switching module for 230 V AC / 10 A

INDOOR AIR QUALITY MONITORS

AIR QUALITIY

HIGHLIGHTS:

- Indoor air qualitiy permitting calculation of automatic ventilation rate by CO_2 analysis correlate to the real presence of people in the rooms

HD21-ABE-17

Art. no. 700049

Indoor air quality monitors

General:

HD21-AB-17 IAQ Monitor is a bench-top/portable instrument manufactured by Delta Ohm for the analysis of indoor air quality (IAQ, Indoor Air Quality).

The instrument simultaneously measures the parameters:

- Carbon Dioxide CO_2
- Carbon Monoxide CO
- Atmospheric Pressure
- Temperature
- Relative Humidity

and it calculates:

- Dew Point
- Wet Bulb Temperature
- Absolute Humidity
- Mixing Ratio
- Enthalpy

These regulations apply to all confined spaces that could be used by people. Kitchens, baths, changing rooms and swimming pools are included, due to their high humidity. You should take into account, in regard to air quality, possible chemical, physical and biological contaminants. The instruments have a wide Dot Matrix graphic display with a resolution of 160 x 160 dots.

The instruments typical applications are:

- Measurement of IAQ (Indoor Air Quality) and comfort conditions in schools, offices and indoor spaces.
- Analysis and study of the Sick Building Syndrome, and of the resulting consequences.
- Checking the HVAC (Heating, Ventilation and Air Conditioning) system efficiency.
- Examination of IAQ conditions in factories to optimize microclimate and improve productivity.
- Building Automation checks.

Specifications:

Device	
Dimensions:	300 x 90 x 40 mm (H x W x D) (with probe)
Material:	ABS, rubber
Display:	Backlight, Dot Matrix, 160 x 160 dots, visible area 52 x 42 mm
Operating conditions	
Working temperature:	-5 ... +50 °C
Storage temperature:	-25 ... +65 °C
Working relative humidity:	0 ... 85 % RH without condensation
Protection degree:	IP30
Instrument uncertainty:	±1 digit @ 20 °C
Power supply	
Mains adapter (Code SWD-10):	12 V DC/1 A
Batteries:	4 x 1.2 V Ni-MH rechargeable batteries AA type
Autonomy:	8 h of continuous use in measure mode
Serial interface	
Socket:	mini-USB
Type:	USB 1.1 or 2.0 not insulated
Storage capacity:	67.600 recordings
Scope of supply:	IAQ Monitor datalogger kit. Complete with: DeltaLog10 software (version 0.1.5.3 and later), monitor, and data processing on Personal Computer, 4 x 1.2 V NiMH rechargeable batteries, manual, case, with USB cable and mains adapter

CO_2 Carbon Dioxide	
Sensor:	NDIR Dual Wavelength (two frequences)
Measuring range:	0 ... 5.000 ppm
Sensor working range:	-5 ... +50 °C
Accuracy:	±50 ppm ±3 % of measurement
Resolution:	1 ppm
Temperature dependence:	0.1 % f.s./°C
Response time (T_{90}):	<120 s (air speed = 2 m/s)

CO Carbon Monoxide	
Sensor:	Electrochemical cell
Measuring range:	0 ... 500 ppm
Sensor working range:	-5 ... +50 °C
Accuracy:	±3 ppm ±3 % of measurement
Resolution:	1 ppm
Response time (T_{90}):	<50 s
Service life:	>5 years in normal environment conditions

Atmospheric Pressure (Patm)	
Type of sensor:	Piezo-resistive
Measuring range:	750 ... 1.100 hPa
Accuracy:	±1.5 hPa @ 25 °C
Resolution:	1 hPa
Temperature drift:	±3 hPa with temperature -20 ... +60 °C

Relative Humidity (RH)	
Type of sensor:	Capacitive
Sensor protection:	Stainless steel grid filter (on request 10 µm sintered filter P6 in AISI 316 or 20 µm sintered filter P7 in PTFE)
Measuring range:	0 ... 100 % RH
Sensor working range:	-20 ... +60 °C
Accuracy:	±1.5 % RH (0 ... 90 % RH) ±2 % RH (elsewhere) for T=15 ... 35 °C ±(1.5 +1.5 % of the measure) % RH for T= -20 ... +60 °C
Resolution:	0.1 °C
Temperature dependence:	±2 % on all temperature range
Hysteresis and repeatability:	1 % RH
Response time (T_{90}):	<20 s (air speed = 2 m/s) without filter

Temperature T	
Sensortyp:	NTC 10 kΩ
Measuring range:	-20 ... +60 °C
Accuracy:	±0.2 °C ±0.15 % of measurement
Resolution:	0.1 °C
Response time (T_{90}):	<30 s (air speed = 2 m/s)

Accessories:

SWD-10
Art. no. 700039
Stabilized power supply at 100 - 240 V AC / 12 V DC / -1 A mains voltage.

CP-23
Art. no. 700050
Connection cable with type B MiniUSB connector on instrument's side and USB 2.0 connector on PC's side.

BAT-40
Art. no. 700051
Spare batteries with built-in temperature sensor.

ECO-SURE-2E-CO
Art. no. 700052
CO spare sensor

MINICAN-12-A-0
Art. no. 700059
Nitrogen can for CO and CO_2 calibration at 0 ppm, 20 litres

HD-37-36
Art. no. 700053
Connection tube kit for CO calibration

HD-37-37
Art. no. 700054
Connection tube kit for CO_2 calibration

HD-33-0
Art. no. 700055
33 % RH saturated solution for checking the relative humidity sensor