Engineering Specifications

9245 Sodium analyzer

General

The sodium analyzer shall be continuous monitoring 1 channel, using ion selective electrode measurement method after pH conditioning and temperature compensation.

The analyzer shall have a:
- A measuring range of 0.01 to 10'000ppb freely programmable,
- A response time less than 3 minutes for a step change of 0.1ppb to 10ppb,
- A reproducibility <1.5% of reading or <±0.02 ppb, whichever is greater within 10°C,
- An accuracy <5% of the reading or <±0.1 ppb, whichever is greater.

The analyzer shall provide as a standard:
- sample quick-loop at the bottom of the analyzer for an immediate fresh sample,
- minimum sample flow detection and associated alarms,
- vessel for manually introduced grab sample and fully automatically return to on-line measurement,
- pH conditioning using siphon effect of a liquid sample column with pH set-point programmable,
- temperature compensation based on Iso-thermal point,
- automatic reactivation of sodium electrode by injection of non-hazardous chemical,
- all items mounted on a panel.

The analyzer shall be manufactured per ISO 9001-2000, and comply with CE and UL regulations. The transmitter shall be NEMA4X / IP65 certified, with enclosure in aluminum with stove enameled polyester coating.

Display

The analyzer shall be freely programmable in range with a graphical dot matrix 128 x 128 pixels display of 75 x 75 mm (2.95 x 2.95 in) and LED backlighting.

Display information

Main display shall contain:
- sample name, latest concentration of sodium measured and temperature,
- bar graph tracker of the current analysis in progress and time clock,
- sample trend curve over the last 24h,
- alarm occurrence.

Auxiliary display shall be available without measurement interruption through a "one button" operation and contains:
- potential and temperature value of the current analysis,
- sample name, concentration and timing of latest 4 concentrations measured, analyzer status with sample inhibitions, warning messages, alarm status with threshold value.

User interface

The analyzer shall have worded operation menus in five languages (English, French, German, Spanish and Italian).

Calibration modes

The analyzer shall have calibration by manual introduction of standard solution.

For applications lower than 10ppb sodium, the analyzer shall propose a fully automated calibration based on known addition principle, using only ppm standard solutions to perform one or two point automatic calibration, because it's easier to prepare and more stable.

The analyzer shall have slope or offset calibration:
- manually or fully automated,
- with frequency programmable on a fixed date mode or number of hours.

Calibration data

The analyzer shall self-check new calibration parameter and generates warning or alarm messages if deviation from primary calibration parameter. It shall have a menu for quick comparison of last calibration parameters.

Engineering Specifications

Security

The analyzer shall have three password protected access levels for transmitter calibration, programming and maintenance.

Alarms

The analyzer shall have 2 programmable alarm relays assigned to any of the following:
- concentration limits including direction, delay, hysteresis and normal relay status,
- minimum sample flow rate detection,

The analyzer shall have 2 extra programmable relays allocated to:
- warning messages (reagent level low, small calibration deviation),
- system alarms (no reagents, no sample, no calibration, no power supply)

Outputs

The analyzer shall have 4 of isolated analog outputs to be configured in 0 or 4-20 mA. Three outputs can be assigned to sample concentration, temperature or potential on any channel. The user shall be able to configure any scale in linear or bi-linear mode.

An extra output shall be configurable to report events like calibration occurrence, warning messages, system alarms, within the three possibilities of "live", "last", or "preset".

The transmitter shall have both capabilities of calibration and simulation of the analog output value. Additional digital outputs Jbus / Modbus, Profibus DP shall be available.

Diagnostic tools

The analyzer shall have diagnostic functions:
- data logger of 3'200 lines,
- worded warning or alarm messages for concentration, reagent, calibration, minimum sample flow,
- guided menu for typical maintenance procedure (start-up, reagent refill, long-term stop),
- independently turn on and off each electrical component,
- retrieve raw signal values during calibrations,
- default values loadable,
- software version.

Sample conditioning and hydraulic assembly

The analyzer shall have reagent and calibration solution with minimum cost of ownership through:
- constant buffering capacity from a highly absorbent cartridge plunging down to the bottom of the reagent bottle,
- choices for conditioning reagent including ammonia (NH3), monoethylamine (MEA), diethylamine (DEA), diisopropylamine (DIPA),
- non proprietary reagents and fast bottle substitution,
- reagent autonomy of minimum 50 days,
- no use of forcing gases or permeation tubing,
- no request for manual rejuvenation (HF etching) of electrode,
- injection of calibration solution with ceramic pulse pumps.

The analyzer shall have a sequential constant head system with:
- minimum flow detection per sample,
- manual introduction of off-line sample,
- required volumes for grab sample no greater than 250mL.

The analyzer shall have accessories:
- a fully automated calibration based on known addition principle for an utmost accuracy,
- an enclosure for better safety of personnel (no tubes or cables hanging loose) and providing visibility for electrodes and main hydraulic segments,
- enhanced conditioning type for highly acidic water of samples after cation exchangers. Measuring range amended for a 1 to 200ppm freely programmable.

Warranty

The analyzer shall be warranted for one full year against defects in materials and workmanship.

Model identification

The instrument shall be Hach Ultra Polymetron 9245 Sodium analyzer.

Engineering Specifications

9240 Sodium analyzer

General

The sodium analyzer shall be continuous monitoring multi-channel, using ion selective electrode measurement method after pH conditioning and temperature compensation.

