



Nitrate Ion Sensors



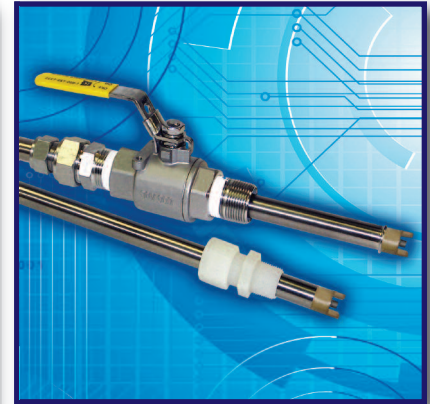
ELECTRO-CHEMICAL DEVICES

Features

- MVS10 or MVS17 Style Sensors
- Multiple materials of construction
- Integral Signal Conditioner
- Replaceable Electrode Cartridge
- Dual Channel Analyzers, pH/pION, pION/pION

Benefits

- Insertion, Immersion or Valve Retractable Service
- 316 Stainless Steel, Titanium, Hastelloy
- Noise free transmission
- Simple and Economical Service
- Mix and Match your choice of measurements



Model MVS10/MVS17
Nitrate Ion Sensors

Description

The MVS10 and MVS17 sensors provide a stable and economical platform for the in line measurement of pH, ORP, Specific Ion, Dissolved Oxygen, Conductivity or Resistivity. The MVS10 is an insertion or immersion style sensor for use in pipe Tees or on the end of a Stand Pipe for immersion into a tank or pond. The MVS17 is a valve retractable design allowing insertion or removal of the sensor into a pipe without interrupting the process flow. Both sensor designs use easily replaceable electrode cartridges. ECD offers several ion selective electrode cartridges suitable for continuous online measurement.

The Nitrate Ion Electrode is a combination electrode with a sensing element made of a PVC membrane containing an ion exchanger and a double junction reference electrode. The nitrate Ion Selective Electrode cartridge develops a millivolt potential proportional to the concentration of nitrate ions in the measured solution. The typical output is 50mV to 60mV per decade of change in concentration. The speed of response varies from a few seconds in concentrated solutions up to a few

minutes in the lower ppm ranges. The Nitrate Ion sensors are used with either the T23, 4-20 mA Transmitter, or the C22 Controller with its dual channel mix and match capabilities. These analyzers will measure nitrate ions from 0.1 ppm to 14,000 ppm autoranging the display between the ppb, ppm and ppt (parts per thousand) scales.

The Nitrate Ion Electrode is an ion exchange sensor that is selective for nitrate ions but many anions also interact with the sensing membrane. Chlorate, iodide, cyanide and chlorite ions all strongly interfere with the measurement. Bromide, bisulfide and nitrite interact at 20 to 40:1 with chloride, carbonate and bicarbonate interacting 250 to 500:1. The chloride ion is very common in water and with 250 chloride ions generating the same signal as 1 nitrate ion, care must be taken in low level measurements, Chloride Compensation is available on the C22 dual channel analyzer.

The sensor is calibrated using two standard solutions differing in concentration by a factor of 10, i.e. 10 ppm and 100 ppm. The calibration sets the slope of the electrode, mV/decade, and the zero potential for the sensor.

The process solution's ionic strength, temperature and pH value may differ widely from the calibration solution. These factors will affect the zero potential of the nitrate sensor causing an offset, but they will typically not affect the slope. To eliminate the offset perform a standardization. Once the sensor has stabilized in the process solution take a grab sample from the process and determine the nitrate ion concentration. Adjust the analyzer to read this laboratory determined value. It is recommended to verify the readings on a weekly basis.



