



Detector Tubes, Sorbent Tubes and Pumps

[Protection for Man and the Environment]

Toximeter® II

[Electronically controlled detector tube pump]



General Remarks

The Toximeter® II is suitable for differing measuring tasks:

- measurements with detector tubes
- collection of samples with sorbent tubes [collection time or volume can be preset]
- collection of samples using sample bags/gas-washing bottles [impinger]
- as a pump to generate smoke with smoke tubes or cartridges

Benefits

- multifunctional use in varied measurement tasks and technologies
- high accuracy of measurement
- simple, menu assisted operation, easy to handle
- certified for use in potentially explosive atmospheres
- multiple functions reduce the cost of measuring hazardous substances
- battery pack exchangeable in the hazardous area

Function

Detector tube pump

The Toximeter® II is a continuously operating, electronically controlled detector tube pump.

The “stroke volume” [electronic stroke 100 ± 5 ml] is regulated by a temperature-compensated differential pressure sensor. Detector tubes are inserted on the inlet side [tube port with white

arrow] as well as the outlet side [blue arrow].

For increased accuracy the calibration factor F must be considered. This calibration factor and the number of pump strokes are set with the appropriate menus prior to the start of the measurement. The presently available range of detector tubes and tubes in stock on site can be used without restrictions.

Sampling pump

Sorbent tubes and gas-washing bottles are used only on the inlet side [constant flow approx. 0.25 LPM] – collection time or sampling volume can be preset.

Additional functions

Use of smoke generating tubes and collecting samples with a gas bag only on the outlet side.

Menus are available for the tightness check and the selection of the language.

Construction

The Toximeter® II consists of a changeable battery pack and a pump assembly with:

- membrane pump
- differential pressure sensor
- two tube ports
- display to indicate the main and sub-menus
- two pushbutton switches [yellow/black] to select the menus
- fixture to break off tips
- two LED's and an acoustic signal transmitter

Technical Data

Dimensions:

[H x W x D] 194 x 72 x 33 mm

Weight:

580 g

Battery type:

NiCd

Service time per battery charge:

approx. 8 h

Ambient conditions:

Temperature:

– 10 to + 50 °C

Protection class:

IP54

ATEX Approval:

II 1G EEx ia IIC T4

Signal transmitter:

visual by 2 LED's, acoustic by piezo buzzer

Automatic switch off:

after 10 minutes

Ordering Information

D5142705 Toximeter II
[without charger]

D6172760 DELTA charger

D6170724 OMEGA II charger

D6172755 Intrinsically safe
battery pack
rechargeable

D6172153 Leather carrying case

D5142707 Adapter for sampling
hose

Gas-Tester II H and Kwik-Draw

[Mechanically controlled detector tube pumps]



Application

The Gas-Tester II H with incorporated stroke counter – is a manually – and intermittently – operated detector tube pump which together with detector tubes is used to monitor the ambient air or the air in confined spaces for hazardous gases.

Measurements using the Gas-Tester II H and appropriate detector tubes are required in areas where combustible, toxic or corrosive components as well as substances dangerous to human health can occur. One of many applications is e.g. monitoring the workplace atmosphere for TLV compliance.

1 Gas-Tester II H

2 Plastic carrying case

3 Leather carrying case

4 Large carrying case

5 Spare parts kit

6 Sampling line [4 m or 15 m] with tube holder

7 Kwik-Draw detector tube pumps

Design and Function

The Gas-Tester II H is a bellows type pump. It is set for action by compressing the bellows. The actual pump stroke can then be started at any time by pressing the release button. After the defined sample [100 ml] has been drawn through the tube, the end-of-stroke indicator signals this by an obvious colour change. A high accuracy of measurement is guaranteed by the fact that the sample draw procedure itself is controlled only by the specifications of the pump and the flow resistance of the detector tube.

In addition, the Gas-Tester II H can increase the accuracy of measurements with other short-term detector tubes manufactured in Europe.

Features and Benefits

- Accurate measurements
- Elimination of errors by:
 - Defined sample draw volume [guaranteed by locking mechanism and end-of-stroke indicator]
 - Unconstrained relaxation of the bellows
 - Existence of an end-of-stroke indicator [prevents premature sample cut-off]
 - Additional incorporated stroke counter
- Antistatic, shock-resistant housing
- Small number of component parts
- Requires little maintenance

Technical Data

Sampling volume:

[100 ± 3] ml/stroke

Sampling time:

Depends on flow resistance of the detector tube, typical value 20 seconds

Weight: 350 g

Dimensions:

Length 210 mm, largest diameter 75 mm

ATEX Approval:

II 1G C IIC T6

Ordering Information

1 D5146760
Gas-Tester II H

2 D5146770

Carrying case for Gas-Tester II H and one package detector tubes resp. spare parts kit

3 D5146709

Leather carrying case for Gas-Tester II H and 4 packages detector tubes and sampling line [4 m] resp. space for 8 packages detector tubes in the outer case

4 D5146914

Large carrying case with space for 24 packages of detector tubes, pump, a 4 m sampling line and the spare parts kit – Delivery without the pictured devices –

5 D5146906

Spare parts kit, includes important spare parts and sealing caps

D5140924

Sealing caps for detector tubes, 10 pcs.

6 D5146705 Sampling line [4 m] with tube holder

D5140927 Sampling line [4 m] without tube holder

10015366 Sampling line [15 m] with tube holder

7 D5146761

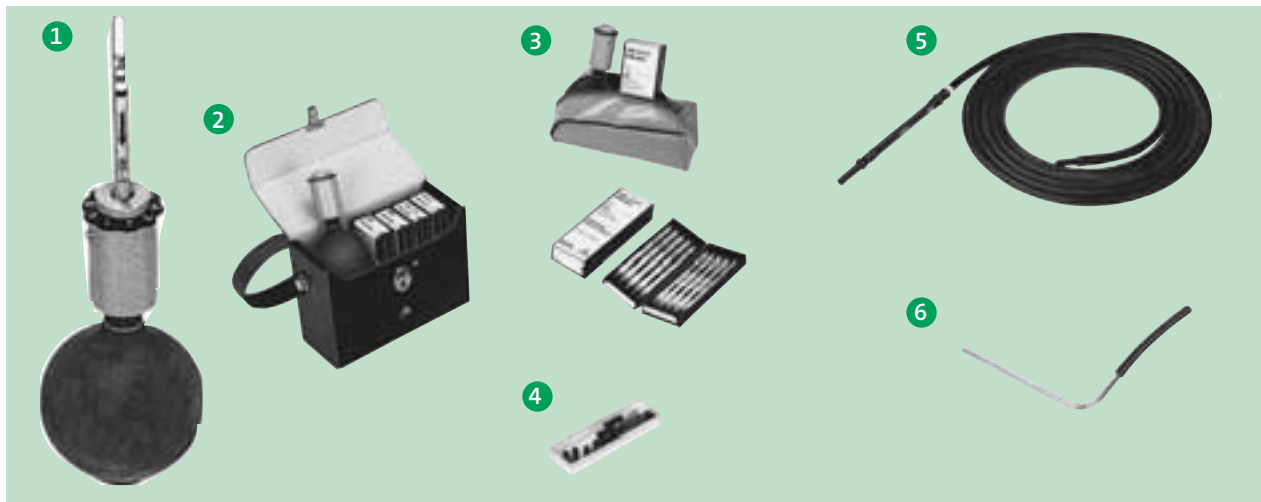
Detector tube pump Kwik-Draw Basic [without end of stroke indicator]

