HORIBA
Scientific

LAQUA

pH	ORP	Ion	Conductivity
Resistivity	Total Dissolved Solids		Salinity

Benchtop Water Quality Instruments

Colour Touchscreen Meters

MADE IN JAPAN

www.horiba-laqua.com

LAQUA

Benchtop Water Quality Instruments
Colour Touchscreen Meters

2011

LAQUA Benchtop Water Quality Instruments

2012

LAQUAtwin Pocket Water Quality Meters

2013

LAQUA Handheld Water Quality Instruments

D-50 (portable) Waterproof, IP67-rated housing and multi-parameter.

2003

F-50 (desktop) The world's first pH meter with colour LCD display. Navigation panel guides operators on how to use the meter as well as resolve errors.

1993

F-20 (benchtop) The world's first wireless pH meter. Large graphical display gives user instructions on screen.

1990

B-111 (Pen type) The pen type sensor allows small samples to be tested.

1987

C-1 (card) Development of the world's first flat sensor.

1980

Model F-80 (benchtop) The world's first instrument capable of measuring pH at 0.001 resolution includes an integral computer with automatic calibration and a self-diagnostic function.

L-7 (integrated) Introduction of a small, handheld pH meter with integrated electrode.

1977

Model F-7AD (benchtop) Incorporating an industry-first LCD display, the combination of a glass electrode, a reference electrode and a temperature-compensating electrode, makes testing easier.

1964

M-5 (benchtop) conversion from vacuum tube to semiconductor allows miniaturization and development of fast response meter

1950

HORIBA introduces Japan's first glass electrode pH meter.

History of the HORIBA pH Meter

The humble beginning of HORIBA...

In 1950, Dr. Masao Horiba pioneered and launched Asia's first pH meter in Kyoto, Japan. Since then, HORIBA has been introducing several of the world's firsts such as the first 0.001 resolution pH meter, the first flat sensor featured in the Cardy, the first wireless pH meter, the first colour LCD display, etc.

Touchscreen Precision. The New Benchmark.

- Large touch screen color graphic LCD—5.7 inches (115.2 x 86.4 mm)
- Chemical-resistant, 2mm thick super white glass panel with protection cover
- Easy to clean and elegant round body
- GLP / GMP compliant
- Switchable display—digital, graph, and analog

Protection Cover

21 CFR Part 11 Software

LAQUA

Benchtop Water Quality Instruments
Colour Touchscreen Meters

Intuitive Touch-Control Operation

360° Electrode Stand Maneuverability

- Each meter comes with standard (Height: 384mm) electrode stand with arm
- Electrode stand arm holds up to 3 electrodes
- Taller electrode stand (Height: 650mm) with telescopic shaft is also available
- Arm level is adjusted by pressing and holding down the clip end while moving it up or down the shaft
- Stopper controls vertical slide of the electrode stand arm
- Arm rotates 360° so beakers can be conveniently positioned anywhere around the stand

Universal Power Adapter

- Multi-voltage (100-240V)
- 6 types of international standard plugs included (US, UK, EU, Australia / New Zealand, Korea and China)

Data Management

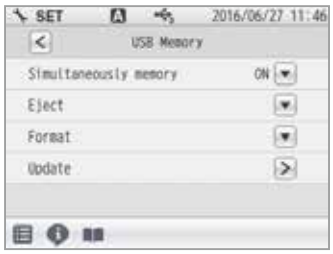
Data Key

- Data key shows settings that allow users to search, view, delete, and copy data from meter to USB flash drive

Sample ID

- Meter internal memory stores up to 2000 data with sample ID for easy reference

Data Storage



- Data can be stored simultaneously on both meter and USB flash drive (if inserted)
- Calibration and measurement data are logged automatically at set time interval

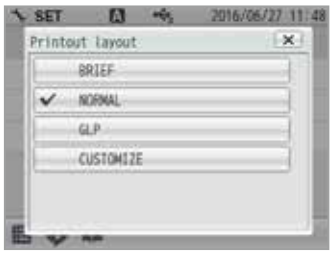
Data Search

- Data search by date, parameter, or sample ID

Meter Connections

- Data output via USB to PC / USB flash drive or via RS232C to PC / printer (cables sold separately)
- Analog output adjustment—voltage output can be acquired from digital multimeter or recorder connected to the analog output connector

Custom Printout



- Auto or manual printing of calibration and measurement values for record keeping
- Printout contents can be customized based on user preference or GMP/GLP requirements—date and time, operator, electrode and meter information, electrode status, and calibration data

Meter Security

- Password setting for security
- Up to 25 administrators or operators can be registered

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Benchtop Water Quality Instruments
Colour Touchscreen Meters

Intelligent Assistant

Provides step-by-step guidance on calibration, sample measurement, application methods, maintenance, inspection and troubleshooting

SMART

Calibration Support Function

Enjoy hassle-free calibration with on screen support. The meter will walk you through the steps of calibration.

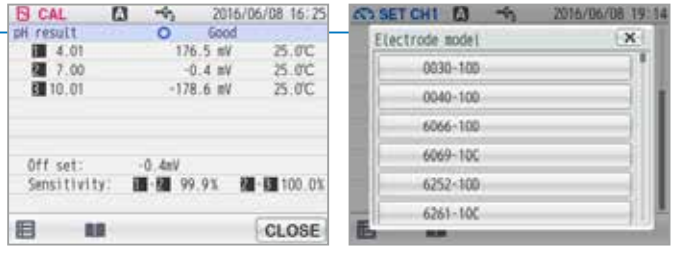
- Auto Buffer Recognition
- Auto Calibration Function

Reading Stability Check

- Perform proper calibration with stable readings
- Determine the stability of reading at a glance in either digital or graph display during pH and ion calibration
- Stability value is a deviation between the maximum and minimum readings in the last 10 seconds

Electrode Status

- Electrode condition and results such as calibrated values, offset, acid and alkaline slopes, are shown at the end of calibration
- Programmable calibration reminder and alarm for measured values exceeding set limits
- Temperature indicator appears when a temperature probe or electrode with integrated temperature sensor is connected to the meter

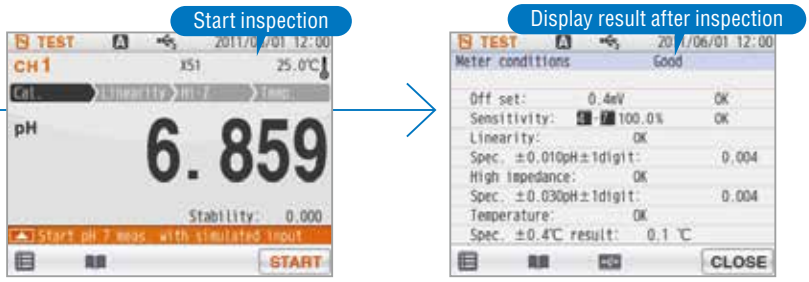


- Electrode model, either selected from preset list or entered manually, and lot or MFG no. (entered manually) are included in stored data and printouts
- Temperature sensor calibration function

Inspection Function

Easy navigation for meter and electrode inspections using a simulator. Various industrial standards (JIS, USP, EP, JP, CP) are also supported.

