

ELECTRO - CHEMICAL DEVICES, INC.

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SPECIFICATION SUMMARY SPECIFIC ION (pIon) SENSOR SPECIFICATION Models MVS10 & MVS17

MEASUREMENT RANGE:

Electrode dependent, refer to the desired Specific ion specification sheet. Ions available include: bromide, calcium, chloride, fluoride, potassium, silver, sodium, sulfide, and cyanide.

OUTPUT:

Signal conditioned output, intrinsically-safe.

SIGNAL CONDITIONER:

Integral to sensor. Four types available:
T23: Models T23, T28, & T21 transmitter
C22: Model system C22

POWER SUPPLY:

Provided by the transmitter.

OPERATING TEMPERATURE:

Electrode dependent. Refer to the appropriate electrode specification sheet.

OPERATING PRESSURE:

Electrode dependent. Refer to the appropriate electrode specification sheet.

DIMENSIONS:

PHS0*: 0.75" dia x 13.75" lg.
(1.9 cm x 34.9 cm)
PHS17*: 0.75" dia x 24.00" lg.
(1.9 cm x 60 cm)

Dimensions are housing diameter x length of sensor.
S10 sensor length is measured from front of seal guard to rear of strain relief.
S17 sensor length is measured from front of the fully extended valve retraction assembly to the rear of the extension assembly.

SHIPPING WEIGHT:

PHS10: 2.50 lbs (1.13 kgs)
PHS17: 2.75 lbs (1.25 kgs)
PHS17-VSS: 5.80 lbs (2.63 kgs)

HOUSING MATERIALS:

Standard: 316 stainless steel
Optional: Titanium, grade 2 (T)
Hastelloy C22 (H)
Kynar, PVDF (K)

O-RING MATERIALS:

Standard: Viton (VIT)
Optional: EPR (EPR)
Fluorosilicone (FSIL)
Silicone (SIL)
Kairez (KLZ)
CV75 (CV75)
HF resistant Viton (VIT75)

CABLE:

Standard: 10 feet
Optional: Specify in 10' increments.
Maximum: 3 miles
T23 Type: 6-conductor shielded (Belden 8786)
C22 Type: 6-conductor shielded (Belden 8786)

PROCESS CONNECTIONS: (optional)

MVS10 -75 3/4' 316ss gland fitting with nylon ferrule.
-75HT 3/4" 316ss gland fitting with Teflon ferrule.
-75SF 3/4" 316ss gland fitting with stainless steel ferrule.
-75TFE 3/4" all Teflon gland fitting.
-100 1" all Teflon gland fitting (Kynar housings only)

MVS17: -VSS 1" 316ss valve-retraction assembly.
-VKY 1" Kynar valve-retraction assembly.

All sensors ordered with valve-retraction assemblies are provided with safety lanyards.

TEMPERATURE COMPENSATION:

Automatic, temperature compensation through customized Isopotential point algorithms.
Accuracy within +/- 0.2°C over the full temperature range.
Uses a 3,000 ohm Balco RTD, integral to sensor.

**SENTINEL DIAGNOSTIC FEATURE:

Option allowing for continuous monitoring of the degradation of the internal reference fill solution.

* The S17 sensor includes an extension assembly. The S10 sensor does not.

** The "SENTINEL" Pre-pHault diagnostic feature is patent pending.



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Application Note: Calcium Ion

Calcium Application Overview

Water hardness is caused by the presence of calcium and magnesium carbonates. The ratio of calcium to magnesium is generally fixed geographically, typically in the ratio 3:1 (Ca:Mg), therefore Total Hardness can be inferred by knowing the amount of calcium present. The unit of measurements are usually milligrams/liter CaCO₃ (calcium carbonate) or ppm CaCO₃ and a normal working range is 0.1 - 10 ppm.

The most common method of softening is by ion exchange using resin beds (traditionally referred to as Sodium Zeolite). The sodium ion attached to the resin is exchanged for the calcium and magnesium ions. Another method is "precipitation" (lime), but this is gradually being replaced by ion exchange. The same ECD equipment will work for both methods; check with ECD if this is to be a hot lime process.

Magnesium is more soluble than calcium and so it is more readily replaced by the sodium. This means the first indication that the softener train is failing is the increase of calcium in the effluent. The ECD measurement/control package is used to detect this "breakthrough" of calcium, indicating the need for the bed to be regenerated and a new bed to be switched in.

Sodium Zeolite does not reduce the alkalinity of the softened water; in some installations a hydrogen zeolite softener is run in parallel to the sodium and the resulting effluents blended to give the desired pH (this provides an opportunity to quote for pH). The softener regeneration requires acids or bases (depending on the exchange method) requiring Conductivity measurement, as % acid or % base.

Suggested (typical) hardware

The transmitter: T23-CA/MA-SP1-UM, the SP1 option for the control relays. Set points are set in "ON-OFF" ppm values.

The sensor: MVS17-T23-CBL-EG-VSS-2005043.VIT Valve retractable calcium ion sensor with "En-Garde" style p/n 2005043.VIT calcium ion electrode and Viton o-rings.

The patent pending Pre pHault "Sentinel" diagnostic feature is available on all selective ion sensors and transmitter. Contact

Common uses for soft water include:

Pretreatment to demineralization, steam production (feedwater), rinse water for dyes and container washing, and specific problems such as soap blending.

