

**Wilson Walton
International**



MARINE GROWTH PREVENTION SYSTEM MGPS

Cathodic Protection Specialist

Manufacturing complying with International Standards

Introduction

Wilson Walton International has a reputation worldwide as a leading supplier of equipment and systems for marine cathodic protection. Experience gained in a variety of environments including sub-zero to tropical temperatures and fresh, estuarine and sea waters has given the company a high level of expertise ensuring the correct selection of materials for cost effective operation. This expertise has now been utilized in the development of a system for the control of corrosion and marine growth in seawater circulation systems.

WWS PRAICOMATIC® v5 System is Wilson Walton International Spain system of Cathodic Protection using the impressed current method (MGPS). Developed over many years of practical experience at sea, the latest version of the *WWS PRAICOMATIC® v5 System* employs some of the best electrical equipment and sea chest, box cooler, etc.. units available, designed to withstand the rigorous of shipboard use with minimal maintenance.

Microprocessors and the availability at low cost of mass memory capability have provided WWI Spain means of monitoring and controlling the performance of the *WWS PRAICOMATIC® v5 System*.

The maintenance of shipboard seawater circulation systems in prime condition is an important aspect of efficient ship management. If seawater lines become corroded or blocked by marine growth, the efficiency of pumps, heat exchangers, condensers and many other pieces of equipment and their associated pipework becomes jeopardized, affecting not only the effective working of the vessel but incurring expense and vital down time and lost man-hours as the affected systems are cleared, repaired or replaced.

To combat the dual problem of marine growth and corrosion, WWI Spain has developed a system called *WWS PRAICOMATIC® v5 System*. Based on simple electrolytic principles, the *WWS PRAICOMATIC® v5 System* is easily installed, requires minimal maintenance and provides complete protection without the problems of toxicity that can be associated with other anti-fouling systems.

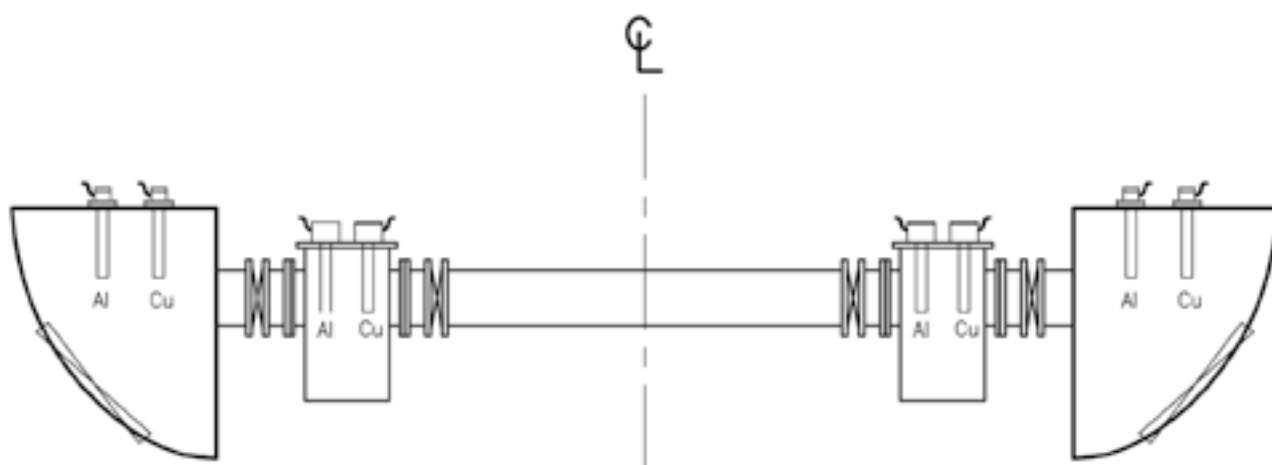


Fig.1 Typical arrangement of anodes in sea chest and strainer. Steel pipework.