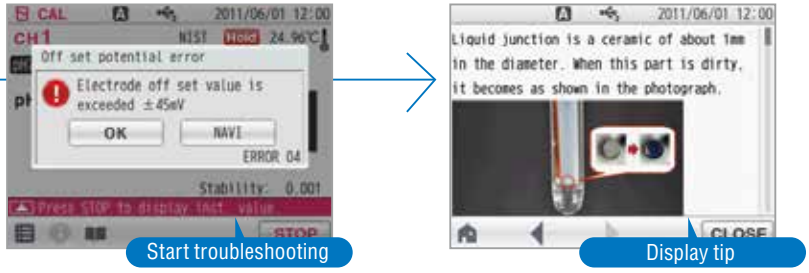
- Convenient for IQ / OQ / PQ validation



NAVIGATION

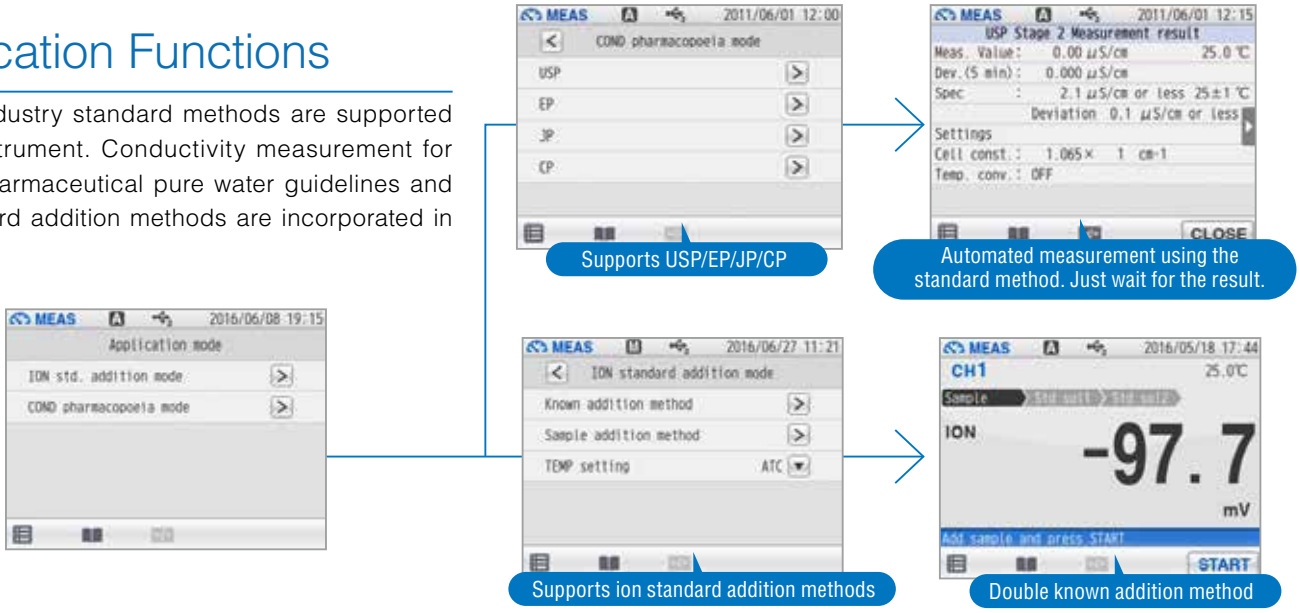
Troubleshooting Function

On-screen support for resolving a problem that occurs during calibration or sample measurements. A user's guide is incorporated in the software to assist with any operational difficulties.



Application Functions

Various industry standard methods are supported by the instrument. Conductivity measurement for several pharmaceutical pure water guidelines and ion standard addition methods are incorporated in the meter.



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Benchtop Water Quality Instruments
Colour Touchscreen Meters

pH

- 5 pH buffer groups
  - USA (1.68, 4.01, 7.00, 10.01, 12.45)
  - NIST (1.68, 4.01, 6.86, 9.18, 12.45)
  - NIST2 (1.68, 4.01, 6.86, 10.01, 12.45)
  - China (1.68, 4.01, 6.86, 9.18, 12.46)
  - Custom (any pH buffers)
- Up to 5 calibration points
- 0.01 and 0.001 pH Resolutions
- Auto setting allows the meter to toggle between 0.01 and 0.001 resolution depending on the stability of the reading
- Auto calibration / Auto buffer recognition

mV

- Display absolute potential and relative potential

ADVANCED

ORP

- Capable of 1-point calibration

Ion

- Make your own calibration curve with maximum of 5 points or perform standard addition techniques
- Programmed with standard addition methods—known addition and sample addition (single and double are available for both methods)
- Measurement units - µg/L, mg/L, g/L, mmol/L, mol/L

Conductivity

- Automatic / manual calibration up to 4 points
- Adjustable temperature coefficient and reference temperature for temperature compensated readings
- Selectable cell constants – 0.1, 1.0, 10.0
- Auto ranging S/cm and S/m units, fix mS/cm unit
- Support conductivity standard methods for pharmaceutical water—USP, EP, JP and CP

Total Dissolved Solids (TDS)

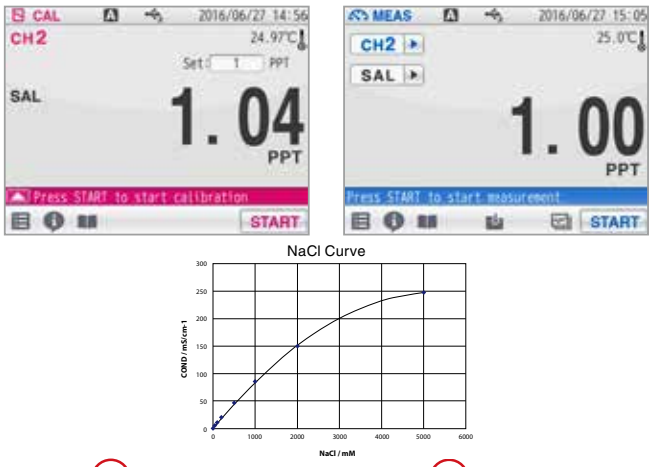
- Programmed with 4 predetermined TDS curves for accurate measurement—Linear, EN27888, 442, and NaCl
- Select the TDS curve suitable for your application
- Calibration only in conductivity mode is required

TDS Calibration Curves

Application	Key chemical species	TDS selection
Aquaculture, pickling	NaCl	NaCl
Boiler water, HVAC	Na_2SO_4, $NaHCO_3$, NaCl	442 (Myron)
Environmental	EN standard for environmental water	EN 27888
General application	Not known	KCl (linear factor) Default: 0.5 Selectable: 0.4 to 1.0

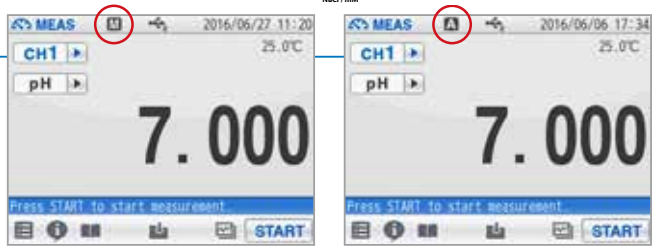
Salinity

- Programmed with 2 predetermined salinity curves—NaCl and seawater
- Salinity value is calculated based on measured conductivity value
- 1-point calibration using standard solution
- Measurement units—percentage (%) and parts per thousand (ppt)



Auto Stable / Auto Hold

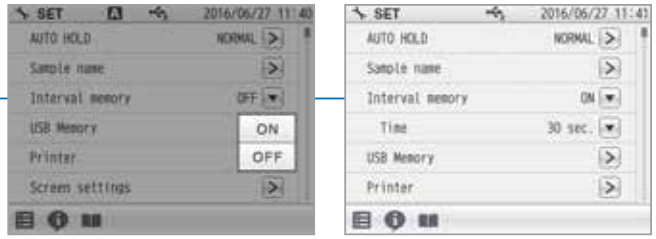
- In measurement mode, the meter displays live readings continuously
- Activate auto hold by tapping START
- Auto hold settings—Exact, Normal, Brief, Time, Customize, and Manual



FEATURES

Auto Log Data

- Log data automatically by setting time interval from 1 to 999 seconds



Multi-Language

- Choose a language that you are familiar with—English, Japanese, Chinese, Korean, and Vietnamese

