

---

# Continuous-Flow Analyzers

---

## Multitest Methods

Status: May 2010

### AutoAnalyzer

#### MT7 for water, waste water, soil and plant extracts, fertilizer, etc.

Dual-range with dialyzer for high range. Dialyzer + heating bath 37°

Alkalinity	G-148-95	0-300 to 0-500 mg/L as CaCO <sub>3</sub>		550
Ammonia (salicylate)	G-102-93	0-0.25 to 0-5 mg/L	0-2.5 to 0-25 mg/L as N	660
Ammonia (phenate)	G-102-93	0-0.5 to 0-5 mg/L	0-2.5 to 0-20 mg/L as N	630
Boron	G-214-98	0-2 to 0-15 mg/L	0-10 to 0-90 mg/L	420
Bromide	G-301-04	0-10 to 0-100 mg/L	0-25 to 0-250 mg/L as Br	600
Calcium	G-209-98		0-12 to 0-100 mg/L Ca	570
Chloride	G-133-95	0-10 to 0-100 mg/L	0-25 to 0-250 mg/L	480
Chromium (6 <sup>+</sup> )	G-284-02	0-1 to 0-10 mg/L	0-5 to 0-45 mg/L	550
Fluoride	G-383-08		0-2 to 0-6 mg/L	620
Hardness	G-244-00		0-400mg/L CaCO <sub>3</sub>	520
Iron	G-210-98	0-1.5 to 0-15 mg/L	0-14 to 0-140 mg/L Fe	560
Iodide	G-300-01	0-20 to 0-150 µg/L	0-100 to 0-300 µg/L as I	420
Magnesium	G-315-05	0-1.5 to 0 – 3 mg/L	0-10 to 0-15/90 mg/L	510
Manganese	G-314-05	0-3.75 to 0-30 mg/L		480
Nicotine	G-217-98	0-400 to 0-4000 mg/L	0-2 to 0-10 g/L	460
Nitrate	G-109-94	0-0.3 to 0-2.75 mg/L	0-1 to 0-11 mg/L as N	550
Nitrite	G-109-94	0-0.3 to 0-2.75 mg/L	0-1 to 0-11 mg/L as N	550
Nitrogen, total (NH <sub>3</sub> + NO <sub>3</sub> only)	G-305-04	0-25 to 0-160 mg/L		660
Nitrogen, total Kjeldahl	G-188-97	0-1 to 0-8 mg/L	0-3.5 to 0-25 mg/L as N	660
Phenol	G-360-06	0-2 to 0-20 mg/L		510
Phosphate	G-103-93	0-1.7 to 0-7.5 mg/L	0-10 to 0-50 mg/L as P	660
Phosphate (molybdovanadate)	G-304-04	0-30 to 0-300 mg/L	0-200 to 0-2000 mg/L	420
Phosphorus, total Kjeldahl	G-189-97	0-1.7 to 0-6 mg/L	0-6 to 0-50 mg/L as P	660
Potassium	G-184-96	0-100 mg/L	0-200 mg/L as K <sub>2</sub> O	flame
Silicate	G-147-95	0-6 to 0-60 mg/L	0-30 to 0-300 mg/L as SiO <sub>2</sub>	660
Sodium	G-184-96	0-100 mg/L	0-200 mg/L as Na	flame
Sulfide	G-213-98	0-0.5 to 0-4 mg/L	0-2.0 to 0-12 mg/L as S	660

high range can be extended by factor 3 with smaller sample pump tube

#### MT8 for water

Heating bath 37°

Same as MT7, but low ranges only.

#### MT7A/MT8A for water

Nitrate/Nitrite, Cd-column G-200-97 0-0.35 to 0-2 mg/L 0-0.85 to 0-6.5 mg/L as N 550

Other parameters and ranges as for MT7 and MT8.

**MT7B/MT8B for water**

Nitrate/Nitrite, Cd-coil	G-287-02	0-0.25 to 0-2 mg/L	0-0.9 to 0-10 mg/L as N	550
Other parameters and ranges as for MT7 and MT8.				

