



## Density/Specific Gravity Meter Concentration Meter



DA-520  
DA-510  
DA-505  
DA-500  
DA-100  
DA-130N  
WBA-504  
WBA-505  
WBA-505B

**KYOTO ELECTRONICS**

## KEM Product Line

# Wide Choice of KEM

Oscillation-type Density/Specific gravity measuring method is excellent at accurately measuring on a small amount of sample with speed.

It finds extensive application in such fields as Petroleum products, Chemical products, Beverage, Pharmaceutical or Food industry for the purpose of quality control or research.

DA-520  
DA-510  
DA-505  
DA-500



High Performance

# Density Meter Series



DA-130N

Portable

We offer a wide and full range of the meter, from high-precision desktop models to portable models, in order users to select meters that are directed toward the operating conditions or applications for users.



DA-100

Low Cost

# DA-520/DA-510/DA-505/DA-500

## Introduction

Density, specific gravity, Brix or concentration of liquid sample can be measured by the DA-520, DA-510, DA-505 or DA-500 Density/Specific gravity meter of resonant frequency method, which is specified in "ASTM D 4052 Test Method for Density and Relative Density of Liquid by Digital Density Meter" and "ASTM D 1250 Petroleum Measurement Tables - Volume Correction Factors" as well as in "API 2540 Manual of Petroleum Measurement Standards".

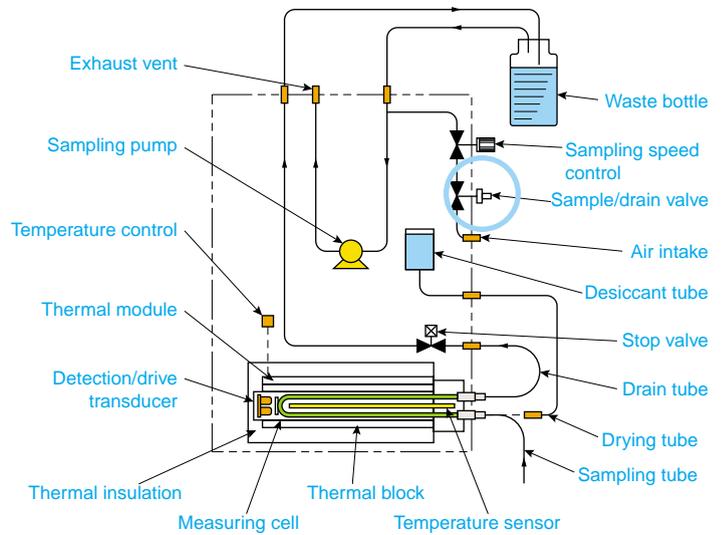
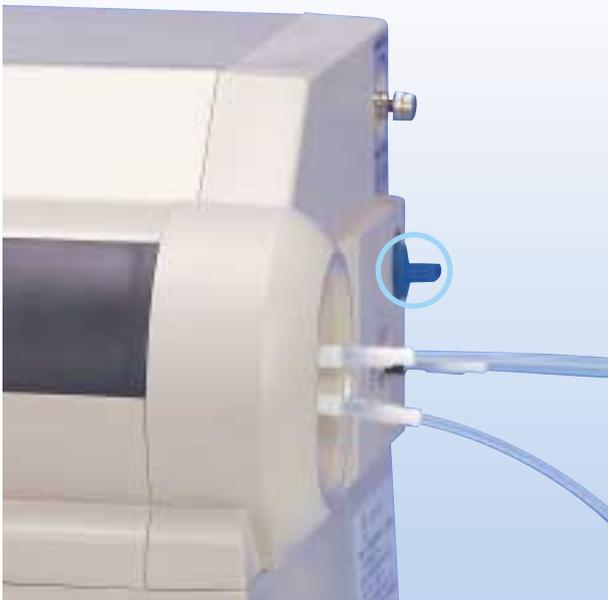
The DA-520 and DA-505 can be used automatic viscosity correction. The DA-510 measures density of liquid sample with reproducibility of  $5 \times 10^{-6} \text{g/cm}^3$  and the DA-500 with  $5 \times 10^{-5} \text{g/cm}^3$  reproducibility. The printout data of measurement results are edited to GLP requirements including instrumental check and its record. These models are CE-marked to meet safety and noise requirements.



## Features

- Viscosity correction is functioned in the DA-520 and DA-505.
- PC card enlarges memory space for measurement data or downloading user's own conversion table.
- The built-in sampling and purge pump make it easy to rinse and dry the cell.
- Enlarged LC display and specially designed keypad provide user with easy view and operation.
- Storage and printout of check measurement and calibration record are made now possible by GLP conformed function.
- The built-in temperature control shortens measuring time at desired temperature, offering short setup time and increased efficiency.
- Weight of the new models is approximately 2/3 of previous models.
- RS-232C interface is now standard (3 channels).
- Standard stored tables are Brix concentration, Alcohol concentration conversion and Crude oil / Petroleum products density conversion.
- A variety of options provides customized system, and when Refractometer (RA-520N/RA-500N) is connected, both density and refractive index can be obtained simultaneously for diversified applications.
- Optional SOFT-CAP<sub>E</sub> Data capture software can download the data direct to workbook of Microsoft Excel or store them in CSV format.

