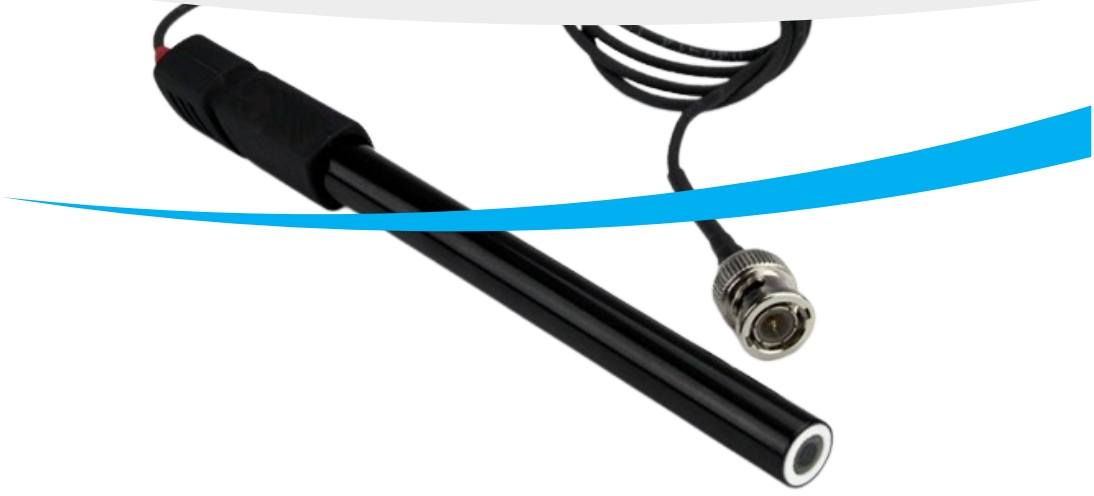
Datasheet
Combination Ion Selective Electrodes (ISE's)



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Smart Storm direction electrodes are rugged solidstate sensors with built in driTEK Teflon double junction references that do not require filling solutions, membrane replacements or operator maintenance. Available in tube or ¾" BSP fittings.

These combination ISEs can be stored dry and are submersible and waterproof. The solid-state sensor and maintenance free reference makes these electrodes ideal for both laboratory and field work. The Epoxy tubular body provides complete protection to the electrode which allows these sensors to be used in field applications by unskilled operators.

Each Combination ISE has a 10 metre cable and a BNC connector (other connectors available on request) allowing use on all types of pH/ION meter including laboratory bench and research models.

The sensor is a crystalline material which can be polished when the slope decreases over time. This will rejuvenate the sensor and give a longer lifetime. The sensor should be stored dry with its protective cap in place.

Ammonia Combination ISE

The direction Ammonia combination ISE is a traditional pH glass sensor with a refillable membrane cap.

This electrode does not have the solid-state advantage of the Ammonium ISE 3051 but is able to detect dissolved Ammonia down to around 50ppb. For successful operation NaOH ISAB should be added to the samples and standards to ensure all the Ammonium is converted to NH3. The analysis is best done in 100ml conical flasks to reduce the loss of NH3 gas. In principle, the Ammonia

penetrates the membrane and causes a change in the pH of the internal solution locally at the interface. This pH change is directly proportional to NH3 concentration.

Specification:

Body Type	Polymer body with replaceable membrane caps.
Cable length	1000mm
Cap Diameter	16mm
Commodity Code	90279050
Concentration Range	0.02-17000ppm
Connector	BNC
Diameter	12mm
Endpoint time	Typically, 10-60 seconds
Interferences	Hydrazine
length	155mm
pH range	11-13pH
Potential Drift	2mV per Day
Reference Type	Single Junction Ag/AgCl
Resistance at 25 Deg C	< 5 MOhm
Temperature range	5-50 Degrees C

Ammonium Combination ISE

The Ammonium sensor is PVC based with a solid-state mount and does not degenerate during storage unlike conventional Ammonium electrodes. The lack of internal solution means that submersion is also possible as the sensor does not flex under reasonable pressure.

Each Combination ISE has a 1-10 metre cable and a BNC connector (other connectors available on request) allowing use on all types of pH/ION meter including laboratory bench and research models.

Cable length	1000mm
Cap Diameter	16mm

Commodity Code	90279050
Concentration Range	0.9-9000 ppm
Connector	BNC
Diameter	12mm
Endpoint time	Typically, 10-60 seconds
Interferences	Calcium, Potassium, Sodium
length	155mm
pH range	0-8.5
Potential Drift	2mV per Day
Reference Type	Double Junction
Resistance at 25 Deg C	< 2.5 MOhm
Temperature range	5-50 Degrees C

Specification:

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Barium Combination ISE

Specification:

Cable length	1000mm
Cap Diameter	16mm
Commodity Code	90279050
Concentration Range	1.4-13,700 ppm

