



## Ion Selective Electrode Selection Guide

To Order					
Electrode	Model No.	Housing	Sensor Type	Direct Measurement Range	
				Molar	PPM
Ammonia (NH <sub>3</sub> )	ISE-8710	Epoxy	Gas-sensing Combination	1.0 to 5x10 <sup>-7</sup>	17000 to 0.01
Ammonium (NH <sub>4</sub> <sup>+</sup> )	ISE-8711 ISE-8712	PVC Glass	Polymer membrane mono Combination	1.0 to 5x10 <sup>-6</sup>	18000 to 0.1
Bromide (Br <sup>-</sup> )	ISE-8720 ISE-8722	Epoxy Glass	Solid-state mono Combination	1.0 to 5x10 <sup>-6</sup>	79900 to 0.4
Cadmium (Cd <sub>2</sub> )	ISE-8730 ISE-8732	Epoxy Glass	Solid-state mono Combination	1x10 <sup>-1</sup> to 1x10 <sup>-7</sup>	11200 to 0.01
Calcium (Ca <sub>2</sub> )	ISE-8740 ISE-8742	PVC Glass	Polymer membrane mono Combination	1.0 to 5x10 <sup>-6</sup>	40000 to 0.2
Carbon Dioxide (CO <sub>2</sub> ) Carbonate (CO <sub>3</sub> <sup>2-</sup> )	ISE-8750	Epoxy	Gas-sensing Combination	1x10 <sup>-2</sup> to 1x10 <sup>-4</sup>	440 to 4.4
Chloride (Cl <sup>-</sup> )	ISE-8760 ISE-8770	Epoxy Glass	Solid-state mono Combination	1.0-5 x 10 <sup>-5</sup>	35500 to 1.8
Copper (Cu <sub>2</sub> )	ISE-8800 ISE-8802	Epoxy Glass	Solid-state mono Combination	1 x 10 <sup>-1</sup> to 1 x 10 <sup>-8</sup>	6350 to 6.4 x 10 <sup>-4</sup>
Cyanide (CN <sup>-</sup> )	ISE-8780 ISE-8782	Epoxy Glass	Solid-state mono Combination	1 x 10 <sup>-2</sup> to 5 x 10 <sup>-6</sup>	260 to 0.13
Fluoride (F <sup>-</sup> )	ISE-8790 ISE-8795	Epoxy Glass	Solid-state mono Combination	Saturated to 1 x 10 <sup>-6</sup>	Saturated to 0.02
Fluoroborate (BF <sub>4</sub> <sup>-</sup> )	ISE-8810 ISE-8812	PVC Glass	Polymer membrane mono Combination	1.0 to 7 x 10 <sup>-6</sup>	10800-0.1 (as B)
Iodide (I <sup>-</sup> )	ISE-8715 ISE-8716	Epoxy Glass	Solid-state mono Combination	1.0 to 5 x 10 <sup>-8</sup>	127000 to 6 x 10 <sup>-3</sup>
Lead (Pb <sub>2</sub> )	ISE-8725 ISE-8726	Epoxy Glass	Solid-state mono Combination	1 x 10 <sup>-1</sup> to 1 x 10 <sup>-6</sup>	20700 to 0.2
Nitrate (NO <sub>3</sub> <sup>-</sup> )	ISE-8735 ISE-8736	PVC Glass	Polymer membrane mono Combination	1.0 to 7 x 10 <sup>-6</sup>	62000 to 0.5
Nitrogen Oxide (NO <sub>x</sub> )	ISE-8830	Epoxy	Gas Sensing Combination	5 x 10 <sup>-3</sup> to 5 x 10 <sup>-6</sup>	220 to 0.2
Perchlorate (ClO <sub>4</sub> <sup>-</sup> )	ISE-8840 ISE-8842	PVC Glass	Polymer membrane mono Combination	1.0 to 7 x 10 <sup>-6</sup>	98000 to 0.7
Potassium (K <sup>+</sup> )	ISE-8745 ISE-8746	PVC Glass	Polymer membrane mono Combination	1.0 to 1 x 10 <sup>-6</sup>	39000 to 0.04
Silver/Sulfide (Ag <sup>+</sup> /S <sup>2-</sup> )	ISE-8755 ISE-8756	Epoxy Glass	Solid-state-mono Combination	Ag <sup>+</sup> = 1.0 to 1 x 10 <sup>-7</sup> S <sup>2-</sup> = 1.0 to 1 x 10 <sup>-7</sup>	Ag <sup>+</sup> = 107900 to 0.01 S <sup>2-</sup> = 32100 to 0.003
Sodium (Na <sup>+</sup> )	ISE-8765	Glass	Combination	Saturated to 1 x 10 <sup>-6</sup>	Saturated to 0.02
Surfactant (X <sup>+</sup> ,X <sup>-</sup> )	ISE-8880 ISE-8882	PVC Glass	Polymer membrane mono Combination	5 x 10 <sup>-2</sup> to 1 x 10 <sup>-5</sup>	12000 to 1.0
Water Hardness (Ca <sup>2+</sup> /Mg <sup>2+</sup> )	ISE-8900 ISE-8902	PVC Glass	Polymer membrane mono Combination	1.0 to 1 x 10 <sup>-5</sup>	40000 to 0.4 (as Ca)

\* Double Junction Reference Electrode, **PHE-3211**.