## Easy cleaning/drying the cell (compared with conventional model)



## Applications



### Crude oil and petroleum products

Density or specific gravity of crude oil, fuel oil (heavy oil, light oil, kerosene, gasoline) and lubricant is applied to determine trading price or tax rate.



### Chemical products

For quality control of organic products in process or finished products in petrochemical industry or control of purity – concentration of inorganic substance in heavy chemical industry



### Beverages

Milk and dairy products, soft drinks, soda and fruit juice, etc. Density or Brix of these products is used for quality control in line or at finishing process.



### Alcoholic Beverages

Beer, wine, whisky and spirits. Alcohol degree or concentration of extract is measured to determine product price or tax rate.



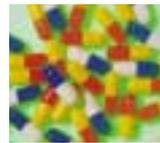
### Foods

Raw material for foods like sucrose solution, concentrated liquid, salty water, syrup, isomerized sugar, etc. and sauce, gravy, seasonings. Brix or concentration of targeted substance is measured to control quality of these products.



### Pharmaceutical products

Measurement of density of products is routinely practiced for quality control or R&D.



### Perfume and medicine

Both density and refractive index are necessary for quality control of perfume, and minimum sample required for measurement is also important for its cost. The new density meter can be used for combined measurement with refractometer.



### Fats and oils

Density or specific gravity of vegetable oil and animal fats is measured for quality control or research work.



### Electronic parts and semiconductor

These materials are quality controlled by measuring density of surface finishing liquid like etching solution or acid cleanser.



### Electrical products

Quality is controlled by measuring density of flux or plating solution.



### Others

Not only foregoing products and industries, many other applications are possible by measuring density, specific gravity, Brix and property concentration.

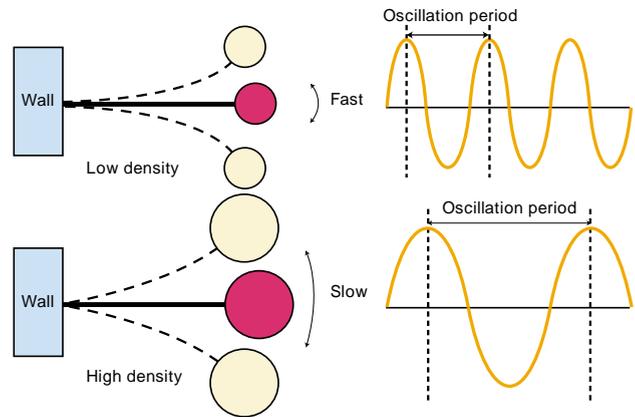
## Measurement principle

Just imagine the model where a weight is attached to a bar at the end and a bar is fixed on a wall as shown in the right figures.

And when you hit the weight by a finger, the weight starts vibrating.

Now you will find that the heavier the weight becomes, the slower it vibrates and vice versa. This is because the weight will vibrate on the oscillation period specific to a substance in proportion to the mass of a weight.

This means that one can determine the density of a substance by measuring its oscillation period since density becomes proportional to the mass when the volume is constant, i.e. a fixed tube.



## Front view of the instrument

Desiccator

Measurement cell

Cell window

Waste liquid bottle

IDP-100 printer

PC card slot

Sampling-speed control valve

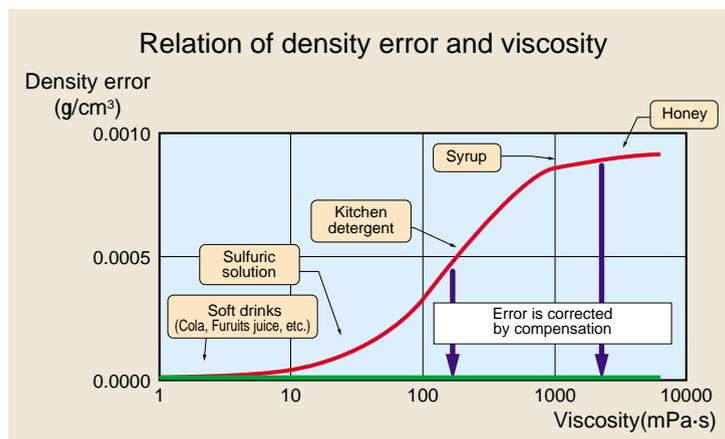
Sample/Drain switching valve

Desiccant tube  
Drain tube

Sampling tube  
LC Display

Power switch

Operation keypad



## Examples of measurement

### Concentration of NaCl

```

*** R e s u l t ***
Sample No.    01-01
Date : 2001/09/18 09:55
Meas.Temp.   : 20.00 °C
d[g/cm3]    : 1.06999
<Result>
Conc.       :      6.57319 %
    
```

