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Data Sheet 201050

ISFET pH combination electrode

Type 201050

Brief description

The ISFET pH combination electrode can provide accurate and stable pH measurements in a vast number of industrial applications. The main features of this sensor are its sturdy design and its fast response time. The sensor works without a glass membrane. Measurement of the pH value is based on ISFET (ionselective field-effecttransistor) technology.

Areas of application

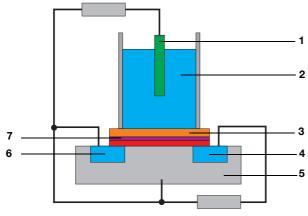
- · Food and drinks industry
- · Dairies, cheese factories
- Hygienic production processes to meet 3-A requirements¹
- · Pharmaceuticals and
- In all hygienic production processes

Function

A semi-conductor chip - the ISFET - takes on the function of the familiar glass membrane of normal combination electrodes. This measuring chip is embedded in a stable plastic body. This ensures a long service life in a variety of different media.

When in operation, voltage is applied to the measuring chip. The extent of the current between source and drain is determined by the pH-sensitive gate. With a transmitter (such as the JUMO AQUIS 500 pH), the current can be displayed as a pH-Wert or used for control.

Block diagram



- Reference electrode
- Gate region with H+ ion-sensitive coating 3
- Silicon substrate (P)
- Insulation

- Measurement medium
- Drain (N)
- Source (N)



Type 201050/04...

Type 201050/

Key features

- Break-resistant
- · Good response rate
- High measuring accuracy even at low temperatures
- Stable measurement values
- Can be used without a fitting
- Not susceptible to "dry-running"
- · Excellent shelf life

¹ 3-A Sanitary Standards define the standards for food-safe materials that also have to be suitable for cleaning and disinfecting. These standards should ensure product quality, thus safeguarding the health of the final consumer.

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Data Sheet 201050

Storage

ISFET pH combination electrodes can be stored for a very long time. Checks only have to be made once a year, to make sure that the padding in the protective probe cap is still damp. If necessary, the padding should be soaked in a saturated KCI solution.

Not suitable for use

At temperatures below -10°C and above +110°C, as well as at pressures above 10 bar

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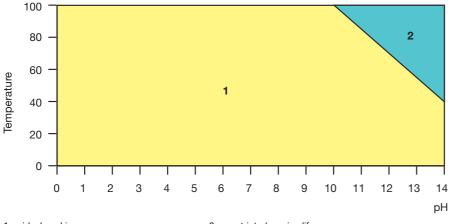
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- In fluoride-rich media
- In media with pH 14 at temperatures above +45°C (limited durability)
- In highly effective oxidizing agents
- In media with excessive salt concentrations
- For ultra-pure water applications (conductivity less than 10 µS/cm)
- In polluted media, that could block the ceramic diaphragm

Installation guidelines

- The ISFET pH combination electrode can be installed in any position.
- The incident flow velocity should not exceed 1.5 m/s.
- The flow rate quantity should be reduced for media of higher viscosity or abrasiveness.
- When used in abrasive media, the ISFET sensor should be turned away from the direction of flow.
- When used in oil-containing media, the ISFET sensor should be parallel to the direction of flow.
- For immersion measuring, the ISFET pH combination electrode must be submerged at least 5 cm deep in the medium.
- The ISFET pH combination electrode is not susceptible to "dry-running"; however, in this situation, a small amount of the gel filling may escape, and be more quickly consumed than in normal operation.
- Calibration is advisable if dry-running continues for some time.

