

\*10

## Wiggens Analytics

#### > Auto Titrator

EN

- > Rotational viscometer
- > Falling ball viscometer
- > Density meter
- > pH,COND,DO and electrode
- > Refractometer

## About WIGGENS

What Does Wiggens Stand for?

*ide Product Range International Orientation reat Quality reat Service nergetic Team New Technology olutions*



Wiggens was established in 2005 with the goal of delivering the best laboratory equipment and service for reliable results. Since then Wiggens has been producing top-quality general laboratory equipment, analysis apparatus and chemical reaction solutions. Our brand Wiggens stands for high quality, durability and remarkable performance.

Wiggens is your reliable laboratory companion and provides products that can be used in different kinds of laboratory environments. The Wiggens product range includes:

- \* Rotary Evaporator
- \* Pump
- \* Vacuum Filtration Apparatus
- \* Heating & Mixing unit
- \* Incubator & Oven
- \* Analysis Apparatus
- \* Gas Generator
- \* Chemical Reactor

#### **ChemV**(k

ChemVak, the product brand of Wiggens, is specialized in vacuum technology offering an extensive range of vacuum pumps for all applications, including chemical-resistant diaphragm pumps, oil-free pumps and rotary vane vacuum pumps, complemented by vacuum filtration equipment for a wide range of different applications. In addition, solvent recovery systems and bio-suction systems are part of the product range.

#### hemTron

ChemTron is our product brand focusing on analysis apparatus, gas generators and chemical reaction solutions, as well as efficient chemical separation tools-rotary evaporator, automatic distillation system, crystalization system etc...



## Innovation

New concepts and solutions Customers as generator of ideas Friendly and modern working atmosphere

# Thinking the unusual is usual for us.

## Competence

Specialists in all teams Expert knowledge and experience

## Quality

Reliability ISO 9001 Strong After Sales Service Made in Germany, China, Switzerland & USA

## Flexibility

Special Design, customized products Constant feedback from subsidiaries and customers







## Auto Titrator Make titration easier...

CAT Automatic Titrator has been designed to simply and precisely perform the widest range of potentiometric titrations, and has always been the first choice if you are looking for a very easy-to-use automatic titrator for any application. A special training or a deeper knowledge of automatic titration are not necessary to get precise and quick results. That and much more is exactly what the new generation of CAT stands for:

- > High resolution pH/mV-measurement input for pH-, silver-,mV-electrodes and double platinum electrode
- > Pt 100 temperature measurement input for automatic temperature compensation
- > Pre-installed standard methods for alkalinity, total acidity in drinks, free and total SO<sub>2</sub> in wine, chloride etc.
- > Constant and progressive titration to equivalent points
- $\,>\,$  Titration to pH and mV-end points
- > Automatic pH measurement (If the auto sampler is present)







#### Typical applications of water/wastewater and environmental analysis

- > Automatic pH measurement
- > Alkalinity (p+m value)
- > Total kjeldahl nitrogen
- > Chloride in wastewater

#### Typical applications of food analysis

- > Salt content (chloride, sodium chloride)
- $\,>\,$  pH-value, total acidity in wine, drinks and other food products
- > Ascorbic acid
- > protein determination (Kjeldahl-nitrogen in milk and dairy products)
- > Free  $SO_2$ ,total  $SO_2$  determination in wine
- > Iodine and peroxide value

## CAT. Everything you need. The advantages at a glance.



Brilliant

Bright display with strong illumination can be viewed easily from a long distance.



#### Auto-level adjuster

Designed to optimize the procedure of samples auto level, in order to speed up the sample preparation.



#### Compact

Compact instrument and can be both upgraded and configured to satisfy the ever challenging laboratory needs.



Auto-degassing system Nitrogen valve for sample degassing.



#### Easy-to-use

The wide colour touch screen display contains all the messages and the icons that make CAT extremely easy to use. The titrator guides the user in each programming phase, analysis and data interpretation.



#### Titration curve

During the titration process the graphic trend is displayed in real time, so that the operator is immediately informed about the analysis trend.



Modular design Up to 2 burettes and 3 peristaltic pumps, operating together or separately, every stage of titration process can be made truly automatic.



Report

pH electrode calibration report, Standard titration report and Sample titration report.



Peripheral modules Single analysis stand, 16-position autosampler, 35-position autosampler, printer and software.



Software Data management software via external PC



#### Methods

Default methods, Method template make it quick to edit and start your experiments.



Plug and Play Intelligent operating concept. Ready for operation with just a few quick and easy steps.



## Features



#### Standard methods

- $>\,$  Pre-installed standard methods for alkalinity, total acidity in drinks, chloride, SO\_2 in wine etc.
- > Each standard method can be used directly or edited according to actual needs
- > The commonly used titration method can be marked and set to the top, which is easy for operators to choose quickly.

#### Menu

Built-in system setting, date and time setting, calibration solution setting, operator setting, burette manual operation, creep pump manual operation, electrode lifting device manual setting, and continuous titration turntable manual setting function





#### Utility

Including: manual setting of cleaning steps, manual filling of burette, calibration program settings, pH measurement settings, titration results query, import, transfer and deletion, calibration reports and records

#### Titration curve

- > During the titration process, the titration curve is displayed in real time, and the integral curve will be shown after the titration is finished
- > After titration, display titration results, including starting values, ending values and calculation results



#### Specification – CAT

	Features						
Display	4.3" monochromatic LCD touch screen						
Ruratta disponsation accuracy	Syringe volume: 10mL (It is possible to install up to 2 burettes)						
bulette dispensation accuracy	Burette for titrant dosage resolution at 12,000 steps (means 0.83 µL at any step)						
Dispensation accuracy	<0.2% (2µL with 10ml syringe)						
Dispensation repeatability	± 0.2% (2µL with 10ml syringe)						
Peristaltic pump	Interchangeable pump head (up to 3 per unit), 1ml/sec.						
рН	Range: 0-14pH, Accuracy:±0.02pH, Resolution:±0.01pH						
mV	Range: ±2000mV, Accuracy:±2mV, Resolution:±0.1mV						
μΑ	Range: ±10µA, Accuracy:±2µA, Resolution:±0.1µA						
Temperature	Range: 0-100°C , Accuracy:±1°C , Resolution:±0.1°C						
Utility procedures	1.Priming 2.Cleaning 3.Electrode calibration						
Method template	EP, EQ, free SO <sub>2</sub> , total SO <sub>2</sub> and double SO <sub>2</sub>						
	Automatic buffer recognition. Refusal of defective electrodes. Notice expired calibration (to be set from 0 to 7 days). Temperature compensation with pt100						
	probe during pH calibration						
nH calibration	1. 1 buffer calibration (7)						
	2. 2 buffers calibration (7, 4 or 10)						
	3. Theorical (Nernst equation)						
	4. Oenological: 2 buffers calibration (7, 3)						
	1. Electrode port (x2)						
	2. USB A						
Communication	3. USB B						
communication	4. RS232 serial (for external printer)						
	5. RS232 serial (for sampler)						
	6. Bluetooth (for external PC)						
	Last 50 analyses and last 10 calibrations						
Internal memory	Up to 30 methods						
	Data export: (date, hour, operator ID, sample ID, method, result, titrant volume) a) To USB pen drive (file csv) b) To external pc (via dedicated						
	1. Printer						
	2. Single analysis stand						
	3. 16-position sampler						
Accessories	4. 35-position micro-sampler						
	5. Auto-level adjuster						
	6. Automatic degasser						
	7. Software for data management on external PC						

#### Order index, for your custom unit configuration

Order I	Order No.				-	T1	-	S1	-	B1	-	P1	-	G1	-	L1
M1	pH electrode															
M2	Ag-combined electrode															
M3	Double platinum electrode															
M4	pH electrode and Ag-combined electrode															
M5	pH electrode, Ag-combined electrode and double platinum electrode															
M6	pH micro electrode, for AS24 35-position micro-sampler															
M7	Ag-micro combined electrode, for AS24 35-position micro-sampler															
M8	pH micro electrode and Ag-micro combined electrode, for AS24 35-position micro-sampler															
TO	Without temperature sensor															
T1	With temperature															
<i>c</i> .																
51	Single analysis stand															
\$2	AS24 16-position micro-sampler															
S3	AS24 35-position micro-sampler					_			]							
R1	1 huratta															
B2	2 hurettes															
02	2 buckes															
P1	1 peristaltic pump															
P2	2 peristaltic pumps															
P3	3 peristaltic pumps															
G0	Without automatic degassing system															
G1	With automatic degassing system															
11	Without auto-laval adjuctor															
12	Without duty level adjuster															



