



Matheson-Kitagawa Toxic Gas Detector System

**NEW****New ergonomic pump with contoured padded grip****Description**

The Matheson-Kitagawa Toxic Gas Detector System is a complete "sampling and analysis" kit for on-the-spot readings. It is an excellent method for day-to-day checking, screening, QC in the lab or plant and spot testing. Non-technical employees can operate the Matheson-Kitagawa System with a minimum of training.

The Model 8014KB Toxic Gas Detector System provides accurate, dependable, and reproducible results in determining concentrations of toxic gases and vapors. It has been proven through extensive use by leading industrial companies and government agencies. One constant and reproducible sample volume reduces sampling and analysis errors — as opposed to other pump designs, there are no orifice changes or multiple strokes to keep track of. The same basic sampling technique applies to all Matheson-Kitagawa Precision Detector Tubes.

Only three easy steps are required to operate the detector: (1) break off the tips of a fresh detector tube, (2) insert the tube with arrow pointing toward the pump into the pump's sample inlet,

(3) pull out the pump handle to automatically lock, drawing a 100 cc sample. A proprietary Sample Vue™ indicator shows when sampling is completed. Only one stroke is needed for most analyses; no need for multiple volumes or stroke counters.

Matheson-Kitagawa precision detector tubes are formulated with high purity chemical reagents which absorb and react with the gas or vapor being measured. The reaction causes a colorimetric stain which varies in length to the concentration of the gas or vapor being measured. The length of stain is normally read directly off a scale printed on each tube. Four types of Matheson-Kitagawa tubes provide the needed flexibility for different gases and sampling conditions.

Request Brochure BR-56 and Tech-Brief TB-102-1 for complete product specifications.

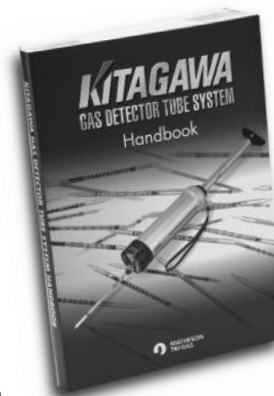
SEI Certification

The Matheson-Kitagawa precision sampling pump and several detector tubes are certified by the Safety Equipment Institute (SEI). SEI is a recognized organization that offers certification programs to assist the industrial safety equipment industry in providing the American worker protective equipment that meets recognized standards and current state of the art.

**Fourth Edition Handbook**

This handbook printed in 2001 contains all the information you need to know concerning the Matheson-Kitagawa Toxic Gas Detector System. Detailed specifications for every tube, applications, system operating principles and much more, are all included in this comprehensive source of information.

This book is a valuable reference guide for anyone using a Matheson-Kitagawa Toxic Gas Detector System.

**Ordering Information**

Model Number	Description
8014KB	Toxic Gas Detector Kit - with 400B Pump (SEI approved), Spare Parts, Carrying Case and Instruction Card. Order tubes separately.
8014-400B	Precision Sampling Pump (replacement only)
8014-002	Rubber Inlet Flange and Ring for 400A Pump (pkg 6) (replacement)
8014-002B	Rubber Inlet Flange and Ring for 400B Pump (pkg 2) (replacement)
8014-003B	Sampling Pump Lubricant for both 400A and 400B Pumps (replacement)
8014-017	5 Meter Extension Hose for 400A Pump (with tube holder)
8014-017B	5 Meter Extension Hose for 400B Pump (with tube holder)
8014-018	10 Meter Extension Hose for 400A Pump (with tube holder)
8014-018B	10 Meter Extension Hose for 400B Pump (with tube holder)
8014-300K	AirFlow Indicator Kit - with Aspirator Bulb, Case, and one box 8014-300 Smoke Tubes.
8014-300K2	Continuous Air Flow Indicator Kit
8014-BOOK	Kitagawa Handbook



