

DIGITAL ION/pH METER

Model: IM-55G

The Model IM-55G digital ion/pH meter forms a part of the G-series of instruments and features GLP/GMP compliance. A vast range of electrodes enable this instrument to be used for a wide range of applications.

FEATURES

- **Two input channels**
Both pH and ions can be measured simultaneously (or ion/ion, or pH/pH).
- **Intelligent pH/Temperature sensor**
Sensor itself can store up to 3 sets of calibration data.
- **Auto-calibration function**
5 point calibration is possible for ion measurement and 3 point calibration is possible for pH measurement. This provides enhanced accuracy across a wide range. Calibration is performed automatically and data is stored for each individual channel.
- **Built in printer**
Hard-copy data output is available from the built in thermal printer.
- **Automatic stability determination**
Measurement stability is automatically determined and measurement result held. The stability reference data can be pre-set to cope with stability variations between different types of sample.
- **RS232 output**
RS232 data output is provided as a standard feature.
- **Data storage function**
Data from up to 100 previous measurements can be stored in the memory allowing access to previous measurement results.
- **ORP measurement**
ORP (mV) measurement available when the instrument is combined with ORP electrode.
- **System expandability**
The instrument can be expanded by adding optional modules such as turn tables (12, 18 or 36 samples) and electrode selector (max. 5 channels).
- **Wide range of electrodes available**
A wide range of electrodes are available for use with this instrument. Please refer to the selection tables in this specification document.

SPECIFICATIONS

Measuring item	: Ion conc./pH/mVx2, temp.x2
Measuring range	: Depends on ion electrode
Indication	: Graphic LCD with back light
pH/mV range	: pH 0.00 to 14.00 / 0 to ± 2000.0 mV
Ion concentration range	: 0.0001 to 2,000x 10 ³ mg/L
Temperature range	: 0 to 100.0°C
Repeatability (main body)	
pH/mV	: ± 0.01 pH ± 1 digit/ ± 0.1 mV ± 1 digit
ion conc.	: $\pm 1\%$ r.d.g. ± 1 digit
Temperature	: $\pm 0.1^\circ\text{C}$ ± 1 digit
Outputs	
pH/mV	: ± 700 mV(pH0 to 14)/ ± 1 V(0 to 2000mV)
Ion conc.	: ± 1 V(electrode potential)
Temperature	: 0 to 1V(0 to 100°C)
Calibration	: 3 points (pH), 5 points (ion), automatic
Printer	: Built-in
RS-232C	: Built-in



mV shift	: Provided
Clock function	: Provided
Data storage function	: 100 data points each
Holding function	: Provided
Interval function	: Provided
Average calcu. function	: Provided
Turn-table connecting func.	: Provided
Electrode selector con. func.	: Provided
Dialog function	: Provided
Power source	: AC line 50,60Hz (by AC adapter)
Power consumption	: Approx. 16VA
Dimensions	: Approx. 183(w) x 60(h) x 318(d) mm
Weight	: Approx. 1kg
Operating temp. range	: 0 to 40°C

STANDARD ACCESSORIES

Description	Qty
• Beaker (100mL)	3
• Electrode holder/stand	1
• Electrode adapter	1
• Support rod	1
• Stopper for holder	1
• Electrode attachments	5 (G type x 2, IONx1, Jx1, DPx1)
• Grounding wire	1
• AC adapter	1
• Printer chart paper	2
• Chart paper case	1
• Shield case (including ground wire)	1

When ordering, please specify the necessary Ion, pH, reference and/or ORP electrodes, standard solution, ionic strength adjuster (ISA), refilling solution, magnetic stirrer ST-15.

OPTIONS

1. **External printer (EPS-G)**: 60mm width, long-term data storage by normal paper available
2. **Turn table TTT-510**: Continuous measurement of 12, 18 or 36 samples available
3. **Electrode selector ES-1G**: Max. 5 electrodes can be connected to it.
4. **Magnetic stirrer ST-15**: Irrespective of ion measurement, smooth & variable speed control available