**MT11 for water**

Glass only				
Chloride	G-100-93	0-20 to 0-150 mg/L		480
Silicate	G-101-93	0-7.5 to 0-70 mg/L as SiO <sub>2</sub>		660

**MT13 for water (EPA) and waste water**

Dual-range with dialyzer for high range					
Alkalinity (methyl orange)	G-153-95	310.2	0-80 to 0-500 mg/L	0-0.3 to 0-2 g/L as CaCO <sub>3</sub>	550
Chloride	G-152-95	325.2	0-7 to 0-100 mg/L	0-21 to 0-300 mg/L	480
Nitrate	G-139-95	353.2	0-0.25 to 0-2 mg/L	0-0.9 to 0-7 mg/L as N	520
Nitrite	G-140-95	353.2	0-0.2 to 0-1.8 mg/L	0-0.75 to 0-6.5 mg/L as N	520

**MT14 for water (EPA)**

Glass only				
Alkalinity (methyl orange)	G-153-95	310.2	0-80 to 0-500 mg/L as CaCO <sub>3</sub>	550
Chloride	G-152-95	325.2	0-7 to 0-100 mg/L	480
Nitrate	G-139-95	353.2	0-0.25 to 0-2 mg/L as N	520
Nitrite	G-140-95	353.2	0-0.2 to 0-1.8 mg/L as N	520

**MT15 for water (EPA in low range) and waste water**

Dual-range with dialyzer for high range. Dialyzer + heating bath					
Alkalinity (methyl orange)	G-153-95	310.2	0-80 to 0-500 mg/L	0-0.3 to 0-2 g/L as CaCO <sub>3</sub>	550
Ammonia	G-145-95	350.1	0-1.5 to 0-12 mg/L	0-5 to 0-45 mg/L as N	630
Chloride	G-152-95	325.2	0-7 to 0-100 mg/L	0-21 to 0-300 mg/L	480
Nitrate	G-139-95	353.2	0-0.25 to 0-2 mg/L	0-0.9 to 0-7 mg/L as N	520
Nitrite	G-140-95	353.2	0-0.2 to 0-1.8 mg/L	0-0.75 to 0-6.5 mg/L as N	520
Phosphate	G-146-95	365.1	0-1 to 0-10 mg/L	0-8 to 0-80 mg/L as P	660
Silicate	G-151-95		0-5 to 0-30 mg/L	0-23 to 0-200 mg/L as SiO <sub>2</sub>	660
Total Phosphorus (acid digests)	G-202-97	365.4	0-1.5 to 0-5 mg/L	0-5 to 0-20 mg/L as P	660

**MT16 for water (EPA)**

Heating bath				
Alkalinity	G-153-95	310.2	0-80 to 0-500 mg/L as CaCO <sub>3</sub>	550
Ammonia	G-145-95	350.1	0-1.5 to 0-12 mg/L as N	630
Chloride	G-152-95	325.2	0-7 to 0-100 mg/L	480
Nitrate	G-139-95	353.2	0-0.25 to 0-2 mg/L as N	520
Nitrite	G-140-95	353.2	0-0.2 to 0-1.8 mg/L as N	520
Phosphate	G-146-95	365.1	0-1 to 0-10 mg/L as P	660
Silicate	G-151-95		0-5 to 0-30 mg/L as SiO <sub>2</sub>	660
Total Nitrogen (acid digests)	G-310-04	351.2	0-0.5 to 0-4 mg/L as N	660
Total Phosphorus (acid digests)	G-202-97	365.4	0-1.5 to 0-5 mg/L as P	660

**MT16B for water (EPA)**

Heating bath, Cd coil				
Nitrate, nitrite	G-309-04	353.2	0-0.2 to 0-2 mg/L as N	550



### MT17 for water and soil extracts

UV digester, heating bath			
Total and free dissolved Iron	G-306-04	0-0.5 to 0-5 mg/L as Fe	550
Total Nitrogen	G-157-96	0-1 to 0-20 mg/L as N	550
Total Phosphorus	G-092-93	0-5 to 0-45 mg/L as P	660