Single Junction Reference Electrode, **PHE-3111**.



## Ion Selective Electrode Selection Guide

Slope mV per Decade	pH Range	Temp. Range °C	Resp Time Secs	Interferences	Reference Electrode*	Reference Electrolyte
56 ±3	above 11	0 to 50	30	Volatile amines	N/A	NH <sub>4</sub> CL
56 ±2	4 to 10	0 to 50	30	K <sup>+</sup>	Double Junction	NaCl
57 ±2	2 to 14	0 to 80	20	S <sup>2-</sup> , I <sup>-</sup> , CN <sup>-</sup> , high levels of Cl and NH <sub>3</sub>	Double Junction	KNO <sub>3</sub> KNO <sub>3</sub>
27 ±2	2 to 12	0 to 80	20	Ag <sup>+</sup> , Hg <sup>+2</sup> , Cu <sup>+2</sup> , high levels of Pb <sup>+2</sup> & Fe <sup>+2</sup>	Double Junction	KNO <sub>3</sub>
27 ±2	3 to 10	0 to 50	30	Pb <sup>+2</sup> , Hg <sup>+2</sup> , Cu <sup>+2</sup> , Ni <sup>+2</sup>	Single Junction	KCl
56 ±3	4.8 to 5.2	0 to 50	30	Volatile weak acids	N/A	NaHCO <sub>3</sub>
56 ±2	2 to 12	0 to 80	20	S <sup>2-</sup> , I <sup>-</sup> , CN <sup>-</sup> , Br <sup>-</sup>	Double Junction	KNO <sub>3</sub>
27 ±2	2 to 12	0 to 80	20	Ag <sup>+</sup> , Hg <sup>+2</sup> , high levels of Cl <sup>-</sup> , Br <sup>-</sup> , Fe <sup>+2</sup> , Cd <sup>+2</sup>	Double Junction	KNO <sub>3</sub>
57 ±2	11 to 13	0 to 80	20	S <sub>2</sub> , I <sup>-</sup> , Br <sup>-</sup> , Cl <sup>-</sup>	Double Junction	KNO <sub>3</sub>
57±2	5 to 8	0 to 80	20	OH <sup>-</sup>	Single Junction	KCl
56 ±2	2.5 to 11	0 to 50	30	ClO <sub>4</sub> <sup>-</sup> , I <sup>-</sup> , CN <sup>-</sup>	Double Junction	(NH <sub>4</sub> ) <sub>2</sub> SO <sub>4</sub>
57 ±2	0 to 14	0 to 80	20	S <sup>2-</sup> , CN <sup>-</sup> , Br <sup>-</sup> , Cl <sup>-</sup> , S <sub>2</sub> O <sub>3,2</sub> <sup>-</sup> , NH <sub>3</sub>	Double Junction	KNO <sub>3</sub>
25 ±2	3 to 8	0 to 80	20	Ag <sup>+2</sup> , Hg <sup>+2</sup> , Cu <sup>+2</sup> , high levels of Cd <sup>+2</sup> and Fe <sup>+2</sup>	Double Junction	KNO <sub>3</sub>
56 ±2	5 to 10	0 to 50	30	Na <sup>+</sup> , K <sup>+</sup> , Ca <sup>+2</sup>	Double Junction	(NH <sub>4</sub> ) <sub>2</sub> SO <sub>4</sub>
57 ±2	2.5 to 11	0 to 50	30	ClO <sub>4</sub> <sup>-</sup> , I <sup>-</sup> , CN <sup>-</sup> , BF <sub>4</sub> <sup>-</sup>	Double Junction	(NH <sub>4</sub> ) <sub>2</sub> SO <sub>4</sub>
56 ±3	1.1 to 1.7	0 to 50	30	SO <sub>2</sub> , HF, acetic acid	N/A	NaNO <sub>2</sub>
56 ±2	2.5 to 11	0 to 50	30	no significant interference	Double Junction	(NH <sub>4</sub> ) <sub>2</sub> SO <sub>4</sub>
56 ±2	2 to 12	0 to 50	30	Cs <sup>+</sup> , NH <sub>4</sub> <sup>+</sup>	Double Junction	NaCl
Ag <sup>+</sup> =57±2 S <sup>2-</sup> =27±2	2 to 12	0 to 80	20	Hg <sup>2+</sup> , Hg <sup>+</sup>	Double Junction	KNO <sub>3</sub>
56 ±2	5 to 12	0 to 80	20	H <sup>+</sup> , K <sup>+</sup> , Li <sup>+</sup> , Ag <sup>+</sup> , Cs <sup>+</sup> , Tl <sup>+</sup>	Double Junction	NH <sub>4</sub> Cl
for titration	2 to 12	0 to 50	30	similar types of surfactants	Single Junction	KCl
26 ±3	5 to 10	0 to 50 (as Ca)	30	Cu <sup>+2</sup> , Zn <sup>+2</sup> , Ni <sup>+2</sup> , Fe <sup>+2</sup>	Single Junction	KCl