TABLE OF SELECTIVE ION ELECTRODE *1

Type	Range	Temp. range	Optimum pH range	Replacable ion electrode tip membrane	Influence of coexisting ions (selective coefficient at 10 ⁻¹ mol/L) *2, *3
Sodium ion NA-2011	10 ⁻⁴ to 10 ⁰ mol/L 2.3 to 23,000mg/L	0-60°C	pH10-11	NA-100B	Mg ²⁺ , Ca ²⁺ , NH ₄ ⁺ , Li ⁺ , K ⁺ = 10 ⁻³
Chloride ion CL-2021	3x10 ⁻⁵ to 10 ⁰ mol/L 1 to 35,000mg/L	0-50°C	pH5-6	CL-200B	S ²⁻ must be absent. CN ⁻ , I ⁻ =10 ⁻⁵ , Br ⁻ , S ₂ SO ₃ ²⁻ =10 ⁻² F ⁻ , NO ₃ ⁻ , SO ₄ ²⁻ , CO ₃ ²⁻ , PO ₄ ³⁻ =10 ⁻³ F ⁻ , NO ₃ ⁻ , SO ₄ ²⁻ , CO ₃ ²⁻ , PO ₄ ³⁻ =10 ⁻⁴
Bromide ion BR-2021	10 ⁻⁵ to 10 ⁰ mol/L 0.8 to 80,000mg/L	0-50°C	pH5-6	BR-200	S ²⁻ must be absent. CN ⁻ , I ⁻ =10 ⁻⁴ , S ₂ SO ₃ ²⁻ SCN ⁻ =10 ⁰ Cl ⁻ =10 ⁻² , NO ₃ ⁻ , SO ₄ ²⁻ , CO ₃ ²⁻ F ⁻ =10 ⁻⁴
Iodide ion I-2021	10 ⁻⁷ to 100mol/L 0.013 to 127,000mg/L	0-50°C	pH5-6	I-200	S ²⁻ must be absent. CN ⁻ =10 ⁰ , S ₂ SO ₃ ²⁻ =10 ¹ SCN ⁻ =10 ³ , Br ⁻ =10 ⁴ , NO ₃ ⁻ , CO ₃ ²⁻ , PO ₄ ³⁻ , Cl ⁻ , F ⁻ =10 ⁵
Cyanide ion CN-2021	10 ⁻⁷ to 10 ⁻² mol/L 0.003 to 260mg/L	0-50°C	pH12-13	CN-200B	S ²⁻ must be absent. I ⁻ =10 ⁻¹ , S ₂ O ₃ ²⁻ =10 ¹ , Br ⁻ =10 ³ NO ₃ ⁻ , SO ₄ ²⁻ , PO ₄ ³⁻ =10 ⁴ , CO ₃ ²⁻ , Cl ⁻ , F ⁻ =10 ⁵ (at 10 mol/L)
Cadmium ion CD-2021	10 ⁻⁷ to 10 ⁻² mol/L 0.01 to 1,120mg/L	0-50°C	pH5-6	CD-200	Hg ²⁺ , Ag ²⁺ , Cu ²⁺ must be absent. Pb ²⁺ , Fe ³⁺ =10 ⁰ , Cr ³⁺ =10 ² , Na ⁺ , K ⁺ , Mg ²⁺ , Ca ²⁺ , Zn ²⁺ , Al ³⁺ =10 ⁵
Copper ion CU-2021	10 ⁻⁶ to 10 ⁻² mol/L 0.06 to 630mg/L	0-50°C	pH5-6	CU-200	Hg ²⁺ , Ag ²⁺ must be absent. Fe ³⁺ =10 ⁻¹ , Al ³⁺ =10 ¹ , Cr ³⁺ =10 ² , Na ⁺ , K ⁺ , Mg ²⁺ , Zn ²⁺ , Al ³⁺ =10 ⁵
Silver ion AG-2021	10 ⁻⁶ to 10 ⁰ mol/L 0.06 to 108,000mg/L	0-50°C	pH5-6	AG-200	Hg ²⁺ must be absent. Mg ²⁺ =10 ³ , Ca ²⁺ , Cu ²⁺ , Pb ²⁺ , Cd ²⁺ , Zn ²⁺ =10 ⁴ Na ⁺ , K ⁺ =10 ⁶
Sulfur ion S-2021	10 ⁻⁵ to 10 ⁰ mol/L 0.3 to 32,000mg/L	0-50°C	pH13 or more	S-200	-----
Fluoride ion F-2021	10 ⁻⁶ to 10 ⁰ mol/L 0.019 to 19,000mg/L	0-50°C	pH5-6	F-200	OH ⁻ =10 ¹ HPO ₄ ²⁻ , HCO ₃ ⁻ =10 ³ (pH7-8) Cl ⁻ , Br ⁻ , I ⁻ , NO ₃ ⁻ , SO ₄ ²⁻ , S ₂ O ₃ ²⁻ =10 ⁵
Potassium ion K-2031	10 ⁻⁵ to 10 ⁻¹ mol/L 0.39 to 3,900mg/L	0-50°C	pH5-6	K-300B	H ⁺ =10 ² , NH ₄ ⁺ =3x10 ² Na ⁺ =2x10 ³ Li=10 ⁴
Calcium ion CA-2031	10 ⁻⁵ to 10 ⁰ mol/L 0.4 to 40,000mg/L	0-50°C	pH5-6	CA-300	Pb ²⁺ =33 Zn ²⁺ =45 Mn ²⁺ =1.7x10 ² Cd ²⁺ =8.8x10 ² Fe ²⁺ =1.2x10 ³ Mg ²⁺ =1.8x10 ³ Ba ²⁺ =1.9x10 ³ Cu ²⁺ =2.7x10 ³ Ni ²⁺ =9.0x10 ³
Nitrate ion N-2031	10 ⁻⁵ to 10 ⁰ mol/L 0.62 to 62,000mg/L	0-50°C	pH5-6	N-300	I ⁻ =7x10 ⁻² Br ⁻ =1.7 NO ₂ ⁻ =4.5 Cl ⁻ =2x10 CH ₃ COO ⁻ =1.2x10 ² SO ₄ ²⁻ , CO ₃ ²⁻ =1.7x10 ² F ⁻ =2x10 ²
Ammonium ion AE-2041	5x10 ⁻⁵ to 10 ⁻¹ mol/L 0.09 to 1,800mg/L	0-50°C	pH12 or more	membrane AE-FILM (10 sheets)	-----
CO ₂ gas CE-2041	Disso lved gas: 3x10 ⁻⁵ to 3x10 ⁻² mol/L Gas in air: 0.1 to 100%	0-50°C	-----	membrane cartridge CTC-211 (4pcs)	dissolved gas: volatile weak acid Gas in air: acid gas