### MT18 for seawater and low level water

Heating bath				
Nitrite	G-173-96	0-4.2 to 0-84 µg/L	0-84 to 0-700 µg/L as N	550
Phenol	G-285-02	0-200 to 0-4000 µg/L		505
Phosphate	G-175-96	0-0.15 to 0-1.9 mg/L	0-1.7 to 0-17 mg/L as P	880
Total P in persulfate digests	G-175-96	0-0.15 to 0-1.9 mg/L	0-1.7 to 0-17 mg/L as P	880
Phosphorus, total Kjeldahl	G-270-01	0-5 to 0-50 mg/L as P		880

### MT19 for seawater and low level water

Heating bath + Cd column for nitrate				
Aluminium	G-381-07	0-0.1 to 0-0.8 mg/L	0-1 to 0-8 mg/L	600
Ammonia	G-171-96	0-42 to 0-380 µg/L	0-0.35 to 0-4.2 mg/L as N660/630	
Colour	G-302-04	0 - 70 to 0-250 Pt units		440
Chloride	G-279-01	0-6 to 0-40 mg/L	0-60 to 0-400 mg/L	480
Copper	G-311-04	0-1 to 0-4.5 mg/L		480
Iron (acidified samples)	G-290-03	0 - 0.1 to 0 - 4.4 mg/L		550
Manganese	G-303-04	0-0.3 to 0-7.5 mg/L		480
Nitrate	G-172-96	0-40 to 0-650 µg/L	0-700 to 0-7000 µg/L as N	550
Total N in persulfate digests	G-172-96	0-40 to 0-650 µg/L	0-700 to 0-7000 µg/L	550
Nitrogen, total Kjeldahl	G-225-99		0 - 2.2 to 16.8 mg/L	660
Phosphate	G-297-03	0-50 to 0-500 µg/L as P		880
Phosphorus, total Kjeldahl	G-371-07		0 - 5 to 0 - 15 mg/L	880
Silicate	G-177-96	0-0.5 to 0-6 mg/L	0-7 to 0-60 mg/L as SiO <sub>2</sub>	820
Sulfide	G-372-07	0-0.15 to 0-1.5 mg/L	0-1.5 to 0-15 mg/L as S	660
Zinc	G-316-05	0-20 to 0-60 mg/L		630

### MT19B for seawater and low level water

Nitrate/Nitrite, Cd-coil	G-384-08	0-14 to 0-560 µg/L	0-140 to 0-5600 µg/L as N	550
--------------------------	----------	--------------------	---------------------------	-----

### MT21 for water

Distillation bath				
Cyanide	G-215-98	0-60 to 0-500 µg/L	0-0.7 to 0-6 mg/L as CN	570
Phenol	G-216-98	0-500 to 0-8000 µg/L	0-7 to 0-50 mg/L	510

### MT23 for seawater

UV-digester, heating bath 95°C				
Phosphorus, total	G-219-98	0-300 to 0-3000 µg/L as P		880
Nitrogen, total	G-218-98	0-80 to 0-500 µg/L as N		550

**MT24 for tobacco**

Dialyzer, heating bath 37°C

Nitrate	G-265-01	0-18 to 0-150 mg/L as N	520
Total Alkaloids	G-264-01	0-200 to 0-1600 mg/L as nicotine	460
Ammonia	G-266-01	0-4 to 0-30 mg/L as NH <sub>3</sub>	660
Chloride	G-267-01	0-125 to 0-1000 mg/L as Cl <sup>-</sup>	480
TKN	G-273-01	0-10 to 0-100 mg/L	660
Phosphate	G-355-06	0-15 to 0 -100 mg/L P	660

**MT25 for tobacco**

Distillation bath

Total volatile Bases	G-268-01	0-10 to 0-75 mg/L as NH <sub>3</sub>	420
Total volatile Acidity	G-269-01	0-200 to 0-1400 mg/L as acetic acid	420

**MT26 for tobacco**

Dialyzer, heating bath 37°C

Nitrate	G-280-02	0-0.5 to 0-4.5 mg/L as N	520
TKN	G-281-02	0-4 to 0-60 mg/L as N	660