## Order Information





Order No.	Model	Description
CAT1-1-M1	Basis set	Basic unit without electrode, including CAT1,magnetic stirrer(1),stir bar(1),10ml burette(1),titration tube(1),power supply(1),1L glass bottle(1), GL45 and S40 adapter(1),drying tube(1).
CAT1-1-M2	For pH titration	CAT1-1-M1 with pH electrode and buffer solution
CAT1-1-M3	For Precipitation titration	CAT1-1-M1 with Ag electrode
CAT1-1-M4	For Redox titration	CAT1-1-M1 with Pt electrode
CAT1-1-M5	For Dead stop titration	CAT1-1-M1 with Double Platinum electrode



Order No.	Model	Description
CAT2-1-M1	Basis set	Basic unit without electrode, including CAT2, Magnetic stirrer(1), Stir bar(1), 10ml burette(2), titration tube(2), power supply(1), 1L glass bottle(2), GL45 and S40 adapter(2), drying tube(2).
CAT2-1-M2	For pH titration	CAT2-1-M1 with pH electrode and buffer solution
CAT2-1-M3	For Precipitation titration	CAT2-1-M1 with Ag electrode
CAT2-1-M4	For Redox titration	CAT2-1-M1 with Pt electrode
CAT2-1-M5	For Dead stop titration	CAT2-1-M1 with Double Platinum electrode



#### CAT1 Automatic titrator with 16-position auto-sampler

Order No.	Model	Description
CAT1-16-M1	Basis set	Basic unit without electrode, including CAT1, AS24 16 position auto-sampler (1), Stir bar(1),10ml burette(40),titration tube(2),power supply(1),1L glass bottle(2), GL45 and S40 adapter(2),drying tube(2).
CAT1-16-M2	For pH titration	CAT1-16-M1 with pH electrode and buffer solution
CAT1-16-M3	For Precipitation titration	CAT1-16-M1 with Ag electrode
CAT1-16-M4	For Redox titration	CAT1-16-M1 with Pt electrode
CAT1-16-M5	For Dead stop titration	CAT1-16-M1 with Double Platinum electrode



#### CAT2 Automatic titrator with 16-position auto-sampler

Order No.	Model	Description
CAT2-16-M1	Basis set	Basic unit without electrode, including CAT2, AS24 16 position auto-sampler (1), Stir bar(1),10ml burette(40),titration tube(2),power supply(1),1L glass bottle(2), GL45 and S40 adapter(2),drying tube(2).
CAT2-16-M2	For pH titration	CAT2-16-M1 with pH electrode and buffer solution
CAT2-16-M3	For Precipitation titration	CAT2-16-M1 with Ag electrode
CAT2-16-M4	For Redox titration	CAT2-16-M1 with Pt electrode
CAT2-16-M5	For Dead stop titration	CAT2-16-M1 with Double Platinum electrode



#### CAT2 Automatic titrator with 35-position micro-sampler

Order No.	Model	Description
CAT2-35-M1	Basis set	Basic unit without electrode, including CAT2, AS24 35 position micro-sampler (1), Stirring paddle(2), 10ml burette(2), titration tube(2), power supply(1), 1L glass bottle(2), GL45 and S40 adapter(2), drying tube(2).
CAT2-35-M2	For pH titration	CAT2-35-M1 with Micro pH electrode and buffer solution
CAT2-35-M3	For Precipitation titration	CAT2-35-M1 with Micro Ag electrode
CAT2-35-M4	For Redox titration	CAT2-35-M1 with Micro Pt electrode
CAT2-35-M5	For Dead stop titration	CAT2-35-M1 with Micro Double Platinum electrode

## Case study

Application	Model	Rigent		
Determination of acidity and alkaline	CAT1-1-M2, CAT2-1-M2, CAT2-16-M2, CAT2-35-M2	-		
Redox titration	CAT1-1-M4, CAT2-1-M4, CAT2-16-M4, CAT2-35-M4	-		
Halogen titration	CAT1-1-M3, CAT2-1-M3, CAT2-16-M3, CAT2-35-M3	-		
		Solvent: distilled water		
Datarmination of Sodium biculfita	CAT1 1 M5 CAT2 1 M5 CAT2 16 M5 CAT2 25 M5	Standardisation: $Na_2S_2O_3$		
Determination of Sourain bisunte	CALIF-1-M3, CA12-1-M3, CA12-10-M3, CA12-33-M3	Titrant: lodine solution (I2) 0.025mol/LL or 0.01 mol/L		
		Other reagents $H_2SO_4$ 10 %, NaOH 4 mol/l, KI-solution 5 %		
Determination of total acidity in fruit juice		Titrant: sodium hydroxide solution 0.1mol/l		
wine and beverage	CAT1-1-M2, CAT2-1-M2, CAT2-16-M2, CAT2-35-M2	Soda lime for carbon dioxide uptake of the reagent.		
while and beverage		Titer: potassium hydrogen phthalate (reference material)		
Determination of total alkalinity of code ach	CAT1_1_M2_CAT2_1_M2_CAT2_16_M2_CAT2_35_M2	Titrant: hydrochloric acid 0.1mol/l		
		Titer: Sodium carbonate		
Determination of chloride / sodium chloride in		Solvent: distilled water		
food and water	CAT1-1-M3, CAT2-1-M3, CAT2-16-M3, CAT2-35-M3	Titration agent: silver nitrate solution (AgNO3)0.1 mol/L		
		Standard: NaCl titrimetric standard, HNO3 1 mol/l		
		Solvent: distilled water		
Determination of total / Free $SO_2$ in wine and	CAT1-1-M5, CAT2-1-M5, CAT2-16-M5, CAT2-35-M5	Standardisation: Na <sub>2</sub> S <sub>2</sub> O <sub>3</sub>		
fruit juice		Titrant: lodine solution (I2) 0.025mol/LL or 0.01 mol/L		
		Other reagents $H_2SO_4$ 10 %, NaOH 4 mol/l, KI-solution 5 %		
		Solvent: distilled water		
Determination of acidity/acid degree in milk		Standardisation: $Na_2S_2O_3$		
and milk products	CATT-T-IM2 CAT2-T-IM2, CAT2-T0-IM2 CAT2-55-IM2	Titrant: Sodium hydroxide 0.1mol/l 0.25(SH) or 0.11(Dornic) mol/L		
		Titer: potassium hydrogen phthalate (reference material)		
Reducing Sugar titration	CAT1-1-M4, CAT2-1-M4, CAT2-16-M4, CAT2-35-M4	-		
Quantitative analysis of ascorbic acid with		Titration agent: lodine solution 0.01 mol/L		
lodine titrant	CATT-T-IVIS, CATZ-T-IVIS, CATZ-T0-IVIS, CATZ-SS-IVIS	Other reagents: $H_2SO_4$ 25 % and glyoxal solution 40 %		
Determination of nitrate in pickles	CAT1-1-M4, CAT2-1-M4, CAT2-16-M4, CAT2-35-M4	Titrant: Potassium permanganate 0.1 mol/L. and iron (II) 0.1 mol/L.		
Determination of Indina Number		Solvent: dest. Water, Wijs solution in acetic acid		
	CATT-T-M4, CATZ-T-M4, CATZ-T0-M4, CATZ-SS-M4	Titration : Sodium thiosulphate solution c $(Na_2S_2O_3) = 0.1$		
Determination of alkalinity	CAT1 1 M2 CAT2 1 M2 CAT2 16 M2 CAT2 25 M2	Titrant: H <sub>2</sub> SO <sub>4</sub> or HCI 0.01-0.1 mol/L		
	CATT-T-M2, CAT2-T-M2, CAT2-T0-M2, CAT2-33-M2	Titer: Possible with TRIS		
COD	CAT1 1 M5 CAT2 1 M5 CAT2 16 M5 CAT2 25 M5	Titrant: ferrous ammonium sulfate hexahydrate		
	CATT-T-MS, CATZ-T-MS, CATZ-T0-MS, CATZ-SS-MS	Titer: potassium dichromate		
Determination of the Permanganate Index	CAT1-1-M4, CAT2-1-M4, CAT2-16-M4, CAT2-35-M4	Titrant: Potassium permanganate and Sodium oxalate		
Determination of FOS TAC value in Biogas	CAT1 1 M2 CAT2 1 M2 CAT2 16 M2 CAT2 25 M2	Titrant: Sulfuric Acid		
plants	CATT-T-M2, CAT2-T-M2, CAT2-T0-M2, CAT2-33-M2	Titer: Possible with TRIS(Tris(hydroxymethyl)-aminomethan)		
		Solvent: Distilled water		
Determination of Nitrogen	CAT1-1-M2, CAT2-1-M2, CAT2-16-M2, CAT2-35-M2	Titrant: chloric acid 0.1mol/L		
		Titer: Sodium Carbonate		

