

# Magnesium Anode Current Controller ( MACC )

## Data Sheet

Cathtect Engineering (Pty) Ltd are proud to announce the multimode **Magnesium Anode**



**Current Controller (MACC)**. The user programable multimode (MACC) unit has the ability to control the structure potential through controlling the Output current of Magnesium, Aluminium and/or Zinc Anode/s in one of either Instant Off potential control, Constant Reference control, Net Current pick up and/or Constant Current control. The unit is powered utilizing 90 through 264V AC Single phase and is equipped with a Long Life battery, which is charged when connected to mains or

when the solar panel is exposed to sunlight. The battery backup is capable of sustaining the units operation for more than three days and as such provides seamless operation when power outages occur. Truly the (MACC) has the ability to reduce Anode material wastage (premature consumption) and overdriving of current when installed into the Anode circuit. Intelligent and optimal control of the reliable Sacrificial Cathodic Protection process.

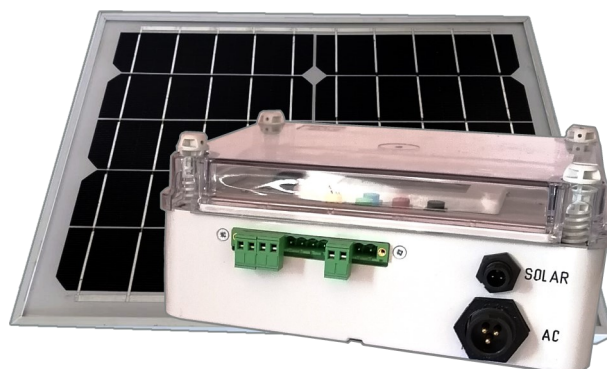
## Benefits and Features

Auto control in one of the following modes;

- ⇒ Control of Tank to Electrolyte Potential on Instant Off
- ⇒ Constant Reference Electrode feedback control
- ⇒ Constant Current control
- ⇒ Net Current Pick up
- ⇒ Eliminates IR Free errors
- ⇒ Limits unnecessary Anode current
- ⇒ Prolongs Anode life
- ⇒ User friendly menu driven controls



- ⇒ Regulates unnecessary wastage of Anode current
- ⇒ Limits Tank Potentials to user defined Potential levels
- ⇒ Suited to remote off grid tank and structure systems
- ⇒ Long battery life >10Years
- ⇒ Super resolution of 1mA
- ⇒ High Contrast LCD display
- ⇒ Suited to Magnesium, Aluminium and Zinc Anodes
- ⇒ Suited to multiple Reference Electrode types
- ⇒ Capable of control up to 6Amps with an automatic range/resolution control adjustment (typically required by today's highly improved coatings).
- ⇒ Extremely low current demand upon tank refurbishment to higher current demand as the coating deteriorates over time.
- ⇒ Simplified control brought about through digital electronics.
- ⇒ Optional Remote Monitoring
- ⇒ Industrialised, rugged and simple installation
- ⇒ 4 High input impedance >20 meg $\Omega$
- ⇒ Simple user definable feedback reference Electrode (on the fly)
- ⇒ Displays all Reference Electrodes, even in INSTANT-OFF control displaying "OFF" measurement as well as the last "ON BEFORE OFF" measurement.



## Principle of Operation

When a metal is immersed in an electrically conducting liquid it takes up an electrode potential; this is known as its corrosion potential. This potential is determined by the equilibrium between the Anodic and Cathodic reactions occurring on the surface and it is measured with reference to a standard electrode, such as a Copper-Copper Sulphate electrode, CSE. The coupling of two metals together increases the corrosion rate of the Anode (initially the metal with the more electronegative potential) and reduces, or even suppresses, corrosion of the Cathode (the metal with the more electropositive potential).

Coupling a structure to a Sacrificial Anode can Cathodically protect the structure, subsequently understood as Cathodic Protection. Abandoning the two metals to operate in the electrolyte leads to wastage and the lack of optimisation in the abandonment of the metals to freely interact, becomes obvious.

Changing, introducing and understanding the impedances involved in the aforementioned process can lead to the reduction of waste and provide an environment that permits control and measurement.

The (MACC) optimises the interaction between the Anode and the Cathode by introducing a purposeful variable impedance into the circuit, thereby regulating the current to optimal levels and reducing overprotection and over current. The (MACC) having an external power source, in no manner adds to the consumption of the oxidising Anode and contributes to the further optimisation of the consumption of the Anode and reduces unnecessary coating stress through overprotection.

The (MACC) simply and effectively controls the flow of current with pertinent features such as Current and Reference Electrode measurement. The feedback elements, current and measured potential, permit the automatic control of the Anode consumptive protection process, limiting premature Anode consumption and possible early coating failure.

It has, over time, become evident that natural corrosion is averted if the measured potential between a Cu/CuSO<sub>4</sub> Reference Electrode and a structure is measured to be more negative than -850mV CSE and in some cases -950mV.



In the presence of stray or interfering current flow, this measurement becomes obscured and thus the (MACC) provides for the measurement and automatic control of the structure to Reference Electrode potential in three distinct control modes;

- ⇒ Constant Current
- ⇒ Constant Reference
- ⇒ Net Current Pick up
- ⇒ Instant Off

The (MACC) is another product in a range of products actively designed to provide the user with productive worldwide expertise, garnered over more than 50 years of Cathodic Protection installation exposure.

*Our expertise becomes your ease of operation and optimisation.*

#### **(MACC) Components and Accessories;**

- ⇒ The (MACC) is housed in a GEWISS Poly Carbonate IP64 enclosure, suited for outdoor use.
- ⇒ A 6V 10W solar panel is utilized for maintaining charge on the internal life battery.
- ⇒ 4# Long life Cu/CuSO<sub>4</sub> Reference Electrodes
- ⇒ Remote Monitoring module
- ⇒ Vandalism environment shield
- ⇒ Extended Reference Electrode cable (Min qty 30ft)
- ⇒ Extended solar connection cable including plugs for easy client deployment.
- ⇒ Mains power extension

#### **SPECIFICATIONS**

##### **DISPLAY**

- ⇒ White high visibility background with black letters
- ⇒ Multiple user, real time interface screens manually negotiated via push button.
- ⇒ AC Supply 96-264VAC single phase

