

Amperometric cell housing for the measurement of chlorine, bromine or other oxidants in clear, salt or marine waters
Single cell or Output – 4...20 mA isolated 12/24V DC
Types BMP4xxx and AMMxx5x

The BMP4xx1 and AMMxx5x cell housing are used to measure active free chlorine, free bromine or any other oxidant contained in fresh water, salt water or seawater by the so-called "open" amperometric method with two electrodes (Cu/pt or Cu/Gold). Cu/gold technology is used preferably with electrolysis techniques.

2. Technical specifications

BMP 4001 : Cell housing Cu/pt - Connection Acetal push 8x5mm
AMM 0150 : Cell housing Cu/pt 10ppm with converter 4...20mA

Measured values: Active free chlorine, free bromine or other oxidant

Application area : Fresh, salt or marine pools

Without converter:

Raw electrode sensitivity Cu/pt (25°C and pH=7,5) About 40uA/ppm
Raw electrode sensitivity Cu/gold (25°C and pH=7,5) About 8uA/ppm
Resting current (excluding oxidant) From 5 to 20uA
Usual load 500 to 5KΩ

With isolated measurement converter:

Available measuring ranges (for 4-20mA):
Bromine or chlorine: 0 to 2mg/l
Bromine or chlorine: 0 to 5mg/l
Bromine or chlorine: 0 to 10mg/l
Bromine or chlorine: 0 to 20mg/l

Minimal conductivity >200uS/cm

pH of use: Must be constant
pH range: Depends on the oxidant and its chemistry

Sensitivity to isocyanuric acid: High sensitivity: Isocyanuric acid < 20mg/l

Maximum input pressure: 0,5 to 3 bars
Pressure dependence 1%

Adjustable micrometric flow rate: mini : 20 l/h
Maxi : 100 l/h
Recommended : 30 l/h

Flow regulation between the electrodes: By micrometric screw

Start time: first calibration after 4 hours
Recommended calibration: after 24 hours

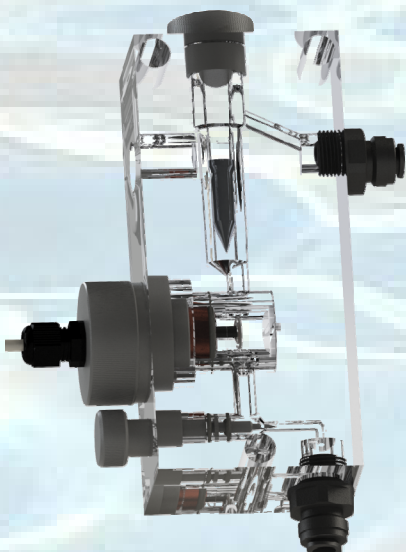
Electrode life Cu/pt: Depends on water quality
(Normally 12 to 24 months)

Mechanical cleaning: By cobalt activated glass beads
Electrode materials: Cu/pt and Cu/gold

Cell housing material: Plexiglas (PMMA)
Connection parts: PVC, PVDF or 316L stainless steel
Primary connection type: Fast 5x8mm or conical 4x6
Type of output connection : Fast 5x8mm with "sewer" kit

Type of protection IP65

Flow sensor: Yes (Option)
Supply voltage (with converter 4...20mA) 12VDC or 24VDC



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Tolerance	+/- 5%
Output signals with converter	4-20mA Galvanically isolated

3. Method of chlorine or bromine measuring

The determination of the content of active free chlorine or free bromine or any other oxidant using so-called "open" cells uses the "amperometric" measuring method.

Two measuring electrodes made of copper and platinum (or gold) constitute, with the medium as electrolyte, an electrochemical current generating couple.

If the measuring medium does not contain chlorine or bromine, the measuring cell is fully polarized. Only a small residual current is generated and must be electrically compensated inside the measuring instrument. If the medium contains chlorine or bromine or another oxidant, depolarization is opposed to polarization. An electrical current (depolarization current) is obtained which, under stable conditions, is proportional to the amount of chlorine, bromine or oxidant transformed.

