

ISFET pH combination electrode

Type 201050

Brief description

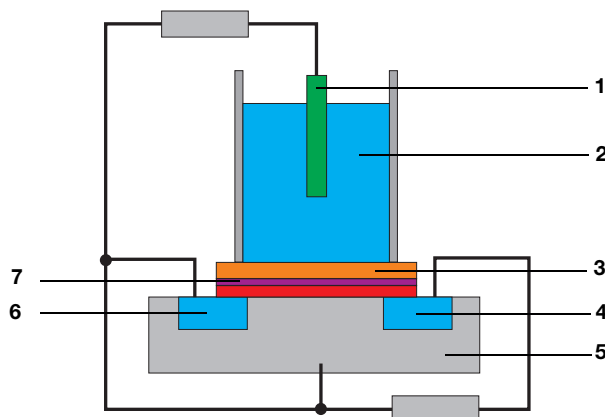
The ISFET pH combination electrode can provide accurate and stable pH measurements in a vast number of industrial applications. The main features of this sensor are its sturdy design and its fast response time. The sensor works without a glass membrane. Measurement of the pH value is based on ISFET (ionselective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

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



- | | |
|---|----------------------|
| 1 Reference electrode | 2 Measurement medium |
| 3 Gate region with H ⁺ ion-sensitive coating | 4 Drain (N) |
| 5 Silicon substrate (P) | 6 Source (N) |
| 7 Insulation | |



Type 201050/05...

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



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.

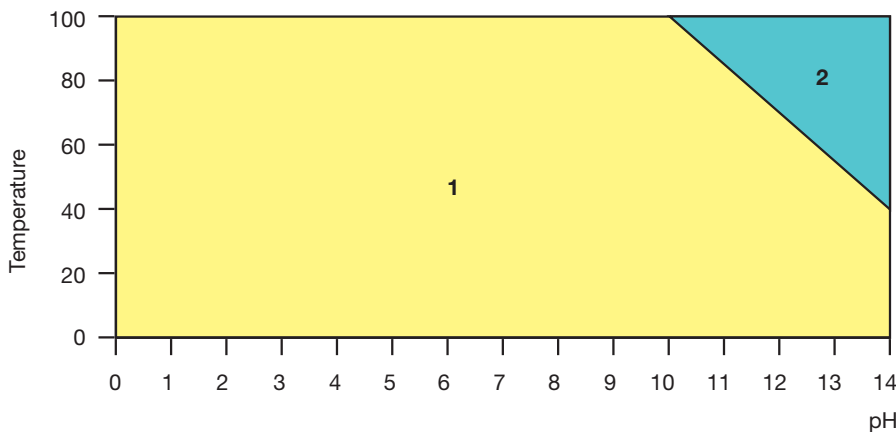
Not suitable for use

- 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

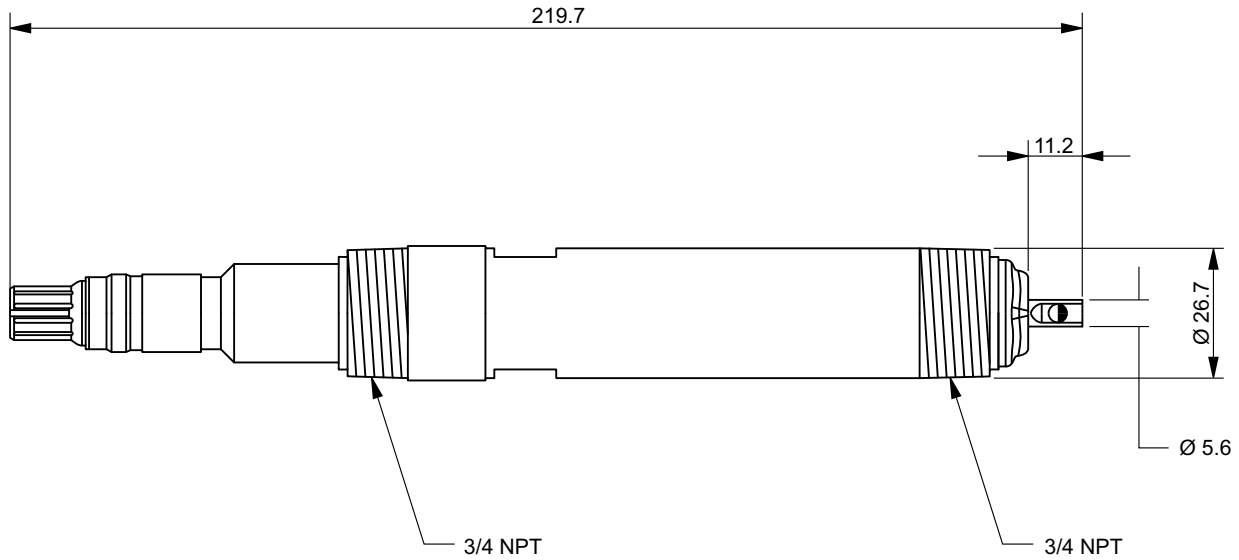
2 restricted service life

Technical data

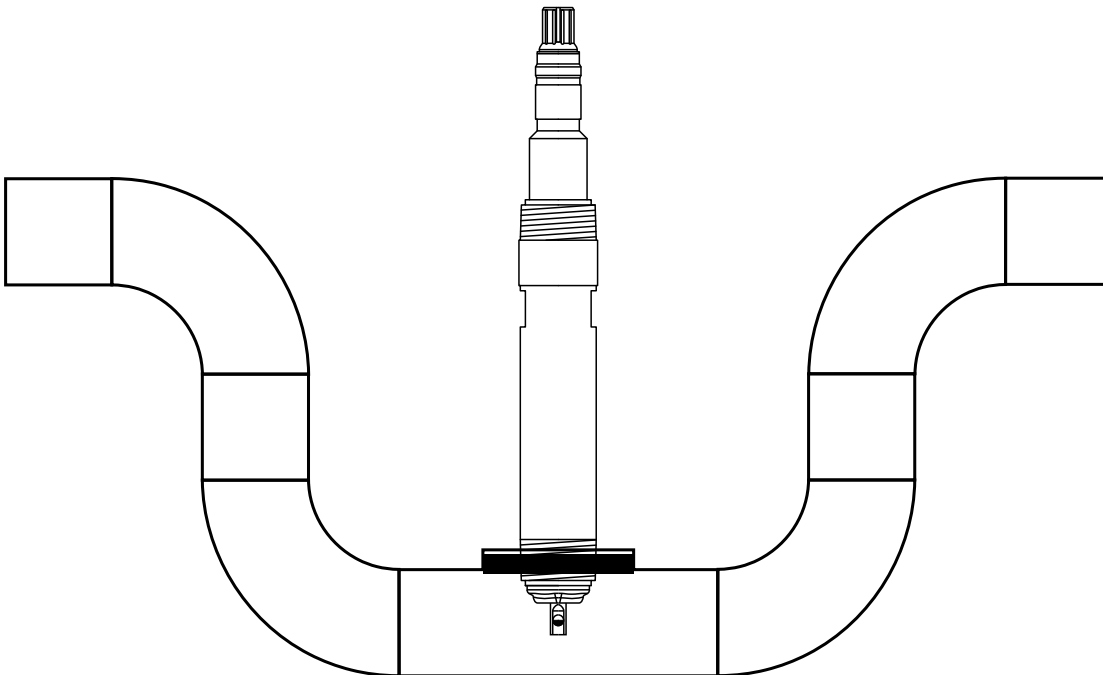
Sensor	
Measuring range	0 to 14 pH
Temperature range	-10 to +110 °C
Sterilizable at	+130 °C at max. 3.5 bar (20 min.)
Maximum process pressures	0 to 7 bar at -10 to +100 °C 0 to 3.5 bar at temperatures above +100 °C
Parts coming into contact with the medium	PPS (polyphenylene sulfide), silicone, ceramic, FKM (fluorocarbon rubber), E/P (ethylene propylene copolymer)
Sealant	FKM (fluorocarbon rubber)
Process connection	Screw connection 3/4-14 NPT
Electrical connection	VarioPin connector, IP68 (Cap adapter is required for connection to a transmitter/controller)
Weight	Approx. 200 g

Cap adapter	
Preamplifier	Integrated in the cap adapter
Cable length	6 m or 15 m
Electrode connection	VarioPin socket, IP68
Electrical connection	Stripped ends, tinned

Dimensions



Installation example

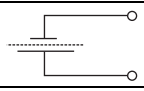
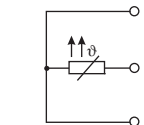


Note

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

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^a				
Supply voltage DC ± 5 V, 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	

^a The orange-colored conductor of the Cap adapter ist not connected!

Order details:

Basic type	
201050	ISFET pH combination electrode
(1) Basic type extension	
05	Screw-in version
(3) Active component	
50	ISFET module
(4) Electrical connection	
28	VarioPin (VP) connection
(5) Process connection	
145	Screw connection 3/4-14 NPT
(6) Fitting length	
24,0	24 mm (for connection 145 only)

Order code	(1)	(2)	(3)	(4)	(5)	(6)
Sample order	201050	/ 05	- 50	- 28	- 145	- 24,0

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.

JUMO GmbH & Co. KG

Hausadresse: Moritz-Juchheim-Straße 1, 36039 Fulda, Germany

Lieferadresse: Mackenrodtstraße 14, 36039 Fulda, Germany

Postadresse: 36035 Fulda, Germany

Telefon: +49 661 6003-714

Telefax: +49 661 6003-605

E-Mail: mail@jumo.net

Internet: www.jumo.net



Stock versions

Type	Brief description	Part no.
201050/05-50-28-145-24,0	ISFET pH combination electrode, screw-in version, process connection screw connection 3/4-14 NPT, fitting length 24 mm	00525415

Accessories

Type	Brief description	Part no.
JUMO Cap adapter	Connecting cable (6 m) with preamplifier for JUMO ISFET pH combination electrode, prefabricated (PG 209791)	00525421
JUMO Cap adapter	Connecting cable (15 m) with preamplifier for JUMO ISFET pH combination electrode, prefabricated (PG 209791)	00525420