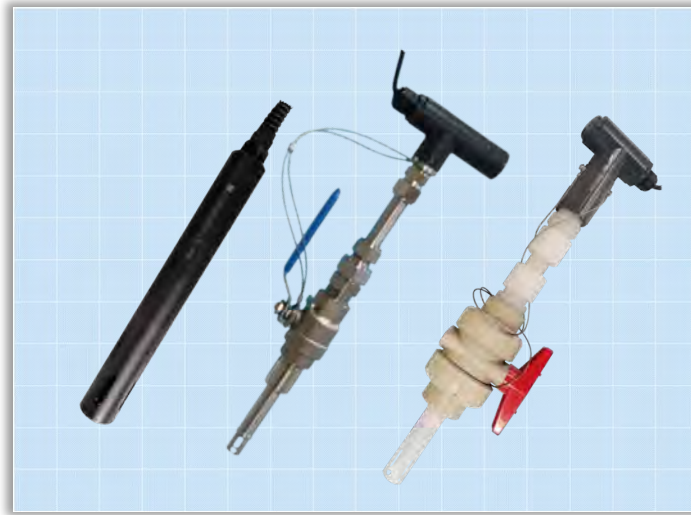


CROSS SMART SENSOR

MV7 Smart Electro-Chemical Specific Ion Sensor

Specific Ion (NH_4^+ , NO_3^- , CN^- , K^+ , Ca^{2+} , Cl^- , F^- and so on)



FEATURES & BENEFITS

- Measuring Specific Ion & Temperature
- Robust pION & Temperature sensors.
- Digital sensor with reliable RS485 communication.
- Plug and play with GDC series terminals or computers with Delta-Phase View™ software.
- Calibration history data stored in sensor, Easy to recalibrate.
- Lightning and surge protection for worry-free power.
- Optional Self-Diagnosis function.
- Optional Analog sensor for two-wire application.
- Rebuildable sensor using cartridge electrode.
- Optional disposal sensor for special applications.

APPLICATIONS

- Water and Waste water treatment**
Ammonium, Nitrate, Calcium, Chloride-ion, Fluoride-ion, and so on.
- Surface Water**
Ammonium, Bromide, Nitrate, Calcium, Chloride-ion, Fluoride-ion, Sodium, Potassium, Silver, Copper, etc.
- Typical Industrial Applications**
 - Mining: Calcium, Cyanide, Fluoride-ion.
 - Metallurgy: Copper, Cyanide, Fluoride-ion, Nitrate.
 - Pharmacy: Calcium, Fluoride-ion, Ammonium, Iodide.
 - Semiconductor: Fluoride-ion

PRINCIPLE OF ELECTROCHEMICAL

Ion-Selective Electrodes (ISEs) are sensing elements that are designed to respond selectively to ions in an aqueous solution. When the reference half-cell and the sensing half-cell are combined into the same body housing, they are referred to as a “combination” electrode. Delta-Phase incorporates Combination ISE cartridges into standard MV7 Field Rebuildable sensors that widely cover pION measurements including most municipal water and wastewater, surface water and industrial process water and wastewater. These specific ion electrodes are popular for many applications due to their convenience, affordability and accuracy. The MV7 sensors are ideal for both portable handheld and stationery in-situ applications, offering quick time response, minimal flow dependence and low power consumption. The cartridge electrode features a “long life” reference element eliminating the need to frequently replace the electrode cartridge. By using fixed electrodes, optional disposable sensors are suited for many special applications. Both rebuildable and disposal sensors come with different mounting types such as immersion, flow-cell and insertion /retractive ball-valve assembly installations.

ISES TYPICALLY UTILIZE ONE OF 4 PRIMARY SENSOR TYPES:

Polymer Membrane – This common sensor design incorporates ionophores or other ion-exchange agents that are specific to the ion of interest, into an inert matrix such as PVC. A millivolt potential develops at the surface of the membrane and accurately correlates to the ion concentration. Sensors of this type include: NH_4^+ , Ca^{2+} , BF_4^- , NO_3^- , K^+ , and Surfactant.