### Brix degree

```

*** R e s u l t ***
Sample No.    01-01
Date : 2001/09/18 10:00
Meas.Temp.   : 20.00 °C
d[g/cm3]    : 1.04052
<Result>
Brix        :      10.582 %
    
```

### Density of lubricant (Converted to the density at 15°C using Temperature compensation function)

```

*** R e s u l t ***
Sample No.    01-01
Date : 2001/09/18 10:01
Meas.Temp.   : 20.00 °C
d[g/cm3]    : 0.98731
<Temperature Comp.>
Temp.Formula  OilTable-2
Comp.Temp.   : 15.00 °C
d[g/cm3]    : 0.99069
    
```

### % Alcohol

```

*** R e s u l t ***
Sample No.    01-01
Date : 2004/01/20 15:25
Meas.Temp.   : 20.00 °C
d[g/cm3]    : 0.98485
<Result>
Alcohol     :      9.88 %
    
```

### Density of shampoo

```

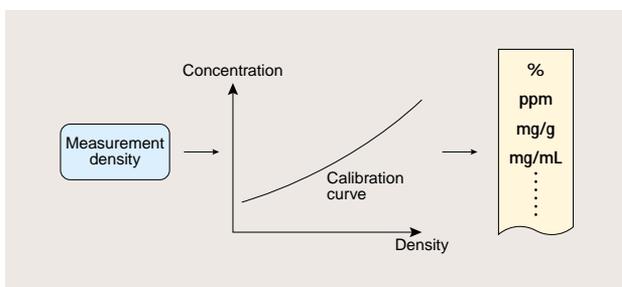
*** R e s u l t ***
Sample No.    01-01
Date : 2001/09/18 10:03
Meas.Temp.   : 20.00 °C
d[g/cm3]    : 1.04059
    
```

### Viscosity-corrected density of high-concentration sugar solution

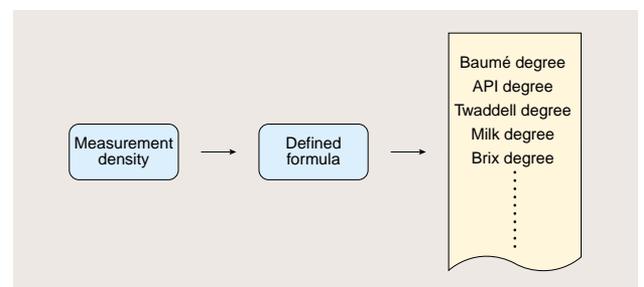
```

*** R e s u l t ***
Sample No.    51-01
Date : 01/20/2004 14:03
Meas.Temp.   : 20.00 °C
Period T     : 11630416
d[g/cm3]    : 1.286661
Visco. corrected
T           : 11629818
Visco. corrected
d[g/cm3]    : 1.286367
d(t/t)     : 1.288680
<Result>
Brix       :      59.990 %
Meas.Time  : 00:05:48
    
```

## Concentration conversion



Calibration curve is pre-determined and plotted, using a plural number of liquid of which concentration is known. When density of a sample of which concentration is unknown is measured, the results are converted to unit like % or ppm.



Convert to values obtained by various hydrostatic methods.

