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Laboratory Products

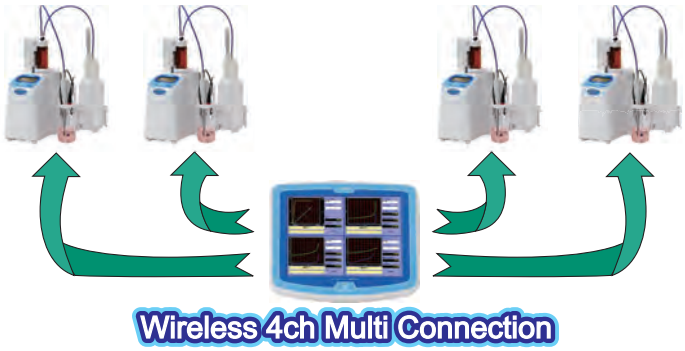
KYOTO ELECTRONICS MANUFACTURING CO., LTD.

Foods | Beverage | Alcoholic drink | Animal oil | Vegetable oil | Crude oil | Petroleum products | Pesticides
Chemicals | Pharmaceuticals | Cosmetics | Flavors | Fragrances | Paints | Steel | Electric/ Electronic Parts

Automatic Potentiometric Titrator
AT-710M / AT-710S / AT-710B

4-ch Concurrent Measurement Saves Time, Space, and Cost

▸Connecting Automatic Potentiometric Titrator , Karl Fischer Moisture Titrator (up to 4 sets maximum), enables multiple simultaneous titration operations! (AT-710M)



▲ AT-710S

▼ AT-710B

Simple, Accurate, and Safe

- ▸The large 8.4” color touch panel, one of the largest available panels, allows easy operation. (AT-710M/ S)
- ▸Easy management of the measurement data via USB memory stick.
- ▸Improved security via the user group authority setting. (AT-710M / S)
- ▸Two different potentials from different detection methods, such as pH/ temperature, pH/ conductivity can be logged simultaneously. This enables you to study behavior of conductivity against pH change, the correlation of color change with indicator and pH change etc. (AT-710M / S)
- ▸Remote operation protects the operator from toxic gases or organic solvents. (AT-710M) *Commercially available Bluetooth® adapters are required.
- ▸Ability to monitor titration temperature ensures safe measurements during titrations - in cases where the temperature rises, such as Strong acid—Strong base. (AT-710M / S)

Customizable Instruments by Selecting Various Options

- ▸Automatically records and recognizes the calibration results of titration solutions or electrodes by using a smart burette or a smart electrode cable incorporating an IC chip. (optional)
- ▸By adding a second burette or auto dispenser, complicated titrations involving preprocessing or dosing becomes much more compact. (optional)

Detection range	1) Potentiometric: -2000mV to +2000 mV 2) pH: -20.000 to +20.000pH 3) Temperature: 0°C to 100°C
Burette size	20mL glass burette with brown cover (Standard) Optional burette units: 10mL, 5mL, or 1mL
Burette accuracy	50mL (Auto dispenser): ±0.5mL 20mL: ±0.02mL Reproducibility: ±0.01mL 10mL: ±0.015 mL Reproducibility: ±0.005mL 5mL: ±0.01 mL Reproducibility: ±0.003 mL 1mL: ±0.005 mL Reproducibility: ±0.001 mL *1
Titration type	Potentiometric (acid-base, redox, precipitation), Photometric, Polarization, Conductivity
Data memory	500 samples (AT-710M / S), 50 samples (AT-710B)

*1 Available in late 2018

Multiple Sample Changer

The sample changer enables continuous measurements on multiple samples easily when connected with KEM’s Automatic Potentiometric Titrators.

▶Various applications are available with pre-treatment and electrode cleaning.

▶Space-saving compact design.
▶One touch operation is available.