**MT27 for tobacco**

Dialyzer, heating bath 37°C

Chloride	G-282-02	0-45 to 0-250 mg/L as Cl	480
Total alkaloids (Nicotine)	G-283-02	0-200 to 0-2000 mg/L Nicotine	460

**MT29 for water**

Glass, without distillation

Cyanide	G-342-06	0-25 to 0-450 µg/L as CN	570
Phenol	G-341-06	0-200 to 0-500 µg/L	505

**MT30 for fertilizer**

heating bath 37°C, 2 dilution loops

Ammonia	G-353-06	0-20 to 0-180 mg/L	0-80 to 0-720 mg/L as N	660
Nitrate	G-354-06	0-7 to 0-45 mg/L	0-28 to 0-180 mg/L as N	550

**MT32 for waste water**

heating bath 37°C, dialyzer, dilution loop

Ammonia	G-404-10	0-9 to 0-90 mg/L N (max. range)	550
Nitrite	G-403-10	0-2.3 to 0-23 mg/L N (max. range)	550
Phosphate	G-404-10	0-20 to 0-200 mg/L P (max. range)	880

**MT32A for waste water**

heating bath 37°C, dialyzer, Cd column, dilution loop

Nitrate / Nitrite	G-402-10	0-3 to 0-30 mg/L N (max. range)	550
-------------------	----------	---------------------------------	-----

# QUAATRO

## MT1 for water

Glass				
Alkalinity	Q-021-04	0-80 to 0-500 mg/L as CaCO <sub>3</sub>	310.2	550
Ammonia (EPA)	Q-022-04	0-0.3 to 0-7 mg/L as N	350.1	660
Chloride (EPA)	Q-023-04	0-15 to 0-200 mg/L as Cl	325.1	480
Hardness (EPA)	Q-059-05	0-200/400 mg/L as CaCO <sub>3</sub>	130.1	520
Nitrate/Nitrite (EPA)	Q-020-04	0-0.2 to 0-5 mg/L as N	353.1	520
Nitrite (EPA)	Q-019-04	0-0.2 to 0-4 mg/L as N	353.2	520
Nitrogen, tot. Kjeldahl	Q-024-04	0-0.2 to 0-7.5 mg/L as N	351.2	660
Phosphate (EPA)	Q-025-04	0-0.4 to 0-12 mg/L as P	365.1	660
Phosphorus, tot. Kjeldahl	Q-026-04	0-0.5 to 0-12 mg/L as P	365.4	660
Silicate	Q-027-04	0-1.5 to 0-75 mg/L as SiO <sub>2</sub>	-----	660

## MT1A for water

Glass, Cd coil				
Nitrate/Nitrite (EPA)	Q-044-04	0-0.15 to 0-4.5 mg/L as N	353.2	520

## MT3 for seawater and low level water

Dual-range (automatic changeover with QuAAtro range-switch option)

### MT3 A

Glass				
Chloride	Q-029-05	0-2 to 0-10 mg/L	0-8 to 0-250 mg/L	480
Nitrite	Q-030-04	0-0.021 to 0-0.8 mg/L	0-0.56 to 0-2.8 mg/L N	520
Phosphate	Q-031-04	0-0.062 to 0-3 mg/L	0-0.248 to 0-12 mg/L as P	880
Tot. Phosphorus (microw. dig.)	Q-032-05	0-62 to 0-3100 µg/L	0-248 to 0-12400 µg/L	880
Tot Kjeldahl Phosphorus	Q-085-07	0-0.25 to 0-1 mg/L		880

### MT3 B

Glass				
Ammonia	Q-033-04	0-70 to 0-3360 µg/L	0-280 to 0-12600 µg/L N	660
Chloride	Q-034-05	0-2 to 0-10 mg/L	0-8 to 0-250 mg/L	480
Chromium	Q-051-05	0 – 400 to 0 – 6000 µg/L Cr		550
Nitrate	Q-035-04	0-35 to 0-1750 µg/L	0-140 to 0-5600 µg/L N	550
Tot. Nitrogen (Kjeldahl digests)	Q-036-05	0-420 to 0-14000 µg/L		660
Phosphate	Q-037-05	0-155 to 0-2400 µg/L	0-0.6 to 0-7.7 mg/L as P	880
Silicate	Q-038-04	0-0.3 to 0-4.2 mg/L	0-1 to 0-12 mg/L as SiO <sub>2</sub>	820
Sulfide	Q-108-09	0-0.3 to 0-4 mg/L	0-1 to 0-18 mg/L S	660