## Specifications of Density/Specific gravity meters

Type and Model name	DA-520 Density/ Specific gravity Meter	DA-510 Density/ Specific gravity Meter	DA-505 Density/ Specific gravity Meter	DA-500 Density/ Specific gravity Meter
Measuring method	Resonant frequency detection			
Measuring range	0 ~ 3g/cm <sup>3</sup>			
Measuring temperature	4 ~ 70°C	4 ~ 70°C	4 ~ 90°C	4 ~ 90°C
Accuracy	Density	± 0.00002g/cm <sup>3</sup>	± 0.00002g/cm <sup>3</sup>	± 0.00005g/cm <sup>3</sup>
	Temperature	± 0.02°C	± 0.02°C	± 0.03°C
Reproducibility	SD : 0.000005g/cm <sup>3</sup>	SD : 0.000005g/cm <sup>3</sup>	SD : 0.00001g/cm <sup>3</sup>	SD : 0.00005g/cm <sup>3</sup>
Minimum sample required	1) Approx. 1.2mL by manual syringe 2) Approx. 2mL by built-in sampling pump			
Auto viscosity correction	Built-in	Not available	Built-in	Not available
Measuring time	1) 1 ~ 4 minutes by manual 2) 2 ~ 10 minutes by programmed			
Display	1)240 x 64 dot LCD with back light 2)Display messages: density, specific gravity, frequency, temperature and guiding messages for measurement			
Sampling	1) Manual by syringe 2) Automatic by the built-in pump			
Method	Up to 10 methods can be stored in file for measuring conditions on each sample			
Stability sense	Select 0 (precise), 1 (normal) or 2 (quick)			
Factor saving	Factor by "Air & Water" and "Other STD" at 10 different temperatures can be saved.			
Temperature compensation	Formula of temperature vs. density can be input. Table of temperature vs. density can be input			
Auto conversion	Formula of concentration vs. density can be input Table of concentration vs. density can be input			
Petroleum table	Table of temperature correction (15°C/60°F) as standard			
Brix conversion	Standard supplied			
Alcohol conversion table	Standard supplied			
Auto statistical data	Mean value, standard deviation, relative SD			
Recalculation	Data can be recalculated			
Printout	IDP - 100 impact dot printer (Option)			
PC card	1) Data and parameters can be saved 2) Instrument can be upgraded by PC card (Option)			
Interface	Serial interface for RS232C (PC) Serial interface for printer      Serial interface for sample changer			
Combined measurement	Can be connected to Refractometer (RA-520N/RA-500N)			
Liquid contact material	PTFE and borosilicate glass			
Ambient condition	1)Temperature 5~35°C 2)Humidity less than 85%RH (under no condensation)			
Power	AC100V - 240V, 50/60Hz approx. 100W			
Dimension	385(W) x 490(D) x 411(H)mm			
Weight	15kg			
Supplied parts	Power cord: 1pce., Waste liquid bottle (250mL with cap): 1pce., Cup with magnet: 1pce., Desiccant: 1pce., Sampling tube (with joint): 1pce., Drain tube (with joint): 1pce., Exhaust tube (1m): 1pce., Sampling/drain tube: 1set, Desiccant tube: 1pce., Sample injector: 2pcs., Silica gel (500g): 1pce., Operation manual: 1pce., Others			

## Specifications of Density/Specific gravity meters and Concentration meters

Type and Model name		DA-100 Density/ Specific gravity meter	DA-130 Density/ Specific gravity meter	WBA-504 General Concentration meter	WBA-505/WBA-505B General concentration M. / Beer analyzer
Measuring method		Resonant frequency detection		Density: Resonant frequency detection Refractive Index: Detection of critical angle with Na-D line	
Measuring range		0 ~ 3g/cm <sup>3</sup>	0 ~ 2g/cm <sup>3</sup>	Density: 0 ~ 3g/cm <sup>3</sup> Refractive: 1.32 ~ 1.70	Density: 0~3g/cm <sup>3</sup> Refractive: 1.32~1.58
Measuring temperature		15 ~ 40°C ; 59 ~ 104°F	0 ~ 40°C	15 ~ 50°C	
Accuracy	Density	± 0.001g/cm <sup>3</sup> When calibrated by pure water and dry air		± 0.00005g/cm <sup>3</sup>	
	Refractive index	N/A		± 0.0001	± 0.00005(R.I.1.32 ~ 1.40) ± 0.0001 (R.I.1.40 ~ 1.58)
	Temperature	± 0.5°C	N/A	± 0.05°C	
Minimum sample required		2 mL		6 mL	
Auto viscosity correction		Not available		Built-in	
Measuring time		1 ~ 4 minutes by manual		1 ~ 4 minutes by manual 2 ~ 10 minutes by programmed	
Display		LCD with back light			
Sampling		Manual by syringe Auto by ASU-100 (option)	Manual by hand pump	Manual by syringe Automatic by DCU-551Auto Clean and Sampling unit(option)	
Calibration		Air & Water		"Air & Water" and "Other STD"	
Auto statistical data		N/A		Mean value; Standard deviation (SD); Relative SD	
Recalculation		N/A		Data can be recalculated	
Printout		IDP-100 impact dot printer(Optional)			
Data I/O		N/A		PC card (option) for additional data storage and application method	
External control		RS-232C (1 channel)	IrDA personal computer	Personal computer: RS-232C serial interface External printer: RS-232C serial interface AUX (Barcode): RS-232C serial interface Sample changer: Serial interface PC card: Conform to PCMCIA standard	
Power source		AC100 ~ 115V or AC220~240V ; 50/60Hz	Alkaline AAA dry cells 1.5V x 2	AC 100 ~ 120 or AC200 ~ 240V ; 50/60Hz	
Power consumption		Approx. 30W	N/A	Approx. 140W	
Dimension		275(W)x350(D)x165(H) mm	65(W)x115(D)x333(H) mm(with sampling tube)	288 (W) x 468(D) x 442(H) mm	
Weight		Approx. 6kg	Approx. 360g	Approx. 19kg	
Supplied parts		Power cord 1 pce. Sampling syringe 10 pcs. Sampling/Drain tube 2 pcs. Tube joint 2 sets Desiccant 1 pce. Desiccant tube 1 pce. Surge prevention fuse 2 pcs. Operation manual 1 pce. Others	N/A	SOFT-CAP/Beer 1 pce. (WBA-505B only), Power cord 1 pce., Desiccant 1 pce., Desiccant tube (with joint) 1 pce., Sampling tube (with joint) 1 pce., Silica gel (500g) 1 pce., Connecting tube A (with joint) 1 pce., Connecting tube B (with joint) 1 pce., Operation manual 1 pce. Others	