For the depolarization current to be measurable as a function of the oxidant in the solution to be measured, the cell must be pre-polarized in the medium containing the same oxidant.

The BMP4xxx and AMMxx5x cell housing can be subjected to a supply pressure of 0.5 to 3 bar. There is a total water flow of 50-200 l/h.

The overall water flow rate is adjusted by the micrometer throttle screw of the cell.

4. Assembly/installation/connection of the Cu/pt cell

The BMP4xxx and AMMxx5x cell housing must be mounted on a vertical, dry and clean wall. The measuring chambers are delivered assembled and ready for use.

- Secure the measuring cell to the wall with 4 screws and dowels
- Mount other sensors if necessary
- Connect the hydraulic tubes (The outlet must be free, vertical and without back pressure.
- Fully open the shut-off valve of the sample rod.
- Slowly turn the throttle screw to the left until the water allows the float of the integrated flowmeter to rise to the height engraved on the measuring chamber. If the flow rate is too high, the float reaches its high level and locks in.

Caution:

The measuring cell must be preceded by a shut-off valve and a filter (pores \leq 0.5 mm). For a water pressure higher than 3 bar a pressure reducer must be provided.

Before mounting the probe in the measuring chamber, close the shut-off valve upstream of the chamber. Depressurize the system.

Take appropriate protective measures when handling oxidizing solutions or chlorinated or brominated water.

4.1 Maintenance: Changing Cu/pt electrodes

The measurement must be checked regularly (e. g. weekly).

If the water temperature changes, perform a new calibration. The same applies if the salinity (conductivity) and pH value of the water change.

Depending on the degree of water clogging, the filter should be cleaned at regular intervals.

Electrodes changing Cu/pt (CAA0023) or Cu/or (CAA0034)

It is necessary to change the electrodes:

- When they are defective
- When one of the electrodes is heavily worn
- When the sealing of the electrode seal is defective.

Identification of terminal block connections

Pt (gold) : Blue wire Cu: Brown wire



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Caution:

When disassembling the Cu/pt or Cu/gold electrode, make sure that the glass beads in the measuring chamber do not fall out. To do this, unscrew the chamber from its wall bracket and orient it horizontally.

- Stop the water flow upstream of the chamber.
- Empty the measuring chamber of the water it contains by opening the drain connection.
- Caution: water runs out (approx. 60 ml)
- Remove the cable gland (PE) completely to reach the electrodes
- Unscrew the nut with the PE and disconnect the connecting cable from the terminal block
- Orient the measuring chamber horizontally
- Remove the measuring electrodes from the measuring chamber.
- Also change the glass beads

Reassembly is done in the opposite direction.

5. Calibrations

Once the assembly work has been completed and the cell has been electrically connected to the device (see controller commissioning brochure), proceed with commissioning.

5.1 Polarization

Before the start of the calibration, the measuring device must have operated for at least 24 hours in chlorinated or brominated water. This delay is necessary to condition the copper surface of the measuring electrode.

5.2 Zero point calibration

- Send non-chlorinated water through the measuring cell or switch off the flow of analysis water.
Ideally, non-chlorinated or non-brominated water is obtained by passing the water through an activated carbon filter before entering the measuring cell.
- After approx. 10 minutes of waiting, set the display to zero using the "zero" calibration system of the measuring instrument.

5.3 Slope calibration

- Open the circuit until water flows through the measuring cell again (approx. 5 minutes). Choose a chlorine content, which allows to obtain a measured value close to the end of the scale or the usage measurement.
- Set the display to the measured value using the "Gain or slope" calibration system of the measuring instrument.



Caution:

After changing the Cu/pt electrodes, a complete calibration of the "zero" and slope must be performed in all cases!

6. Accessories

Cu/pt electrode kit: reference. CAA 0023
Cu/gold electrode kit: reference. CAA 0034