Matheson-Kitagawa Precision Detector Tubes

Substance To Be Measured	Measuring Range (ppm)	Tube No.
Acetaldehyde	0.004-1%	8014-1333A
Acetaldehyde	5-140	8014-1335B ³
Acetic Acid	1-50	8014-2165 ¹
Acetone	0.1-5.0%	8014-1025A
Acetone	0.01-4.0%	8014-1025C ³
Acetone	20-5000	8014-1025D ¹
Acetylene	50-1000	8014-1015
Acetylene/Ethylene	20-300/200-2000	8014-2805
Acrolein	0.005-1.8%	8014-136 ³
Acrylonitrile	0.1-3.5%	8014-1285A
Acrylonitrile	10-500	8014-1285B
Acrylonitrile	1-120	8014-1285C* ³
Acrylonitrile	0.25-20	8014-1285D*
Allyl alcohol	20-500	8014-1845
Ammonia	0.5-10.0%	8014-1055A
Ammonia	50-900	8014-1055B
Ammonia	10-260 5-130	8014-1055C ¹
Ammonia	1-20 0.2-1	8014-1055D
Ammonia	0.5-30%	8014-1055H
Ammonia	0.1-1.0%	8014-1055M
Aniline	2-30 1-15	8014-1815
Arsine	5-160	8014-1405A
Arsine	0.05-2.0	8014-121U
Benzene — in presence of gasoline and/or other aromatic hydrocarbons	0.2-80	8014-1185E*
Benzene	1-100	8014-1185C ¹
Benzene	0.1-75	8014-1185D
Bromine	1-20	8014-114
Butadiene	0.03-2.6%	8014-1685A
Butadiene	30-600	8014-1685B
Butadiene	2.5-100	8014-1685C
n-Butane	0.05-0.6%	8014-2215A
1-Butanol	5-100	8014-190U
2-Butanol	4-300	8014-189U
Butyl acetate	0.01-1%	8014-1395B
Butyl acetate	15-400	8014-138U
Butyl acrylate	5-60	8014-211U
Butyl cellosolve	10-1000	8014-190U
Carbon dioxide	300-7000 100-1500	8014-126B
Carbon dioxide	0.1-2.6%	8014-1265A ¹
Carbon dioxide	0.05-1.0%	8014-1265B
Carbon dioxide	100-4000	8014-1265F
Carbon dioxide	0.02-1.4%	8014-1265G
Carbon dioxide	1.0-20.0%	8014-1265H
Carbon dioxide	5-50%	8014-126UH
Carbon dioxide/Oxygen	1-20%/2-10%	8015-2815
Carbon disulfide	30-500	8014-1415A* ³
Carbon disulfide	2-50 1-25	8014-1415B* ^{1,3}
Carbon monoxide	5-1000	8014-100
Carbon monoxide	10-250	8014-1065 ¹
Carbon monoxide	0.1-2.0%	8014-1065H
Carbon monoxide	0.1-20%	8014-106UH
Carbon monoxide	10-1000	8014-106B
Carbon monoxide — in presence of ethylene and nitrogen oxides	10-100	8014-106C
Carbon monoxide	10-1000	8014-1065A
Carbon monoxide	1-50	8014-1065C

