

Waste water treatment: pH, ORP, Conductivity after primary clarification

application note



9135 transmitter



8350 probe

1. THE PROCESS

In a waste water treatment plant, several purely chemical processes will be applied. But before doing that, the influent will go through a primary treatment, generally made of the following mechanical operations :

- screening: big solids are eliminated
- desilting: decantation of sand (low process flowrate)
- degreasing: injection of air bubbles => the grease will come at the surface
- primary clarification: during 1 or 2 hours, a first decantation is made in order to eliminate the biggest suspended solids

2. INTEREST OF pH, ORP & CONDUCTIVITY MEASUREMENTS DIFFICULTIES TO BE SOLVED

➤ *Interest :*

Controls are done at the end of that primary treatment to inform about unexpected trend changes: the absolute values are less important. An important change in basic parameters such as pH, redox or conductivity (or dissolved salts) will alarm the users that the further process treatments will certainly have to be adapted.

➤ *Difficulties :*

At this point of the process, the medium is generally quite dirty or abrasive and the users will of course appreciate units which are less affected by this (maintenance cost reduced).

3. CONDUCTIVITY LOOP : 9125 CONC + 8332

➤ *System configuration :*

This is a complete measuring loop made of 3 parts : the 9125 transmitter + the 8332 probe + a 5m cable.

That system can be ordered under the reference [9125/C07/1](#) or [9125/C07/2](#)

➤ *Advantages :*

The 8332 conductivity probe is based on inductive technology. It is made of 2 coils molded in a PVDF body : a known current is applied on the primary coil and the induced current in the secondary coil is measured. That induced current is proportionnal to the medium conductivity.

A Pt100 is of course included in the 8332 for automatic temperature compensation, which can be done by the transmitter 9125 CONC.

The main advantage of inductive technology is that the measuring devices (coils) are not in contact with the process : the problems due to dirty samples are therefore considerably reduced (coating, mechanical shocks).

The 9125 CONC allows the display in concentration (TDS) or conductivity. The 0/4-20 mA outputs or setpoints must be programmed in concentration.

The relation between the conductivity & concentration (at different temperature if needed) is done during the programmation when installing the unit. The different values, depending on the plant, must therefore be previously determined by the customer.

➤ *Option :*

A two channel transmitter version is available if necessary (8921 CONCENTRATION).

4. pH LOOP: 9135 + 8350 IMMERSION

➤ **System configuration :**

It is made of 3 parts in standard : the 9135 transmitter + the 8350 combined sensor with its 10m cable + an immersion probe equipped with a loose flange (3 lengths are proposed).

These complete loops can be ordered under the following references :

9135/P06/1 or 9135/P06/2 : 0.5 m immersion

9135/P07/1 or 9135/P07/2 : 1 m immersion

9135/P08/1 or 9135/P08/2 : 1.5 m immersion

➤ **Description of the optional cleaning device :**

Air, water or chemical cleaning available.

➤ **Advantages :**

The 8350 is a combined pH probe constituted by the following parts :

- * a glass bulb installed in a recessed area in order to protect it from shocks
- * a double junction reference system (KNO₃ then KCl)
- * an integrated Pt100 for automatic temperature compensation by the transmitter
- * a built-in low noise 10 m cable

The process liquid junction is made of a special porous Teflon and the first stage of reference system of KNO₃ : these 2 features allows excellent results against polluting ions.

For very dirty samples (coating mediums), the optional chemical cleaning kit can be installed. There is no maintenance needs on reference part (electrolyte supply).

5. ORP LOOP : 9135 + 8351 IMMERSION

➤ **System configuration :**

It is made of 3 parts in standard : the 9135 transmitter + the 8351 combined sensor with its 10m cable + an immersion probe equipped with a loose flange (3 lengths are proposed).

These complete loops can be ordered under the following references :

9135/R01/1 or 9135/R01/2 : 0.5 m immersion

9135/R02/1 or 9135/R02/2 : 1 m immersion

9135/R03/1 or 9135/R03/2 : 1.5 m immersion

➤ **Description of the optional cleaning device :**

Air, water or chemical cleaning available.


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➤ **Advantages :**

The 8351 is a combined ORP probe constituted by the following parts :

- * a platinum measuring element
- * a double junction reference system (KNO₃ then KCl)
- * a built-in low noise 10 m cable

The process liquid junction is made of a special porous Teflon and the first stage of reference system of KNO₃ : these 2 features allows excellent results against polluting ions. For very dirty samples (coating mediums), an optional chemical cleaning kit can be installed. There is no maintenance needs on reference part (electrolyte supply).

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