## Accessories and spare parts

Order No.	Model	Description
285101260	pH electrode	Glass shaft, 3 x ceramic junction, gel electrolyte, Silamid <sup>®</sup> -reference system, sphere membrane, A-glass, length 120 mm, 12 mm Ø, -5+80 °C , 014 pH
285102413	Silver electrode	Glass shaft, platinum junction, electrolyte KNO3 2 mol/l + KCl 0.001 mol/l, Ag/AgCl-reference system, sensor silver cap 4 mm Ø, chlorinated, plug head, length 120 mm, 12 mm Ø, -5+100 $^{\circ}$ C
285102002	Redox electrode	Glass shaft, platinum junction, electrolyte KCl 3 mol/l,Silamid®-reference system, sensor platinum pin 1 mm Ø, plug head, length 170 mm, 12 mm Ø, -5+100 $^{\circ}$ C
285103512	Double platinum electrode	Double platinum electrode, glass shaft, sensor 2 platinum pins 1 mm Ø, plug head, length 120 mm, 12 mm Ø, -30+135 $^\circ C$
285105702	Micro pH electrode	Microelectrode, glass shaft, platinum junction, electrolyte KCl 3 mol/l, Ag/AgCl-reference system, sensor platinum pin 1 mm Ø, 1 m fixed cable with BNC plug, tapper NS 7.5, length 96 mm, 5 mm Ø, -5+100 $^{\circ}$ C
285122497	Electrode cable	Coaxial electrode plug, 1 m coaxial cable, BNC instrument plug
SFLA2261	Peristaltic pump	Peristaltic pump
SFLA2691	Auto-level adjuster	Auto-level adjuster
SQTR074926	Temperature sensor	Temperature sensor
SFLA2681	Automatic degassing system	Automatic degassing system
SQFV062829	Easydata Software	Easydata Software
SQTR074678	Thermal printer	EPSON Thermal printer
SQTR075651	Printing paper	Printing paper



#### Rotational viscometer

## **ALPHA** series

Alpha series rotational viscometers allow fast and accurate viscosity readings. They are low budget and easy to use.

#### Touch Keyboard

Latest keyboarding technology, comfortable and easy to handle (6 keys)

#### Program Features

Time to Torque Time to Stop

#### Data Displayed

Selected Speed Selected Spindle Viscosity readings (cP or mPa·s or cSt) Percentage of Full Scale Range (%) Sample Temperature (°C or °F ) Shear rate (with coaxial spindles) (s-1) Shear Stress (with coaxial spindles) (N/m²) Density (introduced by the user) (g/cm³)

#### Viscosity Readings

Absolute viscosity (cP or mPa·s) Apparent viscosity (cP or mPa·s) Kinematic viscosity (cSt, mm<sup>2</sup>/sec) (Density introduced by the user)

#### Graphic Display

Provides huge range of graphical options

#### Temperature Reading By PT100

Temperature sensor PT100 is opition

#### USB Interface

Faster transfer data to the USB stick

#### 9 working memories

Set up the unit and get it ready to be used every day choosing the memory you need

#### Universal Adapter





#### Main Features

- > Touch key board 6 keys.
- > Direct readout on a graphic display.
- > Data displayed:

1.2	
Selected speed	r.p.m
Selected spindle	SI
Viscosity reading	cP (mPa·s) or cS
Percentage of full scale	
Sample temperature	•C or •
Shear Rate (with coaxial spindles)	SR (s <sup>-1</sup>
Shear Stress (with coaxial spindles)	SS (N/m²)
Density (introduced by the user)	g/cm <sup>3</sup>
AND A DECEMBER OF A	

- > Viscosity reading: dynamic viscosity
  (cP or mPa·s) or kinematics viscosity (cSt).
- > Unit converter SI to CGS.
- > Program features:

Time to torque: target torque pre-setting device.
Time to stop: target time pre-setting device.
9 working memories.

- $\,>\,$  AUTO-TEST with sound and visual malfunction alarm.
- > AUTO-RANGE function.
- > Temperature reading by PT100 (optional).
- > User-enabled viscosity and temperature (optional) calibration.
- > 7 language options.
- > Interface: USB.



### Order Information

### Technical File

- > Precision: ± 1% of full scale
- Resolution:
  With low viscosity adapter: 0.01
  For lower than 10.000 viscosity cP: 0.1
  - For viscosity equal to or above 10.000 cP: 1
- > Repeatability: 0.2%
- > Thermometer features:
  Temperature margins:
  -40° C to + 300.0° C (- 40.0°F to + 572.0°F )
- > Resolution: 0.1°C / 0.1722 °F
- > Precision: +/- 0.1 °C
- > Type of probe: PT100
- > Supplied at 100-240 VAC, 50/60 Hz

#### Spindles

AISI 316 stainless steel spindles, easily identified

by number and letter when changed according to range of viscosity.

These are the standards our units follow:

- > BS: 6075, 5350
- > ISO: 2555, 1652
- > ASTM: 115, 789, 1076, 1084, 1286, 1417, 1439, 1638, 1824, 2196, 2336, 2364, 2393, 2556, 2669, 2849, 2983, 2994, 3232, 3236, 3716

			2				
Model	Order No.	Measuring range	Standard spindles	Speed (r.p.m)	Number of speeds	Power supply	Weight
ALPHA L	VL1001601	20 to 2,000,000 cP	L1,L2,L3,L4	0.01 to 200	18	100~240V 50/60Hz, 25W	5kg
ALPHA R	VL1001602	100 to 13,000,000 cP	R2,R3,R4,R5,R6,R7	0.01 to 200	18	100~240V 50/60Hz, 25W	5kg
ALPHA H	VL1001603	200 to 106,000,000 cP	R2,R3,R4,R5,R6,R7	0.01 to 200	18	100~240V 50/60Hz, 25W	5kg

#### Standard Delivery

Viscometer head with serial number / Stand, 3 levelling adjustment for stand / Boss head / Standard spindles / Spindle protector / Power supply cable / Datalogger software in CD / USB cable / Calibration Certificate / Operating manual

NOTE: All parts (including the viscometer stand) find room in the Carrying case.

#### Extra Accessories

APM (Small Sample Adapter) / LCP (Low Viscosity Adapters) / Heldal unit (High Viscosity Adapter) / Silicon Standard Oils / Thermostatic Bath / Universal adapter for all accesories such as Brookfield (Optional) / PPR Plugging System (Optional)

NOTE: The material of the accessories including the temperature probe can be changed under customer specification (High Temperature Resistance).

Rotational viscometer

## SMART series

Professional and Accurate viscosity results. Customize your measurement.

SMART

0

V

SMART SERIES

+Instrument Setup

Measurement Information

WIGGENS

#### Touch Keyboard

Latest keyboarding technology, comfortable and easy to handle (6 keys)

#### Program Features

Time to Torque Time to Stop

#### Data Displayed

Selected Speed Selected Spindle Viscosity readings (cP or mPa·s or cSt) Percentage of Full Scale Range (%) Sample Temperature (°C or °F ) Shear rate (with coaxial spindles) (s-1) Shear Stress (with coaxial spindles) (N/m<sup>2</sup>) Density (introduced by the user) (g/cm<sup>3</sup>)

#### Viscosity Readings

Absolute viscosity (cP or mPa·s) Apparent viscosity (cP or mPa·s) Kinematic viscosity (cSt, mm<sup>2</sup>/sec) (Density introduced by the user)

#### Graphic Display

Provides huge range of graphical options

#### Temperature Reading By PT100

#### USB Interface

Faster transfer data to the USB stick

#### 9 working memories

Set up the unit and get it ready to be used every day choosing the memory you need

#### Universal Adapter



#### Main Features

- > Touch key board 6 keys.
- > Direct readout on a graphic display.
- > Data displayed:

Selected speed	r.p.m
Selected spindle	SI
Viscosity reading	cP (mPa·s) or cS
Percentage of full scale	%
Sample temperature	····· °C or °
Shear Rate (with coaxial spindles)	SR (s <sup>-1</sup>
Shear Stress (with coaxial spindles)	SS (N/m²)
Density (introduced by the user)	g/cm <sup>3</sup>
And the last the second	

- > Viscosity reading: dynamic viscosity
  (cP or mPa·s) or kinematics viscosity (cSt).
- > Unit converter SI to CGS.
- > Program features:

Time to torque: target torque pre-setting device.
Time to stop: target time pre-setting device.
9 working memories.

