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BENCH TOP INSTRUMENTS DELTA OHM

HD2205.2, HD2206.2, HD2256.2, HD2259.2 HD22569.2 Electrochemical measurements

The instrument series **HD2205.2, HD2206.2, HD2256.2, HD2259.2,** and**HD2569.2** is made up of bench top instruments for electrochemical measures:**pH**, **conductivity**, **dissolved oxygen,** and **temperature**.
They are fi tted with a large backlighted LCD display.

The **HD2205.2** is equipped with two BNC inputs for the measurement of **pH**, **mV**, **redox potential** (ORP) with pH or redox electrodes, or electrodes with separate reference, and one input for combined pH/temperature probes fi tted with SICRAM module.

The **HD2206.2** measures **conductivity**, **resistivity** in liquids, **total disssolved solids** (TDS), and **salinity** with combined 4-ring and 2-ring conductivity/temperature probes. The conductivity probes can have a direct input or with SICRAM module. The inputs are separate.

The **HD2256.2** measures **pH**, **mV**, **redox potential** (ORP) with pH, redox electrodes or electrodes with separate reference. **Conductivity and resistivity** in liquids, **total dissolevd solids** (TDS) and **salinity** with combined 4-ring and 2-ring Conductivity /temperature probes. The conductivity probes can have a direct input or with SICRAM module. The inputs are separate.

The **HD2259.2** measures **pH**, **mV**, **redox potential** (ORP) with pH, redox electrodes or electrodes with separate reference; the **concentration of dissolved oxygen in** liquids (in mg/l), and **saturation index** (in %), using SICRAM combined probes of polarographic type with two or three electrodes and integrated temperature sensor.

The **HD22569.2** measures **pH**, **mV**, **redox potential** (ORP) with pH, redox electrodes or electrodes with separate reference; **conductivity**, **resistivity** in liquids, **total dissolved solids** (TDS) and **salinity** with combined 4-ring and 2-ring conductivity/ temperature probes with direct input or SICRAM module; **concentration of dissolved oxygen in** liquids (in mg/l) and **saturation index** (in %), using SICRAM combined probes of polarographic type with two or three electrodes and integrated temperature sensor.

Al models are fi tted with input for the measurement of t**emperature** with Pt100 or Pt1000 immersion, penetration or contact probes. The probes are equipped with an automatic detection module, with the factory calibration settings already being memorized inside.

- The pH electrode calibration can be carried out on one or fi ve points and the calibration sequence can be chosen from a list of 13 buffers Temperature compensation can be automatic or manual.

- The conductivity probe calibration can be performed automatically with automatically detected conductivity calibration solutions: 147⌈S/cm, 1413⌈S/cm, 12880⌈S/cm or 111800⌈S/cm or manually with calibration solutions having different values.

- The dissolved Oxygen probe's quick calibration function guarantees timely correctness of the performed measurements.

- Conductivity, dissolved oxygen and temperature probes fi tted with SICRAM module can store factory and calibration data inside.

The instruments of the series HD22… are **datalogger**, they memorize up to 2,000 samples of data:

- pH, mV and temperature: HD2205.2

- conductivity or resistivity or TDS or salinity and temperature: HD2206.2

- pH or mV, conductivity or resistivity or TDS or salinity and temperature: HD2256.2,

- pH or mV, concentration of dissolved oxygen or saturation index and saturation index and temperature: HD2259.2,

- pH or mV, conductivity or resistivity or TDS or salinity, concentration of dissolvedoxygen and temperature: HD22569.2.

The data can be transferred from the instrument connected to a PC via the multistandard RS232C serial port and USB 2.0. The storing parameters can be configured using the menu.
The RS232C serial port can be used to transfer the acquired measurements to a 24 column portable printer in real time (S'print-BT).
The instruments equipped with **HD22BT** (Bluetooth) option can transfer data without any connection to a PC or printer fi tted with Bluetooth input or through Bluetooth/RS232C converter.
The software DeltaLog11 allows instrument management and confi guration, and data processing on PC.

The instruments have IP66 protection degree.

TECHNICAL CHARACTERISTICS OF THE INSTRUMENTS SERIES HD22…
COMMON TECHNICAL DATA

Instrument
Dimensions (Length x Width x Height) 265x185x70mm
Weight 490g
Materials ABS, rubber
Display Back lighted, matrix point display.
240x64 points, visible area: 128x35mm

Operating conditions
Working temperature -5 … 50°C
Storing temperature -25 … 65°C
Working relative humidity 0 … 90% R.H. without condensate
Protection degree IP66

Power
Mains adapter (cod. SWD10) 12Vdc/1A
Auxiliary socket For supplying of electrode holder with built-in stirrer HD22.2

Security of memorized data
Unlimited

Time
Date and hour Real time schedule with backup battery E 3.6V - ½AA
Accuracy 1min/month max drift

Measured values storing
Quantity 2000 screens
Storage interval 1s … 999s

Calibration storage
Quantity Last 8 calibrations of each physical quantity

RS232C serial interface
Type RS232C electrically isolated
Baud rate Can be set from 1200 to 115200 baud
Data bit 8
Parity None
Stop bit 1
Flow Control Xon/Xoff
Length of serial cable Max 15m