Substance To Be Measured	Measuring Range (ppm)	Tube No.
Carbon tetrachloride	0.5-60	8014-1475* ³
Chlorine	1-40	8014-1095A
Chlorine	0.5-10 0.1-0.5	8014-1095B ¹
Chlorine	0.05-2	8014-109U
Carbonyl sulfide	5-60	8014-2395 *
Free residual chlorine	0.4-5	8014-2345A
Chlorine dioxide	1-20	8014-116
Chlorobenzene	5-140	8014-1785
Chloroform	70-500 23-100	8014-1525* ³
Chloropicrin	0.1-16	8014-1725* ³
Chloroprene	0.5-32	8014-1695
Cresol	0.5-25	8014-183U
Cyclohexane	0.01-0.6%	8014-1155
Cyclohexanol	5-500	8014-206U
Cyclohexanone	2-100	8014-197U
Diacetone alcohol	10-250	8014-190U
Diborane	0.02-5	8014-2425
o-Dichlorobenzene	5-100	8014-2145
p-Dichlorobenzene	10-150	8014-2155
1,1-Dichloroethane	10-160	8014-2355* ³
1,2-Dichloroethane	5-50	8014-2305* ³
1,2-Dichloroethylene	5-400	8014-1455* ³
Dichloromethane	30-1000 10-200	8014-1805* ³
1,3-Dichloropropane	10-500	8014-1945* ³
Diethylamine	1-20	8014-2225
Diethyl ether	0.04-1.4%	8014-1075A
Diethyl ether	20-400	8014-107U
Dimethyl ether	0.01-1.2%	8014-1235
N,N-Dimethylacetamide	5-70	8014-2295
N,N-Dimethyl formamide	1-30	8014-1965
Dioxane	0.05-2.5%	8014-1395B
Dioxane	20-500	8014-119U
Epichlorohydrin	5-50	8014-1925*
Ether	0.04-1.4%	8014-1075A
Ether	20-400	8014-107U
Ethyl acetate	0.1-5.0%	8014-1115A
Ethyl acetate	10-1000	8014-111U
Ethyl acrylate	5-60	8014-211U
Ethyl alcohol	0.05-5.0%	8014-1045A
Ethyl benzene	10-500	8014-1795
Ethyl cellosolve	5-500	8014-190U
Ethyl cellosolve acetate	5-150	8014-190U
Ethyl mercaptan	1-160	8014-1655A
Ethyl mercaptan in LP Gas	2.5-80	8014-1655B
Ethylene	0.5-100 0.1-20	8014-108B
Ethylene	20-1200	8014-1085A
Ethylene/Acetylene	200-2000/20-30	8014-2805
Ethylene dibromide	1-50	8014-1665* ³
Ethylene glycol	20-250 mg/m ³	8014-2325A*
Ethylene glycol	3-40 mg/m ³	8014-2325B*
Ethylene oxide	0.05-2.2%	8014-1225A*
Ethylene oxide	1-15	8014-1225C
Ethylene oxide	0.1-14	8014-1225D
Ethylene oxide	5-100	8014-1225M
Formaldehyde	1-35	8014-1715B* ¹
Formaldehyde	20-1500	8014-1715A* ³
Formaldehyde	0.1-4	8014-1715C



Matheson-Kitagawa Precision Detector Tubes (continued)