### MT3 A

Glass, ADM (digestion)				
Tot. Phosphorus	Q-114-10	0-150 to 0-8000 µg/L P		880

### MT3 B

Glass, ADM (digestion)				
Tot. Nitrogen	Q-113-10	0-400 to 0-9000 µg/L N		550

### MT3 P

Glass, ADM (distillation)				
Cyanide	Q-111-10	0-50 to 0-1550 µg/L CN		570
Phenol	Q-110-10	0-1 to 0-60 mg/L Phenol		505



### MT4 for water

for use with on-line distillation

Cyanide	Q-053-04	0-70 to 0-550 µg/L as CN	570
Phenol	Q-052-04	0-250 to 0-7500 µg/L	510

### MT9 for water and waste water

Dual-range with dialyzer for high range.

Ammonia	Q-001-04	0-0.25 to 0-8 mg/L	0-2 to 0-90 mg/L as N	660
Calcium	Q-010-05	0-10 to 0-200 mg/L as Ca		570
Chloride	Q-006-04	0-9 to 0-110 mg/L	0-60 to 0-650 mg/L as Cl	480
Hardness	Q-012-05	0-70 to 0-500 mg/L as CaCO <sub>3</sub>		520
Nitrate/Nitrite	Q-003-04	0-0.08 to 0-3 mg/L	0-0.6 to 0-30 mg/L as N	550
Nitrate/Nitrite/ T.O.N.	Q-002-04	0-0.25 to 0-3 mg/L	0-0.8 to 0-30 mg/L as N	550
Phosphate	Q-004-04	0-0.35 to 0-6 mg/L	0-5 to 0-100 mg/L as P	880
Silicate	Q-005-04	0-0.5 to 0-60 mg/L	0-6.5 to 0-650 mg/L as SiO <sub>2</sub>	820
Total Kjeldahl Nitrogen	Q-016-05	0-0.2 to 0-5.5 mg/L	0-1.5 to 0-45 mg/L as N	660
Total Kjeldahl Phosphorus	Q-017-05	0-0.35 to 0-10.5 mg/L	0-5 to 0-165 mg/L as P	660

### MT10 for water

Glass				
Alkalinity	Q-007-05	0-500 mg/L as CaCO <sub>3</sub>	550	
Ammonia	Q-001-04	0-2 to 0-90 mg/L as N		660
Chloride	Q-006-04	0-9 to 0-110 mg/L as Cl		480
Nitrate/Nitrite	Q-003-04	0-0.08 to 0-3 mg/L as N		550
Nitrate/Nitrite/T.O.N.	Q-002-04	0-0.25 to 0-3 mg/L as N		550
Phosphate	Q-004-04	0-0.35 to 0-6 mg/L as P		880
Silicate	Q-005-04	0-0.5 to 0-60 mg/L as SiO <sub>2</sub>		820
Total Kjeldahl Nitrogen	Q-016-05	0-1.5 to 0-45 mg/L as N		660
Total Kjeldahl Phosphorus	Q-017-05	0-5 to 0-165 mg/L as P		660

### MT28 for water

Glass, dual-range (automatic changeover with QuAAtro range-switch option)

Cyanide (EPA)	Q-061-05	0-100 to 0-5000 µg/L	0-250 to 0-2500 µg/L as CN	570
Fluoride	Q-062-05	0-1 to 0-3 mg/L	0-5 to 0-15 mg/L as F	620
Phenol (EPA)	Q-060-05	0-200 to 0-7500 µg/L	0-1100 to 0-42500 µg/L	510

### MT31 for seawater and low level water

Glass, heating bath, dual-range (automatic changeover with QuAAtro range-switch option)

Ammonia	Q-084-07	0-140 to 0-5600 µg/L	0-0.6 to 0-25 mg/L N	660
---------	----------	----------------------	----------------------	-----