Sound Setting

- Play a click sound every time you tap a key

Screen Settings

- Set stylish theme on your meter screen—Standard, Cool, Monotone, and Kyoto
- Power saving mode—turns off the backlight to save power

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Benchtop Water Quality Instruments
Colour Touchscreen Meters

F-73G
Dual Channel

F-72G
Single Channel

Features:

- Up to 5 calibration points for pH and Ion
- 5 pH buffer groups – USA, NIST, NIST2, China, and Custom
- 0.01 and 0.001 pH resolutions
- pH calibration interval setting – 1 to 999 days
- 1-point ORP calibration
- Ion calibration curve and standard addition methods
- Temperature sensor calibration function
- Single channel for F-72 and dual channel display for F-73

Ordering Information:		
Meter Kit*	 **F-72A-S** (3999960011) • F-72 meter • electrode stand • protection cover • power adaptor with 6 plugs • 9615S-10D - refillable, glass-body pH electrode with integrated temperature sensor, 1m cable, BNC & phono jack • 502-S - pH 4.01, 7.00, 10.01, 3.33M KCl solutions (250ml each)	 **F-73A-S** (3999960012) • F-73 meter • electrode stand • protection cover • power adaptor with 6 plugs • data acquisition software in USB • 9615S-10D - refillable, glass-body pH electrode with integrated temperature sensor, 1m cable, BNC & phono jack • 502-S - pH 4.01, 7.00, 10.01, 3.33M KCl solutions (250ml each)
Meter Kit with 21 CFR Part 11 Software	**F-72A-S-CFR** (3999960210)	**F-73A-S-CFR** (3999960212)
Meter with Electrode Stand	**F-72G** (3200575120) • F-72 meter • electrode stand • protection cover • power adaptor with 6 plugs	**F-73G** (3200575123) • F-73 meter • electrode stand • protection cover • power adaptor with 6 plugs
pH Electrode	**9615S-10D** (3200585428) • refillable, glass-body pH electrode with integrated temperature sensor, 1m cable, BNC & phono jack	**9615S-10D** (3200585428) • refillable, glass-body pH electrode with integrated temperature sensor, 1m cable, BNC & phono jack

*Kit with 501-S is available upon request. Add 'N' suffix to the order code when ordering.

Model	F-72G pH/ORP/Ion/Temp (°C)	F-73G Dual Channel pH/ORP/Ion/Temp (°C)
pH Range	-2.000 to 20.000 pH	-2.000 to 20.000 pH
Resolution	0.01 / 0.001 pH	0.01 / 0.001 pH
Accuracy	± 0.001 pH	± 0.001 pH
Calibration Points	Up to 5	Up to 5
Buffer Options	USA, NIST, NIST2, China, Custom	USA, NIST, NIST2, China, Custom
ORP Range	± 1999.9 mV	± 1999.9 mV
Resolution	0.1 mV	0.1 mV
Accuracy	±0.2 mV	±0.2 mV
Ion Range	0.000 µg/L to 9999 g/L (mol/L)	0.000 µg/L to 9999 g/L (mol/L)
Resolution	4 significant digits	4 significant digits
Accuracy	± 0.3% of full scale	± 0.3% of full scale
Calibration Points	Up to 5	Up to 5
Temperature Range	-30.0 °C to 130.0 °C	-30.0 °C to 130.0 °C
Resolution	0.1 °C	0.1 °C
Accuracy	±0.4°C	±0.4°C
Calibration Option	Yes	Yes
Navigation Function	Yes	Yes
Memory	2000	2000
Auto Data-Logging	Yes	Yes
Data Search	Yes	Yes
Custom Printing	Yes	Yes
Real Time Clock	Yes	Yes
Date / Time Stamp	Yes	Yes
Sample ID Input	Yes	Yes
Operator ID Input	Yes	Yes
Password Setting	Yes	Yes
Auto Stable / Auto Hold	Yes	Yes
Offset / Slope Display	Yes (independent acid and alkaline slopes depending on calibration)	Yes (independent acid and alkaline slopes depending on calibration)
Calibration Alarm Limit	Yes	Yes
Electrode Status	On screen display	On screen display
Diagnostic Messages	Yes	Yes
Display	Touch screen color graphic LCD	Touch screen color graphic LCD
Languages	English / Japanese / Chinese / Korean / Vietnamese	English / Japanese / Chinese / Korean / Vietnamese
Inputs	BNC, phono, DC socket	Dual BNC, dual phono, DC socket
Outputs	USB, RS232C, analog output	USB, RS232C, analog output
Power Requirements	AC adaptor 100 ~ 240V, 50/60 Hz	AC adaptor 100 ~ 240V, 50/60 Hz
Electrode Stand	Stand alone	Stand alone
Weight	700g	700g
Dimensions	170 (W) x 174 (D) x 73 (H) mm	170 (W) x 174 (D) x 73 (H) mm

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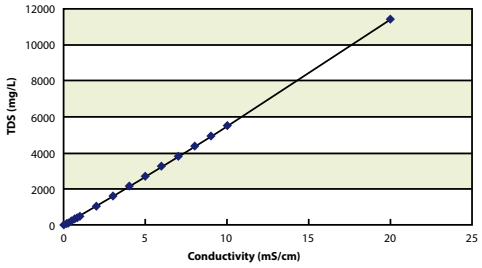
Colour Touchscreen Meters

Features:

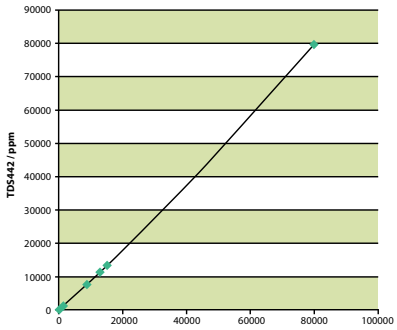
- Wide conductivity range
- Automatic / manual conductivity calibration
- Up to 4 calibration points
- Adjustable temperature coefficient, reference temperature, and cell constant
- Temperature sensor calibration function
- Auto ranging S/cm and S/m and fix mS/cm conductivity units
- Parts per thousand (ppt) and percentage (%) salinity units
- NaCl and seawater salinity curves
- 4 Total dissolved solids (TDS) curves – EN27888, Linear, NaCl, 442

DS-72G
Single Channel

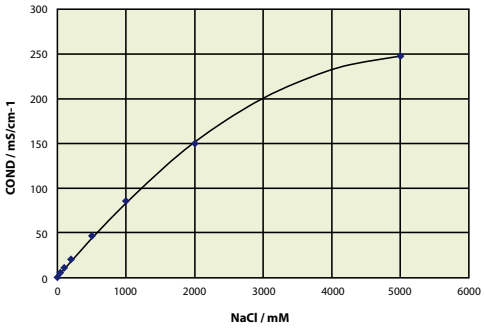
EN 27888 Curve



442 (Myron) Curve



NaCl Curve



Ordering Information:

Meter Kit	 **DS-72A-S** (3999960013) • DS-72 meter • electrode stand • protection cover • power adaptor with 6 plugs • 3552-10D - Platinum/Platinum black, glass-body k=1.0 conductivity cell with integrated temperature sensor, 1m cable, BNC & phono jack • 503-S - 84µS/cm, 1413µS/cm, 12.88mS/cm & 111.8mS/cm conductivity standard solutions (250ml each)
Meter Kit with 21 CFR Part 11 Software	**DS-72A-S-CFR** (3999960216)
Meter with Electrode Stand	**DS-72G** (3200575136) • DS-72 meter • electrode stand • protection cover • power adaptor with 6 plugs
Conductivity Cell	**3552-10D** (3014081545) • Platinum/Platinum black, glass-body k=1.0 conductivity cell with integrated temperature sensor, 1m cable, BNC & phono jack