Model	CHA-600		CHA-700	
Number of samples	12 samples	18 samples	6 samples	11 samples
Stirring device	Built-in magnetic stirrer at titration position Option : Pre-treatment stirrer (Assembled at factory before shipment)		Propeller stirrer	
Available vials	300mL tall beaker 200mL disposable cup 200mL beaker	100mL disposable cup 50mL beaker	250mL beaker 200mL disposable cup 200mL beaker	100mL disposable cup 50mL beaker
	Optional beaker holder for : 200mL erlenmeyer flask 100mL disposable cup 50mL beaker		Optional beaker holder for : 100mL disposable cup 100mL beaker 100mL tall beaker 50mL beaker	
Cleaning	Standard : Shower rinsing Option : Dipping rinsing Rinsing with two kinds of solution		Standard : Dipping in beaker at fixed position Option: Shower cleaning	
Dimensions	520(W) × 434(D) × 509(H) mm		365(W) × 443(D) × 315(H) mm	
Compatibility	AT-710M / S, AT-710B + AT-Win		AT-710M / S / B, AT-710B + AT-Win	

Software for Automatic Potentiometric Titrator AT-Win

Parameter settings, titration control, and data analysis
for Automatic Potentiometric Titrator AT-710B are available via a PC .

Foods | Animal oil | Vegetable oil | Crude oil | Petroleum products | Chemicals
Pharmaceuticals | Cosmetics | Flavors | Fragrances | Paints | Minerals

Karl Fischer Moisture Titrator
MKV-710M / MKV-710S / MKV-710B (Volumetric method)

MKV-710M ▶

4-ch Concurrent Measurement Saves Time, Space, and Cost

▸By connecting Karl Fischer Moisture Titrator and Automatic Potentiometric Titrator (up to 4 sets), multiple simultaneous titration measurements are possible. (MKV-710M)

Remote Operation

▸Remote operation protects the operator from toxic gases or organic solvents. (MKV-710M optional) *Commercially availavle Bluetooth® adapters are required,

Various Advanced Functions are Available

▸Automatically calibrates the reagent titer by simply pressing a button (MKV-710M / S optional)

▸A stirrer with an automatic solvent change unit simplifies injecting / draining the solvent

Karl Fischer Moisture Titrator
MKC-710M / MKC-710S / MKC-710B (Coulometric method)

MKC-710M ▼

4-ch Concurrent Measurement Saves Time, Space, and Cost

▸By connecting Karl Fischer Moisture Titrator and Automatic Potentiometric Titrator (up to 4 sets), multiple simultaneous titration measurements are possible. (MKC-710M)

Remote Operation

▸Remote operation protects the operator from toxic gases or organic solvents. (MKV-710M optional) *Commercially availavle Bluetooth® adapters are required,

Various Advanced Functions are Available

▸Increased electrolysis rate shortens the pre-titration time and the measurement time.(Maximum electrolytic rate: 2.6mgH_2O/min)

Volumetric titration	Measurement range	Water content	100µg to 500mg H_2O (depends on KF reagent factor)
		Concentration	1ppm to 100% H_2O
	Burette accuracy	Discharge precision	10mL ±0.015mL
		Repeatability	±0.005mL
Coulometric titration	Measurement range	Water content	1µg to 300mg H_2O
	Accuracy	RSD	less than 0.3% (n=10)
		Display resolution	0.1µg
Hybrid titration	Measurement range	Water content	1µg to 500mg H_2O
	Accuracy	RSD	less than 0.3%(n=10) (KF reagent factor 3mg/mL)
		Display resolution	0.1µg

Hybrid Karl Fischer Moisture Titrator
MKH-710 CE:Under application

The world's first hybrid measurement meter has enabled the measurement of moisture content from trace levels to high volume with just a single instrument.

Volumetric method + Coulometric method ⇒ Hybrid method

▸It can measure without adjusting the sample amount.

Cost-saving

▸Electrolytic Factor Measurement system has delivered a fully automatic titration, without using pure water or standard solution.

Evaporator / Multiple Sample Changer

An evaporator is ideal for measuring the moisture content of samples containing interfering substances as solid substances which are insoluble in the dehydration solvent.