- $\,>\,$  AUTO-TEST with sound and visual malfunction alarm.
- > AUTO-RANGE function.
- > Temperature reading by PT100 (optional).
- > User-enabled viscosity and temperature (optional) calibration.
- > 7 language options.



Order Information



### Technical File

- > Precision: ± 1% of full scale
- Resolution:
  With low viscosity adapter: 0.01
  - For lower than 10.000 viscosity cP: 0.1 For viscosity equal to or above 10.000 cP: 1
- > Repeatability: 0.2%
- > Thermometer features:
  Temperature margins:
  -40° C to + 300.0° C (- 40.0°F to + 572.0°F )
- > Resolution: 0.1°C / 0.1722 °F
- > Precision: +/- 0.1 °C
- > Type of probe: PT100
- > Supplied at 100-240 VAC, 50/60 Hz

#### Spindles

AISI 316 stainless steel spindles, easily identified

by number and letter when changed according to range of viscosity.

These are the standards our units follow:

- > BS: 6075, 5350
- > ISO: 2555, 1652
- > ASTM: 115, 789, 1076, 1084, 1286, 1417, 1439, 1638, 1824, 2196, 2336, 2364, 2393, 2556, 2669, 2849, 2983, 2994, 3232, 3236, 3716

			-				
Model	Order No.	Measuring range	Standard spindles	Speed (r.p.m)	Number of speeds	Power supply	Weight
SMART L	VL1001611	20 to 2,000,000 cP	L1,L2,L3,L4	0.01 to 200	18	100~240V 50/60Hz, 25W	5kg
SMART R	VL1001612	100 to 13,000,000 cP	R2,R3,R4,R5,R6,R7	0.01 to 200	18	100~240V 50/60Hz, 25W	5kg
SMART H	VL1001613	200 to 106,000,000 cP	R2,R3,R4,R5,R6,R7	0.01 to 200	18	100~240V 50/60Hz, 25W	5kg

#### Standard Delivery

Viscometer head with serial number / Stand, 3 levelling adjustment for stand / Boss head / Standard spindles / Spindle protector / Spindle rack / PT100 probe / Power supply cable / Datalogger software in CD / USB cable / Carrying case / Calibration Certificate / Operating manual NOTE: All parts (including the viscometer stand) find room in the Carrying case.

#### Extra Accessories

APM (Small Sample Adapter) / LCP (Low Viscosity Adapters) / Heldal unit (High Viscosity Adapter) / Silicon Standard Oils / Thermostatic Bath / Universal adapter for all accesories such as Brookfield (Optional) / PPR Plugging System (Optional)

NOTE: The material of the accessories including the temperature probe can be changed under customer specification (High Temperature Resistance).

Rotational viscometer

## **PREMIUM** series

Innovative equipments with an advanced design and multifunctional viscosity measurements.

- > Colour TFT screen for easy readings and fast data recognition.
- > Intuitive full-touch keypad: data at your fingertips.
- > New USB connection: Type A 2.0 generation for downloading data to the PC.





#### Screen Data:

Selected speed	r.p.m
Selected spindle	SP
Viscosity reading	cP (mPa·s) or cSt
Percentage of full scale	%
Sample temperature	°C or °F
Shear Rate (with coaxial spindles)	SR (s <sup>-1</sup> )
Shear Stress (with coaxial spindles)	SS (N/m <sup>2</sup> )
Density (introduced by the user)	a/cmª

#### Viscosity reading:

- > Dynamic viscosity (cP or mPa·s)
- > Kinematic viscosity (cSt).
- > Units Converter from SI to CGS.

#### Program Features:

- > Time to torque: Ending of the test upon reaching a programmed torque.
- > Time to stop: Ending of the test upon reaching a programmed time.
- > Multistep: posibility to programme several essays in a successive way
- $\,>\,$  Ramps: essay programation with an initial and final speed in an specific time
- > 10 working memories.

#### Other main features:

- > AUTO-TEST with visual and resonant alarm
- > AUTO-RANGE function
- > Temperature Reading through PT100 probe
- > User-enabled viscosity and temperature calibration
- > 6 language options
- > Port: USB
- > Datalogger: Posibility to tranfer data to a pendrive into Excel format
- > Statistics: Posibility to see data in graphics

#### Standard delivery:

- The equipement is supplied complete with standard spindles
- (4 spindles for L model / 6 spindles for R and H models)
- Viscometer stand 
  Spindle protector 
  Temperature probe PT100 
  Carrying case
- USB cable External power supply

- > Precision: +/- 1% full scale of range
- $\,>\,$  Resolution: For a minus viscosity of 100 cP : 0.01 cP
- For a major viscosity of 1000 cP : 0.1 cP
- For a major viscosity of 5000 cP : 1.0 cP
- For a major viscosity of 10.000 cP : 5.0 cP For a major viscosity of 25.000 cP : 10.0 cP
- For a major viscosity of 50.000 cP : 25.0 cP
- For a major viscosity of 100.000 cP : 100.0 cP
- For a major viscosity of 1.000.000 cP : 1.000.0 cP
- > Repeatability: 0.2%
- > Temperature probe features: Temperature limits:
- -40°C to 300°C -40°F to 572°F Resolution: 0.1°C / -17.722 °F
- > Precision: +/- 0.2°C / +/- 17.666 °F
- > Type of probe: PT100
- > Supplied at 110-240VAC, 50/60 Hz.
- > Software: FGB Data Boss
- The FGB Data Boss software complies the FDA 21CFR PART 11 regulation

#### Accessories

- > APM Small Sample Adapter with circulation jacket (without TL or TR spindles) Sample volume (6.7 - 13 ml.) Compatible with Brookfield viscometers
- > APM/B Small Sample Adapter without circulation jacket (without TL or TR spindles).
- Sample volume (6.7 13 ml.) Compatible with Brookfield viscometers
- > LCP Low Viscosity Adapter with circulation jacket (with spindle) Sample volume (16 ml.) Compatible with Brookfield viscometers
- LCP/B Low Viscosity Adapter without circulation jacket (with spindle) Sample volume (16 ml.) Compatible with Brookfield viscometers
- > HELDAL Helix Drive Unit. Accessory for measuring non-flowing substances viscosity (with spindles)
- > THERMOSPHERE Temperature control unit up to 300 °C

#### Spindles:

AISI 316 Stainless steel spindle, easily to identify according to its letter and number, in terms of the range of viscosity.

#### Standards:

These are the standards our units follow:

- BS: 6075, 5350
- ISO:2555,1652
- ASTM: 115, 789, 1076, 1084,

1286, 1417, 1439, 1638, 1824, 2196, 2336, 2364, 2393, 2556, 2669, 2849, 2983, 2994, 3232, 3236, 3716



### Order Information

Model	Order No.	Measuring range	Standard spindles	Speed (r.p.m)	Number of speeds	Power supply	Weight
PREMIUM L	VL1001647	10 to 6,000,000 cP	L1,L2,L3,L4	0.01 to 250	2600	100~240V 50/60Hz, 25W	5kg
PREMIUM R	VL1001648	25 to 40,000,000 cP	R2,R3,R4,R5,R6,R7	0.01 to 250	2600	100~240V 50/60Hz, 25W	5kg
PREMIUM H	VL1001649	200 to 320,000,000 cP	R2,R3,R4,R5,R6,R7	0.01 to 250	2600	100~240V 50/60Hz, 25W	5kg

### Accessories for rotational viscometers

#### Low Viscosity Adapter

The low viscosity adapter is used on the rotational viscometers to perform accurate and reproducible readings on materials with viscosity as low as 1 cP (mPa-s). Cylindrically designed for shear measurements. (Supplied with spindle.)