Notes:

- *1 Ion sensors listed above are not compatible with water-proof construction.
- *2 When measuring sample with coexisting ion, it is required to remove the interference by pretreatment.
- *3 Selective coefficient: It represents the degree that coexisting ions in sample influences the ion being measured as error. Ex. Selective interference 10² to 1mol/L measuring ion denotes that a concentration of interfering ion that is 100 times of 1mol/L will show same indication as 1mol/L of measuring one.

Reference electrodes for single type ion electrode

Type	Description
HS-305DS, glass body	General use, 0~80°C
HS-305DP, plastic body	For fluoride ion, 0~80°C

FEATURES

- 15 kinds of ion electrode can meet to wide applications.
- Ion sensitive section of combination type is of cartridge tip type for easy replacement.
- Liquid junction of combination type is also replaceable (except membrane type electrodes, NH₄, CO₂)
- Combination type ion electrodes are the built-in memory sensor "Calibration memo."

Notes:

- 1 Single type ion sensors listed above are compatible with Calib. Memory function.
- 2 When measuring sample with coexisting ion, it is required to remove the interference by pretreatment.
- 3 Selective coefficient: It presents the degree that coexisting ions in sample influences the ion being measured as error.
Ex. Selective interference 10² to 1mol/L measuring ion
Denotes that a concentration of interfering ion that is 100 Times of 1mol/L will show same indication as 1mol/L of measuring one.

Spare electrode tip/parts for combination ion electrodes

Name	Type	Note
Sodium ion electrode tip	NA-100B	Glass membrane, for NA-2011
Potassium ion electrode tip	K-300B	Liquid membrane for K-2031
Calcium ion electrode tip	CA-300	Liquid membrane, for CA-2031
Fluoride ion electrode tip	F-200	Solid membrane, for F-2021
Chloride ion electrode tip	CL-200B	Solid membrane for CL-2021
Cyanide ion electrode tip	CN-200B	Solid membrane for CN-2021
Nitrate ion electrode tip	N-300	Liquid membrane for N-2031
Bromide ion electrode tip	BR-200	Solid membrane for BR-2021
Iodide ion electrode tip	I-200	Solid membrane for I-2021
Cadmium ion electrode tip	CD-200	Solid membrane for CD-2021
Copper ion electrode tip	CU-200	Solid membrane for CU-2021
Sulfur ion electrode tip	S-200	Solid membrane for S-2021
Membrane for AE-235	AE-FILM	For AE-2041, 10 sheets
Membrane cartridge	CTC-211	For CE-2041, 4 sheets
Spare liquid junction for ion electrode (10 pcs.)	OLF00001	Common for combination type ion electrodes except AE,CE