▸Automatic operation through a touch pannel.(MKV/MKC-710M / S)

▸Two types of furnace enables measurement for hygroscopic moisture and combined moisture.

▸PID control by the built-in thermostat provides an accurate and stable oven temperature.

Model	ADP-611	ADP-512 (Non-CE)	ADP-512S (Non-CE)
Application	Chip, Particulate or Powder samples, such as plastic pellets	Iron ores	Ores, Metallic powder, Ceramics, Other solids, Powder materials
Heating temp. range	50 to 300°C	High temp. furnace: 50 to 1000°C Low temp furnace: 50 to 130°C	50 to 1000°C
Compatibility	MKV / MKC-710, MKH-710, MKV / MKC-710B + KF-Win		

*Nitrogen gas and the regulator (Adjustable to 50kPa) are required.

▸Indirect method enables consecutive measurement without discarding waste after each test.

▸The mantel heater ensures the complete extraction of moisture of sugar samples.

▸Suitable for the continuous measurement up to 24 samples.

Model	ADP-513 (Non-CE)	ADP-344 (Non-CE)	CHK-501 (Non-CE)
Application	Lubricants, Petroleum products	Sugar samples	Multiple measurement for powder samples
Heating temp. range	Room temp. to 300°C	Room temp. to 60°C	Room temp. to 300°C
Compatibility	MKV / MKC-710, MKH-710, MKV / MKC-710B + KF-Win		MKC-710M / S, MKH-710

*Nitrogen gas and the regulator (Adjustable to 50kPa) are required.

Software for Moisture Titrator
KF-Win

Parameter settings, titration control, and data analysis for the Karl Fischer Moisture Titrators MKV-710B and MKC-710B are available via a PC.

Foods Beverage Alcoholic drink Animal oil Vegetable oil Crude oil Petroleum products
Chemicals Pharmaceuticals Cosmetics Flavors Fragrances Electronic device Semiconductor Electrics

Density / Specific Gravity Meter
DA-650 / DA-645 / DA-640 / DA-100

▲ DA-645

DA-100 ▼

A resonant frequency oscillation-type density meter enables quick measurement even with small samples.

Temperature Stabilization from the built-in Constant Temperature Unit shortens time

Connecting the Refractometer enables Density and Refractive Index Measurement at the Same Time. (DA-650/645/640)

Model	Measurement range	Accuracy *1	
		Density	Temperature
DA-650	0 to 3 g/cm³	±0.00002 g/cm³	±0.02°C
DA-645		±0.00005 g/cm³	±0.03°C
DA-640		±0.0001 g/cm³	±0.05°C
DA-100		±0.001 g/cm³	±0.5°C

*1 According to KEM standard measurement conditions.

Foods Beverage Alcoholic drink Crude oil Petroleum products
Chemicals Pharmaceuticals Cosmetics Flavors Fragrances

Refractometer
RA-620 / RA-600

RA-620 ▼

Measuring the refractive index by the Detection of Critical Angle of Optical Refraction method.

Refractive index and concentration of sample can be measured with a simple operation.

In the critical angle image mode, the image of the Abbe measurement scale can be viewed.

Model	Measurement range	Accuracy *1	Temperature control *2
RA-620	nD: 1.32000 to 1.58000 Brix: 0.00 to 100.00 %	nD: ±0.00002 Brix: ±0.014 % *3	5°C to 75°C
RA-600	nD: 1.3200 to 1.7000 Brix: 0.00 to 100.00 %	nD: ±0.0001 *4 Brix: ±0.1 %	5°C to 75°C 5°C to 100°C (Option)

*1 Based on KEM standard measurement conditions.
*2 Lower limit 12°C below ambient.
*3 Calculated from measurement accuracy of refractive index: nD 0.00002 = Brix 0.014%.
*4 Accuracy is not guaranteed when the set temperature is above 75°C.

Auto Clean and Sampling Unit / Multiple Sample Changer

The following units enable sampling, cell cleaning and purge drying that are necessary to complete the process of measurement. Adoption of a peristaltic pump enables the measurement of density on higher viscous sample of 50,000mPa･s.