D5146762

Detector tube pump Kwik-Draw Deluxe [incorporated end of stroke indicator]

Gas-Tester

[Mechanically forced detector tube pump]



Application

The Gas-Tester is a manually operated detector tube pump which together with detector tubes is used to quickly and accurately measure and monitor gases and vapours in the range of the threshold limit value [TLV]. The application of the Gas-Tester is every place where gaseous contaminants in air can be expected, resp. where work with technical gases is performed.

- 1 Gas-Tester
- 2 Gas-Tester, in leather carrying case with selection of spares and accessories and space for 3 packages detector tubes
- 3 Gas-Tester, in plastic carrying case with space for 1 package detector tubes
- 4 Selection of spares and accessories, containing 1 special key to remove the valve ring, 3 valve rings, 10 sealing caps to close opened tubes
- 5 Sampling line [4 m or 15 m] with tube holder
- 6 Exhaust cooling probe

Design and Function

The main components of the Gas-Tester are an aspirator bulb and a pump body into which the detector tube is inserted. When the aspirator bulb expands, the resultant negative pressure draws sampling air through the detector tubes. The chemical in the detector tubes have been calibrated for the gases and vapors to be sampled and will show a characteristic colour change in their presence. With the majority of tubes a printed scale provides a direct reading. The design of the Gas-Tester is as simple as possible. It consists of only 10 components and is disassembled and reassembled in a short time.

The use of plastic and rubber makes the device largely resistant against corrosive gases and vapours. Except for a simple leak test, the robust design requires practically no maintenance.

Features and Benefits

- One hand operation
- Always ready for use
- Simple handling
- Consists of only 10 components
- Robust design
- Requires practically no maintenance
- Attractive price

Technical Data

Sampling volume:

Approx. 100 ml/stroke

Sampling time:

Approx. 10 – 30 seconds, depending on type of tube

Weight:

120 g/Dimensions: Length 148 mm, largest diameter 68 mm



Ordering Information

D5140904
Gas-Tester

D5140911
Carrying case for Gas-Tester and one detector tubes

D5140912
Leather carrying case for Gas-Tester and 3 packages detector tubes

D5140929
Exhaust cooling probe

D5140920
Selection of spares and accessories, containing 1 special key to remove the valve ring, 3 valve rings, 10 sealing caps to close opened tubes

D5140924
Sealing caps to close opened tubes (package of 10)

D5140705
Sampling line, 4 m with tube holder

5140-927
Sampling line, 4 m without tube holder

10015366
Sampling line [15 m] with tube holder

Further information on request

See:

<http://www.MSA-tubes.com>

Short Term Detector Tubes

[for Gas-Tester, Gas-Tester II H and Toximeter® II]

Substance measured	Detector tube applicable	Part No. [10 tubes/pkg]	Measuring range [ppm]
A Acetaldehyde	Formaldehyde-0.1	D5086813	5 ... 50
Acetic Acid	Acetic Acid-1	D5086821	1... 80
Acetylene	CO-0.1%	D5085817	400... 8300
Acetone	Acetone-100	D5086829	100...10000
	MEK-50	D5086837	25 ...3500
Acrolein	Acrolein-0.1	10017882	0.1 ...10
Acrylonitrile	Acrylonitrile-0.5 ^c	10016376	0.5 ...30
Alcohols, aliph.	Ethanol-100	D5086818	100... 6000 [Ethanol]
Amines	Triethyl Amine-5	D5086816	5 ... 30
Aminopropane see Propyl Amine			
Ammonia	NH ₃ -2	D5085845	2... 600
	NH ₃ -20	D5085814	20...1000
	NH ₃ -100	D5086859	100... 2000
	NH ₃ -0.1%	D5085815	0,1...10 ^①
	NH ₃ -A	D5085755	Warning Marks
	Triethyl Amine-5	D5086816	0.25 ... 3
B Benzene	Benzene-0.25 [specific]	D5086852	0.25...10
	C ₆ H ₆ -1	D5086835	1... 25
	C ₆ H ₆ -5	D5085816	5 ...100
	Aromatic HC	D5086811	5 ... 500
	Aromaten-A	D5085770	Warning Marks
Blistering Agents see HD; HN; Lewisite			
Bromine	Cl ₂ -0.2	D5085801	0.2 ... 3
Blood; Choking Agents simultaneous measurement of:			
CG + DP [Phosgene + Diphosgene]			
AC [Hydrogen Cyanide]			
CK [Cyanogene Chloride]	CK, AC, DP, CG	D5086884	5 ^②
Bromobenzene	Aromatic HC	D5086811	30... 720
Bromoethane	Trichloroethan-5	D5086834	15 ... 400
Bromomethane	Methyl Bromid-2	D5086845	2 ...100
	Methyl Bromid-200	D5086847	200... 8000
	Trichloroethan-5	D5086834	20... 270
1-Bromopropane	Trichloroethan-5	D5086834	3,5 ... 740
Butadiene, 1,3-	Ethylene-50	D5086833	100... 1200
Butane, n-	Propane-200	D5086831	200... 3800
Butyl Alcohol, iso-	Alcohol-A	D5085773	Warning Marks
	Ethanol-100	D5086818	150... 2900
Butyl Alcohol, n-	Alcohol-A	D5085773	Warning Marks
	Ethanol-100	D5086818	100... 3900
Butyl Alcohol, s-	Alcohol-A	D5085773	Warning Marks
	Ethanol-100	D5086818	300... 5100
Butyl Amine, n-	Triethyl Amine-5	D5086816	3 ... 36
Butyl Amine, s-	Triethyl Amine-5	D5086816	2 ...18
Butyl Amine, t-	Triethyl Amine-5	D5086816	2 ...14
Butyl Mercaptan, n-	Ethyl Mercaptan-0.5	D5086815	1.5...15
Butyl Mercaptan, t-	Ethyl Mercaptan-0.5	D5086815	0.8... 5
Butene, 1-	Benzin-A	D5085769	Warning Marks
	Ethylene-50	D5086833	100... 5000
Butene, 2-	Ethylene-50	D5086833	200... 5000
	Benzin-A	D5085769	Warning Marks