Connector	BNC
Diameter	12mm
Endpoint time	Typically, 10-60 seconds
Interferences	Potassium, Sodium, Strontium
length	155mm
pH range	3-10 pH
Potential Drift	2mV per Day
Reference Type	Double Junction
Resistance at 25 Deg C	< 2.5 MOhm
Temperature range	5-50 Degrees C

Bromide Combination ISE

Specification:

Cable length	1000mm
Cap Diameter	16mm
Commodity Code	90279050
Concentration Range	0.4-81,000 ppm
Connector	BNC

Diameter	12mm
Endpoint time	Typically, 10-60 seconds
Interferences	Sulphide, Cyanide, Iodide
length	155mm
pH range	1 - 12 pH
Potential Drift	2mV per Day
Reference Type	Double Junction
Resistance at 25 Deg C	< 2.5 MOhm
Temperature range	5-50 Degrees C

Cadmium Combination ISE

Specification:

Cable length	1000mm
Cap Diameter	16mm
Commodity Code	90279050
Concentration Range	0.1-11,200 ppm
Connector	BNC
Diameter	12mm
Endpoint time	Typically, 10-60 seconds
Interferences	Copper Mercury, Silver

length	155mm
pH range	3-7 pH
Potential Drift	2mV per Day
Reference Type	Double Junction
Resistance at 25 Deg C	< 2.5 MOhm
Temperature range	5-50 Degrees C

Chloride Combination ISE

Specification:

Cable length	1000mm
Cap Diameter	16mm
Commodity Code	90279050
Concentration Range	1-35,500 ppm
Connector	BNC
Diameter	12mm
Endpoint time	Typically, 10-60 seconds
Interferences	Iodide, Bromide, Cyanide Sulphide
length	155mm
pH range	1-12
Potential Drift	2mV per Day
Resistance at 25 Deg C	< 2.5 MOhm

Temperature range	5-50 Degrees C

Copper Combination ISE

Specification:

Cable length	1000mm
Cap Diameter	16mm
Commodity Code	90279050
Concentration Range	0.006-64000 ppm
Connector	BNC
Diameter	12mm
Endpoint time	Typically, 10-60 seconds
Interferences	Mercury, Silver, Sulphide
length	155mm
pH range	2-7 pH
Potential Drift	2mV per Day
Reference Type	Double Junction

Resistance at 25 Deg C	< 2.5 MOhm
Temperature range	5-50 Degrees C

Cyanide Combination ISE

Specification:

Cable length	1000mm
Cap Diameter	16mm
Commodity Code	90279050
Concentration Range	0.03-260 ppm
Connector	BNC
Diameter	12mm
Endpoint time	Typically, 10-60 seconds
Interferences	Sulphide, Bromide, Iodide
length	155mm
pH range	11-13 pH
Potential Drift	2mV per Day
Resistance at 25 Deg C	< 2.5 MOhm
Temperature range	5-50 Degrees C

Fluoride Combination ISE

Specification:

Cable length	1000mm
Cap Diameter	16mm
Commodity Code	90279090
Concentration Range	0.02-1900 ppm
Connector	BNC
Diameter	12mm
Endpoint time	Typically, 10-60 seconds
Interferences	Hydroxide
length	155mm
pH range	4-8 pH
Potential Drift	2mV per Day
Reference Type	Single Junction
Resistance at 25 Deg C	< 2.5 MOhm
Temperature range	5-50 Degrees C

Iodide Combination Ion Selective Electrode

Specification:

Cable length	1000mm
Cap Diameter	16mm
Commodity Code	90279050
Concentration Range	0.06-127,000 ppm
Connector	BNC
Diameter	12mm
Endpoint time	Typically, 10-60 seconds
Interferences	Sulphide, Cyanide
length	155mm
pH range	2-12 pH
Potential Drift	2mV per Day
Reference Type	Double Junction
Resistance at 25 Deg C	< 2.5 MOhm
Temperature range	5-50 Degrees C

Lead Combination ISE

Specification:

Cable length	1000mm
Cap Diameter	16mm
Commodity Code	90279050
Concentration Range	0.2-20,800 ppm
Connector	BNC
Diameter	12mm
Endpoint time	Typically, 10-60 seconds
Interferences	Mercury, Silver, Copper
length	155mm
pH range	3-7 pH
Potential Drift	2mV per Day
Reference Type	Double Junction
Resistance at 25 Deg C	< 2.5 MOhm
Temperature range	5-50 Degrees C

Mercury Combination ISE

Specification:

Cable length	1000mm
Cap Diameter	16mm
Commodity Code	90279050
Concentration Range	0.2-201,000 ppm
Connector	BNC
Diameter	12mm
Endpoint time	Typically, 10-60 seconds
Interferences	Sulphide, Silver
length	155mm
pH range	0-2 pH
Potential Drift	2mV per Day
Reference Type	Double Junction
Resistance at 25 Deg C	< 2.5 MOhm
Temperature range	5-50 Degrees C

Nitrate Combination ISE

Specification:

Cable length	1000mm
Cap Diameter	16mm
Commodity Code	90279050
Concentration Range	0.4-62,000 ppm
Connector	BNC

Diameter	12mm
Endpoint time	Typically, 10-60 seconds
Interferences	Chloride, Nitrite
length	155mm
pH range	2-11 pH
Potential Drift	2mV per Day
Reference Type	Double Junction
Resistance at 25 Deg C	< 2.5 MOhm
Temperature range	5-50 Degrees C

Nitrite Combination ISE

Specification:

Cable length	1000mm
Cap Diameter	16mm
Commodity Code	90279050
Concentration Range	0.5-460 ppm
Connector	BNC
Diameter	12mm
Endpoint time	Typically, 10-60 seconds
Interferences	Cyanide

length	155mm
pH range	4.6-8 pH
Potential Drift	2mV per Day
Reference Type	Double Junction
Resistance at 25 Deg C	< 2.5 MOhm
Temperature range	5-50 Degrees C

Potassium Combination ISE

Specification:

Cable length	1000mm
Cap Diameter	16mm
Commodity Code	90279050
Concentration Range	0.04-39,000 ppm
Connector	BNC
Diameter	12mm
Endpoint time	Typically, 10-60 seconds
Interferences	Caesium, Ammonium
length	155mm
pH range	1-9 pH
Potential Drift	2mV per Day
Reference Type	Double Junction
Resistance at 25 Deg C	< 2.5 MOhm

Temperature range	5-50 Degrees C

Silver Combination ISE

Specification:

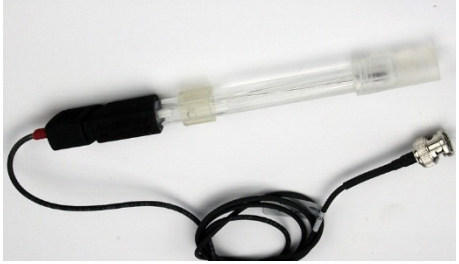
Cable length	1000mm
Cap Diameter	16mm
Commodity Code	90279050
Concentration Range	0.01-107,900 ppm
Connector	BNC
Diameter	12mm
Endpoint time	Typically, 10-60 seconds
Interferences	Sulphide, Mercury
length	155mm
pH range	1-9 pH
Potential Drift	2mV per Day
Reference Type	Double Junction
Resistance at 25 Deg C	< 2.5 MOhm
Temperature range	5-50 Degrees C

Sodium PVC Combination ISE

Specification:

Cable length	1000mm
Cap Diameter	16mm
Commodity Code	90279050
Concentration Range	1-35000 ppm
Connector	BNC
Diameter	12mm
Endpoint time	Typically, 10-60 seconds
Interferences	Sulphide, Bromide, Cyanide, Iodide
length	155mm
pH range	1-12
Potential Drift	2mV per Day
Resistance at 25 Deg C	< 2.5 MOhm
Temperature range	5-50 Degrees C

Sodium Glass Combination ISE



The Smart Storm Sodium ISE is a glass based 12mm bodied electrode which is sensitive to Sodium levels down to ppb levels.

This ISE operates in the same way as a traditional combination pH electrode except the bulb glass is ultra-sensitive to changes in Sodium concentration.

An important consideration is that the pH of standards and samples need to be in the range pH9-12. If low level Sodium work is to be performed the pH should be 12 as the glass bulb is still sensitive to Hydrogen Ions which should be minimised.

Specification:

Cable length	1000mm
Cap Diameter	16mm
Commodity Code	90279050
Concentration Range	0.002-69,000 ppm
Connector	BNC
Diameter	12mm
Endpoint time	Typically, 10-60 seconds
Interferences	Lithium, Potassium, Barium, pH
length	155mm
pH range	9-12 pH
Potential Drift	2mV per Day
Reference Type	Double Junction
Resistance at 25 Deg C	< 2.5 MOhm
Temperature range	5-50 Degrees C

Sulphide Combination ISE

Specification:

Cable length	1000mm
Cap Diameter	16mm
Commodity Code	90279050
Concentration Range	0.003-32,000ppm
Connector	BNC
Diameter	12mm
Endpoint time	Typically, 10-60 seconds
Interferences	Mercury, Silver
length	155mm
pH range	13-14 pH
Potential Drift	2mV per Day
Reference Type	Double Junction
Resistance at 25 Deg C	< 2.5 MOhm
Temperature range	5-50 Degrees C

Thiocyanate Combination ISE

Specification:

Cable length	1000mm
Cap Diameter	16mm
Commodity Code	90279050
Concentration Range	1-5800 ppm
Connector	BNC

Diameter	12mm
Endpoint time	Typically, 10-60 seconds
Interferences	Sulphide, Bromide, Chloride, Iodide
length	155mm
pH range	2-12 pH
Potential Drift	2mV per Day
Reference Type	Double Junction
Resistance at 25 Deg C	< 2.5 MOhm
Temperature range	5-50 Degrees C