#### **Technical Features**

- > Easy to clean, removable stainless steel sample container.
- > Sample volume: from 16 to 18 ml.
- > Flow jacket for sample thermostatisation from -10 to +100°C (optional).
- > PT100 accurate temperature probe (optional).

Order No. (with jacket)	Order No. (without jacket)	Measuring range (cP)
W8004011	W8004021	1~2,000
W8004012	W8004022	5~21,333



APM

APM/B

#### Small Sample Adapter

The small sample adapter consists of a cylindrical sample chamber and coaxial spindles, designed for flawless, accurate viscosity measurements of small volumes. Cylindrically designed for shear measurements. (Spindles supplied separately).

#### **Technical Features**

- > Removable, easy-to-clean stainless steel sample chamber.
- > Flow jacket sample thermostatisation between -10 and +100°C (optional).
- > Sample volume: from 8 to 13 ml, varies with spindle.
- > PT100 probe for accurate sample temperature (optional).

Order No. (with jacket)	Order No. (without jacket)	Measuring range (cP)
W8003011	W8003021	20~6,000,000
W8003012	W8003022	100~40,000,000

#### Heldal unit for helicoidal movement

Accessory designed for viscosity measurements of non-flowing substances. In these materials the viscosity cannot be measured by standard methods and spindles due to cavitation effect around the spindle. We recommend using the HELDAL unit and T-bar spindles for comparative measurements on nonflowing substances. A Wiggens viscometer is mounted on the Heldal unit, and it restricts measuring head to smoothly run up and down within pre-established limits, allowing constant contact between T-bar spindle and test sample thanks to the helical line described.

Additional Features

- > Easy to use, install and clean.
- > Supplied with motor, 6 T-shaped spindles and carrying case.
- > Compatible with all Wiggens rotational viscometers.

#### Applications

- > Creams Gels
- > Pastes Gelatin
- > Other non-flowing substances.

Order No. (without jacket)	Measuring range (cP)
W8005011	234~3,120
W8005012	5~21,333











#### Silicone standard oil

> Silicone viscosity standards for rotational viscometers

> With certified reference material certificate National Institute of Metrology (NIM)

> Temperature: 20°⊂

> Package: 250ml / each bottle

Order No.	Standard value	Reference value, actual value is a little different		
	K.V. (mm2/s)	K.V. (mm2/s)	D.V. (mPa·s)	Urel(k=2)
W8006091	2	1.9918	1.5757	0.10%
W8006092	5	4.9579	4.0223	0.16%
W8006093	10	9.8821	8.0134	0.16%
W8006094	20	20.621	17.179	0.21%
W8006095	50	52.335	44.574	0.21%
W8006096	100	103.63	89.184	0.27
W8006097	200	208.07	179.11	0.27
W8006098	500	557.52	542.13	0.33%
W8006099	1,000	1100.1	1070.7	0.33%
W8006100	2,000	2131.5	2074.8	0.39%
W8006101	5,000	5076.5	4945.0	0.39%
W8006102	10,000	10230	9964.0	0.44%
W8006103	20,000	20563	20010	0.44%
W8006104	50,000	50384	49119	0.50%
W8006105	100,000	122660	119590	0.50%

#### Spindle

Order No.	Model	For Model
W8006010	Included L1,2,3,4	Smart L
W8006011	L1	Smart L
W8006012	L2	Smart L
W8006013	L3	Smart L
W8006014	L4	Smart L
W8006020	Included R2,3,4,5,6,7	Smart R
W8006021	R1	Smart R
W8006022	R2	Smart R
W8006023	R3	Smart R
W8006024	R4	Smart R
W8006025	R5	Smart R
W8006026	R6	Smart R
W8006027	R7	Smart R
W8006030	LCPS	Smart L/R with LCP
W8006040	Included TL5,6,7	Smart L with APM
W8006045	TL5	Smart L with APM
W8006046	TL6	Smart L with APM
W8006047	TL7	Smart L with APM
W8006050	Included TR8,9,10,11	Smart R with APM
W8006058	TR 8	Smart R with APM
W8006059	TR 9	Smart R with APM
W8006060	TR 10	Smart R with APM
W8006061	TR 11	Smart R with APM
W8006070	Included PA~PF	Smart R with Heldal
W8006071	PA	Smart R with Heldal
W8006072	PB	Smart R with Heldal
W8006073	PC	Smart R with Heldal
W8006074	PD	Smart R with Heldal
W8006075	PE	Smart R with Heldal
W8006076	PF	Smart R with Heldal

#### Temperature sensor and adapter

Order No.	Model	For Model
W8006081	Temperature sensor	Smart and Premium
W8006082	Temperature sensor with adapter	LCP
W8006083	Temperature sensor with adapter	APM



#### Visco bath

It is very important to keep the temperature stable during the viscosity measurement

Order No.	Model	Temp. range	Temp. stability	Bath opening / depth	Filling volume	Dimensions
		°C	°C	W×L/D cm	L	W×L×H cm
9021701	DD-200F	-20+200	±0.01	13×15/15	3~4	23×39×65
9021702	DD-201F	-20+200	±0.01	13×15/15	3~4	44×41×44
9021506	DD-BC6	+20+200	±0.01	13×20/15	4.5~6	24×44×47

#### Falling ball viscometer

## VISCO BALL

The Viscoball measures accurately the viscosity of transparent Newtonian liquids and gases (with a special ball). 2 YEARS WARRANTY

#### Measuring principle

Complies with DIN 53015 / ISO 12058, The rolling and sliding movements of a ball through the sample liquid are timed in an inclined cylindrical measuring tube. The sample viscosity is correlated to the time a ball requires to traverse a definite distance. By turning the measuring tube upside down again the return of the ball may also be used for an additional measurement applying the return constant.

The test results are given as dynamic viscosity in the internationally standardized, absolute units of mPa-s.

#### Main Features

- > High accuracy through improved visibility of falling ball.
- > Minimized test time due to accurate return run of the ball.
- > Reduced cost of ownership through increased life time of falling tube.
- > Extended re-calibration periods through improved bearing support.
- The VISCO BALL viscometer is mainly used for low viscosity substances such as used in:
- > Mineral oil industry (oils, liquid hydrocarbons, ...)
- > Food industry (sugar solution, honey, beer, milk, gelatine, fruit juice, ...)
- > Chemical industry (polymer solutions, solvents, resin solutions, latex dispersions, adhesive solutions, ...)
- > Cosmetic/Pharmaceutical industry (raw materials, glycerine, emulsions, suspensions, solutions, extracts, ...)

0.6-75000 mPas-s (cP)

- > Petroleum industry (light crude, machine oil, crude petroleum,...)
- > Fuels (petrol, diesel oil, paraffin, ...).

Technical data Viscosity range

- $\,>\,$  Paper industry (emulsions, pigment dispersion, paper additives, ...)
- $\,>\,$  Paints and varnishes (printing inks, varnishes, water lacquers, inks,...)
- > Detergents (liquid washing agents, washing-up liquids, tenside solutions,...)



Falling ball Viscom

Viscosity range	0.6-75000 mPas·s (cP)
Temperature range	-20°C up to +120°C
Reproducibility	Better than 0.5%
Comparability	Better than 1%

Temperature range	-20°C up to +120°C
Temperature resolution	0.1 ℃
Inner size of measure tube	15.95mm
Size of jacket joint	10mm
Reproducibility	Better than 0.5%
Comparability	Better than 1%
Certificate	Factory calibration certificate
Standard delivery	Set of 6 balls / digital thermometer / Cleaning tools / Calibration sheet / User manual

Temperature control unit need to be ordered separately

#### Order information

Order No.	Model	Material	Measuring range mPas·s (cP)
V92000	Falling ball viscome	ter	
V92101	1	Borosilicate glass	0.6~10
V92102	2	Borosilicate glass	7.0~130
V92103	3	Stainless steel	30~700
V92104	4	Stainless steel	200~4800
V92105	5	Stainless steel	1500~45000
V92106	6	Stainless steel	>75000



Pincers



## Density meter



#### Density meter

## Dendi

Portable Density/Specific Gravity/Concentration Meter 2 YEARS WARRANTY

#### Principle of operation

The operating principle of the device is – weighting of the glass float with filler fully immersed in liquid. It allows measuring observed density and temperature of wide range of opaque and transparent liquids. The buoyancy force of liquid acts on the float, which has precise weight and volume; the float's movement is transmitted to the beam with balance. The electronics employ sophisticated signal processing and computational algorithms to deliver high accuracy measurements. The device has a rugged design with little need for service and easy cleaning. The calibration requires only distilled water. Built-in tables of water densities at testing temperatures and air density (average value for standard european conditions) allows to determine linear dependence of density and weight (see graph on top). Taken together these features result in a device with a long service life and very low cost of ownership.