① = Vol.-% ② = mg/m³ ③ = Package includes 5 pre tubes and 5 detector tubes plus one piece of rubber

Measurement of further substances on request. Also see: www.MSA-tubes.com
additional information: contact@msa-europe.com

Substance measured	Detector tube applicable	Part No. [10 tubes/pkg]	Measuring range [ppm]
C Carbonic Dichloride [Carbonyl Chloride] see Phosgene			
Carbon Dioxide	CO ₂ -100	D5086814	100... 3000
	CO ₂ -0.1%	D5085817	0.1...7 ^①
	CO ₂ -0.5%	D5086844	0.5...10 ^①
	CO ₂ -1%	D5085841	1...20 ^①
	CO ₂ in biogas	10012107	5...40 ^①
	CO ₂ -HP	D5085848	100... 2000
	CO ₂ -A	D5085758	Warning Marks
Carbon Disulfide	CS ₂ -2	D5085834	2... 300
Carbon Monoxide	CO-5	D5085836	5...1000
	CO-10 [ppm]	D5085821	10... 3000
	CO-10 [Vol.-%]	D5085820	0.001... 0.3 ^①
	CO-0.1%	D5085822	0.1...1.0 ^①
	CO-3000	D5086839	3000... 70 000
	CO-0.5%	D5085835	0.3...7 ^①
	CO-HP	D5085847	5...70
	CO-A	D5085759	Warning Marks
Chlorine	Cl ₂ -0.2	D5085801	0.2... 30
	ClO ₂ -0.05	D5086812	1...46
	Cl ₂ -50	D5086855	50... 500
	Cl ₂ -A	D5085757	Warning Marks
Chlorine Dioxide	ClO ₂ -0.05	D5086812	0.05...15
Chlorobenzene	Aromatic HC	D5086811	40... 610
	Chlorbenzol-10	D5093811	10...140
	CKW-A	D5085771	Warning Marks
Chlorobromomethane	Trichloroethane-5	D5086834	5... 180
Chlorobutane, 1-	Trichloroethane-5	D5086834	5... 170
Chloroethane	Trichloroethane-5	D5086834	50... 800
Chloropentane, 1-	Trichloroethane-5	D5086834	5... 550
Chloropropane, 1-	Trichloroethane-5	D5086834	5... 220
Chloropropane, 2-	Trichloroethane-5	D5086834	8...1700
Cyanogen Chloride	Chlorcyan	D5093884	0.2... 2
Cycloheptane	Hexane-20	D5086832	80... 3300
Cyclohexane	Benzin-A	D5085769	Warning Marks
	Hexane-20	D5086832	20... 3400
Cyclohexyl Amine	Triethyl Amine-5	D5086816	7... 38
Cyclooctane	Hexane-20	D5086832	20... 2100
Cyclopentane	Hexane-20	D5086832	80... 2700
D Decane, n-	Hexane-20	D5086832	50... 500
Dibromoethane, 1,2-	Trichloroethane-5	D5086834	25... 700
Dibromomethane	Trichloroethane-5	D5086834	9... 200
Dichlorobenzene, 1,2-	CKW-A	D5085771	Warning Marks
Dichloroethane, 1,1-	Trichloroethane-5	D5086834	8... 300
	CKW-A	D5085771	Warning Marks
Dichloroethane, 1,2-	Dichloroethane-5	D5085823	30... 720
	CKW-A	D5085771	Warning Marks
Dichloroethylene, 1,1-	Trichloroethane-5	D5086834	10... 600
Dichloroethylene, 1,2-	Trichloroethane-5	D5086834	10... 500

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Substance measured	Detector tube applicable	Part No. [10 tubes/pkg]	Measuring range [ppm]
Dichloromethane	Dichloromethane-50	D5085823	50...1000
	Dichloromethane-A	D5085772	Warning Marks
Dichloropropane, 1,2-	Trichloroethane-5	D5086834	5...440
Dichloropropane, 1,3-	Trichloroethane-5	D5086834	5...220
Diethyl Amine	Triethyl Amine-5	D5086816	3...27
Dimethyl Amine	Triethyl Amine-5	D5086816	3...27
Dimethylbutane, 2,2-	Hexane-20	D5086832	100...4900
Dimethyl Hydrazine	Hydrazine-0.1	D5086861	0.1...1.6
E Ethyl Acetate	Ethyl Acetate-200	10024253	200...3000
Ethyl Alcohol	Alcohol-A	D5085773	Warning Marks
	Ethanol-100	D5086818	100...6000
Ethyl Amine	Triethyl Amine-5	D5086816	4...55
Ethyl Benzene	Aromaten-A	D5085770	Warning Marks
	Tol.-5	D5085828	5...1800
Ethanol [s. Ethyl Alcohol]	-	-	-
Ethyl Mercaptan	Ethyl Mercaptan-0,5	D5086815	0.5...80
Ethylene	Ethylene-50	D5086833	25...5000
	Benzin-A	D5085769	Warning Marks
Ethylene Diamine	Triethyl Amine-5	D5086816	5...27
Extraction Gasolines	BNZ-Test	D5085807	qualitative
F Formaldehyde	Formaldehyde-0.1	D5086813	0.1...55
Formic Acid	Acetic Acid-1	D5086821	2...160
Furfuryl Alcohol	Phenol-1	D5086838	170...1500
G Gasoline	Gasoline-30	D5085898	30...6000
	BNZ-Test	D5085807	Warning Marks
H Heptane, all Isomers	BNZ-Test	D5085807	Warning Marks
Heptane, n-	Hexane-20	D5086832	20...2600
	Benzin-A	D5085769	Warning Marks
Hexane, all Isomers	BNZ-Test	D5085807	Warning Marks
Hexane, n-	Hexane-20	D5086832	20...3200
	Benzin-A	D5085769	Warning Marks
	Benzin-A	D5085769	Warning Marks
Hydrogene Chloride	HCl-1	D5085846	1...30
	HCl-50	D5086858	50...5000
	HCl-A	D5085762	Warning Marks
Hydrazine	Hydrazine-0.1	D5086861	0.1...10
Hydrogen Cyanide	HCN-2	D5085824	2...50
	HCN-A	D5085756	Warning Marks
Hydrogen Fluoride	HF-1	D5086830	1...50
Hydrogen Sulfide	H ₂ S-0,1	10023818	0.1...6
	H ₂ S-1	D5085826	1...200
	H ₂ S-100	D5085827	100...4000
	H ₂ S-0.4%	D5086857	0.1...4 [Ⓢ]
	H ₂ S-A	D5085764	Warning Marks
I Isobutane	Propane-200	D5086831	200...4200
Isobutyl Amine	Triethyl Amine-5	D5086816	3...36
Isobutylene	Ethylene-50	D5086832	400...2600
Isobutyl Methyl Ketone	MEK-50	D5086837	50...400
Isooctane	Hexane-20	D5086832	100...3000
Isopropyl Amine	Triethyl Amine-5	D5086816	5...30
Isopropyl Mercaptan	Ethyl Mercaptan-0.5	D5086815	0.5...5.5