Comes complete with operator's manual.

Ordering Examples: ISE-8711, ammonium electrode. ISE-8756, silver/sulfide electrode.



# pH FIELD & LAB ELECTRODES

**ISE Standards, ISA & Reference  
Outer-Fill Solutions**

PHI-359 bench  
top pH meter,  
shown smaller  
than actual size.



## To Order

Electrode	Standard (475 mL)			ISA (475 mL)	Reference Outer-Fill (125 mL)	
	0.1 m	1000 PPM	100 PPM		Single Junction	Double Junction
Model No.	Model No.	Model No.	Model No.	Model No.		
Ammonia	ISE-8710-S1	ISE-8710-S2	ISE-8710-R2	PHFS-8710	—	—
Ammonium	ISE-8711-S1	ISE-8711-S2	ISE-8711-S3	ISE-8711-R1	PHFS-1042	PHFS-1043
Bromide	ISE-8720-S1	ISE-8720-S2	—	ISE-8720-R1	—	PHFS-NO3
Cadmium	—	—	—	ISE-8730-R1	—	PHFS-NO3
Calcium	ISE-8740-S1	ISE-8740-S2	ISE-8740-S3	ISE-8740-R1	—	PHFS-4MKCL
Carbon Dioxide	ISE-8750-S1	ISE-8750-S2	ISE-8750-S3	ISE-8750-R1	PHFS-8750	—
Chloride (Solid State, PVC)	ISE-8770-S1	ISE-8770-S2	ISE-8770-S3	ISE-8770-R1 PHFS-1045	PHFS-1046 PHFS-1044	PHFS-NO3
Copper	ISE-8800-S1	ISE-8800-S2	—	ISE-8800-R1	PHFS-1046	PHFS-NO3
Cyanide	—	—	—	—	PHFS-1046	PHFS-NO3
Fluoride	ISE-8790-S1	ISE-8790-S2	—	ISE-8790-R2 ISE-8790-R1	PHFS-KCL	PHFS-4MKCL
Fluoroborate	ISE-8810-S1	ISE-8810-S2	—	ISE-8810-R1	PHFS-1045	PHFS-1044
Iodide	ISE-8715-S1	ISE-8715-S2	—	ISE-8715-R1	PHFS-1046	PHFS-NO3
Lead	ISE-8725-S1	—	—	ISE-8725-R1	PHFS-1046	PHFS-NO3
Lithium	—	—	—	—	PHFS-1041	PHFS-1044
Nitrate	ISE-8735-S1	ISE-8735-S2	ISE-8735-S3	ISE-8735-R1	PHFS-1045	PHFS-1044
Nitrogen Oxide	ISE-8830-S1	ISE-8830-S2	ISE-8830-S3	ISE-8830-R1	PHFS-NOX	—
Perchlorate	ISE-8840-S1	ISE-8840-S2	—	ISE-8840-R1	PHFS-1045	PHFS-1044
Potassium	ISE-8745-S1	ISE-8745-S2	—	ISE-8745-R1	PHFS-1042	PHFS-1043
Silver/Sulfide	ISE-8755-S1	ISE-8755-S2	—	ISE-8755-R1	PHFS-1046	PHFS-NO3
Sodium (Glass)	ISE-8765-S1	ISE-8765-S2	ISE-8765-S3	ISE-8765-R1	PHFS-1041	PHFS-1047
Sodium (PVC)	ISE-8860-S1	ISE-8860-S2	ISE-8860-S3	ISE-8860-R1	PHFS-1041	PHFS-1047
Surfactant	ISE-8880-S1	ISE-8880-S2	—	ISE-8880-R1	PHFS-KCL	PHFS-4MKCL
Water Hardness	ISE-8900-S1	ISE-8900-S2	ISE-8900-S3	ISE-8900-R1	PHFS-KCL	PHFS-4MKCL