Model	DS-72G EC/TDS/Res/Sal/Temp (°C)
EC Range	0.000 µS/cm to 19.99 mS/cm (k=0.1) 0.00 µS/cm to 199.9 mS/cm (k=1.0) 0.0 µS/cm to 1.999 S/cm (k=10.0)
Resolution	0.05% of full scale
Accuracy	±0.6% of full scale (±1.5% full scale > 18.0 mS/cm)
Reference Temperature	15 to 30°C (adjustable)
Temperature Coefficient	0.00 to 10.00% (adjustable)
Cell Constants	0.1 / 1.0 / 10.0
Calibration Points	4 (Auto / Manual)
Measurement Units	Auto-Ranging / Manual S/cm, S/m, Fix (mS/cm)
TDS Range	0.01 mg/L to 1000 g/L
Resolution	0.01 mg/L
Accuracy	±0.1% of full scale
TDS Curves	EN27888, Linear (0.40 to 1.0), 442, NaCl
Resistivity Range	0.00 kΩ.cm to 199.9 MΩ•cm (k=0.1) 0.000 kΩ.cm to 19.99 MΩ•cm (k=1.0) 0.0 Ω.cm to 1.999 MΩ•cm (k=10.0)
Resolution	0.05% of full scale
Accuracy	±0.6% of full scale (±1.5% full scale > 1.80 MΩ•cm)
Salinity Range	0.00 to 80.00 ppt / 0.000 to 8.000%
Resolution	0.01 ppt / 0.001%
Accuracy	0.2% of full scale
Salinity Curves	NaCl / Seawater
Temperature Range	-30.0 °C to 130.0 °C
Resolution	0.1 °C
Accuracy	± 0.4 °C
Navigation Function	Yes
Memory	2000
Auto Data-Logging	Yes
Data Search	Yes
Custom Printing	Yes
Real Time Clock	Yes
Date / Time Stamp	Yes
Sample ID Input	Yes
Operator ID Input	Yes
Password Setting	Yes
Auto Stable / Auto Hold	Yes
Diagnostic Messages	Yes
Display	Touch screen color graphic LCD
Languages	English / Japanese / Chinese / Korean / Vietnamese
Inputs	BNC, phono, DC socket
Outputs	USB, RS232C, analog output
Power Requirements	AC adaptor 100~240V, 50/60 Hz
Electrode Stand	Stand alone
Weight	700g
Dimensions	170 (W) x 174 (D) x 73 (H) mm

LAQUA

Benchtop Water Quality Instruments
Colour Touchscreen Meters

Features:

- Combine the functions of F-72 and DS-72 models
- Dual channel and simultaneous measurements
  - Channel 1: pH, Ion, mV, ORP
  - Channel 2: Conductivity, Salinity, Resistivity and TDS
- Switchable single or dual channel display

F-74G
Dual Channel

Channel 1: pH

Channel 2: Conductivity

Dual Channel

Ordering Information:	
Meter Kit*	 **F-74A-S** (3999960014) • F-74 meter • electrode stand • protection cover • power adaptor with 6 plugs • 9615S-10D - refillable, glass-body pH electrode with integrated temperature sensor, 1m cable, BNC & phono jack • 3552-10D - Platinum/Platinum black, glass-body k=1.0 conductivity cell with integrated temperature sensor, 1m cable, BNC & phono jack • 502-S - pH 4.01, 7.00, 10.01, 3.33M KCl solutions (250ml each) • 503-S - 84µS/cm, 1413µS/cm, 12.88mS/cm & 111.8mS/cm conductivity standard solutions (250ml each)
Meter Kit with 21 CFR Part 11 Software	**F-74A-S-CFR** (3999960214)
Meter with Electrode Stand	**F-74G** (3200575130) • F-74 meter • electrode stand • protection cover • power adaptor with 6 plugs
pH Electrode	**9615S-10D** (3200585428) • refillable, glass-body pH electrode with integrated temperature sensor, 1m cable, BNC & phono jack
Conductivity Cell	**3552-10D** (3014081545) • Platinum/Platinum black, glass-body k=1.0 conductivity cell with integrated temperature sensor, 1m cable, BNC & phono jack

*Kit with 501-S is available upon request. Add 'N' suffix to the order code when ordering.

Models	F-74G Dual Channel pH/ORP/Ion/EC/TDS/Res/Sal/Temp (°C)
pH Range	-2.000 to 20.000 pH
Resolution	0.01 / 0.001 pH
Accuracy	± 0.001 pH
Calibration Points	Up to 5
Buffer Options	USA, NIST, NIST2, China, Custom
ORP Range	± 1999.9 mV
Resolution	0.1 mV
Accuracy	± 0.2 mV
Ion Range	0.000 µg/L to 9999 g/L (mol/L)
Resolution	4 significant digits
Accuracy	± 0.3% of full scale
Calibration Points	Up to 5
EC Range	0.000µS/cm to 19.99mS/cm (k=0.1) 0.00 µS/cm to 199.9 mS/cm (k=1.0) 0.0 µS/cm to 1.999 S/cm (k=10.0)
Resolution	0.05% of full scale
Accuracy	±0.6% of full scale (±1.5% full scale > 18.0 mS/cm)
Reference Temperature	15 to 30°C (adjustable)
Temperature Coefficient	0.00 to 10.00% (adjustable)
Cell Constants	0.1 / 1.0 / 10.0
Calibration Points	4 (Auto / Manual)
Measurement Units	Auto Ranging / Manual S/cm, S/m, Fix (mS/cm)
TDS Range	0.01 mg/L to 1000 g/L
Resolution	0.01 mg/L
Accuracy	±0.1% of full scale
TDS Curves	EN27888, Linear (0.40 to 1.0), 442, NaCl
Resistivity Range	0.00 kΩ.cm to 199.9 MΩ•cm (k=0.1) 0.000 kΩ.cm to 19.99 MΩ•cm (k=1.0) 0.0 Ω.cm to 1.999 MΩ•cm (k=10.0)
Resolution	0.05% of full scale
Accuracy	±0.6% of full scale (±1.5% full scale > 1.80 MΩ•cm)
Salinity Range	0.00 to 80.00 ppt / 0.000 to 8.000 %
Resolution	0.01 ppt / 0.001%
Accuracy	0.2% of full scale
Salinity Curves	NaCl / Seawater
Temperature Range	-30.0 °C to 130.0 °C
Resolution	0.1 °C
Accuracy	± 0.4 °C
Navigation Function	Yes
Memory	2000
Auto Data-Logging	Yes
Data Search	Yes
Custom Printing	Yes
Real Time Clock	Yes
Date / Time Stamp	Yes
Sample ID Input	Yes
Operator ID Input	Yes
Password Setting	Yes
Auto Stable / Auto Hold	Yes
Offset / Slope Display	Yes (independent acid and alkaline slopes depending on calibration)
Calibration Alarm Limit	Yes
Electrode Status	On screen display
Diagnostic Messages	Yes
Display	Touch screen color graphic LCD / dual channel display
Languages	English / Japanese / Chinese / Korean / Vietnamese
Inputs	Dual BNC, dual phono, DC socket
Outputs	USB, RS232C, analog output
Power Requirements	AC adaptor 100~240V, 50/60 Hz
Electrode Stand	Stand alone
Weight	700g
Dimensions	170 (W) x 174 (D) x 73 (H) mm