USB Interface
Type 1.1 - 2.0 electrically isolated
Bluetooth optional

EMC standard regulations

Security	EN61000-4-2, EN61010-1 level 3
Electrostatic discharge	EN61000-4-2 level 3
Electric fast transients	EN61000-4-4 level 3, EN61000-4-5 level 3
Voltage variations	EN61000-4-11
Electromagnetic interference susceptibility	IEC1000-4-3
Electromagnetic interference emission	EN55020 class B

Technical characteristics HD2205.2 : pH - mV - °C - °F measurement

Measured values
pH - mV - °C - °F

Connections

Input for temperature probes with SICRAM module *5*	8-pole male DIN45326 connector
Inputs pH/mV *1 - 2*	female BNC
Inputs for SICRAM module pH/temperature *3 - 4*	8-pole male DIN45326 connector
Serial interface DB9 connector (9- pole male)	
USB interface	USB connector type B
Bluetooth	Optional
Mains adapter	2- pole connector (Ø5.5mm-2.1mm). Positive at centre.
Socket for power supply of electrode holder with built-in magnetic stirrer	2 -pole connector (Ø5.5mm-2.1mm). Positive at centre (output 12Vdc/200mA max).

Measurement of pH by instrument
Measuring range -9.999…+19.999pH
Resolution 0.01 o 0.001pH selectable from menu
Accuracy ±0.001pH ±1digit
Input impedance $>10^{12}$ Ω
Calibration error @25°C |Offset| > 20mV
Slope > 63mV/pH o Slope < 50mV/pH
Sensitivity > 106.5% or Senstivity < 85%
Calibration points Up to 5 points from a list of 13 automatically detected buffers.
Automatically detected pH standard solutions (@25°C)
1.679pH - 2.000pH - 4.000pH - 4.008pH - 4.010pH
6.860pH - 6.865pH - 7.000pH - 7.413pH - 7.648pH
9.180pH - 9.210pH - 10.010pH

Measurement of mV by instrument
Measuring range -1999.9…+1999.9mV
Resolution 0.1mV
Accuracy ±0.1mV ±1digit
Drift after 1 year 0.5mV/year

Measurement of temperature by instrument
Pt100 Measuring range -50…+150°C
Pt1000 Measuring range -50…+150°C
Resolution 0.1°C
Accuracy ±0.1°C ±1digit
Drift after 1 year 0.1°C/year

Technical characteristics HD2206.2 : X – Ω - TDS – ClNa - °C - °F measurement

Measured values
X – Ω - TDS - NaCl - °C - °F

Connections
Input for temperature probes with SICRAM modules *3*
8-pole male DIN45326 connector
2/4 ring direct qconductivity input
8-pole male DIN45326 connector
Conductivity probe with SICRAM module input *7*
8-pole male DIN45326 connector
Serial interface DB9 connector (9- pole male)
USB interface USB connector type B
Bluetooth Optional
Mains adapter 2-pole connector (Ø5.5mm-2.1mm). Positive at centre.
Outlet for power supply of electrode holder with built-in magnetic stirrer 2- pole connector (Ø5.5mm-2.1mm). Positive at centre (output 12Vdc/200mA max).

Measurement of conductivity by instrument
Measuring range (Kcell=0.01) / Res.
0.000…1.999µS/cm / 0.001µS/cm
Measuring range (Kcell=0.1) / Res.
0.00…19.99µS/cm / 0.01µS/cm
Measuring range (K cell=1) / Res.
0.0…199.9µS/cm / 0.1µS/cm
200…1999µS/cm / 1µS/cm
2.00…19.99mS/cm / 0.01mS/cm
20.0…199.9mS/cm / 0.1mS/cm
Measuring range (Kcell=10) / Res.
200…1999mS/cm / 1mS/cm
Accuracy (conductivity) ±0.5% ±1digit

Measurement of resistivity by instrument
Measuring range (Kcell=0.01) / Res.
Up to 1GΩ□cm / (*)
Measuring range (Kcell=0.1) / Res.
Up to 100MΩ□cm / (*)
Measuring range (K cell=1) / Res.
5.0…199.9Ω□cm / 0.1Ω□cm
200…999Ω□cm / 1Ω□cm
1.00k…19.99kΩ□cm / 0.01kΩ□cm
20.0k…99.9kΩ□cm / 0.1kΩ□cm
100k…999kΩ□cm / 1kΩ□cm
1…10MΩ□cm / 1MΩ□cm
Measuring range (Kcell=10) / Res.
0.5…5.0Ω□cm / 0.1Ω□cm
Accuracy (resistivity) ±0.5% ±1digit

Measurement of total dissolved solids (with coeffi cient χ/TDS=0.5)
Measuring range (Kcell=0.01) / Res.
0.00…1.999mg/l / 0.005mg/l
Measuring range (Kcell=0.1) / Res.
0.00…19.99mg/l / 0.05mg/l
Measuring range (K cell=1) / Res.
0.0…199.9 mg/l / 0.5 mg/l
200…1999 mg/l / 1 mg/l
2.00…19.99 g/l / 0.01 g/l
20.0…199.9 g/l / 0.1 g/l
Measurement range (Kcell=10) / Res.
100…999 g/l / 1 g/l
Accuracy (total dissolved solids) ±0.5% ±1digit