- $\,>\,$  Wide range of supported measuring units
- $\,>\,$  Covered Density range: 500...2 000 kg/m³
- > Automatic measurements
- > Simple in operation, safe
- > Density/Concentration and Temperature measurements in one instrument
- > Unit conversion
- > Automatic temperature compensation
- > No experienced personnel required

#### Preparation of the Samples

- > Liquids for measurements must be gas-free and their temperature must be equal to the ambient temperature  $\pm 5^\circ C$  .
- > If the same beaker is used for various liquids clean it thoroughly and dry before filling with new sample!
- > For accurate sample preparation place the float into the beaker and fill it with measured liquid up to the top.
- > Place the beaker to the special tray on the base of the device and set the float on the measuring arm - to ensure that the level sample is 2-4 mm above the float.
- > Then you may take the float off the beaker and make a mark on the beaker with the help of marker for glass.

#### Two Step Operation





Weighting float on air...

Weighting float in liquid ...



#### Preparation of the Device

- > Make an external survey of the float and other submersible parts. They must be clean and dry, without mechanical injuries. Any dents or impurity adhered on the float will influence the accuracy of the density measurements!
- > In case of impurity wash the float in appropriate solvent and dry it with some non-fluffy material (paper towel, rags, etc.).
- > Set and remove the float on the measuring arm to check its free running. All the time take care of cleanness in the inlet of the measuring arm!
- > Set the device on the workplace and adjust its horizontal position (in accordance with level vial) with the help of adjusting screws.
- > Switch ON the device and warm it up for 10 minutes.



Model	DenDi-1
Measuring range	
Density	0 3 g/cm³ (0 3000 kg/m³)
Density Standard	0.6 1.2 g/cm³ (600 1200 kg/m³)
Temperature	+15 +30°C (+59 +86° F)
Accuracy	
Density	±0.0005 or ±0.001 g/cm <sup>3</sup> (±0.5 or ±1.0 kg/m <sup>3</sup> )
Density Standard	±0.2°C (±0.4° F)
Repeatability	
Density	±0.00025 or ±0.00050 g/cm <sup>3</sup> (±0.25 or ±0.50 kg/m <sup>3</sup> )
Temperature	±0.1°C (±0.2° F)
Supported Measuring Units	
Observed/Relative Density	g/cm³, kg/m³, lb/gal, lb/ft³; API; SG
Base Density	at 15°C , 20°C , 60° F; API60; SG60
Tables	ASTM D1250
Alcohol Tables (volume%)	°Bx, °P
Temperature	°C or ° F
Ambient Temperature	+15 +30°C (+59 +86° F)
Sample Volume	100 ml (26.4·10 gal)
Power Supply	NiMH 9V-150 mAh
Operating Time without Charging	Appr. 12 hours
Dimensions (H x L x W), Weight	135 x 100 x 190mm, 1.3 kg
Temperature Compensation	Automatic
Delivery	Delivered in compact carrying case

## Specific Gravity Bottles Measurement System

The gravity bottle is used in the determination of the specific gravity of cement, sand and materials of similar fineness.

#### **Product Features**

- > The top is with standard taper glass stopper
- $\,>\,$  The middle smaller neck bulb holds 17ml, the above is from 18ml-24ml.
- > Powerful and infinitely adjustable pressure pump
- > large color TFT display, multilingual interface
- > Central rotary knob (controller) simplifies operation
- > Integrated programmer
- > Integrated external Pt100 connection
- > USB connection
- > RS232 interface or analog interfaces (optional)





Component	Paramters	Paramters	
Specific Gravity Bottles	Material	Borosilicate glass	
	Capacity	250ml	
	O.D. of bulb	90mm	
	Granduation	24ml	
	High precision	250mm	
Transparent thermostat bath	Working temperature range	R.T.+5°C ~60°C	
	Temperature stability	±0.01℃	
	Measuring station	3	
Support and clamp	Stainless steel, adjustable height		

## Meter and Electrode

pH, COND and DO Precise - reliable - selective In lab and field

### Portable pH Meter

Portable pH Meter pH 90 is a portable yet highly accurate pH meter. It is used in all industries as well as commercial and educational teaching aids. The meter uses a regular BNC connector and accepts a variety of other electrodes for special measurement needs. The meter comes complete in a hard carrying case with calibration buffer solutions.

#### Features

- > Large LCD with multiple display, display of pH, temperature and time simultaneously
- >~ Auto lock Measurement, meter automatically senses a stabilized endpoint reading
- $\,>\,$  This ensures workers only takes in an accurate reading all the time and every time.
- $\,>\,$  Multi-point calibration (ISO, NIST and manual, up to 5 points calibration )
- > Electrode status indicator, able to display percentage of slope of the electrode after successive calibration. This feature enables users to determine if the electrode should be replaced due to wear and tear.
- > Real time memory, able to save records of up to 99 data memory with date and time, enable download to PC.
- > Online PC link, able to link to a PC for online display with optional PC kit (sold separately) and download saved data. Meter uses regular AAA size batteries and tap power source from PC when connected via the USB cable.

#### Specifications

mV Temperature
±700.0mV ±2,000mV 0 to 120°C
0.1mV 1mV 0.1°C
±0.5mV ±2mV ±0.1 ℃ ±0.5℃ (Probe)
:, Max. 5 point
or 95°⊂ depending on the buffer type
e temperature error compensation 0 to 120℃
n real time clock
AAA size battery
RH
±0.5°C (Probe) , Max. 5 point or 95°C depending on the buffer type e temperature error compensation 0 to 120°C n real time clock AAA size battery



### Portable Dissolved Oxygen Meter

DO 80 is a top range meter for field use. Each meter comes with a 3 meter probe for submerged testing under water in streams, ponds or water tanks. Users can preset salinity compensation and atmospheric compensation to allow direct reading without any conversion tables. It can store up to 99 memory with date and time records. To allow night visibility, there is a backlit display handy. The HD3030 is suitable for aquaculture or industrial users.

- Advanced Features:
- > Dual DO and temperature display
- > One touch calibration in air
- $\,>\,$  Able to set salinity and atmospheric pressure compensation
- $\,>\,$  Save up to 99 data in memory with real time clock
- > Make online data logging on PC with optional RS232 kit
- > Able to show maximum and minimum reading over saved data
- > Backlite for night display

Model	D080
Range	0 - 20 ppm, 0 - 50°C
Display Resolution	0.01 ppm, 0.1℃
Accuracy (machine only)	± 1.5% FS, 0.3℃
Operating Temperature	0 to 50°C
Calibration	Single point calibration in air at 100%
Battery type	4 x 1.5V AAA size battery or DC9V adaptor (optional item)
Battery life	Approximately 100 hours continuous use
Size	195 x 40 x 36mm
Order No.	W8003080





### Portable Conductivity Meter

Portable Conducivity-TDS-Salinity Meter CON 90 is a portable yet highly accurate conductivity meter. It is used in all industries as well as commercial and educational teaching aids. It has full functionality that matches an expensive bench meter.

The meter comes complete in a hard carrying case with calibration buffer solutions.

#### Features

- > Large LCD with multiple display, display of conductivity, TDS, Salinity with temperature and time simultaneously, able to display reading in µSiemen, mSiemen, ppm, ppt.
- $\,>\,$  Auto lock Measurement, meter automatically senses a stabilized endpoint reading
- $\,>\,$  This ensures workers only takes in an accurate reading all the time and every time.
- > Automatic Range, meter can automatically switch to the next higher range to enhance the accuracy over the 5 calibrated points.
- > Cell Constant, meter can accept probe of different cell constant 0.1, 1.0 and 10.0
- > TDS Factor, TDS factor can be adjusted to allow higher accuracy of different types of chemical or liquid of known conversion.
- > Real time memory, able to save records of up to 99 data memory with date and time, enable download to PC.
- > Online PC link, able to link to a PC for online display with optional PC kit (sold separately) and download saved data. Meter uses regular AAA size batteries and tap power source from PC when connected via the USB cable.