▶Standard model (N type)

▶High temp. model (H type)

Model	DCU-551N	DCU-551H
Heating temp. range	N/A	Room temp. to 80°C
Number of vials	1 vial (20mL size)	
Sampling method	Pressure filling method	
Drain system	1) Pressure sample discharge	2) Retrieve sample back to vial
Compatibility	DA-6XX , RA-6XX	DA-6XX

▶Standard model (N type)

▶High temp. model (H type)

▶Low temp. model (C type)

Model	CHD-502N	CHD-502H	CHD-502C
Heating temp. range	N/A	Room temp. to 80°C	4°C to Room temp.
Number of vials	30 vials (20mL size)		
Drain system	1) Drain sample by pressurized pumping 2) Retrieve sample back to vial		
Compatibility	DA-6XX , RA-6XX	DA-6XX	

*Thermostat water circulator is required.

Portable Meter
DA-130N / RA-130 / BX-1

Portable meters that are compact, lightweight, and have universal designs.

▶Density / Specific Gravity Meter

▶Refractometer

▶Brix meter

Model	DA-130N	RA-130	BX-1
Measurement parameter	Density, Specific gravity, Brix, and more	Refractive index, Brix	Brix
Measurement range	0.0000 to 2.0000 g/cm^3	nD: 1.3200 to 1.5000 Brix: 0.0 to 85.0 %	Brix: 0.0 to 85.0 %
accuracy	±0.001 g/cm^3	nD: ±0.0005 Brix: ±0.2 %	Brix: ±0.2 %

Karl Fischer Reagent
KEMAQUA Series

These are the dedicated reagents for the Karl Fischer moisture titrators.
These reagents are not only for the moisture meters manufactured by Kyoto Electronics Manufacturing Co., Ltd., but these reagents can also be used for all commercially available Karl Fischer moisture titrators on the market.

A rich lineup supporting a wide range of samples

◇ For Volumetric Titrator

Application	Dehydrated Solvent	Titration Reagent
General samples	MET	TR-1
Oils	OIL	TR-3
Fats and Oils	FAT	TR-5
Ketones	KET	
Sugars	SA	

◇ For Coulometric Titrator

Application	Dehydrated Solvent	Remarks
General samples (Alcohols, Hydrocarbons, Ethers, Esters, Gases, Fats and Oils)	Anolyte AGE Catholyte CGE	AGE/ CGE are non-organic chlorines.
General samples (Amines)	Anolyte AGE Catholyte CGE	Add 10g salicylate acid to 100mL AGE
Fats and Oils	Anolyte AO Catholyte CGE	
Ketones	Anolyte AKE Catholyte CGE	Formaldehyde can only be titrated among other aldehydes.

◇ Water Standard

Application	Water Standard	
For direct method (For MKV-710, MKC-710)	Water Standard 10 Water Standard 1 Water Standard 0.2 Water Standard 0.1	8mL 5mL 5mL 5mL
For indirect method (For MKV-710, MKC-710 with Evaporator)	Solid Standard 5.5 Solid Standard 3.8	10g 10g

Density Standard Liquid (JCSS certified)
Refractive Index Standard Liquid (JCSS certified)

The standard solutions for density and refractive index certified by Japan Calibration Service System (JCSS) are used for evaluating the reliability of Density/ Specific Gravity Meter and Refractometer.
The certification authority (IA Japan) operating JCSS has signed the mutual agreement of the Asia Pacific Laboratory Accreditation Cooperation (APLAC) and the International Laboratory Accreditation Cooperation (ILAC).

R&D of Biology | High molecular | Petro-chemistry | Cosmetics

Electro Magnetically Spinning Viscometer EMS-1000

This is a world-first! A new method of viscosity measurement which is a complete change from common practice. Greatly resolves the problems encountered with conventional viscosity measurement.

Required sample volume is minimal – far less than competing instruments;

- Only 300 µL is required.
- EMS-1000 performs measurement by non-contact, which enables samples to be recovered and re-used in other applications after measurement.
- EMS-1000 will contribute to cost effective measurement of precious and valuable biological and brand new materials.