Measurement of salinity
Measuring range / Resolution 0.000…1.999g/l / 1mg/l
2.00…19.99g/l / 10mg/l
20.0…199.9 g/l / 0.1 g/l
Accuracy (salinity) ±0.5% ±1digit

Automatic/manual temperature compensation
0...100°C with αT = 0.00…4.00%/°C
Reference temperature 0…50°C
χ/TDS conversion factor 0.4…0.8
Cell constants K (cm-1) already set on the instrument
0.01 - 0.1 - 0.5 - 0.7 - 1.0 - 10.0
Cell constants K(cm-1) that can be set by user 0.01…20.00

Standard solutions automatically detected (@25°C)
147µS/cm
1413µS/cm
12880µS/cm
111800µS/cm

Measurement of temperature by instrument
Pt100 measuring range -50…+150°C
Pt1000 measuring range -50…+150°C
Resolution 0.1°C
Accuracy ±0.1°C ±1digit
Drift after 1 year 0.1°C/year

(*) The resistivity measurement is obtained from the reciprocal of conductivity measurement. Close to the bottom of the scale, the indication of resistivity appears like reported in the table below:

Conductivity (µS/cm)	Resistivity (MΩcm)
0.001 µS/cm	1000 MΩcm
0.002 µS/cm	500 MΩcm
0.003 µS/cm	333 MΩcm
0.004 µS/cm	250 MΩcm
0.01 µS/cm	100 MΩcm
0.02 µS/cm	50 MΩcm
0.03 µS/cm	33 MΩcm
0.04 µS/cm	25 MΩcm

HD2256.2 medida: pH - mV - X – Ω - TDS - ClNa - °C - °F Características técnicas

Measured values
pH – mV - X – Ω - TDS - NaCl - °C - °F

Connections
Input for temperature probes with SICRAM modules *3*
8-pole male DIN45326 connector
pH/mV inputs *5*
BNC female
Input SICRAM module pH/ temperature probes *3*
8-pole male DIN45326 connector
Input dissolved oxygen *6*
8-pole male DIN45326 connector
Serial interface DB9 connector (9- pole male)
USB interface USB connector type B
Bluetooth Optional
Mains adapter 2-pole connector (Ø5.5mm-2.1mm). Positive at centre
Outlet for power supply of electrode holder with built-in magnetic stirrer 2- pole connector (Ø5.5mm-2.1mm). Positive at centre (output 12Vdc/200mA max).

Measurement of pH by instrument
Measuring range -9.999…+19.999pH
Resolution 0.01 o 0.001pH selectable from menu
Accuracy ±0.001pH ±1digit
Input impedance $>10^{12}$ Ω
Calibration error @25°C |Offset| > 20mV
Slope > 63mV/pH o Slope < 50mV/pH
Sensitivity > 106.5% or Senstivity < 85%
Calibration points Up to 5 points from a list of 13 automatically detected buffers.
Automatically detected pH standard solutions (@25°C)
1.679pH - 2.000pH - 4.000pH - 4.008pH - 4.010pH
6.860pH - 6.865pH - 7.000pH - 7.413pH - 7.648pH
9.180pH - 9.210pH - 10.010pH

Measurement of mV by instrument
Measuring range -1999.9…+1999.9mV
Resolution 0.1mV
Accuracy ±0.1mV ±1digit
Drift after 1 year 0.5mV/year

Measurement of conductivity by instrument
Measuring range (Kcell=0.01) / Res.
0.000…1.999µS/cm / 0.001µS/cm
Measuring range (Kcell=0.1) / Res.
0.00…19.99µS/cm / 0.01µS/cm
Measuring range (K cell=1) / Res.
0.0…199.9µS/cm / 0.1µS/cm
200…1999µS/cm / 1µS/cm
2.00…19.99mS/cm / 0.01mS/cm
20.0…199.9mS/cm / 0.1mS/cm
Measuring range (Kcell=10) / Res.
200…1999mS/cm / 1mS/cm
Accuracy (conductivity) ±0.5% ±1digit

Measurement of resistivity by instrument
Measuring range (Kcell=0.01) / Res.
Up to 1GΩ□cm / (*)
Measuring range (Kcell=0.1) / Res.
Up to 100MΩ□cm / (*)
Measuring range (K cell=1) / Res.
5.0…199.9Ω□cm / 0.1Ω□cm
200…999Ω□cm / 1Ω□cm
1.00k…19.99kΩ□cm / 0.01kΩ□cm
20.0k…99.9kΩ□cm / 0.1kΩ□cm
100k…999kΩ□cm / 1kΩ□cm
1…10MΩ□cm / 1MΩ□cm
Measuring range (Kcell=10) / Res.
0.5…5.0Ω□cm / 0.1Ω□cm
Accuracy (resistivity) ±0.5% ±1digit