pH Electrode Selection Guide

			3-in-1 ELECTRODES												COMBINATION ELECTRODES			
			PLASTIC					STANDARD ToupH	LONG ToupH	MICRO ToupH	SLEEVE ToupH	SLEEVE	NON-AQUEOUS	NEEDLE	PLASTIC	STANDARD ToupH	MICRO ToupH	SLEEVE ToupH
			9625-10D	9630-10D	9631-10D	9632-10D	9651-10D	9615S-10D	9680S-10D	9618S-10D	9681S-10D	6367-10D	6377-10D	6252-10D	9425-10C	9415-10C	9418-10C	9481-10C
Specification	Applicable temperature range (°C)		0-100	0-100	0-60	0-100	0-60	0-100	0-100	0-60	0-60	0-60	0-60	0-60	0-100	0-100	0-60	0-60
	Diameter (mm)		16	16	16	16	16	12	8	3	12	12	12	12	16	12	3	12
	Length (mm)		150	150	155	150	150	198	283	185	203	150	150	150	150	198	185	203
pH - Sample Conditions																		
Aqueous Solution	Conductivity	Normal (over 100 mS/m)	◉	◉	◉	◉	◉	◉	◉	◉	◉	◉	◉	◉	◉	◉	◉	◉
		Low (approx.10 ~100 mS/m		◉							○		◉					○
		Very low (approx. 5 ~100 mS/m		○							○		◉					○
		High (approx. 5 S/m)	○	○	○	○	○	○	○		◉				○	○		◉
	Strong alkaline (pH 10-12)					◉		○	○		○	○				○		○
	Strong acidity (pH 0-2) * Except HF sample				◉			◉								◉		
	Quick heat change (within 50°C)		◉	◉	◉	◉	◉								◉			
	High viscosity (approx. 5 Pa·S)										◉	○	◉					◉
	Containing non-aqueous solvent							○	○	○	○	○	◉			○	○	○
	Suspension							○	○	○	◉		◉			○	○	◉
Solid/ Semisolid	Inside													○				
	Surface																	
Sample Containers	Microtube/plate (> 50 µL)									◉							◉	
	Ampule	> ø4 mm								◉							◉	
	Micro container (> 2 mL)								○	◉							◉	
	Tube	ID:13 mm, L:100 ~ 150 mm							◉									
	Beaker	10 mL ~ 1 L	◉	◉	◉	◉	◉	◉	○	○	○	○	○	○	◉	◉	○	○
	Large container (> 1 L)		○	○	○	○	○	○	◉						○	○		
	Petri dish																	
	Droplet																	
Water	Pure/ion-exchange water (approx. 0.1 mS/m)/ Distilled water (approx. 0.5 mS/m)							○					◉			○		
	Tap/drinking water (approx. 10 mS/m)		○	◉			○	○			○		◉		○	○		○
	Surface water			◉				○			○		◉			○		○
	Pharmaceutical water/ Enviromental water/acid rain		○	○			○	○			○		○		○	○		○
Chemical reagent/ solvent	Caustic/strong acid (Except HF sample)				◉			◉			○					◉		○
	Hydrofluoric acid				◉													
	Surfactant							○			◉		○			○		◉
	Water-based paint							○			◉		○			○		◉
	Dye/coloring agent										◉		○					◉
Pharmaceutical/ biological sample	Protein-containing sample							○		○	◉	○				○	○	◉
	Medicinal preparation									○	○		○				○	○
	Enzyme solution								○	◉				○			◉	
	Tris buffer							◉		○	○					◉	○	○
	Suspension							○			◉		◉			○		◉
	Agar medium																	
Food	Jam							○			◉		○	○		○		◉
	Meat/fish/Fruit/vegetable/ Dough													◉				
	Honey												◉					
	Cheese/butter													○				
	Yogurt	○	○			○	○	○			○	○		○	○	○		○
Beverage/ seasoning	Beer	○	○			○	○				◉	○	◉		○	○		◉
	Milk/Carbonated drink/juice/ sauce/soy sauce							○			◉	○	○			○		◉
	Mayonnaise/ketchup							○			◉		○			○		◉
Cosmetic/ lotion	Beauty cream/mascara							○			◉		○	○		○		◉
	Gel/soap/shampoo/Hair dye lotion							○			◉		○			○		◉
	Emulsified liquid							○			○		◉			○		○

◉ Recommended ○ Can be measured

			ISFET ELECTRODE
LONG	LONG ToupH	FLAT	GENERAL
6069-10C	9480-10C	6261-10C	0040-10D
0-60	0-100	0-50	0-60
3	8	12	16
291	283	150	190
◉	◉	◉	◉
	○		
	○		
	○		○
	○		○
		◉	◉
○			
○	○		
◉	◉		
○	○	○	○
	◉		
		◉	◉
		◉	◉
	○		
		◉	◉
		○	◉ (surface)
		○	◉ (surface)
			○ (surface)
		○	○ (surface)
		○	◉ (surface)

Stable measurement for a wide range of samples. Standard ToupH glass electrode (9615S-10D)

STANDARD ToupH

High stability and drift reduction. No more worries about the timing of your measurement value readings.

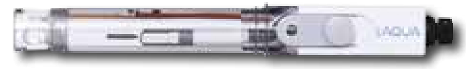
- Uses responsive glass that is 10 times stronger than JIS standard. The domed shape provides strength in all directions, greatly reducing damage concerns.
- Constructed with smooth surfaces for easy wiping and cleaning.

Recommended

Perfect for preparing buffers. Can be used on a wide range of aqueous test solutions.

Stable measurement for routine testing. Standard plastic electrode (9625-10D)

STANDARD



The electrode has a plastic body which is ideal for general purpose measurement.

- Can be submerged up to 1m depth and 30mins. (with refilling port closed)
- Waterproof, Pb-free

Recommended

Ideal for general purpose use. For measurement of tap water and drinking water.

For extremely small samples Micro ToupH glass electrode (9618S-10D)

MICRO ToupH

This pH electrode with temperature compensation sensor can take measurements from samples as small as 50μL, the smallest in the world.

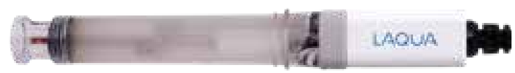
- Our original manufacturing technology (Japanese Patent No. 4054245) is used to produce 2-ply piping 3mm in diameter.
- Compatible with extremely small containers such as micro tubes etc.
- The temperature sensor is located at the tip for high-speed temperature response. Refrigerated samples can be measured without needing to wait for them to return to room temperature.

Recommended

Can be used for a wide range of aqueous solutions, including those that cannot be obtained in large quantities. We recommend using our specialized cleaning solution after measuring samples that contain proteins.

Gel-filled pH Electrode (9651-10D)

STANDARD



150 mm length & 16 mm diameter. BNC & phono jack.

- The plastic body of the electrode is filled with gel electrolyte. Less maintenance is needed as refilling is not required.
- Can be submerged up to 1m depth of water for 30mins.
- Waterproof, Pb-free glass

Recommended

Use in the field.

For highly viscous samples Sleeve ToupH glass electrode (9681S-10D)

SLEEVE ToupH

Stable measurement can also be achieved for high viscous samples.

- The liquid junction section is constructed with a movable sleeve that can be rinsed clean, preventing highly viscous samples from clogging the liquid junction, and maintaining stable measurement performance

Recommended

For highly viscous samples and solutions, and samples that contain non-aqueous solvents (such as cosmetics or paints). We recommend that you take measurements while using the graph display function to confirm stable responses.
(We recommend washing with a neutral detergent after use with samples that contain oil.)

For the surface of solid samples General ISFET pH electrode (0040-10D)

GENERAL ISFET

The sensor is located on the flat surface of the electrode tip, with less than a 100 μm protrusion from the housing.