Sealed Disposable Container

- Enables measurement of volatile, hygroscopic, and anaerobic samples.
- Sample containers need no cleaning, so eliminating contamination risks.
- Safe and secure measurement for samples that are hazardous to human health.

Supports change-over-time, temperature dependability, flow characteristics evaluation

- Measurement using motor shaft rotation count and temperature adjustment allows viscosity measurements that are problematic when using conventional measurement methods.

Viscosity Measurement with Sample Monitoring

- Image captured by the built-in CMOS camera enables monitoring of the sample status in real-time, contributing to identification of the properties of new materials.

Sphere size	Sphere with ϕ2mm	Sphere with ϕ4.7mm(optional)
Measurement range	0.1 to 100,000mPa・s	10 to 1,000,000mPa・s
Accuracy	RSD 3% (according to KEM' standard measuring condition)	
Minimum sample amount	300 µL	700 µL
Temperature Range	0 to 200°C (the ambient temp. must not exceed 20°C for measurement at temp. ≤ 10 °C)	
Stability	±3%	

Beverage | Alcoholic drink

Gas Volume Analyzer GVA-700

Automatically measures gas volume, air content and oxygen concentration necessary to control the bottling process of beverages.

Easy and Safe Operation

- Just set the sample in the sample tray! Full automated measurement in every process from Inserting a needle ⇒Sniffing ⇒Stirring ⇒Measurement Gas Intake, all saving the operator work.
- When the air supply stops, the rotating part is locked, ensuring safe measurement.

Supports Various Types of Containers, Metal cans, Glass bottles, and Plastic bottles

- Liquid volume: 190mL to 2.0L
  Height: 90mm to 320mm
  Diameter: 53mm to 110mm

Industrial materials | Construction materials | Craft materials | Soil | Foods | Automobile

Quick Thermal Conductivity Meter
QTM-710 / QTM-700

A thermal conductivity meter which is not only accurate, but is also easy to operate, with rapid measurement capabilities.

A clear, easy-to-see 5.7" TFT color LCD display touch panel

▸Quickly displays the necessary information and operation menus, such as measurement results and measurement history.

Quick measurement using a 3-ch probe

▸Up to 3 sets probes can be connected and that reduces the entire stabilization time and allows optimum measurement.

A choice of probes allows the optimum selection for each sample

◇ Box type probe (PD-11N)
Measurement samples can be anything from solid blocks to powders to sheets.
(*The sheet-type samples are available only with QTM-710.)

◇ Insulated moisture proof prove (PD-13N)
For the measurement of hydrated compounds such as foods or ready-mixed concrete or conductive materials.

◇ High temperature probe (PD-31N)
For the measurement of high temperature materials such as new materials, firebrick, or heat insulation materials.

◇ Container for powders (Optional)
To measure powder samples.

Model	Measurement range	Measurement temperature	Sheet-type sample
QTM-710	0.03 to 12W/(mK)	5 to 35°C	Applicable
QTM-700		*For PD-11N,PD-13N	Not applicable

Heat Stroke Checker
WBGT-203A / WBGT-213A (NON-CE)

WBGT-203A ▲

▲ WBGT-213A

The wet-bulb globe temperature (WBGT value) to prevent heat stroke can be easily measured at any time.

Measurement range / Accuracy	WBGT-203A for general sports activities	WBGT-213A for working fields
WBGT	0 to 50°C / ±2.0°C (at 15 to 35°C)	
Temperature	0 to 50°C / ±1.0°C (at 15 to 40°C)	
Relative humidity	10 to 90% RH / ±5.0% (20 to 80% RH at 25°C)	
Globe temperature	0 to 60°C / ±2.0°C (at 15 to 50°C)	0 to 80°C / ±2.0°C(at 15 to 50°C)

Portable Heat Flow Meter
HFM-201 (NON-CE)