Ⓢ = Vol.-% Ⓢ = mg/m³ Ⓢ = Package includes 5 pre tubes and 5 detector tubes plus one piece of rubber

Measurement of further substances on request. Also see: www.MSA-tubes.com
 additional information: contact@msa-europe.com

Substance measured	Detector tube applicable	Part No. [10 tubes/pkg]	Measuring range [ppm]	
K Kerosine	BNZ-Test	D5085807	Warning Marks	
	QL	D5085810	qualitative	
	Ketones	QL	qualitative	
L Lewisite Lost, S- Lost, S- + N- Light Fuels Ligroin	Lewisite	D5086883	1 ^②	
	HD	D5086882	1 ^①	
	HD, HN	D5086881	1 ^②	
	BNZ	D5085807	Warning Marks	
	Gasoline-30	D5085898	30... 6000	
	QL	D5085810	qualitative	
	BNZ	D5085807	Warning Marks	
	Propane-200	D5086831	200... 4000 [Propane]	
	QL	D5085810	qualitative	
	M Mercaptans Mercury Methane Methyl Alcohol Methyl Amine Methyl Bromide Methyl Butane, 2- Methyl Cyclohexane Methyl Cyclopentane Methyl Ethyl Ketone Methyl Hydrazine Methyl Mercaptan Methyl Methacrylate Methyl Pentane, 2- Methyl Pentane, 3- Mineralic Oil [Compressor Oil] Mustard Gases see Lost	Ethyl Mercaptan-0.5	D5086815	0.5 ... 100
Hg-0.01		D5085843	0.1... 0.8 ^② 0.01... 0.08	
Erdgas		D5086846	Warning Marks	
Ethanol-100		D5086818	100... 2350	
Methyl Alcohol-100		D5094818	100... 2500	
Alcohol-A		D5085773	Warning Marks	
Triethyl Amine-5		D5086816	4 ... 55	
Methyl Bromide-2 ^c		D5086845	2 ... 100	
Methyl Bromide-200		D5086847	200... 8000	
Hexane-20		D5086832	50... 3000	
Hexane-20		D5086832	80... 4900	
Hexane-20		D5086832	150... 3700	
MEK-50		D5086837	50... 4000	
Hydrazine-0.1		D5086861	0.6... 6	
Ethyl Mercaptan-0.5		D5086815	0.5 ... 5	
Acrolein-0,1 ⁴		10017882	1.5 ... 115	
Hexane-20		D5086832	150... 4500	
Hexane-20		D5086832	100... 3700	
Oil-HP		D5085850	Warning Marks	
N Natural Gas Nerve Agents see Phosphoric Acid Esters Nitrogen Dioxide Nitrous Fumes Nonane, n-		Erdgas	D5086846	Warning Marks
		NO ₂ -0.5	D5085805	0.5 ... 50
		NO ₂ -2	D5085867	2 ... 140
		Nitr-0.5	D5085818	0.5 ... 50
		Nitr-2	D5085844	2 ... 140
		Nitr-10	D5085808	10... 300
		Nitr-50	D5085809	50... 3000
		Nitr-A	D5085760	Warning Marks
		Nitr-0.5	D5085818	0.5 ... 50
	Nitr-2	D5085844	2...140	
	Nitr-10	D5085808	10... 300	
	Nitr-50	D5085809	50... 3000	
	Nitr-A	D5085760	Warning Marks	
	Hexane-20	D5086832	50... 2800	
	Benzin-A	D5085769	Warning Marks	

① = Vol.-% ② = mg/m³ ③ = Package includes 5 pre tubes and 5 detector tubes plus one piece of rubber

Measurement of further substances on request. Also see: www.MSA-tubes.com
additional information: contact@msa-europe.com

Substance measured	Detector tube applicable	Part No. [10 tubes/pkg]	Measuring range (ppm)	
O Octane, n- Organic Arsenic Compounds see Lewisite Other Organic Compounds Ozone	Hexane-20	D5086832	50...3000	
	Benzin-A	D5085769	Warning Marks	
	QL	D5085810	qualitative	
	Ozone-0.05	D5086828	0.05 ... 5	
P Pentachlorethane Pentane, n- Petroleum Distillates Petroleum Ether Phenol Phosgene Phosphine Phosph. Acid Esters Propane Propenal, -2 see Acrolein Prussic Acid see Hydrogene Cyanide or CK, AC, DP, CG Propyl Alcohol, iso- Propyl Alcohol, n- Propyl Amine, iso- Propyl Amine, n- Propyl Mercaptan, iso- Propyl Mercaptan, n- Propylene	Trichlorethane-5	D5086834	10...300	
	Hexane-20	D5086832	50...3900	
	Benzin-A	D5085769	Warning Marks	
	Gasoline-30	D5085898	30...6000	
	QL	D5085810	qualitative	
	BNZ	D5085807	Warning Marks	
	BNZ	D5085807	Warning Marks	
	Phenol-1	D5086838	1...25	
	Phosgene-0.1	D5085854	0.1...20	
	Phosgene-A	D5085761	Warning Marks	
	PH ₃ -0.05	D5085829	0.05 ... 3.0	
	PH ₃ -0.1	D5085830	0.1...100	
	PH ₃ -50	D5085831	5...2000	
	Phosph. Acid Esters	Phosph. Acid Esters	D5086880	0.01 ^①
	Propane-200	D5086831	200...4000	
	Ethanol-100	D5086818	200...5000	
	Alcohol-A	D5085773	Warning Marks	
	Ethanol-100	D5086818	100...3000	
	Alcohol-A	D5085773	Warning Marks	
	Triethyl Amine-5	D5086816	5...30	
	Triethyl Amine-5	D5086816	2...28	
	Ethyl-Mercaptane-0.5	D5086815	0.7...8	
Ethyl-Mercaptane-0.5	D5086815	0.7...8		
Ethylene-50	D5086833	20...5000		
Benzin-A	D5085769	Warning Marks		
S Scentinel E Styrene Sulfur Dioxide	Ethyl Mercaptane-0.5	D5086815	0.5...30	
	Styrene-10	D5086819	10...300	
	SO ₂ -1	D5085803	0.5...30	
	SO ₂ -5	D5085813	5...120	
	SO ₂ -100	D5085825	100...4000	
SO ₂ -A	D5085763	Warning Marks		
T Tetrabromoethane, 1,1,2,2- Tetrachloroethane, 1,1,2,2- Tetrachloroethylene Tetrahydrofuran Tetrahydrothiophene ^c Toluene	Trichloroethane-5	D5086834	5...200	
	Trichloroethane-5	D5086834	50...1000	
	Per-5	D5085865	5...200	
	Per-10	D5085840	10...500	
	CKW-A	D5085771	Warning Marks	
	Ethanol-100	D5085818	30-980	
	THT-1	D5085866	1...10 ^①	
			5...35 ^①	
	Tol-5	D5085828	5...1000	
	Aromatic HC	D5086811	30...750	
Aromatic-A	D5085770	Warning Marks		