## Technical data of WBA-505B Beer Analyzer

Measuring objectives	Item	Resolution	Repeatability	Range
	Alcohol	0.01 wt%	±0.02 wt%	0 ~ 8 wt%
	Real extract	0.01 wt%	±0.02 wt%	0 ~ 12 wt%
	Original extract	0.01 °P	±0.05 °P	0 ~ 20 °P
	Apparent extract	0.01 °P	±0.01 °P	0 ~ 20 °P
	Real fermentation	0.01%		
	Apparent fermentation	0.01%		

# DA-520/DA-510/DA-505/DA-500

## Systems

Standard system



DA-520 Density meter

98030002  
Connecting cable



IBM PC/AT series



DA-510 Density meter



CHD-502N/C/H/SS  
Multi-sample changer  
(with 980303388, connecting cable)



DA-505 Density meter



DCU-551N/H/SS  
Auto clean and sampling unit  
(with 980303388, connecting cable)



DA-500 Density meter

980303388  
Connecting cable



CHG-260B/CHG-260BN  
Multiple sample changer

## Optional Accessories



### CHG-260B Multiple Sample Changer

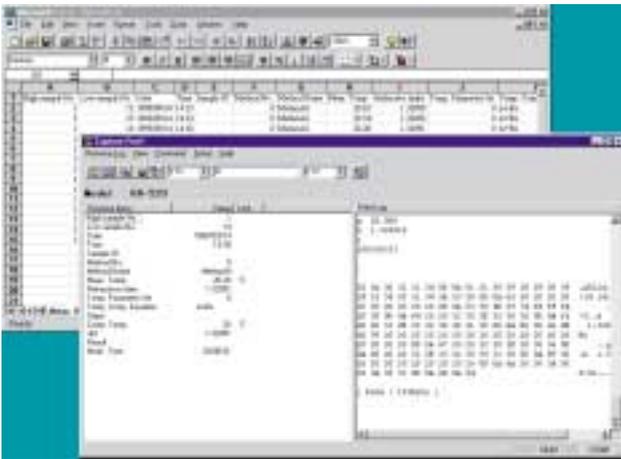
- Connecting cable 980303388 is necessary and separately sold.

Number of sample vial	Maximum 60 (When self-cleaned by sample liquid)
Minimum Sample required	5mL (15mL when self-cleaned)
Sample vial	20mL
Automatic post-treatment	Self-cleaning by sample liquid or by solvent and drying by purge air
Dimension	400(W) x 340(D) x 400(H) mm
Supplied parts	20mL vial..... 60pcs. Sampling nozzle..... 1pce. Sampling tube..... 1pce. Drain tube..... 1pce. Auto drain unit..... 1unit Power cord..... 1pce. Operating manual..... 1copy



### PC Card

- Storage of measurement data  
(The data can be downloaded to an external computer by optional PC Card Read software.)
- Storage of Method files
- Storage of Sample files
- Storage of conversion table and equations
- Upgrade the software of the instrument

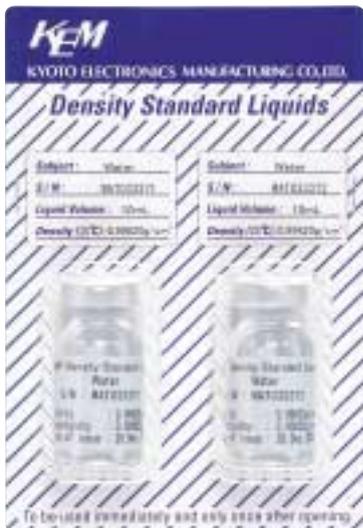


### SOFT-CAP the Data Capture Software for DA-520 / DA-510 / DA-505 / DA-500 Density meter

- Data Capture software can control Density meter.
- Measurement results of Density meter can be downloaded direct to workbook in Microsoft® Excel or filed in CSV format.
- Windows® with Excel must be installed in the connecting personal computer.

### SOFT-PCRE PC Card Read Software

- This software can save in personal computer the method or data files stored in PC card of Density / Specific gravity Meter.



### JCSS Accredited Density Standard Liquids

**JCSS** logo mark is the symbol of an Accredited Calibration Laboratory based on the Measurement Law. Our Density Standard Liquid Laboratory is accredited as Accredited Calibration Laboratory in the field of density (The number "0115" is the JCSS accreditation number assigned for our density standard liquid laboratory). JCSS, Accredited Calibration Laboratories are assessed on JIS Q 17025:2000 (ISO/IEC 17025:1999).