Measurement of total dissolved solids (with coeffi cient χ/TDS=0.5)
Measuring range (Kcell=0.01) / Res.
0.00…1.999mg/l / 0.005mg/l
Measuring range (Kcell=0.1) / Res.
0.00…19.99mg/l / 0.05mg/l
Measuring range (K cell=1) / Res.
0.0…199.9 mg/l / 0.5 mg/l
200…1999 mg/l / 1 mg/l
2.00…19.99 g/l / 0.01 g/l
20.0…199.9 g/l / 0.1 g/l
Measurement range (Kcell=10) / Res.
100…999 g/l / 1 g/l
Accuracy (total dissolved solids) ±0.5% ±1digit

Measurement of salinity
Measuring range / Resolution 0.000…1.999g/l / 1mg/l
2.00…19.99g/l / 10mg/l
20.0…199.9 g/l / 0.1 g/l
Accuracy (salinity) ±0.5% ±1digit

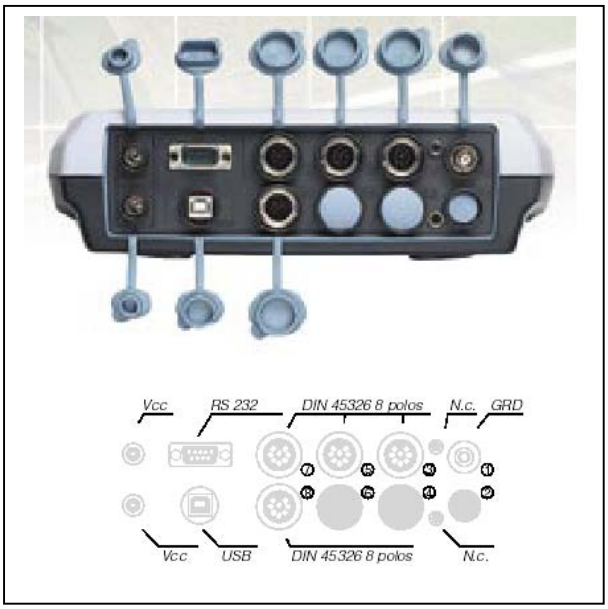
Automatic/manual temperature compensation
0...100°C with αT = 0.00…4.00%/°C
Reference temperature 0…50°C
χ/TDS conversion factor 0.4…0.8
Cell constants K (cm-1) already set on the instrument
0.01 - 0.1 - 0.5 - 0.7 - 1.0 - 10.0
Cell constants K(cm-1) that can be set by user 0.01…20.00

Standard solutions automatically detected (@25°C)
147µS/cm
1413µS/cm
12880µS/cm
111800µS/cm

Measurement of temperature by instrument
Pt100 measuring range -50…+150°C
Pt1000 measuring range -50…+150°C
Resolution 0.1°C
Accuracy ±0.1°C ±1digit
Drift after 1 year 0.1°C/year

(*) The resistivity measurement is obtained from the reciprocal of conductivity measurement. Close to the bottom of the scale, the indication of resistivity appears like reported in the table below:

Conductivity (µS/cm)	Resistivity (MΩcm)
0.001 µS/cm	1000 MΩcm
0.002 µS/cm	500 MΩcm
0.003 µS/cm	333 MΩcm
0.004 µS/cm	250 MΩcm
0.01 µS/cm	100 MΩcm
0.02 µS/cm	50 MΩcm
0.03 µS/cm	33 MΩcm
0.04 µS/cm	25 MΩcm



Technical characteristics HD2259.2: pH - mV – mg / l O_2 - % O_2 – mbar - °C - °F measurement

Measured values
pH - mV – mg / l O_2 - % O_2 – mbar - °C - °F

Connections
Input for temperature probes with SICRAM modules *3*
8-pole male DIN45326 connector
pH/mV inputs *5*
BNC female
Input SICRAM module pH/ temperature probes *3*
8-pole male DIN45326 connector
Imput dissolved O_2
8-pole male DIN45326 connector
Serial interface DB9 connector (9- pole male)
USB interface USB connector type B
Bluetooth Optional
Mains adapter 2-pole connector (Ø5.5mm-2.1mm). Positive at centre
Outlet for power supply of electrode holder with built-in magnetic stirrer 2- pole connector (Ø5.5mm-2.1mm). Positive at centre (output 12Vdc/200mA max).