① = Vol.-% ② = mg/m³ ③ = Package includes 5 pre tubes and 5 detector tubes plus one piece of rubber

Measurement of further substances on request. Also see: www.MSA-tubes.com
additional information: contact@msa-europe.com

Substance measured	Detector tube applicable	Part No. [10 tubes/pkg]	Measuring range [ppm]
Tribromomethane	Trichloroethane-5	D5086834	7...200
Trichloroethane, 1,1,1-	Trichloroethane-5	D5086834	5...1500
Trichloroethane, 1,1,2-	Trichloroethane-5	D5086834	10...170
Trichloroethylene	Tri-5	D5085842	5...250
	CKW-A	D5085771	Warning Marks
Trichloromethane	Trichloroethane-5	D5086834	8...100
Trichloropropane, 1,2,3-	Trichloroethane-5	D5086834	10...1200
Triethyl Amine	Triethyl Amine-5	D5086816	5...30
Trimethyl Amine	Triethyl Amine-5	D5086816	5...30
Trimethyl Pentane, 2,2,4-	Hexane-20	D5086832	100...3000
V Vinyl Chloride	VC-1	D5085837	1...70
	CKW-A	D5085771	Warning Marks
W Water Vapor	H ₂ O-HP (mg/m ³)	D5085849	5...160 ^①
	H ₂ O-HP (ppm)	D5085851	10...200
	H ₂ O-MP	D5085851	100...1000 ^①
	H ₂ O (r.h. %)	D5086849	10...100 ^③
X Xylene	Aromatic HC	D5086811	50...630
Xylene, 1,2-	Tol-5	D5085828	5...2500
	Aromatic HC	D5086811	50...630
	Aromatic-A	D5085770	Warning Marks
Xylene, 1,3-	Tol-5	D5085828	5...2500
	Aromatic HC	D5086811	50...630
	Aromatic-A	D5085770	Warning Marks
Xylene, 1,4-	Tol-5	D5085828	5...1200
	Aromatic HC	D5086811	50...630
	Aromatic-A	D5085770	Warning Marks
Y Yperite see Lost			

Detector tubes [one package of 200 tubes]

Carbon Dioxide	CO ₂ -0.1%	D5085917	0.1...7.0 ^②
Carbon Dioxide	CO ₂ -1%	D5085941	1...20 ^②
Carbon Monoxide	CO-5	D5085936	5...1000
Carbon Monoxide	CO-10 [Vol.-%-scale]	D5085920	0.001...0.3 ^②
Carbon Monoxide	CO-10 [ppm-scale]	D5085921	10...3000
Carbon Monoxide	CO-0.5%	D5085935	0.03...7 ^②
Gasoline	Gasoline-30	D5085998	30...6000
Hydrogen Cyanide	HCN-2	D5085924	2...50
Hydrogen Sulfide	H ₂ S-1	D5085926	1...200
Hydrogen Sulfide	H ₂ S-100	D5085927	100...4000
Phosphine	PH ₃ -0.1	D5085930	0.1...100
Phosphine	PH ₃ -50	D5085931	50...2000
Qualitest	QL	D5085910	qualitative
Nitrogen Dioxide	NO ₂ -0.5	D5085905	0.5...50
Nitrous Fumes	Nitr.-0.5	D5085918	0.5...50
Nitrous Fumes	Nitr.-50	D5085909	50...3000
Tetrahydrothiophene	THT-1	D5085966	1...10 ^③
Trichloroethylene	Tri-5	D5085942	5...250
Tetrachloroethylene	Per-10	D5085940	10...500

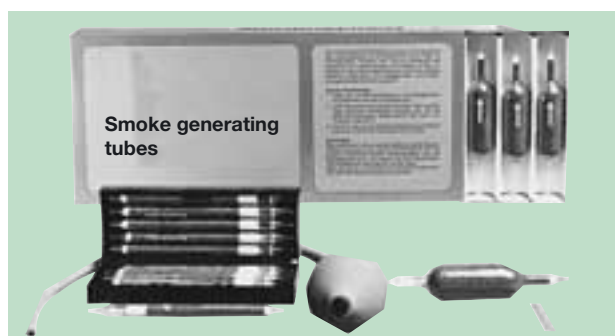
① = mg/m³ ② = Vol.-%

③ = Package includes 5 pre tubes and 5 indication tubes plus one piece of rubber

Measurement of further substances on request.

**Also see: www.MSA-tubes.com
Additional Information:
contact@msa-europe.com**

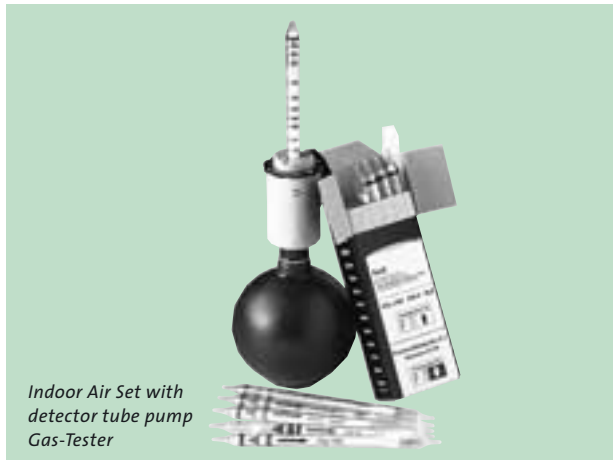
Detector Tubes for Special Applications; Ventilation Smoke Tubes