Model T23 Transmitter



Model C22 Analyzer

Nitrate Ion Sensors

Specifications

MVS10 and MVS17 Sensors

Combination electrode cartridge with a PVC/ion xchgr measurement cell and a double junction, KNO₃/KCl /AgCl, reference electrode, signal conditioner, ATC

Electrode Slope

54 ± 5 mV per decade of concentration change

Measurement Range

Nitrate: 0.1 ppm to 14,000 ppm (3-11 pH)
7 x 10⁻⁶ molar to 1 molar NO₃

Temperature Range

0° C to 40° C (32° F to 104° F)

Pressure Range

0 - 50 psig (0 - 3.5 barg)

Response Time

T90 in 10 seconds

Electrode Life

3 to 6 months

Interfering ions

CIO₄, CIO₃, I, CN, Br, NO₂, HS, HCO₃, CO₃, Cl,

Wetted Materials

Radel, epoxy, PVC, PTFE, 316 SS, Viton O-Ring

Process Connections

MVS10 ¾" MNPT compression fitting

MVS17 1" MNPT Ball Valve

T23 Transmitter

General purpose, ½ DIN, NEMA 4X, 24 VDC 4-20 mA loop powered Transmitter, CE Marking, Auto ranging display, ppb → ppm → ppthousand

C22 Analyzer/Controller

General purpose, ½ DIN, NEMA 4X, 110/220 VAC, CE Marking, single or dual channel, with or without pH compensation, (1) 4-20 mA output and (2) Alarm Relays per channel, Auto ranging display, ppb → ppm → ppthousand

Part No.	Model and Product Description
1418060.3000.NO3	MVS10-C22-CBL-EG-2005086.VIT, NO ₃ ⁻ ISE sensor, 316 SS body, ¾" Diameter. x 10" length, 10 ft cable
1414060.3000.NO3	MVS10-T23-CBL-EG-2005086.VIT, NO ₃ ⁻ ISE sensor, 316 SS body, ¾" Diameter. x 10" length, 10 ft cable
1419060.3000.NO3	MVS17-C22-CBL-EG-2005086.VIT, NO ₃ ⁻ ISE sensor, 316 SS body, ¾" Diameter. x 17" length, 10 ft cable
1415060.3000.NO3	MVS17-T23-CBL-EG-2005086.VIT, NO ₃ ⁻ ISE sensor, 316 SS body, ¾" Diameter. x 17" length, 10 ft cable
1900101.0042	Model T23 Nitrate Ion transmitter, 24VDC loop powered, Universal Mounting Bracket (UMB)
16B01221.S000	Model C22 Nitrate Ion Analyzer, 110/220 VAC, (1) 4-20 mA output, (2) Alarm Relays, UMB
16BB2421.SS00	Model C22 2 Channel Nitrate Analyzer, 110/220 VAC, (2) 4-20 mA outputs, (4) Alarm Relays, UMB
16BA2421.S100	Model C22 pH & Nitrate Ion Analyzer, 110/220 VAC, (2) 4-20 mA outputs, (4) Alarm Relays, UMB

Part No.	Spare Parts and Accessories Description
2005086.VIT	Nitrate Ion Electrode, Radel body, double junction Teflon Ref, 0.1 ppm -14,000 ppm, 0°-80°C
2010451	Nitrate Ion Calibration Solution, 1 ppm, 500 ml
2010465	Nitrate Ion Calibration Solution, 10 ppm, 500 ml
2010452	Nitrate Ion Calibration Solution, 100 ppm, 500 ml
2005145.VIT	General Purpose pH electrode cartridge, double junction reference, 0-14 pH, 0°-100°C
3600064	MVS10 Compression Gland Fitting, all polypropylene, ¾" MNPT to ¾" tube fitting
2000072	MVS10 Compression Gland Fitting, 316 SS with Teflon ferrule, ¾" MNPT to ¾" tube fitting
2000264	MVS10 Immersion Assembly, 5 ft. x 1" stand pipe, ¾" FNPT fitting and T handle, requires 3600064
2000743	MVS17 Valve Retraction Assembly, polypropylene, 1" ball valve, 1" x ¾" tube fitting and safety lanyard.
2000745	MVS17 Valve Retraction Assembly, 316 SS, 1" ball valve, 1" x ¾" tube fitting and safety lanyard.

Specifications subject to change without notice.

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