Measurement of pH by instrument
Measuring range -9.999…+19.999pH
Resolution 0.01 o 0.001pH selectable from menu
Accuracy ±0.001pH ±1digit
Input impedance $>10^{12}$ Ω
Calibration error @25°C |Offset| > 20mV
Slope > 63mV/pH o Slope < 50mV/pH
Sensitivity > 106.5% or Senstivity < 85%
Calibration points Up to 5 points from a list of 13 automatically detected buffers.
Automatically detected pH standard solutions (@25°C)
1.679pH - 2.000pH - 4.000pH - 4.008pH - 4.010pH
6.860pH - 6.865pH - 7.000pH - 7.413pH - 7.648pH
9.180pH - 9.210pH - 10.010pH

Measurement of mV by instrument
Measuring range -1999.9…+1999.9mV
Resolution 0.1mV
Accuracy ±0.1mV ±1digit
Drift after 1 year 0.5mV/year
Measurement of dissolved oxygen by instrument
Resolution 0.01mg/l
Measuring range 0.00…90.00mg/l
Accuracy ±0.03mg/l±1digit (60...110%, 1013mbar, 20...25°C)
Measurement of saturation index of dissolved oxygen
Measuring range 0.0…600.0%
Resolution 0.1%
Accuracy ±0.3% ±1digit (in the range 0.0…199.9%)
±1% ±1digit (in the range 200.0…600.0%)
Automatic temperature compensation
0…50°C
Measurement of barometric pressure
Measuring range 0.0…1100.0mbar
Resolution 0.1mbar
Accuracy ±2mbar±1digit between 18 and 25°C
±(2mbar+0.1mbar/°C) in the remaining range
Salinity setting
Setting directly from menu or automatically by conductivity measurement
Setting range 0.0…70.0g/l
Resolution 0.1g/l
Temperature measurement with the sensor inside the dissolved oxygen probe
Measuring range 0.0…50.0°C
Resolution 0.1°C
Accuracy ±0.1°C
Drift after 1 year 0.1°C/year
Measurement of temperature by instrument
Pt100 measuring range -50…+150°C
Pt1000 measuring range -50…+150°C
Resolution 0.1°C
Accuracy ±0.1°C ±1digit
Drift after 1 year 0.1°C/year

Technical characteristics HD22569.2
pH – mV - X – Ω - TDS - ClNa – mg / l O_2 - % O_2 – mbar - °C - °F measurement

Measured values
pH – mV - X – Ω - TDS - ClNa – mg / l O_2 - % O_2
mbar - °C - °F

Connections
Input for temperature probes with SICRAM modules *3*
8-pole male DIN45326 connector
pH/mV inputs *5*
BNC female
Input SICRAM module pH/ temperature probes *3*
8-pole male DIN45326 connector
2/4 ring direct qconductivity input
8-pole male DIN45326 connector
Conductivity probe with SICRAM module input *7*
8-pole male DIN45326 connector
Imput dissolved O_2
8-pole male DIN45326 connector
Serial interface DB9 connector (9- pole male)
USB interface USB connector type B
Bluetooth Optional
Mains adapter 2-pole connector (Ø5.5mm-2.1mm). Positive at centre
Outlet for power supply of electrode holder with built-in magnetic stirrer 2- pole connector (Ø5.5mm-2.1mm). Positive at centre (output 12Vdc/200mA max).

Measurement of pH by instrument
Measuring range -9.999…+19.999pH
Resolution 0.01 o 0.001pH selectable from menu
Accuracy ±0.001pH ±1digit
Input impedance $>10^{12}$ Ω
Calibration error @25°C |Offset| > 20mV
Slope > 63mV/pH o Slope < 50mV/pH
Sensitivity > 106.5% or Senstivity < 85%
Calibration points Up to 5 points from a list of 13 automatically detected buffers.
Automatically detected pH standard solutions (@25°C)
1.679pH - 2.000pH - 4.000pH - 4.008pH - 4.010pH
6.860pH - 6.865pH - 7.000pH - 7.413pH - 7.648pH
9.180pH - 9.210pH - 10.010pH

Measurement of mV by instrument
Measuring range -1999.9…+1999.9mV
Resolution 0.1mV
Accuracy ±0.1mV ±1digit
Drift after 1 year 0.5mV/year

Measurement of conductivity by instrument
Measuring range (Kcell=0.01) / Res.
0.000…1.999µS/cm / 0.001µS/cm
Measuring range (Kcell=0.1) / Res.
0.00…19.99µS/cm / 0.01µS/cm
Measuring range (K cell=1) / Res.
0.0…199.9µS/cm / 0.1µS/cm
200…1999µS/cm / 1µS/cm
2.00…19.99mS/cm / 0.01mS/cm
20.0…199.9mS/cm / 0.1mS/cm
Measuring range (Kcell=10) / Res.
200…1999mS/cm / 1mS/cm
Accuracy (conductivity) ±0.5% ±1digit

Measurement of resistivity by instrument
Measuring range (Kcell=0.01) / Res.
Up to 1GΩ□cm / (*)
Measuring range (Kcell=0.1) / Res.
Up to 100MΩ□cm / (*)
Measuring range (K cell=1) / Res.
5.0…199.9Ω□cm / 0.1Ω□cm
200…999Ω□cm / 1Ω□cm
1.00k…19.99kΩ□cm / 0.01kΩ□cm
20.0k…99.9kΩ□cm / 0.1kΩ□cm
100k…999kΩ□cm / 1kΩ□cm
1…10MΩ□cm / 1MΩ□cm
Measuring range (Kcell=10) / Res.
0.5…5.0Ω□cm / 0.1Ω□cm
Accuracy (resistivity) ±0.5% ±1digit