JCSS Accredited Density Liquids can be used to guarantee the quality of calibration for oscillation-type density meters. KEM density standard liquid laboratory (JCSS Accreditation No.: 0115) has been supplying the JCSS accredited density standard liquids traceable to the specific standard (Spherical mono-crystal silicon) of National Measurement Standard (AIST) using the density hydrometer.

Density Standard	Density (at 20°C)	Uncertainty
Pure Water	0.99*** g/cm <sup>3</sup>	±0.00003 g/cm <sup>3</sup>

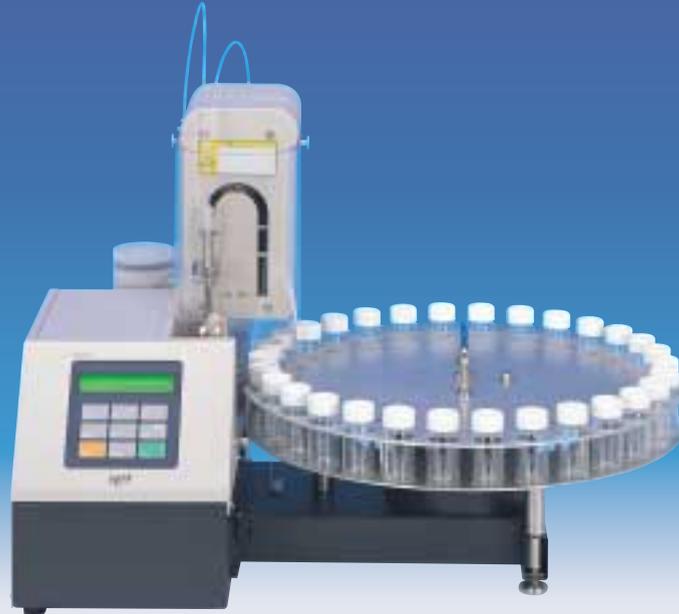
# Multiple Sample Changers, CHD-502 Series

## Introduction

The CHD-502 multiple sample changer is used in combination with density meter.

Maximum 30 samples in each 20mL vial can be set on carousel. This sampler provides when connected to a density meter a series of events in sequence including cleaning and drying the sample line up to the measuring cell.

This unit is conformed to CE-mark for safety and noise regulation.



## Features

- Adoption of a peristaltic pump allows an operator to measure the density on higher viscous sample of 30,000 mPa\*s
- The sequential program automatically stops when the unit detects an empty vial position after the last sample vial is finished.
- This unit is equipped with self-diagnostic function by checking sequence program, keypad function and display.
- The auto-power off functions when a series of measurements is finished so that it saves electricity when operated overnight unattended. This feature can be set in while the unit is being activated.
- The cleaning efficiency is increased by blending air into rinse solvent. By this way, the total amount of rinse solvent is decreased and saved. In addition, not only inside but outside of the nozzle can be cleaned very well since the rinse solution is fed from the outside of the nozzle unit.
- Expensive sample materials like perfume or fragrance can be returned back to sample vial after measurement are over.
- The CHD-502 series provides a variety of models with different specifications depending on what type of sample material is going to be measured : N type for room temperature used, SS type for small size sampling, H type for high temperature or C type for low temperature used.

N type : 20mL vials for use at room temperature.

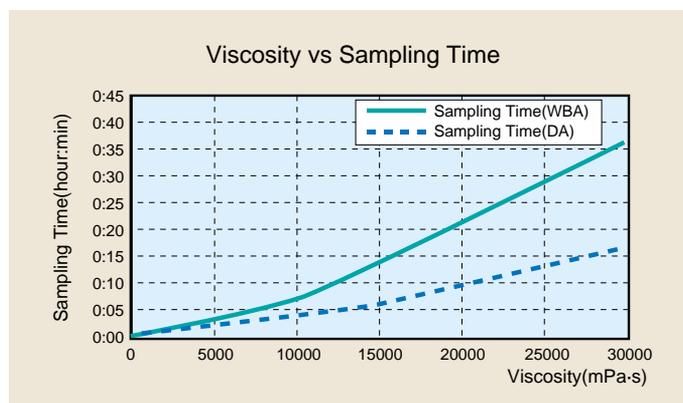
SS type : 8mL vials for small size of liquid samples. Furthermore, the sensor, which inhibits over-sampling minimizes required amount of sample (approx. 6mL).

H type : For the measurements on specimen with higher softening point, both the turntable unit and the sampling path can be heated and kept warm – the H-type option for heating the turntable unit with an electric heater up to 80°C.

C type : For those volatile samples, which evaporate at room temperature can be kept cool by the thermostatic bath.

