

Refex pH System for Meat and Cheese.



Application:

The quality of slaughtered meats (especially beef) is measured by penetration pH measurement directly into the carcass – the grades of meat quality are determined by this Q.C. test method.

Application Problems:

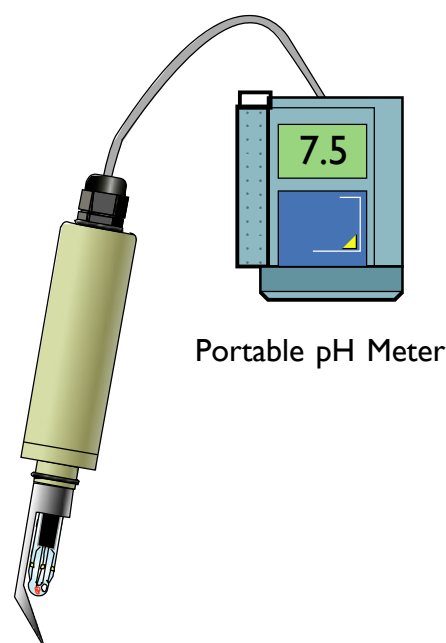
In a typical slaughter/meat packing house hundreds of animals are killed every day. It is a relatively heavy industrial process and each slaughtered carcass has to be pH tested. The pH measurements are made directly in the hanging carcass. Normal pH sensors are fragile glass devices designed for laboratory use. In this application the main causes of electrode failure has been breakage and also protein contamination. The electrode is calibrated using exact pH buffer solutions (typically pH 4.01 and pH 6.88) it is important for the pH measurement of the meat that the electrode does not drift from the calibration values – a drifting pH sensor cannot be relied upon to provide accurate pH values.

Solution to Problems:

Refex Sensors has made an in-depth study of this application and working with a number of meat companies has been successful in developing a reliable and accurate system for the pH measurement of meats. A new 316L stainless steel Stab/knife with a milled out blade has been developed. This accepts a short robust/protein resisting pH combination electrode with a spear point pH membrane and a double ceramic liquid-junction system. This pH combination screws into the Stab/Knife and is sealed with O rings. (See Fig 1.) The Knick Portamess 911 pH meter is supplied also – this instrument has been designed specifically for on-site pH measurement and is accurate and very reliable.

Conclusion:

The new Refex system for penetration pH of meats is resistant to the rigorous demands of this pH application. The new 12mm pH combination electrode sealed inside the 316 stab provides reliable pH values and also the industrial robustness necessary for this harsh environment. To ensure the desired performance from this Refex system please follow the measurement, care and maintenance protocols listed.



Reflex pH System for Meat and Cheese.



Calibration – Care and Maintenance Protocols

1. The Reflex system for penetration pH measurement comprises a stainless steel knife/electrode holder with a Polypropylene handle, a robust protein resisting pH combination electrode and a precision hand held pH meter (which can also be used as a lab instrument) pH buffers and KCl hydrating solution in 500 ml plastic bottles are also available.

2. The pH electrode is supplied with a transparent hydrating cap to keep the pH glass membrane and double ceramic junction fully hydrate. Remove this hydrating cap and wash the electrode glass stem in warm tap water and dry with a clean tissue.

3. The Knife holder has three components the 316L stainless steel penetrating knife, the threaded polypropylene middle part, and the polypropylene handle/grip with cap. Separate these and taking the middle threaded piece screw the pH electrode into place until the 0 ring seals (10.5 x 1.5mm 0 ring). Feed the handle grip over the BNC and electrode cable and screw this handle/grip until the 0 ring seals (22.0 x 1.6mm) feed the handle cap over the BNC and cable and screw this onto the polypropylene handle/grip.

The system is now assembled

4. Connect the BNC connector to the pH meter. Working with the instrument instruction manual switch the instrument on.

5. Calibration of the pH sensor.

Calibration Kit. 3 x 100ml plastic beakers, PH buffer 4.01, PH buffer 6.88, DeMin Water, Tissues.

Half fill a beaker with pH 4.01 pH buffer (always fresh – never reuse)

Half fill a beaker with pH 6.88 pH buffer

Half fill a beaker with DeMin.Water.

Place the stainless steel knife and electrode into the pH 4.01 buffer and calibrate (Cal 1) and wait for the pH instrument to stabilize. Remove the stainless steel knife and electrode and wash off all traces of pH 4.01 buffer in the DeMin water – remove from DeMin and dry using a clean tissue. Place the stainless steel knife and electrode into pH 6.88-pH buffer and allow the pH meter to complete the Cal 2 calibration. Remove from pH buffer 6.88 and wash off all traces in the DeMin water. The electrode is now calibrated and ready for use.

6. The meat knife system must always be used above 15 degree from horizontal this avoids any air-bubbles forming in the tip of the pH glass electrode. Before use shake the meat knife system downwards to release any trapped air.