- Measurements can be made from a minute amount of moisture on the solid sample surface.
- Use of a semiconductor sensor means there are no concerns that the electrode will be damaged.
- Also perfect for measuring samples in shallow containers such as Petri dishes.
- Replaceable sensor

Recommended

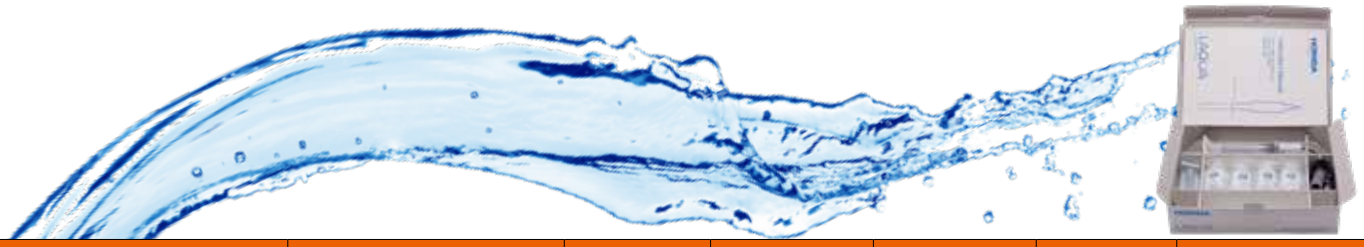
For highly viscous samples and solutions, and samples that contain non-aqueous solvents (such as cosmetics or paints). We recommend that you take measurements while using the graph display function to confirm stable responses.
(We recommend washing with a neutral detergent after use with samples that contain oil.)

Combination ISE

Ion-selective electrodes are responsive to concentration of particular ions in the test liquid and are variable-potential electrodes. They are used in conjunction with reference electrodes to measure the concentration of particular ions. HORIBA's years of experience and know-how in this field are behind the wide range of ion electrodes we offer.

When measurements are made using an ion meter, calibrating it with various standard solutions will give direct readings of the ion concentration. Note that since volume-detection level changes with temperature, measurements must be taken at a fixed temperature.

Model	Accessories Included	Temp. Range (°C)	Measurement Range	pH Range
 **Ammonia ion (NH_3) electrode** **5002S-10C** 3200698386 Overall length: 161 mm Diameter of probe: 15 mm Connector: BNC	• membrane cap, 3pcs • 1000mg/L ammonium ion standard solution, 50ml • 100mg/L ammonium ion standard solution, 50ml • ammonia electrode filling solution, 50ml • syringe • dropper • protective pipe • manual	0 - 50	0.1 - 1,000 mg/L NH_3	Adjust more than pH 12
 **Calcium ion (Ca^{2+}) electrode** **6583S-10C** 3200697410 Overall length: 150 mm Diameter of probe: 16 mm Connector: BNC	• calcium electrode tip, 2pcs • 1000mg/L calcium ion standard solution, 50ml • 100mg/L calcium ion standard solution, 50ml • calcium electrode filling solution, 50ml • calcium ionic strength adjustor, 50ml • syringe • dropper • protective pipe • manual	0 - 50	0.4 - 40,080 mg/L Ca^{2+} (10^{-5} to 1 mol/L Ca^{2+})	4.0 mg/L (10^{-4} mol/L) Ca^{2+}, pH 5 to 11
 **Chloride ion (Cl^-) electrode** **6560S-10C** 3200697407 Overall length: 150 mm Diameter of probe: 16 mm Connector: BNC	• chloride electrode tip • 1000mg/L chloride ion standard solution, 50ml • 100mg/L chloride ion standard solution, 50ml • chloride electrode filling solution, 50ml • chloride ionic strength adjustor, 50ml • syringe • dropper • protective pipe • water-resistant abrasive sheet • manual	0 - 50	0.35 - 35,000 mg/L Cl^- (10^{-5} to 1 mol/L Cl^-)	350 mg/L (10^{-2} mol/L) Cl^-, pH 3 to 11
 **Fluoride ion (F^-) electrode** **6561S-10C** 3200693774 Overall length: 150 mm Diameter of probe: 16 mm Connector: BNC	• fluoride electrode tip • 1000mg/L fluoride ion standard solution, 50ml • 100mg/L fluoride ion standard solution, 50ml • fluoride electrode filling solution, 50ml • fluoride ionic strength adjustor, 50ml • syringe • dropper • protective pipe • manual	0 - 50	0.2 - 19,000 mg/L F^- (10^{-6} to 1 mol/L F^-)	20 mg/L (10^{-3} mol/L) F^-, pH 4 to 10
 **Nitrate ion (NO_3^-) electrode** **6581S-10C** 3200697408 Overall length: 150 mm Diameter of probe: 16 mm Connector: BNC	• nitrate electrode tip, 2pcs • 1000mg/L nitrate ion standard solution, 50ml • 100mg/L nitrate ion standard solution, 50ml • nitrate electrode filling solution, 50ml • nitrate ionic strength adjustor, 50ml • syringe • dropper • protective pipe • manual	0 - 50	0.62 - 62,000 mg/L NO_3^- (10^{-5} to 1 mol/L NO_3^-)	62 mg/L (10^{-3} mol/L) NO_3^-, pH 3 to 7
 **Potassium ion (K^+) electrode** **6582S-10C** 3200697409 Overall length: 150 mm Diameter of probe: 16 mm Connector: BNC	• potassium electrode tip, 2pcs • 1000mg/L potassium ion standard solution, 50ml • 100mg/L potassium ion standard solution, 50ml • potassium electrode filling solution, 50ml • potassium ionic strength adjustor, 50ml • syringe • dropper • protective pipe • manual	0 - 50	0.04 - 39,000 mg/L K^+ (10^{-6} to 1 mol/L K^+)	3.9 mg/L (10^{-4} mol/L) K^+, pH 5 to 11



Selection Coefficient	Replacement Tip	Electrode Filling Solution	100mg/L Standard Solution	1000mg/L Standard Solution	Ionic Strength Adjustor	Applications
—	 **NH_3 electrode membrane caps** 3200705774	500-NH3-IFS 3200697173	500-NH4-SL 3200697172	500-NH4-SH 3200697171	500-NH3-ISA 3200697174 	Agriculture, Soil, Power Station Water, Fish Tanks, Sea Water, Waste Water, Plating Baths, Air / Stack Gases and Biological Cultures or Samples
Fe^{3+} = 0.1, Fe^{2+}, Zn^{2+} = 1, Sr^{2+} = 50 Ni^{2+}, Cu^{2+} = 70, Co^{2+} = 350 Mn^{2+} = 500, Mg^{2+} = 1,000 Na^+, K^+, Ba^{2+}, NH_4^+ = over 1,000	 **7683S** 3200697414 **Calcium**	500-CA-IFS 3200697177	500-CA-SL 3200697176	500-CA-SH 3200697175	500-CA-ISA 3200697178	Agriculture / Plant Tissue, Soil, Water Softening Systems, Boiler Feed Water, Drinking / Mineral Water, Biological Cultures, Dental / Clinical Analysis and Dairy / Food / Beverages Applications
$S_2O_3^{2-}$, S^{2-}, I^-, Ag^+, Hg^{2+} = Not acceptable SCN^- = 0.3, MnO_4^- = 0.1 Br^- = 0.03 NO_3^-, F^-, HCO_3^-, SO_4^{2-}, PO_4^{2-} = 1,000	 **7660S** 3200697411 **Chloride**	500-CL-IFS 3200697169	500-CL-SL 3200697168	500-CL-SH 3200697167	500-CL-ISA 3200697170	Agriculture, River / Tap Water, Plant Tissue, Soils, Boiler Feed Water, Clinical Analysis, Sweat, Urine, Cement, Plating Baths and Dairy / Food / Beverages Samples
Possible interference when multiply-charged ion (ex. Al^{3+}, Fe^{3+}) coexisted and foamed the complex.	 **7661S** 3200693606 **Fluoride**	500-F-IFS 3200697165	500-F-SL 3200697164	500-F-SH 3200697163	500-F-TISAB 3200697166	Dental / Toothpaste / Mouth Wash, Drinking / Seawater, Wastewater, Air / Stack Gases, Acids, Soils, Food, Biological Fluids, Plant Tissue, Coal, Carbonated Beverages and Bone
ClO_4^-, I^- = Not acceptable, Br^- = 2 NO_2^- = 3, Cl^- = 300 HCO_3^-, $H_2PO_4^-$, SO_4^{2-} = over 1000	 **7681S** 3200697412 **Nitrate**	500-NO3-IFS 3200697181	500-NO3-SL 3200697180	500-NO3-SH 3200697179	500-NO3-ISA 3200697182	Agriculture / Plant Tissue / Fertilizers, Surface / Seawater / Drinking Water, Sewage Effluent, Soils, Meats, Vegetables, Foods / Beverages
Rb^+ = 0.4, Cs^+ = 3, NH_4^+ = 70 Li^+, Na^+, Mg^{2+}, Ca^{2+}, Sr^{2+}, Ba^{2+} = over 1,000	 **7682S** 3200697413 **Potassium**	500-K-IFS 3200697185	500-K-SL 3200697184	500-K-SH 3200697183	500-K-ISA 3200697186	Agrculture / Plant Tissue, Soils, Wastewater, River / Tap Water, Clinical Analysis, Saliva, Serum, Fertilizers, Soils and Wines, Dairy / Foods / Beverages