Principle of Operation

The metals in a seawater system are affected by electrochemical corrosion. Corrosion occurs when a current flows from one metal to another, or within a single metal, through an electrolyte.

The electrochemical characteristics of the respective metals and their position in the galvanic series govern the direction of current flow but current flows in the electrolyte from anode to cathode and metal is lost from the anodic component. In a seawater circuit the metals are the component parts of the system, the anodes and cathodes. Seawater is the electrolyte.

Anodic and cathodic areas exist on metals in seawater systems as the result of several conditions, including the coupling of metals of different potentials, differences in composition of the metals and temperature gradients.

Elimination of the anodic areas of metallic components in the circuit is vital if corrosion is to be successfully controlled.

Marine fouling and bio-fouling also commonly occur in seawater circulation system. This involves the establishment of marine plants and animals, and bacterial growths. These fouling organisms enter the system in microscopic or macroscopic form eg, larvae and spats, settle and develop into adult forms wherever favourable environmental conditions exist.

Hard fouling by mussels, barnacles etc. most commonly occurs in seawater circuits and can result in interference in flow conditions, blockage and increase corrosion. Traditional chemical methods of water treatment to prevent fouling are now less favoured, particularly, for example, chlorination. Chlorine accelerates corrosion rates, usually by causing pitting attack on steel, is environmentally unacceptable and treatment requires continuous monitoring and control.

The WWS PRAICOMATIC® v5 System

WWS PRAICOMATIC® v5 System, employs the well-established impressed current cathodic protection principle. Direct current applied to the copper anode(s), WWS CUPROLINE® (created from electrolytic copper), releases a controlled quantity of copper ions into the system to create an environment in which primary forms of marine life cannot exist.

Current applied to the aluminium anode, *WWS ALUMINASA®*. or *WWS ALOLINE®*. (created from purity aluminium), releases a “floc”, a precipitate of aluminium hydroxide.

The aluminium oxidation products reduce corrosion rates in the sea water system on ferrous components by modifying the ferrous oxides formed and by film deposition, *WWS ALUMINASA®* or *WWS ALOLINE®*. Similarly, iron anodes are utilised for reducing corrosion rates of non-ferrous components, *WWS FERROLINE®*.

The *WWS PRAICOMATIC® v5 System*, is automatic, requires minimal maintenance and is environmentally friendly. Mussels are not killed by the system: the environment it creates prevents them settling or developing. A further benefit of the *WWS PRAICOMATIC® v5 System*, is that potable water distillation plants can be operated without interruption.

The anode is mounted on a metal cofferdam at all times ensuring the tightness of the vessel. (Society Class Approved DNV).

Anti-Fouling & Anti-Corrosion Electrodes

WWI Spain has developed a range of anodes with mountings which enable them to be installed in the sea chests or strainers of almost any type of vessel.

The size of the anodes is determined by the flow rates and their anticipated design life, taking into consideration the scheduled dry docking period.

Detailed drawings are supplied for every ship to assist in installation and ensure that the anodes are positioned for maximum effectiveness in the seawater flow.

The anodes can be installed using a number of mounting arrangements.

- Steel pipework – protected by copper and aluminium anodes.
- Cupro-nickel pipework – protected by copper and ferrous anodes.
- Anodes with integral cathodes – used where there is no return path for the current in close proximity.
- Sea chest mounted anodes – generally installed at newbuilding and are replaced at dry-docking.
- Strainer mounted anodes – can be replaced at any time when the vessel is alongside.
- Anodes with dedicated cathode arrangements. Used where strainer bodies are internally lined and the strainer basket is isolated.



Fig.2 Anodes WWS CUPROLINE®, WWS ALOLINE® & WWS FERROLINE®.

