

# DULCOTEST ORP sensors

Reliable online measurement of ORP – with DULCOTEST sensors



**ORP measurements with DULCOTEST sensors: Precise, reliable and application-adapted measured values in real time. Can be used in water treatment or industrial process waters with strict requirements.**

## Technical Details

- Selection of sensor type according to the application
- The insertion angle must be  $> 15^\circ$  from the horizontal
- Max flow  $< 0.8$  m/s
- With cable lengths  $> 10$  m, use the 4-20 mA transducer type PHV1
- Calibration using quality buffer solutions



# DULCOTEST ORP sensors

## Reliable online measurement of ORP – with DULCOTEST sensors

### ORP Sensor RHES-Pt-SE

ORP sensor optimised for use in potable water treatment, swimming pools/hot tubs at up to 60 °C/3 bar

#### Your Benefits

- Electrochemical combination electrode: ORP and reference electrode integrated
- Diaphragm and reference system optimised for use in swimming pools and for potable water
- Ceramic diaphragm with special material, optimised size and optimised pore diameter
- Long service life due to reduced diffusion ("bleeding") of the electrolyte
- Long service life due to the material, which is inert to aggressive disinfectants
- Stable reference system
- Rotating sensor head sleeve. This means that the cable can remain connected during installation and dismantling of the sensor, avoiding moisture on the plug-in contacts
- Lead-free glass for advanced and environmentally-friendly production, use and disposal (RoHS-compliant)

Temperature	0...60 °C
Max. pressure	3.0 bar
Min. conductivity	150 µS/cm
Electrolyte	Gel containing potassium chloride
ORP electrode	Platinum
Diaphragm	Ceramic
Sensor shaft	Glass
Shaft diameter	12 mm
Installation length	120 ±3 mm
Fitting position	Vertical up to +25°
Thread	PG 13.5
Electrical Connection	SN6 plug-in head, rotatable with a ProMinent cable
Enclosure rating	IP 65
Process integration	Bypass: open outlet or return of the sample water into the process line, inline: direct installation into the pipework; fixed or replaceable (replaceable fitting), tank, channel: Immersion in the immersion tube
Controllers	all DULCOMETER controllers
Typical applications	Swimming pools, whirlpools, potable water
Resistance to	Disinfectant
Measuring principle, technology	Direct potentiometric measurement, 2 electrodes, gel electrolyte, ceramic diaphragm

	Installation length	Order no.
RHES-Pt-SE SLg100	100 ±3 mm	1051746
RHES-Pt-SE	120 ±3 mm	150703

# DULCOTEST ORP sensors

## Reliable online measurement of ORP – with DULCOTEST sensors

### ORP Sensor RHES-Au-SE

ORP sensor optimised for use in potable water treatment, swimming pools/hot tubs when electrolysis processes are used for disinfection and with ozone treatment at up to 60 °C/3 bar

#### Your Benefits

- Electrochemical combination electrode: ORP and reference electrode integrated
- Gold electrode to prevent faults caused by products from those electrolysis processes where the electrodes are immersed directly into the sample water
- Diaphragm and reference system optimised for use in swimming pools and for potable water
- Ceramic diaphragm with special material, optimised size and optimised pore diameter
- Long service life due to reduced diffusion ("bleeding") of the electrolyte
- Long service life thanks to material, which is inert to aggressive disinfectants
- Stable reference system
- Rotating sensor head sleeve. This means that the cable can remain connected during installation and dismantling of the sensor, avoiding moisture on the plug-in contacts
- Lead-free glass for advanced and environmentally-friendly production, use and disposal (RoHS-compliant)

Temperature	0...60 °C
Max. pressure	3.0 bar
Min. conductivity	150 µS/cm
Electrolyte	Gel containing potassium chloride
ORP electrode	Gold
Diaphragm	Ceramic
Sensor shaft	Glass
Shaft diameter	12 mm
Installation length	120 ±3 mm
Fitting position	Vertical up to +25°
Thread	PG 13.5
Electrical Connection	SN6 plug-in head, rotatable with a ProMinent cable
Enclosure rating	IP 65
Process integration	Bypass: open outlet or return of the sample water into the process line, inline: direct installation into the pipework; fixed or replaceable (replaceable fitting), tank, channel: Immersion in the immersion tube
Controllers	all DULCOMETER controllers
Typical applications	Swimming pools, whirlpools, potable water, with disinfectants from electrolysis processes (electrodes directly in the process water).
Resistance to	Disinfectant, by-products from electrolysis process and from ozone treatment process
Measuring principle, technology	Direct potentiometric measurement, 2 electrodes, gel electrolyte, ceramic diaphragm