## Specifications

Model name	CHD-502 Multiple Sample Changer			
Type name	Standard type N	Small sampling type SS	Heating type H	Cooling type C
Number of vials	Up to 30 (20mL vial)	Up to 48 (8mL vial)	Up to 30 (20mL vial)	
Min. sample required	10mL	6mL	10mL	6mL
Sample position	Turntable system			
Sampling method	Pressurizing by Peristaltic pump			
Setting temperature	N/A	N/A	Room Temp. ~ 80°C	N/A
Heating or cooling system	N/A	N/A	By electric heater	By circulating water bath
Drain system	1) Pressurized draining 2) Sample-returning to vial system		Sample-returning to vial system	Pressurized draining ; Sample-returning to vial system
Program sequence	1) Sample measurement only 2) Sample measurement after the "Air & Water" calibration 3) Sample measurement after the "Two kinds of Standard liquids" calibration			
Control	1) Auto-start by [Meas.] key of density / specific gravity meter or concentration meter 2) Auto-start by [Start.] key of CHD-502 unit 3) Rinsing and purging 4) Auto-calibration by [Calib.] key of density / specific gravity meter or concentration meter 5) Priority measurement			
Display	20 digits by 2 lines LCD with a backlight			
Ext. communications	1) Simplified serial interface via the connecting cable (980303388) 2) RS-232C interface for communications			
Connectable unit	DA-520 / DA-510 / DA-505 / DA-500 WBA-504 / WBA-505 / WBA-505B		DA-520 / DA-510 / DA-505 / DA-500	
Ambient condition	1) Temperature: 5 ~ 35°C ; 2) Humidity: less than 85%RH (No condensation)			
Power source	AC 100 ~ 120V or 200 ~ 240V ; 50/60Hz			
Power consumption	Max.760W (NRP40W)		Main unit: Max.760W (NRP 40W) Power unit: 340W	Max.760W (NRP40W)
Dimension	582(W) x 445(D) x 392(H) mm		Main unit: 610(W)x455(D)x500(H)mm Power unit: 195(W)x390(D)x100(H)mm	610(W)x455(D)x392(H) mm
Weight	Approx. 17kg		Main U.: Approx.29kg Power U.: Appox.5kg	Approx. 24kg



\* The above data is an example when connected with CHD-502

# Auto Clean and Sampling Unit, DCU-551 Series

This unit allows the end user to drain the measured sample, rinse the cell with two kinds of solvent and air purge in the cell.

## Features

- Adoption of a peristaltic pump allows an operator to measure the density on higher viscous sample of 30,000 mPa•s.
- This unit is equipped with self-diagnostic function by checking keypad function and display.
- The cleaning efficiency is increased by blending air into rinse solvent. By this way, the total amount of rinse solvent is decreased and saved. In addition, not only inside but outside of the nozzle can be cleaned very well since the rinse solution is fed from the outside of the nozzle unit.
- Expensive sample materials like perfume or fragrance can be returned back to sample vial after measurement are over.
- The DCU-511 series provides a variety of models with different specifications depending on what type of sample material is going to be measured : N type for room temperature used, SS type for small size sampling, H type for high temperature used.

N type : 20mL vials for use at room temperature.

SS type : 8mL vials for small size of liquid samples. Furthermore, the sensor, which inhibits over-sampling minimizes required amount of sample (approx. 6mL).

H type : For those samples which are softened when heated, the sampling lines are heated up to 80°C



## Specifications

Model name	DCU-551 Auto Clean and Sampling Unit		
Type name	Standard type N	Small sampling type SS	Heating type H
Number of vials	20mL vial	8mL vial	20mL vial
Min. sample required	10mL	6mL	10mL
Sampling method	Pressurizing by Peristaltic pump		
Setting temperature	N/A	N/A	Room Temp. ~ 80°C
Drain system	1) Pressurized draining 2) Sample-returning to vial system		Sample-returning to vial system
Control	1) Auto-start by [Meas.] key of density meter / specific gravity meter or concentration meter 2) Auto-start by [Start.] key of DCU-551 unit 3) Rinsing and purging 4) Auto-calibration by [Calib.] key of density / specific gravity meter or concentration meter		
Display	20 digits by 2 lines LCD with a backlight		
Ext. communications	1) Simplified serial interface via the connecting cable (980303388) 2) RS-232C interface for communications		
Connectable unit	Density / specific gravity meters: DA-520/DA-510/DA-505/DA-500 Beer analyzer: WBA-505B ; General concentration meters: WBA-505/WBA-504 (Type N only)		
Ambient condition	1) Temperature: 5 ~ 35°C ; 2) Humidity: less than 85%RH (No condensation)		
Power source	AC 100 ~ 120V or 200 ~ 240V ; 50/60Hz		
Power consumption	Max.760W (NRP 40W)	Main unit : Max.760W (NRP 40W) Power unit: Max.150W	
Dimension	291(W) x 310(D) x 342(H) mm		Main unit: 400(W)x350(D)x450(H)mm Power U.: 100(W)x310(D)x180(H)mm
Weight	Approx. 10kg		Main unit : Approx.16.5kg Power unit: Approx.3.2kg

# General Concentration Meter WBA-504/505 and Beer Analyzer WBA-505B

## Introduction

The WBA-504 or WBA-505 General Concentration Meter equipped with the built-in thermal control is combination meter simultaneous measurement of Density and Refractive index, using sensors with high sensitivity designed for small amount of sample required to detect both Density/specific gravity and Refractive index.