Smoke tube (not corrosive) and rubber aspirator bulb

Type	Part No.	Application
Qualitest QL	D5085810	Universal Tube [qualitative] for a large number of gases and vapours [10 tubes/pkg]
Filter tube Ads	D5085832	Filter tube to adsorb interfering substances [10 tubes/pkg]
Smoke generating tubes	D5019701	To identify air flow patterns and leaks [10 tubes/pkg]
Smoke generating kit	D5019702	Kit of 1 package smoke generating tubes and manual smoke pump in plastic carrying case [10 tubes/pkg]
Smoke generating cartridges	D6009000	For ventilation testing, leak testing of pipelines, burners, windows and mining ventilation [10 tubes/pkg]
Ventilation smoke tube [non corrosive]	D5019708	Plastic tube contains two glass ampoules with different chemicals [Ethylenediamine and Acetic Acid]. The user has to crush the ampoules mix the chemicals and can create smoke by pushing air through the tube squeezing the rubber aspirator bulb [12 tubes/pkg]
Ventilation smoke tube kit [not corrosive]	D5019709	Smoke tubes and a hand-held rubber aspirator bulb contained in a plastic carrying case [6 tubes/pkg]
Rubber aspirator bulb [not corrosive]	D5019710	Especially for smoke generation with ventilation smoke tubes also for other smoke generating tubes
Manual smoke pump	D5019903	Pump for smoke tubes
Electronically smoke pump	D5142705	Pump for smoke tubes and -cartridges [Toximeter® II]

Indoor Air Set



Indoor Air Set is used for testing the quality of indoor air. A box of Indoor Air Set is containing 2 each detector tubes of CO-5, CO₂-100, Ozone 0.05, Formaldehyd 0.1 and a detector tube for testing the humidity level. In addition, a thermometer [testig strip] is on the side of each package. A detector tube pump is additionally necessary. Room temperature is indicated with the testing strip from 14 °C... 31 °C or 58 °F... 88 °F. A detector tube pump is necessary for the use of detector tubes. [MSA Gas-Tester, GT II H, Toximeter® II]. The Indoor Air Set provide a quick assessment and a first information of the indoor environment in a wide variety of workplaces offices and other rooms. For additional measurements are used MSA sorbent tubes with connected analyses in a chemical laboratory.

Detector tube	Measuring range	Description
CO	5...1000 ppm	Smokers, lorries and forklifts or other combustion engines inside the building
CO ₂	10...3000 ppm	overall indicator of indoor air quality, levels above 1000 ppm indicate a ventilation problem
Formaldehyde	0.1...10 ppm	smoke from cigarettes, new carpets, particle boards
Ozone	0.05...5 ppm	Copy machines, environmental air
Humidity	10...100% rel. H.	Low humidity can cause irritated eyes and sinus problems

Ordering Information

Indoor Air Set	D5086848
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Alcohol Test Breathalyser Tubes “PromilleTest”

The Alcohol Test Breathalyser Tubes enables the alcohol content in blood to be determined reliably and easily. These tubes are used for precautionary check after alcohol consumption or residual alcohol before driving as well as check of alcohol prohibition as applicable to certain occupational activities.

The basic principle behind the test rests on the fact that a legally determined relationship exist between the alcohol content in exhaled breath and the alcohol content in the blood.

The test provides an analysis of alcohol in blood values from 0.5, 0.8 and 1.0 promille [0.05%, 0.08% and 0.1%].

The official alcohol limit values of 0.5 and 0.8 promille are marked on the detector tubes.

The contents of the package enable ten alcohol readings to be taken and consists of the following parts:

- 10 breathalyser test tubes
- 10 hygienically packed mouth pieces
- 1 breath bag for the measurement of volume
- 2 glass files [on the side of the plastic case]
- 1 set of instructions

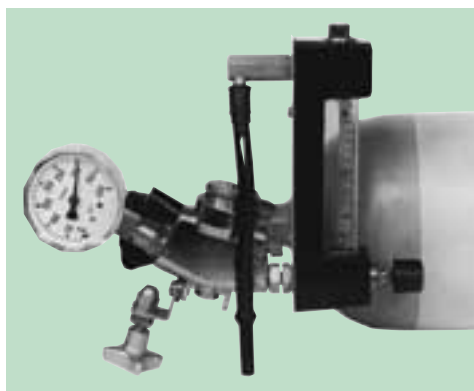
Ordering Information

D5091770
PromilleTest
Breathalyser Test tubes



Airtester HP, MP and Detector Tubes

[Monitoring compressed air for breathing apparatus]



Airtester HP
connected to pressure cylinder



Airtester HP Set
with carrying case

In conjunction with Airtester HP (high pressure 200 bar and 300 bar) or Airtester MP [medium pressure up to 10 bar; 145 psi] the HP and MP Detector Tubes are used to monitor the purity of breathing air as supplied from compressors, pressure cylinders or medium pressure air lines.

The HP Detector Tubes and MP Detector Tubes can indicate quickly and quantitatively the concentration of water vapor, oil, carbon dioxide, carbon monoxide, nitrous fumes according to quality requirements of European Standard DIN EN 12021 [01/99].

Substance measured	Detector tube applicable	Part No. [10 tubes/pkg]	Measuring range [ppm]	Threshold value acc. EN 12021
Carbon dioxide	CO ₂ -HP	D5085848	100... 2000 ppm	500 ppm
Carbon monoxide	CO-HP	D5085847	5...70 ppm	15 ppm
Mineral oil vapours	Öl-HP	D5085850	Two markings 0.3 mg/m ³ – 60 ²⁾ 0.5 mg/m ³ – 25 ¹⁾ 0.5 mg/m ³ – 60 ²⁾ 1.0 mg/m ³ – 25 ¹⁾	0.5 mg/m ³
Oil-HP synth.		10040887	depends on oil type	
Nitrous fumes [NO + NO ₂]	Nitr.-HP	D5086850	0.2–6.0 ppm	not hazardous
Water vapour	H ₂ O-HP H ₂ O-HP [ppm] H ₂ O-HP [mg/m ³] H ₂ O-HP [mg/m ³]	D5085849 D5085851 D5085849 D5086851	5...160 mg/m ³ 10... 200 ppm 5... 160 (mg/m ³) 100... 1000 [mg/m ³]	25 mg/m ³
Airtester HP		D3188701	Sampling system [complete set for high pressure]	
Airtester MP		D5185910	Sampling system [complete set for medium pressure]	

¹⁾ 25 l Testing air

²⁾ 60 l Testing air

Carrying Cases for Measuring Kits

1. Carrying Cases

Made of plastic coated fiber boards, edges and corner protected by plastic. Without special interior equipment for the accommodation of the devices. Special inlays on request.