Model	CON90						
	Conductivity / TD	S				Salinity	Temperature
Range	0~19.99µS	0~199.9µS	0~1999µS	0~19.99mS	0~199.9mS	0 100 0ppt	0 120 %
	0~9.99ppm	0~99.9ppm	0~999ppm	0~9.99ppt	0~99.9ppt	0~100.0ppt	0~120 C
Resolution	0.01 μS / ppm	0.1 μS / ppm	1 µS / ppm	0.01 mS / ppt	0.1 mS / ppt	0.1ppt	0.1 °C
Accuracy	±1% Full Scale ±0.5 ℃						
Calibration	5 points with 1 point on each range						
TDS Factor	Adjustable from 0.40 to 1.00						
Cell constant	Selectable from 0.1 , 1.0 & 10.0						
ATC	Automatic from 0 - 100 ℃						
Memory	99 data with real time clock						
Power source	4 x 1.5Volt AAA size battery						
Battery Life	40 hours of continuous use with white backlight on						
Order No.	W8002090						

### Benchtop pH Meter

#### Features

- $\,>\,$  Large LCD with Multiple Display, display of pH, temperature and time simultaneously
- > Hold Display function, automatically lock reading when a stable reading is established.
- > Multi point calibration, automatic buffer recognition with built-in standards:

ISO - pH7.00, 4.01, 10.01 NIST - pH6.68, 4.01, 9.18 Custom - Manual set to any buffer standard. Up to 5 points calibration



#### Specifications

Model	pH610			
	рН	mV	Temperature	
Range	0 to 14 pH	± 1999 mV	0 to 90°C	
Display Resolution	0.01 pH	0.1-199.9 mV 1-1999 mV	0.1°C	
Accuracy	±0.02 pH ±0.2 mV ±0.5°C			
Calibration	5 point selectable			
Operating Voltage	9 to 12V DC, min 650mA			
Operating Temperature	5 to 40°C			
Storage Temperature	-20 to 60°⊂			
Slope recognition	±60 mV			
Meter Size	217 x 168 x 585mm			
Order No.	W8001610			



### Benchtop Conductivity Meter

The Professional Conductivity Bench Meter is a dedicated stationary meter specially designed for laboratory and educational use. It is able to link with a PC for online data logging, or a user can save data in its memory with the date and time and download the data later to a PC. For enhanced accuracy, the meter can calibrate up to 5 points at 1 point on each of its range. The meter is complete with an electrode stand and a PC communication kit.

Model	CON 600				
Range	0- 19.99µS	0 - 199.9µS	0 -1999 µS	0 -19.99 mS	0 - 199.9 mS
Display Resolution	0.01 µS	0.1 µS	1 µS	0.01 mS	0.1 mS
Accuracy	$\pm$ 1% F.S. + 1digit				
Calibration	5 point with 1 point	on each range			
TDS factor	Adjustable 0.3 to 1.0	Adjustable 0.3 to 1.00			
Temperature compensation	Automatic 0 to 80°C	Automatic 0 to 80°C			
Memory	99 data with real tin	99 data with real time clock			
Operating Temperature	5 to 40°C	5 to 40℃			
Storage Temperature	-20 to 60°⊂	-20 to 60°C			
Operating humidity	Up to 95% relative humidity				
Meter Size	217 x 168 x 585mm				
Order No.	W8002600				



### Accessories

#### Electrode / Probe

Order No.	Model	Description	Suitable for	$\bigcap$
H011-AS004	pH electrode	Glass body combination pH electrode, General purpose, 0.9m cable	рН 90	
H012-0001	pH electrode	Glass body combination pH electrode with Pointed-Tip 0.9m cable	pH 90	
H045-AP001	pH electrode	Glass body combination pH electrode with Flat tip 0.9m cable	pH 90	pH electrode
H04C-A0001	Micro pH electrode	Glass body combination pH electrode, Length: 50 / 80mm, Ø12/Ø5mm, 0.9m cable	pH 90	
CT25-A0016	Conductivity electrode	Plastic body conductivity electrode platinized Platinum cell K=1	CON 90	
CT25-A0026	Conductivity electrode	Plastic body conductivity electrode platinized Platinum cell K=0.1	CON 90	conductivity electrode
CT25-A0036	Conductivity electrode	Plastic body conductivity electrode platinized Platinum cell K=10	CON 90	
HT31-A0001	pH electrode	Glass body combination pH electrode, General purpose, 0.9m cable	pH610	
CT25-A0009	Conductivity electrode	Plastic body conductivity electrode platinized Platinum cell K=1	CON600	
DOG2-A0001	DO electrode	Dissolved Oxygen electrode with 0.9 meter cable for DO80	D080	
				Dissolved Oxygen electrode

1000r 1000r 1000r 1000r

#### pH Reference Solution

Order No.	Model	Description
RFOZNO-A125	RFOZNO	4M KCl, without Ag/Agcl, 125ml
RFOZNO-A500	RFOZNO	4M KCl, without Ag/Agcl, 500ml
RFOZAG-A125	RFOZAG	4M KCl, with Ag/Agcl, 125ml
RFOZAG-A500	RFOZAG	4M KCl, with Ag/Agcl, 500ml

#### pH buffer solution

Order No.	Model	Description
SDH401-A125	SDH401	CAL pH 4.01 Standard pH buffer Solution, 125ml
SDH401-A500	SDH401	CAL pH 4.01 Standard pH buffer Solution, 500ml
SDH686-A125	SDH686	CAL pH 6.86 Standard pH buffer Solution, 125ml
SDH686-A500	SDH686	CAL pH 6.86 Standard pH buffer Solution, 500ml
SDH701-A125	SDH701	CAL pH 7.00 Standard pH buffer Solution, 125ml
SDH701-A500	SDH701	CAL pH 7.00 Standard pH buffer Solution, 500ml
SDH918-A125	SDH918	CAL pH 9.18 Standard pH buffer Solution, 125ml
SDH918-A500	SDH918	CAL pH 9.18 Standard pH buffer Solution, 500ml
SDH100-A125	SDH100	CAL pH 10.01 Standard pH buffer Solution, 125ml
SDH100-A500	SDH100	CAL pH 10.01 Standard pH buffer Solution, 500ml

#### Standard DO Solution

Order No.	Model	Description
DOGALSO-A125	DOGALSO	Electrolyte for DO electrode, 125ml
DOGALSO-A500	DOGALSO	Electrolyte for DO electrode, 500ml

A CONTRACTOR OF THE OWNER OWNER OF THE OWNER OWNER OF THE OWNER OWNE

#### Standard Conductivity Solution

Order No.	Model	Description
SDCO08-A125	SDCO08	CAL 84uS Standard Conductivity Solution, 125ml
SDCO08-A500	SDCO08	CAL 84uS Standard Conductivity Solution, 500ml
SDC014-A125	SDCO14	CAL 1413uS Standard Conductivity Solution, 125ml
SDC014-A500	SDCO14	CAL 1413uS Standard Conductivity Solution, 500ml
SDC128-A125	SDC128	CAL 12.88mS Standard Conductivity Solution, 125ml
SDC128-A500	SDC128	CAL 12.88mS Standard Conductivity Solution, 500ml
SDC150-A125	SDC150	CAL 15.0mS Standard Conductivity Solution, 125ml
SDC150-A500	SDC150	CAL 15.0mS Standard Conductivity Solution, 500ml

#### pH/ORP Storage and Cleaning Solution

Order No.	Model	Description
CSHOST-A125	CSHOST	pH/ORP Storage solution,125ml
CSHOST-A500	CSHOST	pH/ORP Storage solution,500ml
CSHOCL-A125	CSHOCL	pH/ORP Cleaning solution,125ml
CSHOCL-A500	CSHOCL	pH/ORP Cleaning solution,500ml
CSHOPC-A125	CSHOPC	pH/ORP Cleaning solution for Protein,125ml
CSHOPC-A500	CSHOPC	pH/ORP Cleaning solution for Protein,500ml

### Refractometer

WIGGENS offer various model of refractometer for the measurement of sugar, prediction of alcohol and salinity. These meters are self-contained and made of precision prism and optics. Most of the meters come with bi-metal automatic temperature compensation. The mechanical designs require no batteries to operate.