Measurement of total dissolved solids (with coeffi cient χ/TDS=0.5)
Measuring range (Kcell=0.01) / Res.
0.00…1.999mg/l / 0.005mg/l
Measuring range (Kcell=0.1) / Res.
0.00…19.99mg/l / 0.05mg/l
Measuring range (K cell=1) / Res.
0.0…199.9 mg/l / 0.5 mg/l
200…1999 mg/l / 1 mg/l
2.00…19.99 g/l / 0.01 g/l
20.0…199.9 g/l / 0.1 g/l
Measurement range (Kcell=10) / Res.
100…999 g/l / 1 g/l
Accuracy (total dissolved solids) ±0.5% ±1digit

Measurement of salinity
Measuring range / Resolution 0.000…1.999g/l / 1mg/l
2.00…19.99g/l / 10mg/l
20.0…199.9 g/l / 0.1 g/l
Accuracy (salinity) ±0.5% ±1digit

Automatic/manual temperature compensation
0...100°C with αT = 0.00…4.00%/°C
Reference temperature 0…50°C
χ/TDS conversion factor 0.4…0.8
Cell constants K (cm-1) already set on the instrument
0.01 - 0.1 - 0.5 - 0.7 - 1.0 - 10.0
Cell constants K(cm-1) that can be set by user 0.01…20.00

Standard solutions automatically detected (@25°C)
147µS/cm
1413µS/cm
12880µS/cm
111800µS/cm

Measurement of dissolved oxygen by instrument
Resolution 0.01mg/l
Measuring range 0.00…90.00mg/l
Accuracy ±0.03mg/l±1digit
(60...110%, 1013mbar, 20...25°C)

Measurement of saturation index of dissolved oxygen
Measuring range 0.0…600.0%
Resolution 0.1%
Accuracy ±0.3% ±1digit (in the range 0.0…199.9%)
±1% ±1digit (in the range 200.0…600.0%)

Automatic temperature compensation
0…50°C

Measurement of barometric pressure
Measuring range 0.0…1100.0mbar
Resolution 0.1mbar
Accuracy ±2mbar±1digit between 18 and 25°C
±(2mbar+0.1mbar/°C) in the remaining range

Salinity setting
Setting directly from menu or automatically by conductivity measurement
Setting range 0.0…70.0g/l
Resolution 0.1g/l

Temperature measurement with the sensor inside the dissolved oxygen probe
Measuring range 0.0…50.0°C
Resolution 0.1°C
Accuracy ±0.1°C
Drift after 1 year 0.1°C/year

Measurement of temperature by instrument
Pt100 measuring range -50…+150°C
Pt1000 measuring range -50…+150°C
Resolution 0.1°C
Accuracy ±0.1°C ±1digit
Drift after 1 year 0.1°C/year

(*) The resistivity measurement is obtained from the reciprocal of conductivity measurement. Close to the bottom of the scale, the indication of resistivity appears like reported in the table below:

Conductivity (µS/cm)	Resistivity (MΩcm)
0.001 µS/cm 1000 MΩcm	0.01 µS/cm 100 MΩcm
0.002 µS/cm 500 MΩcm	0.02 µS/cm 50 MΩcm
0.003 µS/cm 333 MΩcm	0.03 µS/cm 33 MΩcm
0.004 µS/cm 250 MΩcm	0.04 µS/cm 25 MΩcm