	Installation length	Order no.
RHES-Au-SE	120 ±3 mm	1044544
RHES-AU-SE Slg 100	100 ±3 mm	1092570

# DULCOTEST ORP sensors

## Reliable online measurement of ORP – with DULCOTEST sensors

### ORP Sensor RHEP-Pt-SE

ORP sensor optimised for use with clear process water and conditions of up to 80 °C/6 bar

#### Your Benefits

- Electrochemical combination electrode: ORP and reference electrode integrated
- Diaphragm and reference system optimised for exacting process requirements
- Ceramic diaphragm with special material, optimised size and optimised pore diameter
- Long service life due to reduced diffusion ("bleeding") of the electrolyte
- Long service life thanks to material, which is inert to aggressive chemicals
- Stable reference system for high pressure / temperature requirements
- Rotating sensor head sleeve. This means that the cable can remain connected during installation and dismantling of the sensor, avoiding moisture on the plug-in contacts
- Lead-free glass for advanced and environmentally-friendly production, use and disposal (RoHS-compliant)

Temperature	0...80 °C
Max. pressure	6.0 bar
Min. conductivity	150 µS/cm
Electrolyte	Gel containing potassium chloride
ORP electrode	Platinum
Diaphragm	Ceramic
Sensor shaft	Glass
Shaft diameter	15 mm
Installation length	120 ±3 mm
Fitting position	Vertical up to +25°
Thread	PG 13.5
Electrical Connection	SN6 plug-in head, rotatable with a ProMinent cable
Enclosure rating	IP 65
Process integration	Bypass: open outlet or return of the sample water into the process line, inline: direct installation into the pipework; fixed or replaceable (replaceable fitting), tank, channel: Immersion in the immersion tube
Controllers	all DULCOMETER controllers
Typical applications	Swimming pools during pressurisation for higher temperatures and pressures, potable and industrial water, electroplating.
Resistance to	Disinfectant, not suitable for media containing ozone, cyanides, electrolysis processes (electrodes directly in the sample water)
Measuring principle, technology	Direct potentiometric measurement, 2 electrodes, gel electrolyte, ceramic diaphragm

	Installation length	Order no.
RHEP-Pt-SE	120 ±3 mm	150094
RHEP-PT -SE SLG100	100 ±3 mm	150952

# DULCOTEST ORP sensors

## Reliable online measurement of ORP – with DULCOTEST sensors

### ORP Sensor RHEP-Au-SE

ORP sensor optimised for use with clear process water when electrolysis processes are used for disinfection and with ozone treatment and with cyanide detoxification at conditions of up to 80 °C/6 bar

#### Your Benefits

- Electrochemical combination electrode: ORP and reference electrode integrated
- Gold electrode to prevent faults caused by products from those electrolysis processes where the electrodes are immersed directly into the sample water
- Diaphragm and reference system optimised for exacting process requirements
- Ceramic diaphragm with special material, optimised size and optimised pore diameter
- Long service life due to reduced diffusion ("bleeding") of the electrolyte
- Long service life due to the material, which is inert to aggressive chemicals
- Stable reference system for high pressure / temperature requirements
- Rotating sensor head sleeve. This means that the cable can remain connected during installation and dismantling of the sensor, avoiding moisture on the plug-in contacts
- Lead-free glass for advanced and environmentally-friendly production, use and disposal (RoHS-compliant)