Sugar Refractometer	Range	Resolution	
BR0010N	0~10%	0.1%	
BR0018N	0~18%	0.1%	
BR0032N	0~32%	0.2%	
BR2862N	28~62%	0.2%	
BR5892N	58~92%	0.2%	
Sugar Refractometer ATC			
BR0010T	0~10%	0.1%, ATC	
BR0018T	0~18%	0.1%. ATC	
BR0032T	0~32%	0.2%, ATC	
BR2862T	28~62%	0.2%, ATC	
BR5892T	58~92%	0.2%, ATC	
Salinity Refractometer			
,	0~100%n	1%0	
SA0010	1.000~1.070	0.005	
SA0028	0~28%	0.2%	
Salinity Refractometer ATC			
£40010T	0~100‰	1‰	
SAUUTUT	1.000~1.070	0.005	
SA0028T	0~28%	0.2%	
Honey refractometer			
HN1230	12-30% Honey Moisture	0.1%	
	58-92% Brix	0.5%	
HN5892	38-43° Be'	0.5	
	12-27% water	1%	
Honey refractometer ATC			
HN1230T	12-30% Honey Moisture	0.1%	
	58-92% Brix	0.5%	
HN58921	12-27% water	1%	
Alcohol Refractometer			
	0~80% v/v ·	0~60%(1%)	
AL-1N		60~80%(2.5%)	
AL 2N	0~80% w/w ;	0~60%(1%)	
AL-ZN		60~80%(2.5%)	
AL-3N	0~25% v/v	0.1%	
AI -4N	0~25% v/v	0.1%	
	0~40% Brix	0.2% Brix	
AL-5N	0~25% v/v	0.1%	
	0~20% Baume	0.2% Baume	
Alconol Refractometer AIC	0.25%	0.20/	
AL-31	0~25% v/v	0.2%	
AL-4T	0~25% V/V	0.2%	
AL-5T	0.25% y/y	0.2%	
	0~20Baume	0.2	
Wine Refractometer			
	0~1400e	1	
WN-1N	0~25KMW (Babo)	0.2	
	0~32%Mas Sacch	0.2%	
WN-2N	0~1700e	2	
WN-3N	3~1400e	1	
	U~ 5/%	U / 1/0	











Wine Refractometer AT	C Range	Range			Resolution	
	0~1400e			1		
WN-1T	0~25KMW(Babo	)		0.2		
	0~32%Mas Sac	ch		0.2%		
	lemperature offs	et				
WN-2T	0~1700e			2		
	Temperature ons	,et		a		
W/N 2T	3~1400e			0.20/		
VVIN-51	Temperature offs	et		0.2 /0		
Urea Refractometer (M	edical)					
UR-1N	0~12a/d			0.2a/dl		
	0~12a/dl			0.2a/dl		
UR-2N	1.000~1.050sg	1.000~1.050sg		0.002sq		
	1.3330~1.3600	1.3330~1.3600RI				
Urea Refractometer AT	C (Medical)					
LID 1T	0~12g/dl			0.2g/dl		
0K-11	1.000~1.040sg			0.002sg		
	0~12g/dl			0.2g/dl		
UR-2T	1.000~1.050sg			0.002sg		
	1.3330~1.3600	RI		0.00025RI		
Digital Refractometer						
Model	Scales	Range	Resolut	ion	Accuracy	
BR0035	Brix	0~35%	0.1		±0.5	
	RI	1.3330 ~ 1.3900	0.0001		±0.0005	
BR5892	Brix	58-92% 1 /270 1 5222	0.1		±0.5	
	Priv	0.95%	0.0001		±0.0005	
BR0085	RI	1.3330 ~ 1.5100	0.0001		±0.0005	
	NaCl	0-28%	0.1		+0.2	
SA0028	RI	1.3330 ~ 1.4100	0.0001		±0.0003	
	NaCl (Solubility)	0-30%	0.1		±0.2	
SA0035	RI	1.3330 ~ 1.4100	0.0001		±0.0003	
	Sea Water Salinity	0 100%	0.1		±0 0	
SA0100	Sea Water Specific	1.000 ~ 1.070	0.001		±0.001	
	Gravity					
	Oe (Germany)	3~150	1		±1	
W/N3150	Ue (SWISS) Mass S/W	0-150	1 0.1		±1 +0.2	
100100	Vol AP	0-22%	0.1		+0.2	
	KMW	0-25	0.1		±0.2	
		32 ~ (-58) <sup>0</sup> F	0.1 <sup>o</sup> F		±1 <sup>0</sup> F	
EG3258	EG (CRC88)	0 ~ (-50)°C	0.1°C		±0.5°C	
		0 ~ 75% Volume	0.1		±0.3	
		32 ~ (-58) <sup>o</sup> F	0.1 <sup>o</sup> F		±1 °F	
PG3258	PG (CRC88)	0 ~ (-50)°C	0.1°⊂		±0.5°C	
		0 ~ 60% volume	0.1		±0.3	
ET0060	Ethanol	0 ~ 60% Volume 0 ~ 60% Weight	0.1		±0.3 +0.3	
		0 - 60% Volume	0.1		+0.5	
MT0060		0 ~ 60% Weight	0.1		±0.5	
	Methanol	0 ~ (-50) °C	0.1°C		±0.5°C	
		32 ~ (-58) <sup>o</sup> F	0.1 °F		±1 °F	
		0 ~ 60% Volume	0.1		±0.5	
IPA0060	Isopropyl Alcohol (IPA)	0 ~ 60% Weight	0.1		±0.5	
	1 12	U ~ (-50) °C >> (⊑©\ °⊑	0.1°C		±0.5°C	
	Plata	0 429/	0.1		⊥I F	
PLA0043	Fidlu Plato Specific Gravity	0-43% 1 000-1 134	0.001		±0.1 +0.001	
1 LAUU45	RI	1.3330-1.4082	0.0001		±0.0003	
C140025	Soymilk	0 ~ 35%	0.1		±0.1	
2140032	RI	1.3330-1.4100	0.0001		±0.0003	







## **Gas Generator**



#### HYDROGEN GENERATOR

Purity: 99.9996% or 99.99996% Flow rate: 100mL/min ~ 20L/min General version, Flat version, Tower version and 19" Rack version



## NITROGEN GENERATOR

Flow rate: 200mL/min - 2000L/min Purity: 95 - 99.9999%



#### ZERO AIR GENERATOR

 $\label{eq:response} \begin{array}{l} \mbox{Flow rate: } 1.5 \sim 30 L/min \\ \mbox{HC & CO Content: } < 0.05 ppm \\ \mbox{CO}_2 \mbox{ Content: } < 1 ppm \\ \mbox{NO}_x \mbox{ SO}_x \mbox{ Content: } < 0.1 ppm \end{array}$ 



#### COMPRESSED AIR SYSTEM / PURIFIED AIR SYSTEM Flow rate: 20 ~ 900L/min

METRAL EVOLUTION

ZERO AIR GENERATO

Pressure: 5 - 10 bar

Product brochure online at www.wiggens.com



## **Glass Reaction System**

Featuring Reactors from Lab to Production Scale

Energy | Petrochemical | Life Sciences | Cosmetics | Pharmaceutical | Environmental

- > Bench top glass reactor
- > EZChem pilot reactor
- > PlusChem pilot reactor
- > Ultra-low temperature reaction system
- > Heating / Magnetic Stirring reaction device
- > Parallel Reaction Station
- > Pressure Reactor ( Up to 3.1bar )
- > Ultrasonic Reactor
- > Photochemical Reactor
- > Hydrogenation Reactor
- > Filter Reactor

Q (





## Stainless Steel Process Scale-Up Systems

Featuring Reactors from Micro to Batch Scale

Energy | Petrochemical | Life Sciences | Cosmetics | Pharmaceutical | Environmental

Individual design and modular reaction vessel construction for pressure and vacuum









WIGGENS China Building No. 45, Tianshan International Enterprise Base, Yanjiao Economic Development Zone, Beijing, China Tel: +86-4008092068



WIGGENS GmbH

Gässlesweg 22-24, 75334 Straubenhardt Germany Tel:+49 7248 4529088 info@wiggens.com www.wiggens.com

Authorized Distributor