Solid State – These sensors utilize relatively insoluble inorganic salts within a hard pellet or crystalline matrix that allows the detection of specific ion activity. These sensors are both accurate and one of the longest lasting ISE sensor types. Periodic buffing helps to restore performance under especially harsh conditions. Sensors of this type include: Br^- , Cd^{2+} , Cl^- , CN^- , F^- , I^- , Pb^{2+} , S^{2-} , Ag^{2+} , and SCN^- .

Gas Sensing – With a gas permeable membrane, an internal buffer solution, and the use of ionic strength adjustors, these sensors enable accurate detection of ions such as NH_3 , CO_2 , NO_x and others.

Glass Membrane – Similar to pH sensors, these ISEs use a special glass formula to be selective for a specific ion. Na^+ is currently the only common parameter for this type of ISE.



SPECIFICATIONS

Measuring Range	Depends on parameter and application, (consult factory)
Accuracy/Resolution	Depends on parameter and application, (consult factory)
Temp. Compensation	Pt1000, 0 to 100°C Automatic.
Respond Time	T90 approx. 10s
Operate Pressure	0 to 100 psig (6.9Bar) standard. Optional HP sensor up to 300 psig (21Bar) (consult factory)
Operate Temp.	32 to 149°F (0 to 80°C), Depends on parameter and application (consult factory)
Power Supply	12 to 30VDC, the maximum consumption 0.5W
Interface	RS485 Modbus RTU standard, mv signal for analog sensors.
Material	Glass/Ceramic, PVC standard. Optional 316L, PP (consult factory for others)
IP Rating	>IP68, submersible
Weight	1.9 pound (0.85kg), standard (consult factory for optional sensor configurations).
Dimension	Dia. 1.54" × 11" (OD. 39.2 × 276 mm) standard. More size available, consult factory.
Mounting	Immersion/Insertion, Optional Insertion with Retractive ball-valve Assembly and "T" handle.