The analyzer shall have a:
- A measuring range of 0.01 to 10'000ppb freely programmable,
- Auto-adapted rinsing sequence to reach accuracy in a minimized cycle time (10 minutes possible). This eliminates carry-over effect and maximizes number of readings per channel per unit of time.
- A reproducibility <1.5% of reading or <±0.02 ppb, whichever is greater within 10°C,
- An accuracy <5% of the reading or <±0.1 ppb, whichever is greater.

The analyzer shall provide as a standard:
- sample quick-loop at the bottom of the analyzer for an immediate fresh sample,
- minimum sample flow detection and associated alarms,
- overflow vessel to allow variations in inlet pressures and for manually introduced sample,
- manually prompted sample shall be followed by an automatic return to on-line measurement,
- pH conditioning using siphon effect of a liquid sample column with pH set-point programmable,
- temperature compensation based on Iso-thermal point,
- regulated conditioning addition across sample pH and temperature changes
- automatic reactivation of sodium electrode by injection of non-hazardous chemical,
- all-integrated analyzer and sequencing system.

The analyzer shall be manufactured per ISO 9001-2000, and comply with CE and UL regulations. The transmitter shall be NEMA4X / IP65 certified, with enclosure in aluminum with stove enameled polyester coating.

Display

The analyzer shall be freely programmable in range with a graphical dot matrix 128 x 128 pixels display of 75 x 75 mm (2.95 x 2.95 in) and LED backlighting.

Display information

Main display shall contain:
- sample name, latest concentration of sodium measured and temperature,
- bar graph tracker of the current cycle in progress and time clock,
- sample trend curve over time,
- alarm occurrence.

Auxiliary display shall be available without measurement interruption through a "one button" operation and contains:
- potential and temperature value of the current analysis,
- sample name, concentration and timing of latest concentration measured per channel,
- analyzer status with sample inhibitions, warning messages, alarm status with threshold value.

Built-in data logger shall allow display of measurement values, calibration results and alarm information to over 3'200 data.

User interface

The analyzer shall have worded operation menus in five languages (English, French, German, Spanish and Italian).

Calibration modes

The analyzer shall have a fully automated calibration based on known addition principle, using only ppm standard solutions to perform one or two points automatic calibration, because it's easier to prepare and more stable.

The analyzer shall also have calibration by manual introduction of standard solution, to serve personal who has standardized on this practice.

The analyzer shall have slope or offset calibration:
- manually or fully automated,
- with frequency programmable on a fixed date mode or number of hours.

Calibration data

The analyzer shall self-check new calibration parameter and generates warning or alarm messages if deviation from primary calibration parameter. It shall have a menu for quick comparison of last calibration parameters.

Engineering Specifications

Security

The analyzer shall have three password protected access levels for transmitter calibration, programming and maintenance.

Alarms

The analyzer shall have 4 programmable alarm relays assigned to any of the following:
- channel selection
- concentration limits including direction, delay, hysteresis and normal relay status,
- minimum sample flow rate detection,

The analyzer shall have 2 extra programmable relays allocated to:
- warning messages (stabilization not reached, reagent level low, small calibration deviation),
- system alarms (no reagents, no sample, no calibration, no power supply)

Outputs

The analyzer shall have 6 of isolated analog outputs to be configured in 0 or 4-20 mA. Five outputs can be assigned to sample concentration, temperature or potential on any channel. The user shall be able to configure any scale in linear, bi-linear mode or logarithmic.

An extra output shall be configurable to report "life signal" of the electrode converted in concentration.

The user can report events like calibration occurrence, warning messages, system alarms, within the three possibilities of "live", "last", or "preset". The transmitter shall have both capabilities of calibration and simulation of the analog output value.

Additional digital outputs Jbus / Modbus, Profibus DP shall be available.

Diagnostic tools

The analyzer shall have diagnostic functions:
- data logger of 3'200 lines,
- worded warning or alarm messages for concentration, reagent, calibration, minimum sample flow,
- guided menu for typical maintenance procedure (start-up, reagent refill, long-term stop),
- independently turn on and off each electrical component,

- retrieve raw signal values during calibrations,
- default values loadable,
- software version.

Sample conditioning and hydraulic assembly

The analyzer shall have reagent and calibration solution with minimum cost of ownership through:
- constant buffering capacity from a highly absorbent cartridge plunging down to the bottom of the reagent bottle,
- choices for conditioning reagent including ammonia (NH3), monoethylamine (MEA), diethylamine (DEA), diisopropylamine (DIPA),
- non proprietary reagents and fast bottle substitution,
- reagent autonomy of minimum 50 days,
- no use of forcing gases or permeation tubing or pH electrode,
- no request for manual rejuvenation (HF etching) of electrode,
- injection of calibration solution with ceramic pulse pumps.

The analyzer shall have a sequential constant head system with:
- minimum flow detection per sample,
- manual introduction of off-line sample,
- required volumes for grab sample no greater than 250mL.

The analyzer shall have accessories:
- easy up-gradable number of channels,
- static heat exchanger system capable 1-4channels absorbing changes of heat,
- an enclosure for better safety of personnel (no tubes or cables hanging loose) and providing visibility for electrodes and main hydraulic segments,
- enhanced conditioning type for highly acidic water of samples after cation exchangers. Measuring range amended for a 1 to 200ppm freely programmable.

Warranty

The analyzer shall be warranted for one full year against defects in materials and workmanship.

Model identification

The instrument shall be Hach Ultra Polymetron 9240 Sodium (multi) analyzer.