Wet chemistry option:

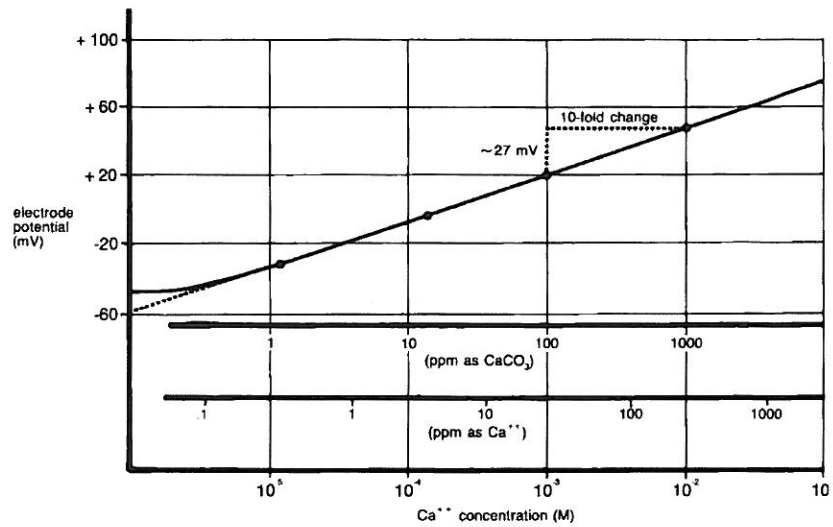
"Wet chemistry" titration is often used for analysing hardness, but this equipment tends to be hard to maintain, require extensive reagent supplies and is expensive compared to an electrode measurement.

Potential Users Include:

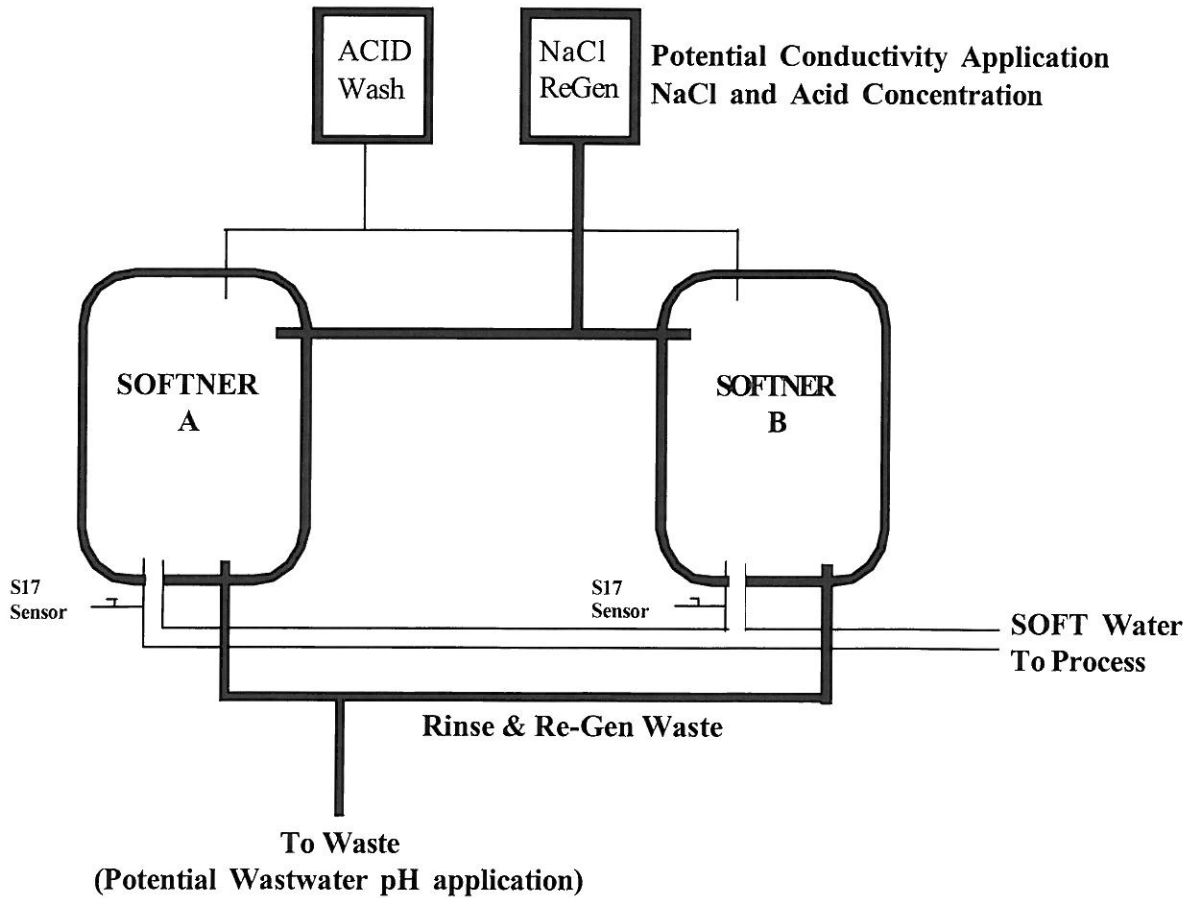
1. Electric Utilities
2. Water Treatment Companies
3. Textile Industry (dyeing & finishing)
4. Industrial Boiler Plants
5. High-Purity Water Users
6. Plant and Parts Washing

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Typical Calcium Electrode Calibration Curve



Typical Dual Softener Application for Hardness