Technical characteristics		HD 2205.2	HD 2206.2	HD 2256.2	HD 2259.2	HD 22569.2
Dimensions (L x W x H)		265 x 185 x 70 mm				
Weight		490 g				
Materials		ABS, Ruber				
Display		Back lighted, matrix point display.240x64 points, visible area: 128x35mm				
Operating Conditions		5 to 50 º C and between 0 and 90% non-condensing Humidity				
Protection		IP 66				
Power		Main adapter 12Vcc / 1A (SWD 10)				
Storage interval		1 to 999 s				
Measured values storing		2000 screens				
Interface		RS232C and USB2.0 electrically isolated - Bluetooh optional				
Measured values		pH, mV, ºC, ºF	X, , Ω, TDS, Cl Na, ºC, ºF	pH, mV, X, , Ω, TDS, Cl Na, ºC, ºF	pH, mV, mg / l O_2 mbar, ºC, ºF	pH, mV, X, , Ω, TDS, Cl Na, mg / l O_2 % O_2 mbar, ºC, ºF
Measurement range	pH	-9,999 to	--	-9,999 to 19,999pH		
	mV	-1999,9 to 1999,9 mV		-1999,9 to 1999,9 mV		
	X (*)	--	0,0 µS/cm to 199,9 mS/cm		--	0,0 µS/cm to 199,9 mS/cm
	Ω (*)	--	5,0 Ω to 10 MΩcm		--	5,0 Ω to 10
	TDS (*)	--	0,0 to 199,9 g/ l		--	0,0 to 199,9 g/ l
	Cl Na (*)	--	0,000 to 199,9 g/ l		--	0,000 to 199,9 g/ l
	mg / l O_2	--	--	--	0,00 to 90,00 mg/ l	
	% O_2	--	--	--	0,0 to 600,0 %	
	mbar	--	--	--	0,0 to 1100,0 mbar	
	ºC (O_2 probe)	--	--	--	0,0 to 50,0 ºC	
	ºC (Pt 100 probe)	-50 to 150 ºC				
Maximum resolution	pH	0,01pH – 0,001pH	--	0,01pH – 0,001pH		
	mV	0,1 mV	--	0,1 mV		
	X (*)	--	0,1 µS/ cm		--	0,1 µS/ cm
	Ω (*)	--	0,1 Ωcm		--	0,1 Ωcm
	TDS (*)	--	0,5 mg/ l		--	0,5 mg/ l
	Cl Na (*)	--	1 mg/ l		--	1 mg/ l
	mg / l O_2	--	--	--	0,01 mg/ l	
	% O_2	--	--	--	0,1 %	
	mbar	--	--	--	0,1 mbar	
	ºC	0,1 ºC				
Accuracy Instrument	pH	±0,001pH±1digit	--	±0,001pH ± 1 digit		
	mV	±0,1 mV± 1 digit	--	±0,1 mV± 1 digit		
	X Ω TDS Cl Na (*)	--	±0,05% ± 1 digit		--	±0,05% ± 1 digit
	mg / l O_2	--	--	--	±0,3 mg/ l± 1 digit	
	% O_2	--	--	--	±0,3%±1 digit (0,0 a 199,9%) ±1%±1 DIGITO (200,0 a 600,0%	
	mbar	--	--	--	±2mbar±1 digit 18 a 25 ºC ±2mbar±0,1 mbar/ºC the rest	
	ºC	± 0,1 ºC ± 1 digit				
Cell constant K (cm^{-1})		--	0,01 – 0,1 – 0,5 – 0,7 – 1,0 – 10,0		--	0,01 – 0,1 – 0,5 0,7 – 1,0 – 10,0
Cell constant K (cm^{-1})		--	0,01 a 20,00		--	0,01 a 20,00
Temperature compensation		pH= -50 to 150 ºC	Conductivity 0 to 100 ºC	pH= -50 to 150 ºC Conductivity 0 to 100 ºC	pH= -50 to 150 ºC O_2 = 0 to 50 ºC	pH= -50 to 150 ºC Conductivity 0 to 100 ºC O_2 = 0 to 50 ºC
Conversión factor X/ TDS		--	0,4 to 0,8		--	0,4 to 0,8
Reference temperatura		--	0 to 50 ºC		--	0 to 50 ºC
PH calibration points		Up to 5 points	--	Up to 5 points		
Standard solutions automatically detected		1,679 pH/2,000pH 4,000pH/4,008pH 4,010pH/6,860pH 6,865pH/7,000pH 7,413pH/7,648pH 9,180pH/9,210pH 10,010pH	147 µS/cm 1413 µS/cm 12880 µS/cm 111800 µS/cm	1,679 pH/2,000pH 4,000pH/4,008pH 4,010pH/6,860pH 6,865pH/7,000pH 7,413pH/7,648pH 9,180pH/9,210pH 10,010pH 147 µS/cm 1413 µS/cm 12880 µS/cm 111800 µS/cm	1,679 pH/2,000pH 4,000pH/4,008pH 4,010pH/6,860pH 6,865pH/7,000pH 7,413pH/7,648pH 9,180pH/9,210pH 10,010pH	1,679 pH/2,000pH 4,000pH/4,008pH 4,010pH/6,860pH 6,865pH/7,000pH 7,413pH/7,648pH 9,180pH/9,210pH 10,010pH 147 µS/cm 1413 µS/cm 12880 µS/cm 111800 µS/cm

(*)The ranges of measurement and resolution of this table refer to a cell constant K = 1 and a conversion factor X/ TDS = 0,5. For securities other than those listed, please consult the instruction manual..

Ordering codes for instrument series HD22…

HD2205.2K: The kit is composed of: instrument HD2205.2 for measurement of pH - redox - temperature,**datalogger**, stabilized power supply at mains voltage 100-240Vac/12Vdc-1A.,instructions manual and software DeltaLog11.
pH/mV electrodes, conductivity probes, dissolved oxygen probes, temperature probes, standard reference solutions for different measurement types, connection cables for pH electrodes with S7 connector, cables for data download to PC or printer have to be ordered separately.

Common accessories for instruments series HD22…

9CPRS232: Connection cable SubD female 9- pole for serial output RS232C.
CP22: USB 2.0 connection cable - connector typo A - connector type B.
DeltaLog11: Software for download and management of the data on PC using Windows 98 to XP operating systems.
SWD10: Stabilized power supply at 230Vac/9Vdc-300mA mains voltage.
S'print-BT: Portable, serial input, 24 column thermal printer, 58mm paper width.
HD2110CSP: Connection cable for instruments series HD34…to printer **S'print-BT**
HD22.2: Laboratory electrode holder composed of basis plate with incorporated magnetic stirrer, staff and replaceable electrode holder. Height max. 380mm.
HD22.3: Laboratory electrode holder with metal basis plate. Flexible electrode holder for free positioning. For Ø 12mm probes.
HD22BT: Bluetooth module for wireless data transmission from instrument to PC. **The fi tting of the module into the instrument is made exclusively by Delta Ohm, at the time of placing the order.**
TP47: Module for the connection of Pt100 4-wire and Pt1000 2-wire probes to instrument series HD22…, without amplifying electronics and linearization.