When connected to PC (Windows 98, 2000, Me, XP of English version), the parameters necessary for quality control of beer products in breweries are computed to determine those as Alcohol (Wt% and vol%), Real extract (wt%), Original extract (°P), Apparent extract (°P), Real fermentation (%) and Apparent fermentation (%).

The required amount of sample is approximately 20mL of degassed beer, and one measurement takes about 3 to 5 minutes per sample.

**Specification : See page 8**



Option: CHD-502N Multiple Sample Changer for WBA-504 and WBA-505

## Features

- The two built-in sensors each for density and refractive index require small amount of sample liquid to measure both density (specific gravity) and refractive index simultaneously.
- The built-in thermostat controls measurement temperature in a short span of time to preset degree for precise and quick measurement of both density and refractive index. The measuring units each for density and refractive index can individually control and preset temperature.
- Density measuring unit is equipped with viscosity correction for samples of high viscosity, which compensates its effect on density value.
- Measuring range is wide enough to measure all sample types:  
Density : 0 ~ 3g/cm<sup>3</sup>  
Refractive index : 1.32000 ~ 1.58000 (WBA-505/WBA-505B)
- With optional CHD-502N Multiple Sample Changer, a series of sample materials can be automatically and continuously measured in an unattended manner.
- The optional PC card expands the versatility of operation including much more storage space for measurement parameters and resulting data as well as user's own concentration conversion tables.
- The optional data acquisition software designed for WBA-504/WBA-505 allows you to download measurement results to PC so that the data can be further processed according to user's needs and requirements for easier management of acquired data.
- The commercially available bar code readers compatible with RS-232C interface can be connected to AUX port and conveniently read sample ID and Lot number.

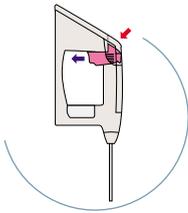
WBA-505B Beer Analyzer is also available.

## Performance of DA-130N

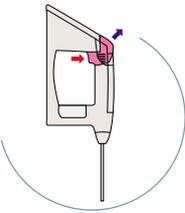


Suction and discharge can be exerted with the thumb and forefinger. The lever stops when finger power is released. The all operational buttons are placed within thumb's reach for increased work efficiency.

When discharging



When suctioning



When measuring  
Operative with a thumb and forefinger only



### Communication function

Infrared port is standard equipped for easy data transmission. (conforming to IrDA ver1.2)



### Monitor display

So easy to see valuable and various information on graphic LCD.



## Portable Density/ Specific Gravity Meter DA-130N

### Features

- Sampling volume and speed is single hand controlled. (Patent pending)
- Operative either by right or left hand, the cell can be viewed during measurement.
- Light weight allows operators to feel tireless in the normal operations.
- Viscous liquid up to ca 2000 mPa·s can be sampled in.
- The display shows density, temperature compensated density, specific gravity, temperature compensated specific gravity, Brix %, alcohol concentration, sulfuric acid concentration, API concentration, Baume degree, Plato and Proof degree and the like.
- Graphic LCD can display temperature (°C/°F), sample number, auto sensing oscillation stability, auto data saving, auto data output, data deletion, battery capacity indicator, and the like.
- Life of battery is increased two times more than conventional makes, providing much longer operation time.
- Both time of day and operator's name can be printed out.
- Backlight display improves readability of displayed characters.

Specification : See page 8

## Density/Specific Gravity Meter DA-100

### Features

- Temperature can be selected in the range from 15 deg. C to 40 deg. C by 0.1 deg. C step. Also setting in deg.F(59°F ~104°F, 1°F step) is available.
- Can convert density/specific gravity to concentration value and display the result. Conversion Equation is linear and display is in 12 different units. It enables more efficient and effective routine measurement than conventional measurement with hydrometer for API degree, Baume degree and others.
- Can output data of density, specific gravity, concentration values, date and time, etc through RS-232C and can be connected to an external computer or an optional printer. (External computer and printer cannot be connected at the same time.)
- Parameter setting and operating is designed user-friendly, easy to use, being guided by dialogue message on display.
- Purge pump is equipped as standard to desiccate the measuring cell.
- Easy factor calibration of measuring cell can be performed using air and pure water. No complicated calculation is required.

Specification : See page 8

The DA-100 has built-in thermostat to enable stable temperature control, and density/specific gravity is measured quickly and precisely.

Accuracy of measurement is  $\pm 0.001\text{g/cm}^3$  by measuring resonant frequency.



Option: Auto sampling Unit ASU-100, and Printer IDP-100 are available.

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