Temperature	0...80 °C
Max. pressure	6.0 bar
Min. conductivity	150 µS/cm
Electrolyte	Gel containing potassium chloride
ORP electrode	Gold
Diaphragm	Ceramic
Sensor shaft	Glass
Shaft diameter	15 mm
Installation length	120 ±3 mm
Fitting position	Vertical up to +25°
Thread	PG 13.5
Electrical Connection	SN6 plug-in head, rotatable with a ProMinent cable
Enclosure rating	IP 65
Process integration	Bypass: open outlet or return of the sample water into the process line, inline: direct installation into the pipework; fixed or replaceable (replaceable fitting), tank, channel: Immersion in the immersion tube
Controllers	all DULCOMETER controllers
Typical applications	Cyanide detoxification, ozone monitoring
Resistance to	Disinfectant, by-products from electrolysis process and from ozone treatment process, cyanides
Measuring principle, technology	Direct potentiometric measurement, 2 electrodes, gel electrolyte, ceramic diaphragm

	Installation length	Order no.
RHEP-Au-SE	120 ±3 mm	1003875

# DULCOTEST ORP sensors

## Reliable online measurement of ORP – with DULCOTEST sensors

### ORP Sensor RHER-Pt-SE

ORP sensor optimised for use in contaminated water containing solids and for low conductivity of  $> 50 \mu\text{S}/\text{cm}$  at up to  $80^\circ\text{C}/6 \text{ bar}$

#### Your Benefits

- Electrochemical combination electrode: ORP and reference electrode integrated
- The large dirt-repellent Teflon® diaphragm prevents the reference system from becoming blocked up
- Long service life when solids are present
- High-viscosity electrolyte combined with a salt reservoir prevents the electrolyte from "bleeding"
- Long service life without drifts when there is clear water with low conductivity
- Rotating sensor head sleeve. This means that the cables can remain connected during installation and dismantling of the sensor, avoiding moisture on the plug-in contacts
- Lead-free glass for advanced and environmentally-friendly production, use and disposal (RoHS-compliant)

Temperature	0...80 °C
Max. pressure	6.0 bar
Min. conductivity	50 $\mu\text{S}/\text{cm}$
Electrolyte	Electrolyte with KCl supplement (salt rings in the reference electrolyte)
ORP electrode	Platinum
Diaphragm	PTFE ring diaphragm
Sensor shaft	Glass
Shaft diameter	12 mm
Installation length	120 $\pm 3$ mm
Fitting position	Vertical up to $+25^\circ$
Thread	PG 13.5
Electrical Connection	SN6 plug-in head/other versions on request
Enclosure rating	IP 65
Process integration	Bypass: open outlet or return of the sample water into the process line, inline: direct installation into the pipework; fixed or replaceable (replaceable fitting), tank, channel: Immersion in the immersion tube
Controllers	all DULCOMETER controllers
Typical applications	Municipal and industrial waste water, cooling water, process water, chemical applications, paper manufacturing. In general for water with a noticeable solid fraction
Resistance to	Disinfectant, solids content (turbid types of water)
Measuring principle, technology	Direct potentiometric measurement, 2 electrodes, Teflon ring diaphragm, polymer electrolyte

	Installation length	Order no.
RHER-Pt-SE	120 $\pm 3$ mm	1002534

# DULCOTEST ORP sensors

## Reliable online measurement of ORP – with DULCOTEST sensors

### ORP sensor RHER-DJ-Pt-SE

ORP sensor optimised for use in contaminated water containing solids and for low conductivity of  $> 10 \mu\text{S/cm}$  at up to  $80^\circ\text{C}/6 \text{ bar}$

#### The benefits for you

- Electrochemical combination electrode: ORP and reference electrode integrated
- The large dirt-repellent Teflon® diaphragm prevents the reference system from becoming blocked up
- Long service life when solids are present
- High-viscosity electrolyte combined with a salt reservoir prevents the electrolyte from "bleeding"
- Long service life without drifts when there is clear water with low conductivity
- Rotating sensor head sleeve. This means that the cable can remain connected during installation and dismantling of the sensor, avoiding moisture on the plug-in contacts
- Lead-free glass for advanced and environmentally-friendly production, use and disposal (RoHS-compliant)