D5185911 Size 1

260 x 330 x 170 mm
[h x l x w], weight: 2 kg

10011103 Size 2

340 x 465 x 165 mm
[h x l x w], weight: 3.2 kg

2. Measuring Kits

The measuring cases are expandable with instruments according to the special measuring functions.

Examples:

- Detector tube pump
- Different boxes of detector tubes
- Sampling hose
- Smoke generating tubes
- Sorbent tubes and sampling pump
- Gas mask and filter
- Gloves
- Goggles
- Portable instruments for combustible and toxic gases and vapors



Carrying cases for detector tube and personal protection equipment, portable instruments etc. Available in three sizes.

The size of the carrying case depends on the desired configuration. Appropriate supply on request.

Detector Tubes for Indication of Ultra Toxic Compounds

The high sensitive and resistant to interfering substances detector tubes are designed for evaluation of the potential presence of ultra toxic chemical substances in the air. These detector tubes are determined for special investigation and inspection groups,

chemical corps, fire brigades and for use in agricultural research chemical industries and chemical agent incineration plants for the detection of chemical warfare agents, pesticides or reagents for chemical synthesis.



MSA detector tubes for indication of ultra toxic compounds

Detector tube	Substance to be detected	max. Sensitivity [mg/m ³] ¹	max. pump strokes	Part No. [10 tubes/pkg]
Phosphoric Acid Esters	Soman, Tabun, Sarin, VX	0.01	10	D5086880
HD, HN	S-Lost, N-Lost	1	50	D5086881
HD	S-Lost [only]	3	30	D5086882
Lewiste [L]	2-Chlorovinyl-dichloro arsine	1	50	D5086883
CK, AC, DP, CG	Cyanogen Chloride, Hydrogen Cyanide, Diphosgene, Phosgene	5	30	D5086884

¹ Detection limit if max. no. of pump strokes is used. If the substance is detectable by using less number of pump strokes the concentration is higher and can be calculated inversely proportional to the no. of pump strokes are taken.

Note: For export of detector tubes for ultra toxic compounds observe legal regulations of individual export licence.

Action Detector Tubes



A quick evaluation of the potential danger resulting from fires, accidents and other disasters is achieved with the Action Detector Tubes. A special calibration permits the use of most of the Action tubes with only two pump strokes. To ensure a fast and unproblematic reading only two warning markings are printed on the Action Tubes. A third mark "ETW" is new printed on the Action tubes. ETW means "Einsatz-toleranzwert" according to the German guide-line vfdB 10/01 [03/03]. The guide-line is published by "Vereinigung zur Förderung des Deutschen Brandschutzes e.V." In case of concentration above ETW for more than 4 hours respiratory protective devices are required. ETW are established for 33 substances.

Substance measured	Action Detector tube Applicable	Part No.* [10 tubes/pkg]	1. Warn. mark [ppm]	2. Warn. mark [ppm]	ETW mark [ppm]	Number of strokes [n]
1. Action Detector Tubes						
Ammonia	NH ₃ -A	D5085755	50	250	110	2
Hydrogen Cyanide	HCN-A	D5085756	10	50	3,5	2
Chlorine	Cl ₂ -A	D5085757	0.5	2,5	1	2
Carbon dioxide	CO ₂ -A	D5085758	5000	25000	10000	2
Carbon monoxide	CO-A	D5085759	30	150	33	2
Nitrous gases	NO ₂ -A	D5085760	5	25	8.2 [NO ₂]	2
Phosgene	Phosgen-A	D5085761	0.02	–	0.08	5
Hydrochloric acid	HCl-A	D5085762	5	25	5.4	2
Sulfur dioxide	SO ₂ -A	D5085763	0.5	2.5	1	2
Hydrogen sulfide	H ₂ S-A	D5085764	10	50	20	2
Gasoline hydrocarbons [n-Hexane]	Benzin-A	D5085769	50	250	200	2
Aromatic hydrocarbons [Toluene]	Aromaten-A	D5085770	50	250	94	2
Halogenated hydrocarbons [easily decomposable] [Trichloroethylene]	CKW-A	D5085771	50	150	100	2
Dichloromethane	Dichlormethan-A	D5085772	100	500	–	5
Alcohols [Methanol]	Alkohol-A	D5085773	200	1000	720	5
2. Action Detector Tubes Assortments						
Action detector tubes assortment 1		D5085752	One tube each of the types D5085755 to D5085764			
Action detector tubes assortment 2		D5085753	Two tubes each of types D5085769 to D5085773			
Detector tube Qualitest		D5085810	Detector tube for qualitative detection of the atmosphere for reducing and organic gases and vapours			
3. Action Kit						
Action kit [Gas-Tester II H]		D5146803	Containing 15 packages of action detector tubes, 1 pack. Qualitest, 1 Gas-Tester II H, sampling line and action detector tube measurement scheme.			
Carrying case		D5146914	To be filled as required with up to 24 packages of detector tubes respectively sampling line and a detector tube pump			
Action detector tube measurement scheme		D5146054				
4. Trainer Tube Assortment						
Trainer tube assortment		D5019703	Kit of tubes containing substances for training and test purposes for handling of detector tubes [e.g. for simulation of unknown gas mixtures]			

Sampling Kit

[For SF₆-Decomposition Products]

Detection tube SF₆-Decomposition Products in conjunction with the sampling system [pressure reducer] is used to analyse the content of decomposition products in SF₆ isolation gas used in high voltage switch gear and other electrical installations.

A special pressure reducer is attached to the installation to be monitored which results in a constant volumeflow through the detector tube attached downstream.

Type	Part No. [10 tubes/ pkg]	Application
Detector tube SF ₆ Decomposition Products	D5085838	0.5–15 ppm [SO ₂]
Sampling Kit [complete]	D5185700	Sampling system [reducer] for the measurement of SF ₆ decompo- sition products in a complete set [see figure above]



Biogas-Reactor Kit



An easy and cost effective method monitoring the fermentation in biogas reactors is possible with the Biogas-Reactor Kit. The kit contains a calibrated syringe [sample volume 15 ml] and a package of ten detector tubes for measuring carbon dioxide in the range of 5 Vol.-% up to 40 Vol.-%. The main components of biogas CO₂ and methane will be calculated as difference from measured CO₂ value and 100 Vol.-%. Other components of interest, e.g. hydrogen sulfide in trace amounts, can be measured with standard type detector tubes.

Ordering Information

10012107 Biogas-Reactor Kit
Calibrated syringe and package of ten detector
tubes carbon dioxide 5–40 Vol.-%

Water Analysis Kit



The water analysis kit permits a quick and easy determination of volatile substances such as perchloroethylene, benzene, etc., in a water sample.