pH/ORP electrodes

Kind of electrode	Type	Application	pH range	Temp. range(°C)	Sample volume
pH three-in-one type	GST-5721C	General use, standard	0-14	0 -100	1ml
	GST-5721S	Organic solvent	0-14	0 -100	3ml
	GST-5722S	Accurate measurement	0-14	0-60	2ml
	GST-5723S	Accurate, trace volume	0-11	0-60	1ml
	GST-5724C	Spear type	0-12	0-60	0.5ml
	GST-5725C	Trace volume	0-13	0-100	0.5ml
	GST-5726S	Ultra-trace volume	0-13	0-60	0.3ml
	GST-5727C	Test tube	0-13	0-100	0.5ml
	GST-5728S	Ultra-trace, test tube	0-13	0-60	0.3ml
ORP 3-in-1 type	GST-5720C	Flow-through type	0-12	0-60	0.25ml
	PST-5721C	General use, standard	---	0-100	1ml

STANDARD SOLUTION & IONIC STRENGTH ADJUSTER

	Inner chamber's solution		Outer chamber's solution		Standard solution	Ionic strength adjuster							
	100mL	50mLx3	100mL	50mLx3		500mL	500ml	50mLx3					
Sodium ion	KCL-100C	OBG00001	RE-2	OBG00003	NA-1000	ISA-NA	OBA00003						
Chloride ion					CL-1000								
Bromide ion					BR-1000								
Iodide ion			KCL-100C	OBG00001	I-1000	ISA-CN	OBA00004						
Cyanide ion			RE-2	OBG00003	CN-100								
Cadmium ion					CD-100			ISA-CU	OBA00007				
Copper ion					CU-100								
Silver ion			KCL-100C	OBG00001	RE-2	OBG00003	*1	ISA-CL	—				
Sulphur ion							KCL-100C	OBG00001	*1	—			
Fluoride ion							KCL-100C	OBG00001	RE-2	OBG00003	F-1000	TISAB-01 *2	OBA00001
												TISAB-11 *3	OBA00002
Potassium ion							RE-3	OBG00004	K-1000	ISA-K	OBA00010		
Calcium ion							KCL-100C	OBG00001	CA-1000	ISA-CA	OBA00009		
Nitrate ion Nitrate nitrogen			RE-3	OBG00004	NO ₃ -1000 NO ₃ -N	ISA-NO	OBA00008						
Ammonium ion	Inner solution RE-11 (500mL)	OBG00006	inner solution OBG00005	NH ₄ -1000 NH ₄ -N	ISA-NH	OBA00006							
Ammonium-nitrogen													
Carbon dioxide	Inner solution RE-11 (500mL)	OBG00006	CGS-111 (Powder: 10 bags, bag for 1L)	ISA-CO	OBA00011								

Notes:

- Standard solution: For 2-point calibration use undiluted and 10 or 100 times diluted ones.
- Standard solutions for silver and sulfur ions are easily changed in conc. and are not available. *1
- Ionic strength adjuster: TISAB-01 for general use, but TISAB-11 for sample containing coexisting materials of aluminum or iron. *2,3
- Outer chamber's solution: Select suitable one according to the sample. KCL-100C (Sat. KCL), RE-2 (10% potassium nitrate KNO₃) or RE-3 (10% lithium acetate CH₃COOLi).

OTHER CONSUMABLE PARTS AND SPARES

pH standard solution, pH6.86, 500ml	Buffer powder	pH6.86	(box of 5 bags, bag for 500ml)
Ditto pH4.01, 500ml	Ditto	pH4.01	(ditto)
Ditto pH9.18, 500ml	Ditto	pH9.18	(ditto)
Ditto pH10.02, 500ml	Printer chart paper	PAP-HCS	(5 rolls)
Ditto pH1.68, 500ml			
3.3mol/L KCl solution, 500ml, refill solution			

DKK-TOA CORPORATION

CAUTION

Do not operate products before consulting instruction manual.

International Operations:

 DKK-TOA Corporation
 29-10, 1-Chome, Takadanobaba, Shinjuku-ku, Tokyo 169-8648 Japan
 Tel: +81-3-3202-0225 Fax: +81-3-3202-5685

Representative Office (Europe):

 DKK-TOA European Representative
 St. Johns Innovation Centre, Cowley Rd., Cambridge CB4 0WS UK.
 Tel: +44 (0)1223-526471 Fax: +44 (0)1223-709239

<http://www.toadkk.co.jp>

Information and specifications are for a typical system and are subject to change without notice.