Note: Detailed information on standard solutions, ISAs, and filling solutions can be found on page 21

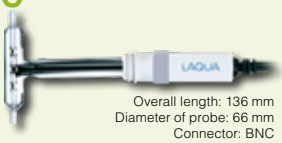
Metallic Electrode (For ORP Measurement)

Model	Operating Temperature Range (°C)	Electrode Material	Internal Solution	Applications
ORP Electrode **9300-10D** Waterproof platinum 3-in-1 type  3014046710 Overall length: 150 mm Diameter of probe: 12 mm Connectors: BNC & phono jack	0-60	Pt / Glass	#300 (KCl)	Waterproof; Platinum on the flat tip allows measurement of small volume samples

Conductivity Cells (Submersible Type)

Model	Cell Constant	Measurement Range	Temp. Range (°C)	Cell Material	Thermistor	Minimum Sample Volume (ml)	Application
3551-10D  3014081712 Overall length: 175 mm Diameter of probe: 23 mm Connectors: BNC & phono jack	0.1 cm^{-1}	0.1 µS/cm - 10 mS/cm	0 - 60	Pt-Pt black / Glass	Built-in	50	Low conductivity water (e.g., deionized, distilled)
	10 m^{-1}	10 µS/m - 1 S/m					
3552-10D  3014081545 Overall length: 150 mm Diameter of probe: 12 mm Connectors: BNC & phono jack	1 cm^{-1}	1 µS/cm - 100 mS/cm	0 - 100	Pt-Pt black / Glass	Built-in	15	General purpose use
	100 m^{-1}	0.1 mS/m - 10 S/m					
3553-10D  3014081714 Overall length: 175 mm Width of probe: 28 mm Connectors: BNC & phono jack	10 cm^{-1}	10 µS/cm - 1 S/cm	0 - 60	Pt-Pt black / Glass	Built-in	50	High conductivity water
	1000 m^{-1}	1 mS/m - 100 S/m					
9382-10D  3014046709 Overall length: 150 mm Diameter of probe: 16 mm Connectors: BNC & phono jack	1 cm^{-1}	1 µS/cm - 100 mS/cm	0 - 80	Ti-Pt black / Plastic	Built-in	20-30	General purpose use; Waterproof
	100 m^{-1}	0.1 mS/m - 10 S/m					

Conductivity Cells (Flow Type)

Model	Cell Constant	Measurement Range	Temp. Range (°C)	Cell Material	Thermistor	Minimum Sample Volume (ml)	Application
3561-10D  3014082350 Overall length: 143 mm Diameter of probe: 18 mm Connectors: BNC & phono jack	0.1 cm^{-1}	0.1 µS/cm - 10 mS/cm	0 - 60	Pt-Pt black / Glass	Built-in	10	Low conductivity water (e.g., deionized, distilled)
	10 m^{-1}	10 µS/m - 1 S/m					
3562-10D  3014082350 Overall length: 205 mm Diameter of probe: 18 mm Connectors: BNC & phono jack	1 cm^{-1}	1 µS/cm - 100 mS/cm	0 - 60	Pt-Pt black / Glass	Built-in	16	General purpose use
	100 m^{-1}	0.1 mS/m - 10 S/m					
3573-10C  3014082590 Overall length: 222 mm Diameter of probe: 18 mm Connector: BNC	10 cm^{-1}	10 µS/cm - 1 S/cm	0 - 60	Pt-Pt black / Glass	—	4	High conductivity water
	1000 m^{-1}	1 mS/m - 100 S/m					
3574-10C  3014082592 Overall length: 136 mm Diameter of probe: 66 mm Connector: BNC	10 cm^{-1}	10 µS/cm - 100 mS/cm	0 - 60	Pt-Pt black / Glass	—	0.25	Small volume sample (e.g., column chroma-tography)
	1000 m^{-1}	1 mS/m - 10 S/m					

pH Buffer Solutions

Code	Part No.	Description	Volume
100-2	320043639	pH 1.68 Buffer Solution at 25°C	500ml
100-4	320043638	pH 4.01 Buffer Solution at 25°C	500ml
100-7	320043637	pH 6.86 Buffer Solution at 25°C	500ml
100-7U	3200738711	pH 7.00 Buffer Solution at 25°C	500ml
100-9	320043636	pH 9.18 Buffer Solution at 25°C	500ml
100-10U	3200738712	pH 10.01 Buffer Solution at 25°C	500ml

Conductivity Standard Solutions

Code	Part No.	Description	Volume
100-21	3200738713	84 µS/cm Conductivity Standard Solution	500ml
100-22	3200738714	1413 µS/cm Conductivity Standard Solution	500ml
100-23	3200738715	12.88 mS/cm Conductivity Standard Solution	500ml
100-24	3200738716	111.8 mS/cm Conductivity Standard Solution	500ml

ORP Powders

ORP Powders

Code	Part No.	Description	Volume
160-51	3200043618	89 mV at 25°C (for 250ml solution)	10 sachets/pack
160-22	3200043617	258 mV at 25°C (for 250ml solution)	10 sachets/pack

220 250

pH/ORP Electrode Filling Solutions

Code	Part No.	Description	Volume
300	3200043640	3.33M KCl	250ml

230

Cleaning Solutions

pH Electrode Cleaning Solutions

Code	Part No.	Description	Volume
220	3014028653	For removing inorganic residues from glass membrane and liquid junction	2 x 50ml
230	3200530494	For removing inorganic and organic residues from glass membrane (30ml Solution A & 100ml Solution B)	30ml & 100ml
250	3200366771	For removing protein residues from glass membrane and liquid junction	400ml

Calcium Ion Electrode Solutions

Chloride Ion Electrode Solutions

Fluoride Ion Electrode Solutions

Potassium Ion Electrode Solutions

Ammonia Ion Electrode Solutions

Nitrate Ion Electrode Solutions

Ion Standard Solutions

Code	Part No.	Description	Volume
500-NH4-SH	3200697171	1000 mg/L Ammonium Ion Standard Solution	500ml
500-NH4-SL	3200697172	100 mg/L Ammonium Ion Standard Solution	500ml
500-CA-SH	3200697175	1000 mg/L Calcium Ion Standard Solution	500ml
500-CA-SL	3200697176	100 mg/L Calcium Ion Standard Solution	500ml
500-CL-SH	3200697167	1000 mg/L Chloride Ion Standard Solution	500ml
500-CL-SL	3200697168	100 mg/L Chloride Ion Standard Solution	500ml
500-F-SH	3200697163	1000 mg/L Fluoride Ion Standard Solution	500ml
500-F-SL	3200697164	100 mg/L Fluoride Ion Standard Solution	500ml
500-NO3-SH	3200697179	1000 mg/L Nitrate Ion Standard Solution	500ml
500-NO3-SL	3200697180	100 mg/L Nitrate Ion Standard Solution	500ml
500-K-SH	3200697183	1000 mg/L Potassium Ion Standard Solution	500ml
500-K-SL	3200697184	100 mg/L Potassium Ion Standard Solution	500ml