Substance To Be Measured	Measuring Range (ppm)	Tube No.	Substance To Be Measured	Measuring Range (ppm)	Tube No.
Formic acid	1-50	8014-216S	Methyl bromide	10-500	8014-157SA* ³
Furan	0.01-1.0% 0.2-2.0%	8014-161S	Methyl bromide	0.4-80	8014-157SB* ^{1,3}
Furfural	2-60	8014-190U	Methyl bromide	0.5-10	8014-157SC*
Furfuryl alcohol	5-25	8014-238S	Methyl cellosolve	5-500	8014-190U
Gasoline	0.05-0.6%	8014-110S	Methyl chloroform	15-400	8014-160S* ³
General hydrocarbons	50-1400	8014-187S	(1,1,1-Tri-chloroethane)		
Heptane	100-2000	8014-113SB	Methyl cyclohexanol	5-200	8014-199U
n-Hexane	0.05-0.6%	8014-113SA	Methyl cyclohexanone	2-100	8014-198U
n-Hexane	50-1400	8014-113SB*	Methyl ethyl ketone	0.05-2.2%	8014-122SA
n-Hexane	5-800	8014-113SC	Methyl ethyl ketone	0.01-1.4%	8014-139SB
Hydrazine	0.05-10	8014-219S	Methyl ethyl ketone	20-1500	8014-139U
Hydrogen	0.05-0.8%	8014-137U**	Methyl iodide	5-40	8014-176S* ³
Hydrogen chloride	20-600 40-1200	8014-173SA	Methyl isobutyl ketone	0.01-0.6%	8014-155S
Hydrogen chloride	0.4-40	8014-173SB* ¹	Methyl isobutyl ketone	5-300	8014-155U
Hydrogen cyanide	0.01-3.0%	8014-112SA	Methyl mercaptan	5-140	8014-164SA
Hydrogen cyanide	0.5-100	8014-112SB ^{1,3}	Methyl mercaptan	50-1000	8014-164SH
Hydrogen cyanide	0.3-8	8014-112SC	Methyl methacrylate	10-160	8014-184S
Hydrogen fluoride	0.17-30	8014-156S ¹	Methyl styrene	10-500	8014-193S
Hydrogen peroxide	0.5-10	8014-247S	Naphthalene	10-100	8014-153U
Hydrogen selenide	5-600 1-100	8014-167S	Nickel carbonyl	20-700	8014-129
Hydrogen sulfide	1-60	8014-120SD ¹	Nitric Acid vapor	1-20	8014-233S ³
Hydrogen sulfide	0.2-6.0	8014-120U	Nitrogen dioxide	20-1000	8014-117SA
Hydrogen sulfide	.05-1.2%	8014-120SM	Nitrogen dioxide	0.5-30	8014-117SB ¹
Hydrogen sulfide	3-150 0.75-37.5	8014-120SB	Nitrogen dioxide	0.1-1.0	8014-117SD**
Hydrogen sulfide — in presence of sulfur dioxide	0.005-0.16%	8014-120SC	Nitrogen oxide and dioxide — separately measurable	NO 10-300 NO ₂ 1-40	8014-174A ¹
Hydrogen sulfide	0.5-40	8014-120SE	Nitrogen oxides	20-250	8014-175SA*
Hydrogen sulfide	50-2000	8014-120SF	Nitrogen oxides	100-2500	8014-175SH
Hydrogen sulfide	0.1-4.0%	8014-120SH	Nitrogen oxides	0.5-30	8014-175U ³
Hydrogen sulfide	2-20%	8014-120UH	Organic compounds	5-2500	8014-186
Hydrogen sulfide	2.5-40%	8014-120UT**	Organic gases, qualitative	—	8014-186B
Hydrogen sulfide	.025-0.4 gr/100cf	8014-120GR	Oxygen (flame req'd)	2-24%	8014-159SA*
Hydrogen sulfide	0.25-2 gr/100cf	8014-120GT	Oxygen (no flame)	2-24%	8014-159SB**
Hydrogen sulfide/Mercaptans	1-30/0.5-5	8014-282S	Oxygen (non-heating type)	1.5-24%	8014-159SC*
Inorganic gases, qualitative	—	8014-131	Oxygen/Carbon dioxide	2-10%/1-20%	8014-281S
Isoamyl acetate	10-400	8014-188U	Ozone	0.05-3.0	8014-182U ¹
Isobutane	50-1200	8014-113SB	Ozone	50-1000	8014-182SA
Isobutyl acetate	0.01-1.4%	8014-139SB	Ozone	2.5-100	8014-182SB
Isobutyl acetate	10-400	8014-153U	Pentane	50-1000	8014-113SB*
Isobutyl acrylate	5-60	8014-211U	Pentyl acetate	10-100	8014-210U
Isobutyl alcohol	5-100	8014-208U	Perchloroethylene	5-300	8014-135SA* ³
Isopentyl alcohol	5-100	8014-209U	Phenol	0.5-25	8014-183U
Isoprene	1-16	8014-190U	Phosgene	0.1-0.5 0.5-20	8014-146S ³
Isopropyl acetate	0.01-1.2%	8014-139SB	Phosphine	0.05-2.0	8014-121U ¹
Isopropyl acetate	10-1000	8014-111U	Phosphine	20-700	8014-121SC
Isopropyl alcohol	0.05-2.5%	8014-150SA	Phosphine	0.25-10	8014-121SD
Isopropyl alcohol	20-1200	8014-150U	Phosphine	100-3200	8014-121SH
Isopropyl mercaptan	0.5-10	8014-130U	Phosphine in acetylene	20-800	8014-121SA ^o
Mercaptans	0.5-10	8014-130U	Phosphine in acetylene	5-90	8014-121SB ^o
Mercaptans/H ₂ S	0.5-5/1-30	8014-282S	Propane	0.02-0.5%	8014-125SA
Mercury vapor	0.5-10 0.1-2.0 mg/m ³	8014-142S	Propyl acetate	0.01-1.4%	8014-139SB
Mesityl oxide	5-100	8014-190U	Propyl acetate	20-1000	8014-151U
Methyl acetate	0.01-3.0%	8014-111SA	Propylene	50-1000	8014-185S
Methyl acrylate	5-60	8014-211U	Propylene oxide	0.05-5.0%	8014-163SA
Methyl alcohol	0.05-6.0%	8014-119SA	Silane	0.5-50	8014-240S
Methyl alcohol	20-1000	8014-119U	Smoke tube (Air Flow Indicator)	—	8014-300
Methyl amine	1-20	8014-227S	Styrene	2.5-300	8014-158S