Accessories for instrument series HD2205.2, HD2256.2, HD2259.2 e HD22569.2 with input for pH measurement

pH electrodes without SICRAM module (Inputs *1* and *2*)
KP20: Combined pH electrode for general use, gel fi lled with screw connector S7 body in Epoxy.
KP30: Combined pH electrode for general use, cable 1 m, gel fi lled, body in Epoxy.
KP50: Combined pH electrode with Tefl on collar diaphragm, for emulsions, deionised water, S7 screw connector, gel fi lled, body in glass.
KP 61: Combined pH electrode, 3 diaphragms for milk, cream, etc. Liquid reference fi lling, with screw connector S7, body in glass.
KP 62: Combined pH electrode, 1 diaphragm for pure water, paints, etc. gel-fi lled, with screw connector S7, body in glass.
KP 63: Combined pH electrode for general use, varnish, cable 1 m, electrolyte KCl 3M body in glass.
KP 64: Combined pH electrode for water, varnish, emulsions, etc., electrolyte KCl 3M with screw connector S7, body in glass.
KP 70: Combined pH micro electrode diam. 4.5 x L=25 mm. Gel fi lled, with screw connector, body in glass.
KP 80: Combined pointed pH electrode, gel fi lled, with screw connector S7, body in glass.
CP: Extension cable 1.5m with BNC connectors on one side and S7 on the other side for electrode with S7 connector.
CP5: Extension cable 5m with BNC connectors on one side and S7 on the other side for electrode with S7 connector.
CE: S7 screw connector for pH electrode.
BNC: Female BNC for electrode extension.

pH electrodes with SICRAM module (Input *3*)
KP63TS: Combined pH/temperature electrode with SICRAM module, body in Epoxy, Ag/AgClsat KCl.

SICRAM Module with BNC input for pH electrodes (Input *3*)
KP47: SICRAM module for pH electrode with BNC standard connector.

ORP Electrodes (Inputs *1* and *2*)
KP90: Redox Platinum electrode, with screw connector S7, electrolyte KCl 3M, body in glass.

ORP Electrodes (Inputs *1* and *2*)
KP91: Redox Platinum electrode with 1m cable, GEL fi lled, body in glass

pH buffer solutions
HD8642: Buffer solution 4.01pH - 200cc.
HD8672: Buffer solution 6.86pH - 200cc.
HD8692: Buffer solution 9.18pH - 200cc.

Redox buffer solutions
HDR220: Redox buffer solution 220mV 0,5 l.
HDR468: Redox buffer solution 468mV 0,5 l.

Electrolyte solutions
KCL 3M: 50cc ready for use solution for refi lling of the electrodes.

Cleaning and maintenance
HD62PT: Diaphragm cleaning (tiourea in HCl) - 500ml.
HD62PP: Protein cleaning (pepsin in HCl) - 500ml.
HD62RF: Regeneration (fl uorhydric acid) - 100ml.
HD62SC: Solution for electrode preservation - 500ml.
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Accessories for instruments HD22… with Temperature input

Temperature probes comlpete with SICRAM module (Input *5*)
TP87: PT100 sensor immersion probe. Stem Ø 3 mm, length 70 mm. Cable length 1 metre.
TP472I.0: Pt100 sensor immersion probe. Stem Ø 3 mm, length 230 mm. Cable length 2 metres.
TP473P.0: Pt100 sensor penetration probe. Stem Ø 4mm, length 150 mm. Cable length 2 metres.
TP474C.0: Pt100 sensor contact probe. Stem Ø 4mm, length 230mm, contact surface Ø 5mm.Cable length 2 metres.
TP475A.0: Air probe, sensor Pt100. Stem Ø 4mm, length 230mm. Cable length 2 metres.
TP472I.5: Immersion probe, sensor Pt100. Stem Ø 6mm, length 500 mm. Cable length 2 metres.
TP472I.10: Immersion probe, sensor Pt100. Stem Ø 6mm, length 1,000mm. Cable length 2 metres.

Temperature probes complete with TP47 module (input *5*)
TP47.100: Direct 4 wires Pt100 sensor immersion probe. Probe's stem Ø 3mm, length 230mm.
Connection cable 4 wires with connector, length 2 metres.
TP47.1000: Pt1000 sensor immersion probe. Probe's stem Ø 3mm length 230mm. Connection cable 2 wires with connector, length 2 metres.
TP87.100: Pt100 sensor immersion probe. Probe's stem Ø 3mm, length 70mm. 4 wire connection cable with connector, length 1 metre.
TP87.1000: Pt1000 sensor immersion probe. Probe's stem Ø 3mm, length 70mm. 2-wire connectioncable with connector, length 1 metre.

Common Accessories for instruments of the series HD22…
TP47: Module for the connection of Pt100 4-wire and Pt1000 2-wire probes to instrument seriesHD22…, without amplifying electronics and linearization..