

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-effect transistor) technology.

Areas of application

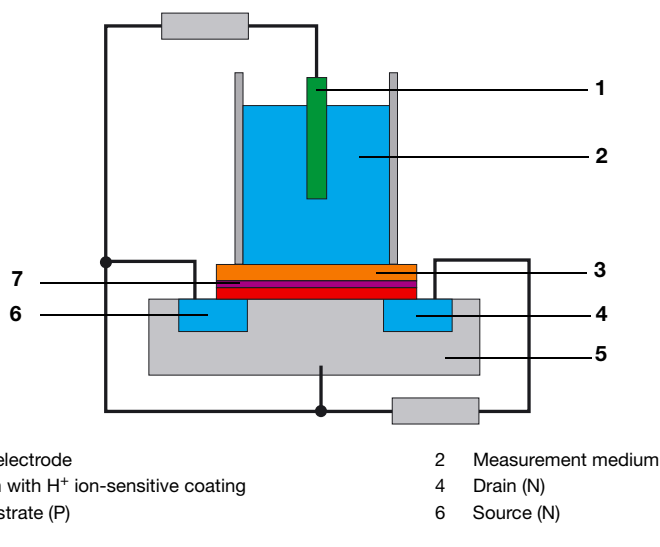
- Food and drinks industry
- Dairies, cheese factories
- Hygienic production processes to meet 3-A requirements¹
- Pharmaceuticals and
- In all hygienic production processes

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



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.

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 KCl solution.

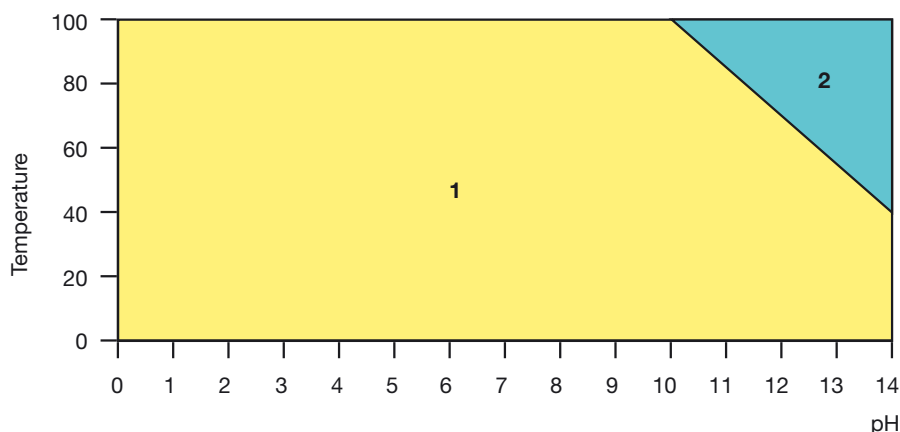
Not suitable for use

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



1 ideal working range

2 restricted service life

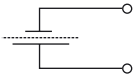
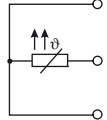
Technical data

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

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 $\perp$ 13 L-	2
pH sensor				
Sensor Reference		White / black Shield	1 3 + 5 bridged	2
Resistance thermometer in 3-wire circuit, Pt 1000		White Red Red / black	8 9 10	

Order details: ISFET pH combination electrode

201050 (1) **Basic type**
ISFET pH combination electrode

(2) **Basic type extension**

	04	Version for hygienic applications
	05	Screw-in version
x x	50	(3) Active component ISFET module
x x	28	(4) Electrical connection VarioPin (VP) connector
x	145	(5) Process connection 3/4" NPT thread
x	615	1.5" clamp
x	24	(6) Fitting length 24 mm (for connection 145 only)
x	95	58.2 mm (for connection 615 only)
x x	000	(7) Extra codes none

Order code	(1)	(2)	(3)	(4)	(5)	(6)	(7)
Sample order	201050	/ 04	- 50	- 28	- 145	- 24	/ 000

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)

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

Accessories (delivery 2 weeks after receipt of order)

Type	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