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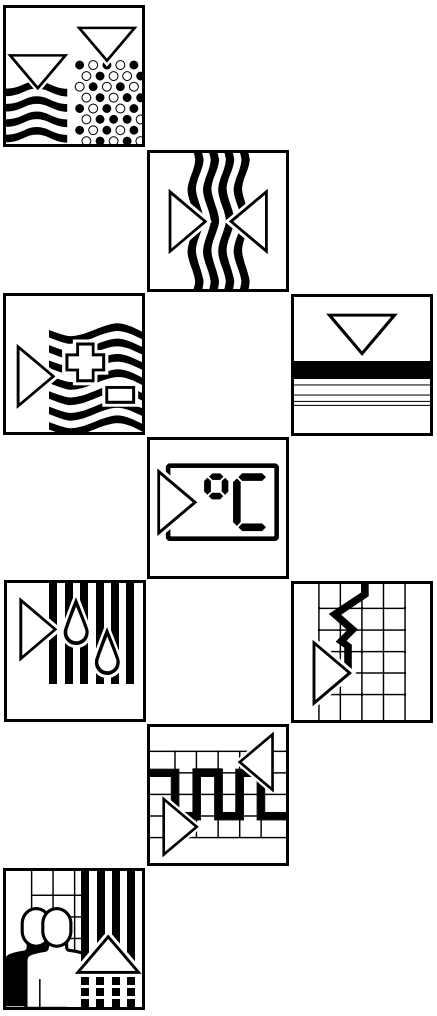
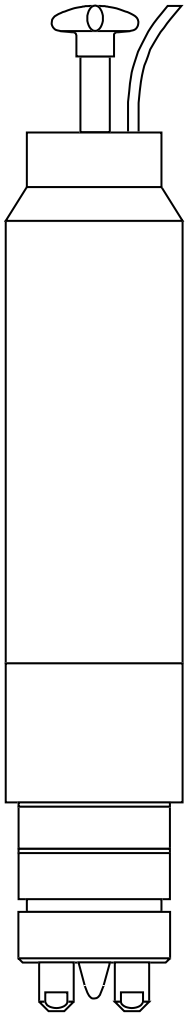
Sensopac
CPA 320
pH / Redox Compact Electrode System

Operating Instructions





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Contents

1. Application

Sensopac CPA 320 is a pH / Redox compact electrode system which can be integrated directly into tanks and pipes for processing applications. The wide range of accessories and mounting fittings enables optimum use of the Sensopac sensor system, even for unusual applications.

The Sensopac pH / Redox sensor incorporates various electrodes or electrode arrangements together in one unit.

Use of an internal electrolyte bridge with dirt-repellent diaphragm, guarantees protection against “poisoning”.

The Sensopac sensor can be used directly for measurement under pressure, without requiring counterpressure.

The Sensopac is fitted with a double reference electrode as standard, which enables automatic self-monitoring when a suitable pH measuring instrument (e.g. Mypex CPM 340) is used.

2. The measuring system

A complete measuring system comprises

- the pH / Redox compact electrode system Sensopac CPA 320, containing the appropriate electrodes (including cable).
- The measuring instrument (e.g. Mypex CPM 340 with one or two inputs for the measurement circuit).
  For self-monitoring, where two measurement circuits are monitored by means of a differential circuit, a measuring instrument with two inputs for the measurement circuit is required.

Sensopac CPA 320 comprises a robust basic structure which can be made of plastics (PP, PVDF) or stainless steel (1.4571).

Impact-resistant bolts, incorporated into the structure, protect the electrodes. One of these bolts is made of Hastelloy C4 and serves as an equipotential bonding pin.

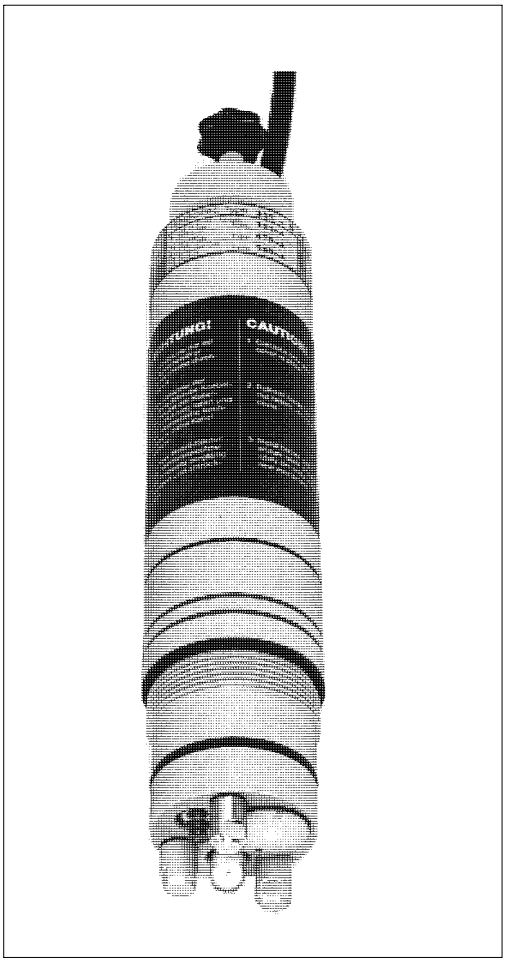

Fig. 1: Compat electrode system Sensopac CPA 320

3. Design and function

Sensopac CPA 320 comprises the following components, relevant to the measurement procedure (see figure 2):