Operative range



ideal working range

restricted service life

Technical data

Sensor			
Measuring range	0 - 14 pH		
Temperature range	-10 to +110		
Sterilizable at	+130°C at max. 3.5 bar (20 min.)		
Maximum process pressures	0 to 7 bar at -10 to +100°C 0 to 3.5 bar at temperatures above +100°C		
Body material	PPS (polyphenylene sulfide), FDA-compliant PSU (polysulfone), FDA-compliant Silicone		
Sealant	FPM (fluoropolymer rubber)		
Process connection	G3/4" NPT thread or 1.5" clamp		
Electrical connection	VarioPin connector, IP68		
Weight	approx. 200 g		

Cap adapter	Cap adapter		
Preamplifier	A preamplifier is integrated in the cap adapter.		
Cable length	6 m		
Electrode connection	VarioPin socket, IP68		
Electrical connection	Stripped ends, tinned		

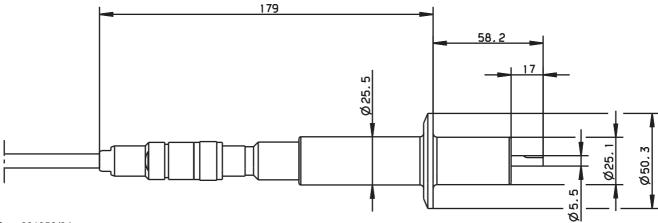
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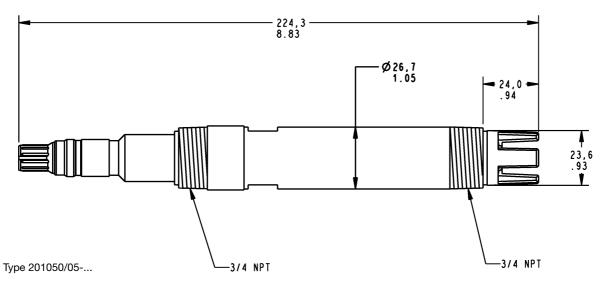


Data Sheet 201050

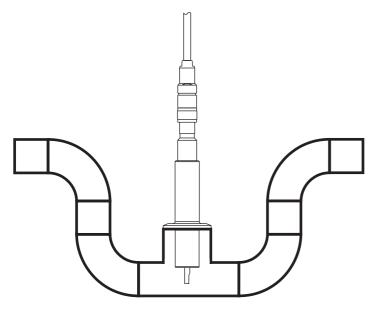
Dimensions



Type 201050/04-...



Installation example



When installed in tubing systems, the sensor should be mounted in the siphon, as shown.

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Data Sheet 201050

Electrical connection

to the JUMO AQUIS 500 pH transmitter/controller, as per data sheet 202560

Connection	Color	Terminal	Row	
Supply voltage for the cap adapter				
Supply voltage ± 5 V DC, 5 mA		Blue Black Green	11 L+ 12 <u> </u>	2
pH sensor				
Sensor Reference		White / black Shield	1 3 + 5 bridged	
Resistance thermometer in 3-wire circuit, Pt 1000	110	White Red Red / black	8 9 10	2

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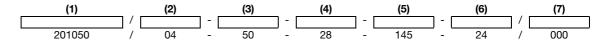
Order details: ISFET pH combination electrode

(1) Basic type 201050 ISFET pH combination electrode

(2) Basic type extension

_				
		04		Version for hygienic applications
		05		Screw-in version
x	х	50	(3)	Active component ISFET module
x	х	28	(4)	Electrical connection VarioPin (VP) connector
x	x	145 615		Process connection 3/4" NPT thread 1.5" clamp
x	х	24 58,2		Fitting length 24 mm (for connection 145 only) 58.2 mm (for connection 615 only)
х	х	000	(7)	Extra codes none





Note:

The type code is a type designation, not a modular system.

If possible, choose items listed under "stock versions" or "production versions" for your orders.

We will have to technically inspect and approve a free combination of individual key features.

In case of doubt, please ask.

Production versions (delivery 2 weeks after receipt of order)

Туре	Brief description	Sales No.
201050/04-50-28-615-95/000	ISFET pH combination electrode, ceramic diaphragm, 1.5" clamp connection,	20/00525411
201050/05-50-28-145-24/000	58.2 mm fitting length ISFET pH combination electrode, ceramic diaphragm, 3/4" NPT thread, 24 mm fitting length	20/00525415

Accessories (delivery 2 weeks after receipt of order)

Туре	Brief description	Sales No.
Cap adapter	Preamplifier, 6 m connecting cable, prefabricated	(PG 201090) 20/00525421
Cap adapter	Preamplifier, 15 m connecting cable, prefabricated	(PG 201090) 20/00525420