Temperature	0...80 °C
Max. pressure	6.0 bar
Min. conductivity	10 $\mu\text{S/cm}$
Electrolyte	Electrolyte with KCl supplement (salt rings in the reference electrolyte)
ORP electrode	Platinum
Diaphragm	2 x PTFE ring diaphragm, double junction
Sensor shaft	Glass
Shaft diameter	12 mm
Installation length	120 $\pm 3$ mm
Fitting position	Vertical up to $+25^\circ$
Thread	PG 13.5
Electrical Connection	SN6 plug-in head/other versions on request
Enclosure rating	IP 65
Process integration	Bypass: open outlet or return of the sample water into the process line, inline: direct installation into the pipework; fixed or replaceable (replaceable fitting), tank, channel: Immersion in the immersion tube
Controllers	all DULCOMETER controllers
Typical applications	Municipal and industrial waste water, cooling water, process water, chemical applications, paper manufacturing. In general for water with a noticeable solid fraction
Resistance to	Disinfectant, solids content (turbid types of water)
Measuring principle, technology	Direct potentiometric measurement, 2 electrodes, Teflon ring diaphragm, polymer electrolyte

	Installation length	Order no.
RHER-DJ-Pt-SE	120 $\pm 3$ mm	1112882

# DULCOTEST ORP sensors

## Reliable online measurement of ORP – with DULCOTEST sensors

### ORP Sensor RHEX-Pt-SE

ORP sensor optimised for use with contaminated water with a high solids content at 6 bar/100 °C or 16 bar/25 °C

#### Your Benefits

- Electrochemical combination electrode: ORP and reference electrode integrated
- Diaphragm and reference system optimised for extremely high solids content
- The solid electrolyte makes the diaphragm redundant and prevents the reference system from becoming blocked up
- Long service life when sludge is present due to lack of a diaphragm
- Long service life as the solid electrolyte prevents the electrolyte from "bleeding"
- Stable reference system
- Rotating sensor head sleeve. This means that the cable can remain connected during installation and dismantling of the sensor, avoiding moisture on the plug-in contacts
- Lead-free glass for advanced and environmentally-friendly production, use and disposal (RoHS-compliant)

Temperature	0...100 °C
Max. pressure	16.0 bar (25 °C), 6.0 bar (at 100 °C)
Min. conductivity	500 µS/cm
Electrolyte	Polymer containing potassium chloride (solid)
ORP electrode	Platinum
Diaphragm	Circular gap (solid electrolyte)
Sensor shaft	Glass
Shaft diameter	12 mm
Installation length	120 ±3 mm
Fitting position	Vertical up to +25°
Thread	PG 13.5
Electrical Connection	SN6 plug-in head/other versions on request
Enclosure rating	IP 65
Process integration	Bypass: open outlet or return of the sample water into the process line, inline: direct installation into the pipework; fixed or replaceable (replaceable fitting), tank, channel: Immersion in the immersion tube
Controllers	all DULCOMETER controllers
Typical applications	Waste water, industrial water, process chemistry, emulsions, suspensions, protein-containing media. In general for water with a high solid fraction. Not suitable for clear media. Not suitable for media with oxidation agents.
Resistance to	Solids content (turbid types of water), sludge, emulsions
Measuring principle, technology	Direct potentiometric measurement, 2 electrodes, no diaphragm, polymer electrolyte

	Installation length	Order no.
RHEX-Pt-SE	120 ±3 mm	305097



# DULCOTEST ORP sensors

## Reliable online measurement of ORP – with DULCOTEST sensors

### ORP Sensor RHEIC-Pt-SE

ORP sensor optimised for use in industrial waste water/water – with DULCOTEST sensors.

#### Your Benefits

- Mechanically resistant platinum dome permits lengthy use even when exposed to abrasive particles
- Large dirt-repellent Teflon diaphragm protects against unwanted blockage of the reference
- Double junction reference system for stability with chemically polluted water
- Large electrolyte reservoir for long service lives
- Solid high-grade plastic housing with integrated process connection for direct installation in the process with ½" and ¾" NPT thread