Ionic Strength Adjustors

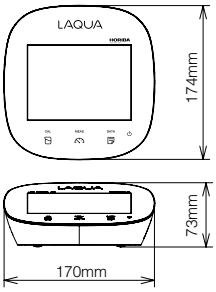
Code	Part No.	Description	Volume
500-NH3-ISA	3200697174	Ammonia Ionic Strength Adjustor 	500ml
500-CA-ISA	3200697178	Calcium Ionic Strength Adjustor	500ml
500-CL-ISA	3200697170	Chloride Ionic Strength Adjustor	500ml
500-F-TISAB	3200697166	Fluoride Ionic Strength Adjustor	500ml
500-NO3-ISA	3200697182	Nitrate Ionic Strength Adjustor	500ml
500-K-ISA	3200697186	Potassium Ionic Strength Adjustor	500ml

Ion Selective Electrode Filling Solutions

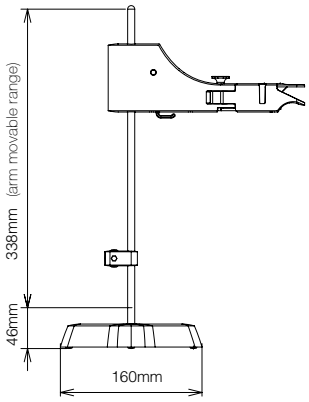
Code	Part No.	Description	Volume
500-NH3-IFS	3200697173	Ammonia Electrode Filling Solution	500ml
500-CA-IFS	3200697177	Calcium Electrode Filling solution	500ml
500-CL-IFS	3200697169	Chloride Electrode Filling Solution	500ml
500-F-IFS	3200697165	Fluoride Electrode Filling Solution	500ml
500-NO3-IFS	3200697181	Nitrate Electrode Filling Solution	500ml
500-K-IFS	3200697185	Potassium Electrode Filling Solution	500ml

Accessories

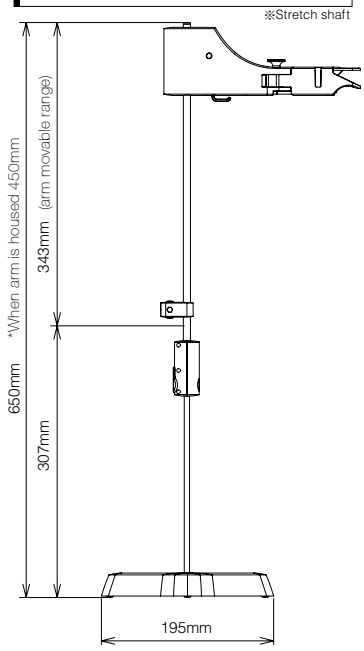
Code	Part No.	Description
 LAQUA-SW-21CFR11	3200707161	21 CFR Part 11 Software includes CD with PIN code, USB cable, and manual
 Printer  Printer cable	5700012747	Printer (for GLP/GMP compliance) Cable sold separately, Plain paper
	3014030148	Printer cable (1.5 m)
 Ink ribbon  Printer paper	3014030149	Printer paper (20 rolls)
	3014030150	Ink ribbon (5 pcs/set)
 Universal AC adapter	3200647413	Multi-Voltage (100-240V) with 6 plugs, (US, UK, EU, ANZ, Korea and China) 1.8 m cable
 X-51  X-52	3014028368	Digital simulator X-51 (pH, mV, Ion, DO, temperature simulator)
	3014028370	Digital simulator X-52 (Conductivity, temperature simulator)
 LCD protection sheet  Protection cover	3200382462	LCD protection sheet (2 pcs/pack)
	3200382441	Protection cover (Protects the meter for F-70, DS-70, 1000 series)
 USB cable  Serial cable	3200373941	USB cable (to connect meter and PC.)
	3014030152	Analog cable (Analog (alarm) output cable)
	3014030151	Serial cable (to connect meter and PC (Serial, 9 pins))
FA-70S	3200382557	Adjustable, free-standing electrode stand (Height: 384 mm) image on the right
FA-70L	3200382560	Long, free-standing electrode stand (Height: 450-650mm) image on the right
	3200373991	Arm for electrode stand FA-70A, FA-70S, & FA-70L
	3200373961	Electrode holders, 2pcs (for mounting electrode with round cap on electrode stand arm)
	3200382477	Electrode protection caps, 3pcs (for 9615S-10D, 9618S-10D, 9681S-10D pH electrode)
	3200043508	Electrode protection caps, 5pcs (for 9621-10D, 9625-10D, 9630-10D, 9631-10D, 9632-10D, 6367-10D, 6377-10D, 6252-10D, 6261-10C, 1066A-10C, 1076-10C, 2060-10T, 9300-10D, 9382-10D, 3552-10D pH electrode)
	3200382482	Electrode protection cap for long electrode (for 9680S-10D, 9480-10C pH Electrode)



Body • Standard Electrode Stand



Long Type Electrode Stand



Standard Electrode Stand FA-70S (384mm)

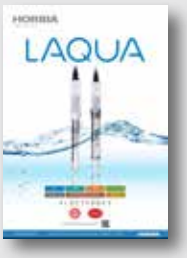
Long Type Electrode Stand FA-70L (450~650mm)

Visit HORIBA's website!

Water Quality Analyzers

www.horiba-laqua.com

With over 60 years of engineering excellence, HORIBA's diverse range of water quality analyzers and electrodes are ideal for everyday laboratory needs through to the most demanding of applications. Visit our website for a wealth of useful information and water quality measurement tips to help you obtain the best results in your work.



Electrodes

HORIBA's superior electrode technology has been employed in manufacturing our unparalleled tough pH glass bulbs and unique flat sensors. Our electrodes have different designs to cater a wide range of applications—from pure water to complex samples. Select the suitable electrode that is specially designed for your application.

Handheld Meters

In the lab, in the field or anywhere you need it. LAQUA Handheld meters are designed for use with one hand and with an IP67 waterproof rating and shock-resistant casing. Meters can be used for long periods, even in dark places, making it ideal for field measurements in rivers and lakes.

Pocket Meters

Analyzing water quality is simplified when using our LAQUAtwin range of meters. Designed to produce accurate and reliable results. Anyone, anywhere, at any time can measure samples easily with a LAQUAtwin meter. See just how good they are at our website.

Application Notes

LAQUAtwin pocket meters offer quick and convenient alternative to analyze important parameters with high accuracy. Several application notes are available at (http://goo.gl/znwE6j) detailing the use of LAQUAtwin and the results achieved for the respective applications. Additional application notes will be added when available.

SUPPORT — HORIBA CUSTOMER SUPPORT SYSTEM

HORIBA offers a variety of services to conform to quality standards and international guidelines such as GLP, GMP and ISO

Technical Support

Please contact us with any technical questions about our products.

www.horiba.com/wq/support

User Support

Our support website is available for registered customers and features:

- Data collection software
- Instruction manual downloads
- Measurement tips, etc.

www.horiba.co.jp/register

Validation Support

Please contact us with any questions or requirements for your validation procedure.

- Traceability certification*
- IQ/OQ/PQ support*
- SOP guidance
- FAQ

*Optional services

⚠ Please read the operation manual before using this product to assure safe and proper handling of the product.

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IMS HORIBA Group is operating Integrated Management System ISO9001 ISO14001 OHSAS18001

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