- One pH electrode (A) which is directly immersed in the measurement solution.
- A low-resistance double reference electrode (B) with reference system B1 for the main measurement circuit and reference system B2 for the monitoring measurement circuit.
  This electrode is immersed in the briding electrolyte C.
- The bridging electrolyte (C) in a large reference chamber.
- A diaphragm cartridge (D) with dirt-repellent, blockage-free PVF diaphragm.

3.1 Operating principle

The compact pH electrode system Sensopac CPA 320 is equipped with a double reference electrode for self-monitoring.
The pH measuring system requires two independent symmetrically high-resistance inputs. The pH measuring instrument Mypex CPM 340-A2 monitores the 2 measuring circuits and signals any occuring difference in measured value.
If the self-monitoring system is not needed, the connection of a pH measuring instrument with an electrode input is sufficient. The pH instrument input should be symmetrically high-resistance.

A pH-dependant half-cell voltage in the measurement solution is detected with the pH electrode (A). The electrical contact between measurement media and bridging electrolyte C is made by way of the blockage-free dirt-repellent PVF diaphragm D. The double reference electrode B is immersed into the electrolyte.
The double reference electrode's reference system B1 supplies the constant half-cell voltage for the main measurement circuit.

The double reference electrode 's reference system B2 supplies the half-cell voltage for the monitoring measurement circuit.

3.2 Self-monitoring

The B2 reference system of the monitoring measurement circuit is located directly behind a diaphragm of reference electrode B.
The B1 reference system for the main or master measurement circuit is integrated into a long cartridge with another diaphragm. Inside reference electrode B, this cartridge is surrounded by solid gel which acts as a second bridging electrolyte.

In the event of electrode "poisons" penetrating into the bridging electrolyte C, this arrangement ensures that reference system B2 is first affected by this poison, and reference system B1 of the main measuring circuit is only affected much later, if at all.
In the event of a fault, any imbalance arising between the reference potentials is detected by the Mypex measuring instrument which issues a signal.

Note:
The essential feature of this monitoring method is **that an alarm is triggered before the main measuring circuit's signal is disturbed**. At the same time, only the main measuring circuit
affects the digital display and analog output of the measuring unit.

After an alarm, the bridging electrolyte must be replaced at the next opportunity. Following recalibration, the measurement procedure may then be continued under normal conditions.
The compact electrode system Sensopac CPA 320 is supplied ready for measurement, i.e. completely equipped with electrodes, including bridging electrolyte solution and measurement cable.
Each compact electrode system Sensopac CPA 320 is tested individually before delivery to ensure high quality.

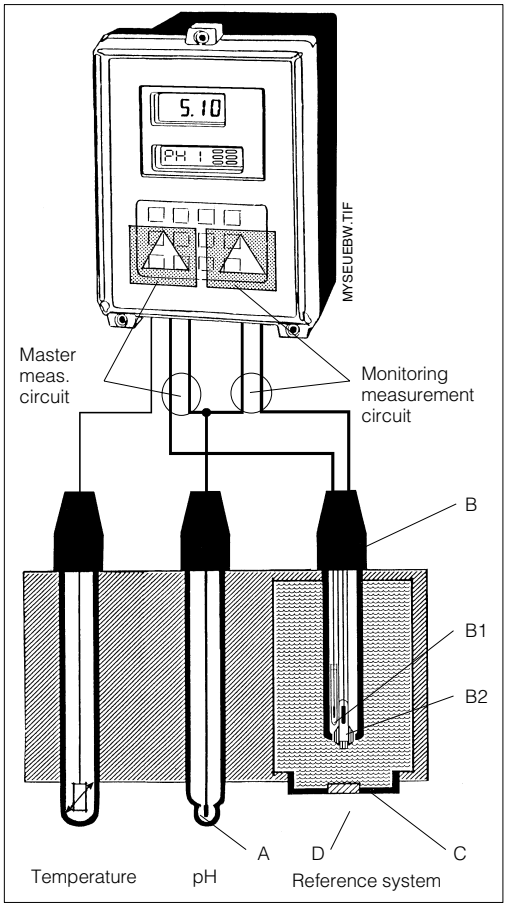

Fig. 2: Operating principle