Temperature	0...80 °C
Max. pressure	6.0 bar
Min. conductivity	50 µS/cm
Electrolyte	Gel containing potassium chloride with a large KCl reservoir of gel
Diaphragm	PTFE ring diaphragm
Sensor shaft	Plastic
Shaft diameter	17 ±0.2 mm (below the ½" NPT thread), 22 ±0.2 mm (below the ¾" thread)
Installation length	20 ±0.2 mm (from the lower end of the ½" thread), 60 ±0.2 mm (from the lower end of the ¾" thread)
Fitting position	Vertical up to +25°
Thread	½" and ¾" NPT thread
Electrical Connection	SN6 plug-in head, rotatable with a ProMinent cable
Enclosure rating	IP 65
Process integration	Bypass: open outlet or return of the sample water into the process line, inline: direct installation into the pipework; fixed or replaceable (replaceable fitting), tank, channel: Immersion in the immersion tube
Controllers	all DULCOMETER controllers
Typical applications	Municipal and industrial waste water Cooling water, process water, water in the chemical industry and paper making, generally for water with a solid matter fraction.
Resistance to	Disinfectant, solids content (turbid water), water-soluble chemicals
Measuring principle, technology	direct potentiometric measurement, 2 probes, double junction, gel electrolyte, large Teflon diaphragm, separate temperature measurement for temperature compensation needed

#### Order no.

RHEIC-Pt-SE

1082281

# DULCOTEST ORP sensors

## Reliable online measurement of ORP – with DULCOTEST sensors

### ORP Sensor RHEN-Pt-SE

Refillable ORP sensor optimised for use with chemically contaminated water at up to 80 °C/without excess pressure

#### Your Benefits

- Electrochemical combination electrode: ORP and reference electrode integrated
- Renewable liquid electrolyte by continuous replenishment from an electrolyte bottle installed above the electrode
- 1 ceramic diaphragm made of special material, with an optimised size and with optimised pore diameter
- Long service life in the presence of chemicals dissolved in the water, which could contaminate the reference system
- Lead-free glass for advanced and environmentally-friendly production, use and disposal (RoHS-compliant)

Temperature	0...80 °C
Max. pressure	Operation at atmospheric pressure
Min. conductivity	150 µS/cm
Electrolyte	KCL electrolyte, refillable
ORP electrode	Platinum
Diaphragm	Ceramic
Sensor shaft	Glass
Shaft diameter	12 mm
Installation length	120 ±3 mm
Fitting position	Vertical up to +25°
Thread	PG 13.5
Electrical Connection	SN6 plug-in head/other versions on request
Enclosure rating	IP 65
Process integration	By tripod or manually
Controllers	all DULCOMETER controllers
Typical applications	Waste water, cooling water, chemically contaminated water, only clear types of water.
Resistance to	Disinfectant, chemicals dissolved in water
Measuring principle, technology	Direct potentiometric measurement, 2 electrodes, liquid electrolyte, 1 ceramic diaphragm

	Installation length	Order no.
RHEN-Pt-SE	120 ±3 mm	305091

Delivered without PE storage tank and hose

# DULCOTEST ORP sensors

## Reliable online measurement of ORP – with DULCOTEST sensors

### ORP Sensor RHEK-Pt-S

ORP sensor with plastic shaft for use with manual measuring instruments, optimised for use in potable water treatment, swimming pools/hot tubs at up to 60 °C/3 bar

#### Your Benefits

- Electrochemical combination electrode: ORP and reference electrode integrated
- Diaphragm and reference system optimised for use in swimming pools and for potable water
- With plastic shaft to prevent glass breakage
- Mechanical protection of the glass diaphragm
- Ceramic diaphragm with special material, optimised size and optimised pore diameter
- Long service life due to reduced diffusion ("bleeding") of the electrolyte
- Long service life due to the material, which is inert to aggressive disinfectants
- Stable reference system
- Lead-free glass for advanced and environmentally-friendly production, use and disposal (RoHS-compliant)

Temperature	0...60 °C
Max. pressure	Operation at atmospheric pressure
Min. conductivity	150 µS/cm
Electrolyte	Gel containing potassium chloride
ORP electrode	Platinum
Diaphragm	Ceramic
Sensor shaft	Polycarbonate
Shaft diameter	12 mm
Installation length	125 ±3 mm
Fitting position	Vertical up to +25°
Thread	none
Electrical Connection	SN6 plug-in head, rotatable with a ProMinent cable
Enclosure rating	IP 65
Process integration	By tripod or manually
Controllers	all DULCOMETER controllers
Typical applications	Manual measurement e.g. swimming pools, potable water, aquarium water
Resistance to	Disinfectant
Measuring principle, technology	Direct potentiometric measurement, 2 electrodes, gel electrolyte, ceramic diaphragm

	Installation length	Order no.
RHEK-Pt-S	125 ±3 mm	305052

# DULCOTEST ORP sensors

## Reliable online measurement of ORP – with DULCOTEST sensors

### ORP Sensor RHEK-Pt-SE

ORP sensor with plastic shaft, optimised for use in potable water treatment, swimming pools/hot tubs at up to 60 °C/3 bar

#### Your Benefits

- Electrochemical combination electrode: ORP and reference electrode integrated
- Diaphragm and reference system optimised for use in swimming pools and for potable water
- With plastic shaft to prevent glass breakage
- Mechanical protection of the glass diaphragm
- Ceramic diaphragm with special material, optimised size and optimised pore diameter
- Long service life due to reduced diffusion ("bleeding") of the electrolyte
- Long service life due to the material, which is inert to aggressive disinfectants
- Stable reference system
- Rotating sensor head sleeve. This means that the cable can remain connected during installation and dismantling of the sensor, avoiding moisture on the plug-in contacts
- Lead-free glass for advanced and environmentally-friendly production, use and disposal (RoHS-compliant)

Temperature	0...60 °C
Max. pressure	3.0 bar
Min. conductivity	150 µS/cm
Electrolyte	Gel containing potassium chloride
ORP electrode	Platinum
Diaphragm	Ceramic
Sensor shaft	Polycarbonate
Shaft diameter	12 mm
Installation length	120 ±3 mm
Fitting position	Vertical up to +25°
Thread	PG 13.5
Electrical Connection	SN6 plug-in head, rotatable with a ProMinent cable
Enclosure rating	IP 65
Process integration	Bypass: open outlet or return of the sample water into the process line, inline: direct installation into the pipework; fixed or replaceable (replaceable fitting), tank, channel: Immersion in the immersion tube
Controllers	all DULCOMETER controllers
Typical applications	Swimming pool, potable water, aquariums
Resistance to	Disinfectant
Measuring principle, technology	Direct potentiometric measurement, 2 electrodes, gel electrolyte, ceramic diaphragm

	Installation length	Order no.
RHEK-Pt-SE	120 ±3 mm	1028459

# DULCOTEST ORP sensors

## Reliable online measurement of ORP – with DULCOTEST sensors

### ORP Sensor RHEK-L Pt-SE

ORP sensor with plastic shaft, optimised for vertical to horizontal installation position for use in potable water treatment, swimming pools/hot tubs at up to 60 °C/3 bar

#### Your Benefits

- Electrochemical combination electrode: ORP and reference electrode integrated
- With plastic shaft to prevent glass breakage
- Horizontal (level) installation possible (90° angle) (usually limited to 0 - 75° angle)
- Diaphragm and reference system optimised for use in swimming pools and for potable water
- Ceramic diaphragm with special material, optimised size and optimised pore diameter
- Long service life due to reduced diffusion ("bleeding") of the electrolyte
- Rotating sensor head sleeve. This means that the cable can remain connected during installation and dismantling of the sensor, avoiding moisture on the plug-in contacts
- Long service life due to the material, which is inert to aggressive disinfectants
- Stable reference system

Temperature	0...60 °C
Max. pressure	3.0 bar
Min. conductivity	150 µS/cm
Electrolyte	Gel containing potassium chloride
ORP electrode	Platinum
Diaphragm	Ceramic
Sensor shaft	Polycarbonate
Shaft diameter	12 mm
Installation length	120 ±3 mm
Fitting position	Vertical to horizontal
Thread	PG 13.5
Electrical Connection	SN6 plug-in head, rotatable with a ProMinent cable
Enclosure rating	IP 65
Process integration	Bypass: open outlet or return of the sample water into the process line, inline: direct installation into the pipework; fixed or replaceable (replaceable fitting), tank, channel: Immersion in the immersion tube
Controllers	all DULCOMETER controllers
Typical applications	Swimming pools, potable water, aquariums, horizontal installation possible
Resistance to	Disinfectant
Measuring principle, technology	Direct potentiometric measurement, 2 electrodes, gel electrolyte, ceramic diaphragm

	Installation length	Order no.
RHEK-L Pt-SE	120 ±3 mm	1034919