Matheson-Kitagawa Precision Detector Tubes (continued)

Substance To Be Measured	Measuring Range (ppm)	Tube No.
Styrene	1-100	8014-158SB
Sulfur dioxide	0.1-3.0%	8014-103SA
Sulfur dioxide	0.02-0.3%	8014-103SB
Sulfur dioxide — in flue gas	0.02-0.3%	8014-103SF
Sulfur dioxide	20-300	8014-103SC
Sulfur dioxide	1-60	8014-103SD ¹
Sulfur dioxide	0.25-10	8014-103SE
Tetrachloroethylene	5-300	8014-135SA ^{*3}
Tetrachloroethylene	5-160	8014-243U
Tetrachloroethylene	0.2-10	8014-135SB ³
Tetrachloroethylene	0.05-2%	8014-135SH
Tetraethoxysilane	5-160	8014-243U
Tetrahydrofuran	0.05-5.0%	8014-102SA
Tetrahydrofuran	20-500	8014-162U
Toluene	10-500	8014-124SA ^{*1}
Toluene	2-100	8014-124SB
Toluene	100-3000	8014-124SH
1,1,2-Trichloroethane	10-100	8014-236S ^{*3}
Trichloroethylene	0.2-36	8014-134SB ³
Trichloroethylene	5-300	8014-134SA ^{*1,3}
Trichloroethylene	0.05-2%	8014-134SH
Triethylamine	1-20	8014-213S
Trimethylamine	1-20	8014-222S
Trimethylbenzene	10-250	8014-111U
Vinyl acetate	5-120	8014-237S
Vinyl chloride	0.05-1%	8014-132SA
Vinyl chloride	5-500	8014-132SB ^{*3}
Vinyl chloride	0.1-12	8014-132SC ^{*1}
Water vapor	1.7-33.8 mg/l	8014-177SA
Water vapor	0.05-2.0 mg/l	8014-177U
Water vapor	2-12 LB/MMCF	8014-177UR
Water vapor	3-80 LB/MMCF	8014-177UL
Xylene	5-1000	8014-143SA ¹
Xylene	5-200	8014-143SB

Notes: Most tubes are in stock for immediate delivery. Matheson guarantees all tubes will have a minimum of three months shelf life remaining when shipped, although they will typically contain more.

¹ SEI certified.

³ Pending SEI certification.

ppm: parts per million

mg/m³: approximate milligrams of substance per cubic meter of air.

All "S" and "U" tubes are direct reading.

All tubes are packaged 10 tubes per box unless otherwise noted.

* Five detector tubes, five pretreat tubes per box.

** Five detector tubes per box.

+ Five detector tubes per box, each tube for one NO/NO₂ test.

• Orifice to be inserted in 8014-400A or 8014-400B pump before sampling (P/N 8014-001).

³ Requires refrigeration (2-10°C.) for storage

Request Brochure BR-56 and Tech/Brief TB-102-1 and associated tube listing for complete product specifications on Matheson-Kitagawa Gas Detection products.



Matheson-Kitagawa Detector Tubes Used for Dissolved Substances In Solution

Substance To Be Measured	Measuring Range (ppm)	Tube No.
Formaldehyde	0.1-4	8014-171SC
Chloride Ion	10-2000 / 5-40	8014-201SA ³
Chloride Ion	3-200	8014-201SB
Chlorine, residual	0.4-5	8014-234SA
Copper Ion	1-100	8014-203S ³
Cyanide Ion	.2-5	8014-204S ³
Iron Ion	50-400	8014-202 ³
Salinity	0.01-0.8%	8014-205SL
Sulfide Ion	2-1000	8014-200SA
Sulfide Ion	0.5-10	8014-200SB