MEASURING PARAMETERS AND PERFORMANCE

Parameters		Range @ 25°C	Sensing Element	Operate Temp.	Repeatability	pH Demand	Known Interferences
Ammonia	NH ₃	0.01 to 17,000 ppm	Gas Sensing	0 to 50°C	±2%	>11	Volatile Amines
Ammonium	NH ₄ ⁺	0.02 to 18,000 ppm	PVC Membrane	0 to 50°C	±2%	4 to 10	K ⁺ , Na ⁺
Bromine	Br ⁻	0.2 to 79,900 ppm	Solid State	0 to 80°C	±2%	1 to 12	I ⁻ , Cl ⁻ , S ²⁻ , CN ⁻ and NH ₃
Divalent Cadmium	Cd ²⁺	0.0 to 11,200 ppm	Solid State	0 to 80°C	±4%	2 to 10	Hg ²⁺ , Ag ⁺ & Cu ²⁺ must be absent, high levels of Pb ²⁺ & Fe ²⁺
Calcium	Ca ²⁺	0.02 to 40,100 ppm	PVC Membrane	0 to 40°C	±4%	2 to 11	Pb ²⁺ , Hg ²⁺ , Cu ²⁺ , Ni ²⁺ , Fe ²⁺
Chloride	Cl ⁻	1.8 to 35,000 ppm	Solid State	0 to 80°C	±2%	2 to 12	CN ⁻ , Br ⁻ , I ⁻ , & S ²⁻ must be absent and NH ₃
Carbon Dioxide	CO ₂	4.4 to 440 ppm	Gas Sensing	0 to 50°C	±2%	4.8 to 5.2	Volatile Weak Acids
Copper	Cu ²⁺	0.064 to 6,450 ppm	Solid State	0 to 80°C	±4%	2 to 6	Hg ²⁺ & Ag ⁺ must be absent; high levels Fe ²⁺ , Br ⁻ and Cl ⁻
Cyanide	CN ⁻	0.2 to 260 ppm	Solid State	0 to 80°C	±2%	10 to 14	I ⁻ , Br ⁻ , Cl ⁻ , S ²⁻ must be absent
Fluoride	F ⁻	0.02 to Saturated	Solid State	0 to 80°C	±4%	5 to 7	OH ⁻
Iodide	I ⁻	0.0064 to 127,000 ppm	Solid State	0 to 80°C	±2%	0 to 14	CN ⁻ , S ₂ O ₃ ²⁻ , Cl ⁻ , S ²⁻ , NH ₃
Lead	Pb ²⁺	0.2 to 20,700 ppm	Solid State	0 to 80°C	±4%	4 to 7	Hg ²⁺ , Ag ⁺ , Cu ²⁺ must be absent; Fe ²⁺ & Cd ²⁺
Nitrate	NO ₃ ⁻	0.4 to 62,000 ppm	PVC Membrane	0 to 40°C	±2%	2.5 to 11	ClO ₄ ⁻ , I ⁻ , ClO ₃ ⁻ , F ⁻
Nitrite	NO ₂ ⁻	1.6 to 6,400 ppm	PVC Membrane	0 to 40°C	±4%	2 to 12	
Potassium	K ⁺	0.04 to 39,000ppm	PVC Membrane	0 to 40°C	±2%	2 to 12	Cs ⁺ , NH ₄ ⁺ , TI ⁺ , H ⁺ , Ag ⁺ , Tris ⁺ , Li ⁺ , Na ⁺
Silver	Ag ⁺	0.01 to 107,900ppm	Solid State	0 to 80°C	±2%	2 to 12	Hg ²⁺
Sodium	Na ⁺	0.1 to 23,000ppm	Glass Membrane	0 to 80°C	±2%	>9	H ⁺ , K ⁺
Sulfur	S ²⁻	0.003 to 32,100ppm	Solid State	0 to 80°C	±4%	>11	Hg ²⁺
Surfactant	X ⁺ /Y ⁻	End point indicator	PVC Membrane	0 to 40°C			
Thiocyanate	SCN ⁻	0.29 to 58,100 ppm	Solid State	0 to 50°C	±4%	2 to 10	I ⁻ , Br ⁻ , CN ⁻ , NH ₃ , S ₂ O ₃ ²⁻ , Cl ⁻ , OH ⁻ , S ²⁻

ORDER CODE

MV7	ion selective electrode sensor					
-	Digital and Rebuildable	A	Analog and Rebuildable Sensor			
D	Digital and Disposal Sensor	AD	Analog and Disposal Sensor			
Measuring Parameter						
-NH4	Ammonium					
-Ca	Calcium					
-Cl	Chloride					
-CN	Cyanide					
-F	Fluoride					
-NO3	Nitrate					
-K	Potassium	<i>The other parameters see the "Measuring Parameters and Performance" table above</i>				
Mounting						
-	3/4" NPT Back Thread for Immersion mounting of rebuildable sensors					
-N0	1.5" NPT Compress Fitting for rebuildable sensors flow-cell mounting					
-N1	1" NPT compress Fitting for rebuildable sensors inserting installation					
-N2	3/4" NPT Compress Fitting for disposal sensors (Immersion/Insertion Mounting)					
-R0	Rebuildable sensors inserting with 1-1/4" NPT Retractive Ball-valve Assembly					
-R1	Disposal sensor inserting with 1" NPT Retractive Ball-valve Assembly					
Material of Housing						
-	Standard PVC					
-SS	316L Stainless Steel					
-PP	Polypropylene <i>Other housing material contact factory</i>					
Length of Housing						
-	Standard 12"					
X17	17" (Min. length for Retractive Ball-valve Assembly Mounting)					
X21	21" <i>Other length of housing please contact factory</i>					
Length of Cable						
-C10	10 ft, approx. 3 m					
-C20	20 ft, approx. 6 m					
-C30	30 ft, approx. 9 m <i>Other length of cable please contact factory</i>					
MV7	-	-Cl	-R1	-PP	X17	-C30



DELTA-PHASE ELECTRONICS, INC.

1502 E. Warner Ave., Suite B,
Santa Ana, CA 92705 U.S.A.
Phone: (949) 701-7728
<http://www.delta-phase.us>

Represented by:

