PH PROBE REINER

IN ASEPTIC DESIGN

PFAUDLER
REACTOR SYSTEMS

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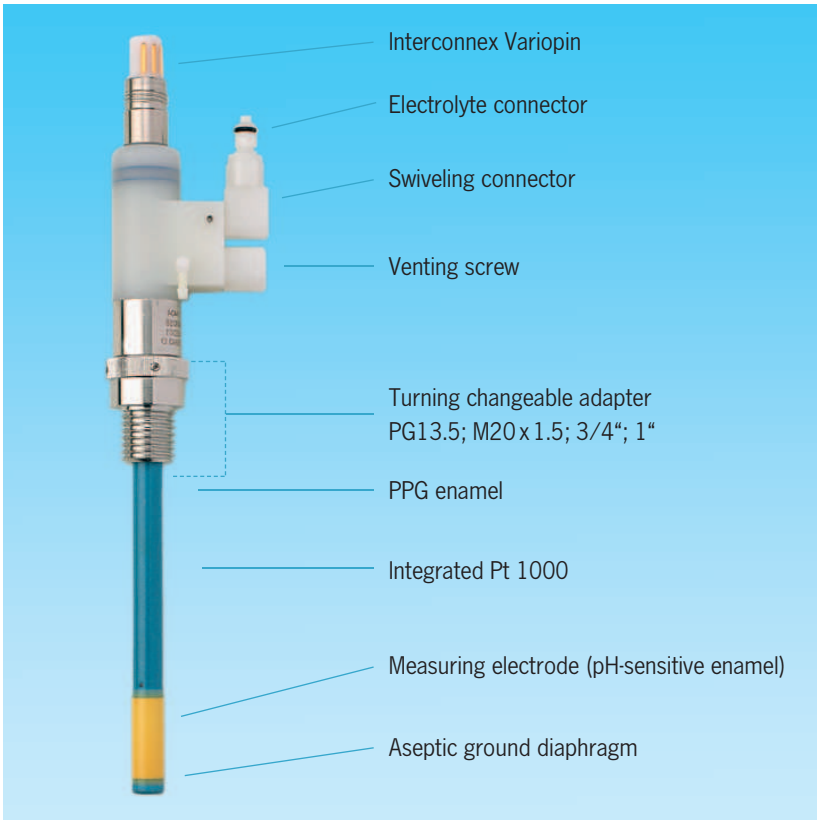
ABSOLUTE PH SENSOR FOR DEMANDING MEASURING LOCATIONS

pH Reiner
reiner = hygienic design
reiner = sterile electrolyte
reiner = suitable for CIP
reiner = inline sterilization capability (SIP)
reiner = Pfaudler PharmaGlass

The pH Reiner probe is used wherever increased demands are made on measuring accuracy, pressure, temperature, sterility and life cycle. For example, in flow fittings and reactors with high pressure, pressure pulses, or for inline cleaning.



Applications
- Food industry, also for paste-like media
- Beverage production/bottling
- Pharmaceutical industry
  Active ingredient production/treatment
  Water treatment
  Blood plasma fractionation
  Fermentation
  Biotechnology
- Water/sewage treatment
- Paper production
- Quality control

Construction and function
The probe carrier of the pH Reiner probes is made of steel that guarantees high mechanical resistance (e.g. to turbulent flow produced by agitators or solids). Therefore, the pH Reiner probes can be directly exposed to the product flow, thus sensing the pH immediately, directly and close to real time without a protective cage or similar devices. The steel itself is protected against corrosion and product incrustation by highly resistant, anti-adhesive Pfaudler Pharma Glass (PPG).

The actual sensor consists of pH-sensitive enamel that is fused on to the lower end of the enamelled probe carrier in an annular shape. It covers the entire perimeter of the lower end of the probe.

The area of the measuring probe is a multiple of that of glass electrodes. Therefore, precision measurements of the pH can even be carried out in those media in which measurement ceased to the possible using other methods. Examples include liquids with a very low electrical conductivity.

The enamelled measuring probe is directly connected to its metal conductor. The weak point offered by internal buffers/discharge electrodes is avoided.

In contrast to conventional glass electrodes, the pH enamel is in contact with the fluid on one side only. Aging of the probe or measured value drifts are therefore not possible.

PH REINER PROBE

The reference electrode is integrated in the probe head, separately from the measuring electrode. The electrolyte connection between the electrolyte vessel, the reference electrode and the product to be measured is made using a tube and quick-action coupling and a shrunk, aseptic ground diaphragm.

A sterile Pfaudler electrolyte (3 Mol KCl solution) is used as a standard. In the corresponding applications, infusion solutions such as a sterile saline solution, may also be used. The electrolyte is supplied in PE bottles with a septum that are placed in a stainless steel pressure vessel. The electrolyte bottles can be replaced without affecting the sterile condition of the system.

The pressure inside the electrolyte system is always kept well above the operating pressure inside the reaction chamber of the pipe. Therefore, no product may leak through the diaphragm and through the electrolyte line up to the reference electrode. Contamination of the reference electrode is entirely excluded.

Temperature compensation of the pH measurement is carried out using an integrated Pt 1000.

The pH Reiner probe is installed directly in a reactor nozzle or in the main current of a pipe. It may remain in the process zone all the time - even if the reactor is empty. The probe can be installed in any orientation and may remain dry without any limitations.

The pH Reiner probe can be sterilized inline at 134 °C without losing its characteristics.

Useful life and calibration cycles
The measuring accuracy of conventional systems normally changes considerably already after a single heating and cooling cycle, making frequent recalibration necessary.

Due to its very construction, aging of the pH Reiner sensor or a measured value drift are not possible, in contrast to conventional measuring methods. Normally, it is entirely sufficient to calibrate the probes once per year directly with the product (single-point calibration).

Your advantages

- Permanent online operation/ measurement possible
- A sterile saline solution may be used as electrolyte
- Self-cleaning through product flow
- Can be used up to a pressure of 6 bar in standard design
- Low maintenance
- No aging of the sensor, long-term stability for many years. (the useful life depends on the product)
- Single-point calibration
- Installation in any orientation
- High mechanical strength
- Extreme corrosion resistance in acids
- Insensitive to organic solvents and proteins
- Can remain dry without any limitations
- Clogging of the diaphragm is not possible
- Contamination of the reference electrode is not possible
- Inline sterilization and CIP capability
- Aseptic design

TECHNICAL DATA

PH REINER PROBE

Technical data	
Measured value	absolute pH
Reference system	– Diaphragm Ground diaphragm (ceramic material) – Reference electrode AgAgCl
Electrolyte	sterile KCl solution; others (such as NaCl) on request
Measuring range	– linear range 0 … +10* pH – application range –2 … +14** pH
Measuring chain zero	8.6 ±1 pH
Slope	57.5 mV/pH
Temperature	0 … +140 °C
Temperature compensation	Pt 1000
Pressure	–1 … +6 bar
Dimensions	
Immersion depth	120 mm (standard), 42 mm (minimum)
Diameter	12.5 mm
Connectors	
Process fitting	optionally PG 13.5; M20 x 1.5; 3/4"; 1"; Pfaudler Aseptic-Adapter for welded-on nozzle DN 30, adapter for welded-on nozzle DN 25, adapter for Varivent system; others on request
Electrical connection	6-pin gold-plated, Interconnex Variopin
Degree of protection	IP 68
Explosion protection	–
Suitable pH measuring transducer	Units with isothermal option. The intersection of the isothermal lines is at approx. 1.35 pH
Materials	
Probe body	Chemically resistant and shock-resistant steel enamelled with Pfaudler PharmaGlass (PPG)
Adapters and connection head	Stainless steel (1.4404), PVDF, PTFE
Electrolyte vessel	Stainless steel (1.4301)

* temperature-dependent

** depending on the alkali error (Na^+)

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