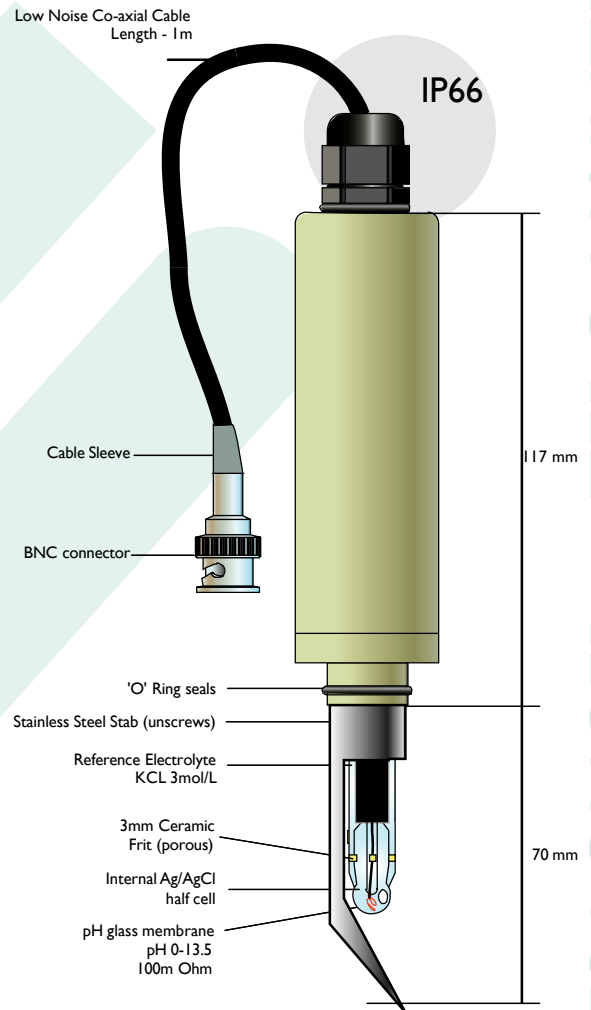
7. Carefully and steadily insert the stainless steel stab into the carcass (about 40mm deep) let the stab settle for 10 seconds then take the pH reading. Carefully and steadily withdraw the stab. Place in DeMin water and wash off any deposits. Repeat the insertion into the next carcass following this protocol.

8. At the end of the day/shift unscrew the stainless steel stab and with a wad of cotton wool soaked in dilute detergent clean off the outside surface of the pH electrode. The stainless steel stab should be cleaned in the same way. After cleaning rinse off the detergent in warm DeMin water – replace the stainless steel stab over the electrode. Half fill the hydrating cap with 3 mol/L KCl hydrating solution and carefully slip this over the stainless steel stab until the hydrating cap seals on the exposed 0 ring.

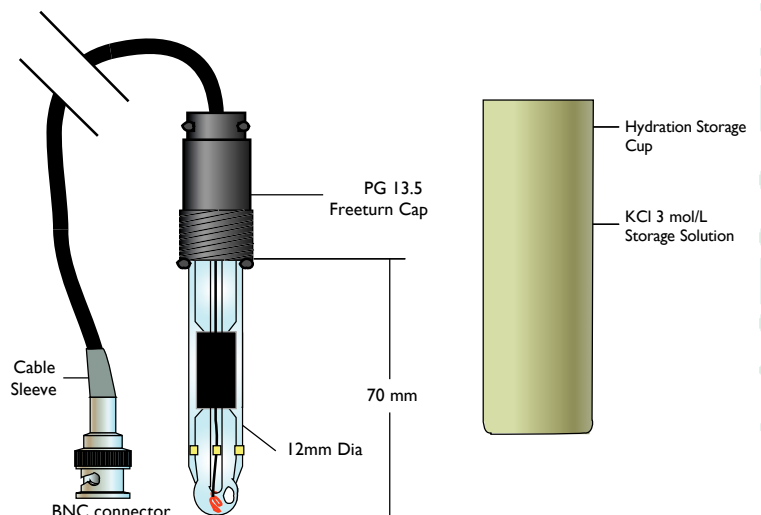
9. Store the Stab penetration vertically (hydrating cap filled with 3 mol/L KCl) so that the sensor is kept in an optimized environment when not in use. Before use remove the hydrating cap and wash the stainless steel stab/electrode in warm DeMin water.

10. Electrode recalibration is not necessary on a daily basis – a buffer check will prove this. Take the three clean 100ml beakers and fill them as if to recalibrate. Place the electrode in pH buffer 4.01 and wash them pH 6.88 if the pH meter shows the correct pH values of the pH buffers then recalibration is not necessary. Should the electrode have drifted away from the values of the pH buffers then a recalibration is necessary.

11. ALWAYS USE FRESH BUFFERS EVERY DAY.



Electrode Specifications:	
pH Range	: 0-13.5
Temperature	: 0-90 deg C
Reference	: Double Junction Ag/AgCl
Cable Length	: 1.5m (Dia 5mm)
Connection	: BNC with cable Sleeve
Electrode Type	: EC-FT-2010-70-11
Kit (Part Numbers):	
pH Meter	: Knick Portamess 911
SS Stab Holder	: SS-STAB
pH Combi Electrode	: EC-FT-2010-70-11
pH Buffers 500ml	: pH 4.01 - 500ml
pH Buffers 500ml	: pH 6.88 - 500ml
KCL hydrating Solution	: KCl - 500ml



LASTS 3 TIMES LONGER ... ZERO MAINTENANCE