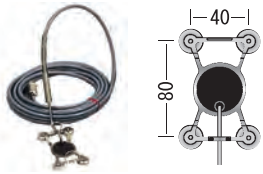
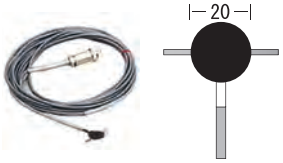
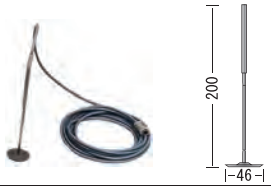
Heat flow measurement enables acquisition of important thermal information which cannot be obtained only by the temperature measurement. This information is widely used for the evaluation of heat insulation performance, energy control, and monitoring of heat flow in/ out.

Handy Portable Type

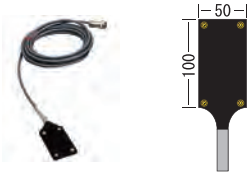
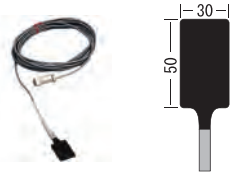
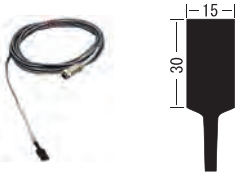
▸Compact and lightweight Single Heat Flow meter

Measurement range	Number of thermal sensor connections
Thermal flow: 0 to ±99,990W/m²	1 set
Temperatures: -40°C to 750°C	

High Heat Flow Sensors for HFM-201

Sensor name	Surface Type High Heat Flow Sensor	Surface Type High Heat Flow Sensor ϕ20	Embedding Type High Heat Flow Sensor
Model	T500B-B	T500B-20-B	T750-B
Application	The sensors can be used in a wide variety of applications, Ranging from energy saving to furnace operation control.		Furnace wall, Insulating materials
Normal heat flow range	350 to 17,000 W/m²		580 to 58,000 W/m²
Normal temperature range	70 to 500 °C		200 to 750 °C
Shape & dimensions			

Low Heat Flow Sensor for HFM-201

Sensor name	General-purpose Low Heat Flow Sensor		Low Heat Flow Sensor
Model	TR2-B	TR6-B	TM1-B
Application	The TR type sensor can be used in a wide variety of applications including the measurement of heat loss from insulated piping and the testing of heat characteristic in insulating materials or soil.		For heat radiation from living bodies and small parts of equipments
Normal heat flow range	12 to 3,500 W/m²		
Normal temperature range	-40 to 150 °C		
Shape & dimensions			

Automatic Potentiometric Titrator and Optional unit

AT-710	Multiple Sample Changer CHA-600 CHA-700	Automatic Piston Burette APB-610	Exchangeable Burette Unit EBU-710	Windows Software AT-WIN
				

Karl Fischer Moisture Titrator and Optional unit

Volumetric Method MKV-710	Coulometric Method MKC-710	Hybrid Method MKH-710	KF Reagent KEMAQUA	Exchangeable Burette Unit EBU-710 (for MKV-710)	Windows Software KF-WIN
		 CE:Under application			

Evaporator ADP-611	for Oil ADP-513	for Ore ADP-512	for High temp. ADP-512S	for Sugar ADP-344	for Powders CHK-501
	 Non-CE	 Non-CE	 Non-CE	 Non-CE	 Non-CE

Density/ Specific Gravity Meter, Refractometer and Optional unit

Densitymeter DA-6XX	Refractometer RA-6XX	Auto Clean and Sampling Unit DCU-551N/H	Multiple Sample Changer CHD-502N/H/C	3 digit Densitymeter with Autosampling Unit DA-100 + ASU-100	Portablemeter		
					Densitymeter DA-130N	Refractometer RA-130	Brixmeter BX-1
							

Dedicated Analyzer

EMS Viscometer EMS-1000	Gas Volume Analyzer GVA-700	Quick Thermal Conductivity Meter QTM-7XX	Heat Stroke Checker WBGT-203A	WBGT-213A
			 Non-CE	 Non-CE

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