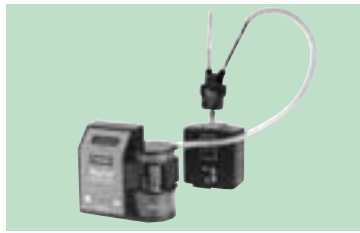
The method of analysis is based on the extraction of the hazardous substance from the water sample. The combination of gas washing bottle with detector tube and pump results in a colour change in the detector tube if the hazardous substance is present. Using a special formula, the reading [in ppm] of the detector tube indication can be used to determine the concentration of the hazardous substance [in mg/l] in the water sample; depending on the temperature of the water.

Substance measured	Detector tube	Measuring range [mg/l]	Number of strokes [n]	Part No. [10 tubes/pkg]
Benzene	C ₆ H ₆ -5	0.5... 5.0	5	D5085816
Toluene	Tol.-5	1.0... 25	5	D5085828
Petrol/Gasoline	Ethylene-50	3.0... 30	6	D5086833
Perchloroethylene	a] Per-5	0.5... 10	8	D5085865
	b] Kombination: Cl ₂ -0,2 combined with a special pre tube Perchloroethylene	0.1... 2.5	4; 8	D5085801
				D5086801
Trichloroethylene	Tri-5	0.1... 1.0	6	D5085842
1,1,1-Trichloroethane	a] Trichlorethan-5	5... 30	5	D5086834
	b] Kombination: Cl ₂ -0,2 combined with a special pre tube Perchloroethane	0.5... 2.0	2	D5085801
				D5086802

Ordering Information

D5146731	Water analysis kit, complete, with: cleaning wash bottle [with insert]; thermometer [0...100°C]; measuring jug; calculator; pencil and instruction sheet; test protocol; measuring instructions; activated carbon tube; Required additionally detector tube pump:
D5146760	Gas-Tester II H

Active Sampling Systems



ESCORT ELF and DigiCal



ESCORT ELF 3.5 and Dust Filter Cassette [BIA-Type]

A suitable sorbent tube – depending on type and concentration of the substance to be measured – is connected to the sampling pump “ESCORT ELF” with a sampling device such as the “GEMINI-Twin-Port Sampler”.

The hazardous substance is concentrated on the sorbent material; specific adsorption tubes may be required for special measurement applications. The automatically controlled flow range of ESCORT ELF is 0.5 up to 3.0 l/m. The new sampling pump ESCORT ELF 3.5 with the automatically controlled flow range 1.0 up to 3.5 l/m is designed for use with sorbent tubes as well as most dust sampling tasks.

With the “Gemini” Sampler in conjunction with ESCORT ELF or ESCORT ELF 3.5 it is possible to simultaneously use different sorbent tubes (independent of the flow volume of the pump), thereby creating a more efficient sampling system for hazardous substances.

Sampling pump – Ordering Information

D6170721	ESCORT-ELF Pump with OMEGA Charger	D6170726	ESCORT ELF 3.5 without OMEGA Charger
D6170722	ESCORT-ELF Pump without OMEGA Charger	D5142705	Toximeter® II
D6170725	ESCORT ELF 3.5 with OMEGA Charger		

Sampling Kit/Tubes Holders – Ordering Information

D6170705	GEMINI Twin-Port Sampling Kit, includes: GEMINI Sampler, tube protectors, Y-connector, clips and carrying case
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Sorbent tubes

Part.-No.	Adsorbens	Type	SL/CL* mg	No. of package
D5086740	Charcoal	B	300/600	10
D5086940	Charcoal	B	300/600	180
D6103740	Charcoal	BIA	300/600	10
D6103940	Charcoal	BIA	300/600	180
D5086741	Charcoal	G	600/300	10
D5086742	Silicagel	B	550/900	10
D5086942	Silicagel	B	550/900	180
D5086743	Silicagel	G	900/550	10
D5086742	Silicagel	BIA	500/1000	10
D5086942	Silicagel	BIA	500/1000	180
D6103730	Charcoal	NIOSH	100/50	10
D6103930	Charcoal	NIOSH	100/50	50
D6103731	Silicagel	NIOSH	150/75	10
D6103931	Silicagel	NIOSH	150/75	50
D6103732	Florisil	NIOSH	100/50	10
D6103932	Florisil	NIOSH	100/50	50
D6103733	Tenax	NIOSH	30/15	10
D6103933	Tenax	NIOSH	30/15	50
D6103735	XAD-2	NIOSH	100/50	10
D6103935	XAD-2	NIOSH	100/50	50
D6103736	Florisil	NIOSH	400/200	10
D6103936	Florisil	NIOSH	400/200	50
D6103738	Mol sieve 5Å	NIOSH	150/-	10

*SL = Sorbent layer / CL = Control layer

Replacement and Parts

D6170760	DELTA Charger [for Toximeter® II]
D6170724	OMEGA II Charger [for ESCORT ELF and Toximeter® II]
D6170710	Battery pack with O-ring
D6170703	220 V single unit OMEGA Charger
D6170712	One replacement inlet filter
D6170711	ESCORT ELF Pump Overhaul Kit (contains common components needed for routine maintenance)
D6170706	DigiCal Flow Indicator, primary standard with measuring range 1–6000 ml/min.

Interchangeability of MSA Detector Tubes and Pumps with other Manufacturers' Tubes and Pumps

The use of detector tubes in equivalent manually operated pumps from other manufacturers is permissible if the following criteria is met.

1. The characteristics of the pump [volume per stroke, sampling time, and flow] must be within the same accuracy range.
2. The detector tubes must have an outer diameter of 7 mm and be factory calibrated with a pump that meets the criteria of [1] above.
3. Manufacturer of tubes and pumps must operate under a certified quality assurance program.

So tubes designed for use with one pump can be used with any of these pumps.

Any pump which does **not meet these criteria should not be used interchangeably.**

Units of Measure

Apart from ppm, Vol.-%, mg/m³ the concentration of gases and vapors is also commonly expressed as ppm [part per million].

The following relation exists between ml/m³ and Vol.-%:

$$\begin{aligned} 1 \text{ ppm} &\triangleq 1 \text{ ml/m}^3 \\ 10000 \text{ ppm} &\triangleq 1 \text{ Vol.-%} \\ 1 \text{ ppm} &\triangleq 1 \text{ mg/m}^3 \cdot \frac{\text{Mol.-Vol.}}{\text{Mol.-W.}} \quad \text{under normal conditions} \end{aligned}$$

Remark

For further information, please demand particularly Technical Information which are available [free of charge] on the following products and applications:

- Toximeter® II
08-613.2 ITL

To ask for more technically details about detector tubes, sorbent tubes and pumps please contact:

tubes@msa-europe.com

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