Standard anodes available

Diamet. (mm)	Length (mm)	WWS CUPROLINE® (Kg)	WWS ALUMINASA® & WWS ALONINE® (Kg)	WWS FERROLINE® (Kg)
50	200 - 400	3,50 - 7,00	1,00 - 2,10	3,10 - 6,20
70	200 - 550	6,90 - 18,90	2,00 - 5,70	6,00 - 16,60
80	300 - 650	13,50 - 29,00	4,00 - 8,80	11,90 - 25,70
90	400 - 750	22,70 - 42,50	6,90 - 18,90	20,00 - 37,50
100	400 - 800	28,00 - 56,00	8,50 - 17,00	24,70 - 49,40
110	400 - 800	34,00 - 67,80	10,20 - 20,50	30,00 - 59,80
120	400 - 900	40,30 - 90,80	12,20 - 27,50	35,50 - 80,00
130	400 - 950	47,30 - 112,50	14,30 - 34,00	41,70 - 99,00

*These anodes/electrodes we can manufacture any other size on request.
All anodes/electrodes are certified.*

Control Power Unit

Our CPU are powered directly at 220Vac - 1pH - 50/60Hz so they do not need to have power transformer, achieving a very considerable savings in weight and volume. CPUs are designed with the best existing electronic components and complying with international regulations.

The CPUs are designed preserving a principle of maximum robustness and maintaining appropriate dimensions and weights for each application, which means that they can be installed directly on bulkheads, saving a lot of space in the place of their location and facilitating their maintenance.

WWI Spain has made a major advance in MGPS technology with the development of CPU **PRAICOMATIC® v5 System**, the intelligent system for naval vessels. Warships require specialized MGPS systems which prevent hull corrosion, but do not interfere with the electrical war-fighting capability of the ship.

The CPU **PRAICOMATIC® v5 System** is specifically designed to meet the stringent requirements of EMC/EFI, shock, vibration, low maintenance and flexibility of operation in the military environment.



Silentblocks installed on Praicomatic® v5 12V/40A

Each CPU can install up to nine (x9) control cards and each control card can control up to four (x4) anodes each one. (Other configurations upon request). Each control card has a visual display for taking and modifying parameters.

One of the main principles behind the design of the new anti-fouling CPU is greater connectivity. The panels produce an MODBUS RTU signal which enables the system to be governed from a more convenient location such as a control room or alternatively the data could be fed to the ship's bridge computers. *(Other communications upon request).*

What's more, filling in log sheets becomes a thing of the past, because the data can be uploaded to a USB stick and then e-mailed to WWI Spain for detailed analysis or send it by GPRS.

Standard CPU Available

Below are some standard sizes but we can manufacture it according to the configuration requested by the client.

Electrodes n°	Output Rating (DC)	Cabinet Size (WxHxD)	Installation	Weight (≈ Kg)
4	12V / 8A	350x250x155	Bulkead or Pedestal	8
8	12V / 16A	400x400x210	Bulkead or Pedestal	16
12	12V / 24A	500x500x210	Bulkead or Pedestal	20
16	12V / 32A	600x600x210	Bulkead or Pedestal	30
20	12V / 40A	600x600x210	Bulkead or Pedestal	32
24	12V / 48A	600x800x210	Bulkead or Pedestal	40
28	12V / 56A	600x800x210	Bulkead or Pedestal	44
32	12V / 64A	600x800x210	Bulkead or Pedestal	52
36	12V / 72A	600x800x210	Bulkead or Pedestal	48



CPU Praicomatic® v5 12V/40A & 20 anodes

Installations, Commissioning & Service

In Fig. 2 a drawing of the typical installations of the *WWS PRAICOMATIC® v5 System* is shown.

The *WWS PRAICOMATIC® v5 System* is supplied complete, except interconnecting cables, cable tray, etc., which are normally shipyard supplies. With each system there is a complete set of drawings. Manuals and specifications are included to facilitate installations and maintenance. The installation is normally carried out by the shipyard under the supervision of an engineer from WWI Spain. When necessary, WWI Spain will obtain the approval of the Classification Society for the installation before the start of the work.

Hull component installations can take place during a few days during ship construction or during a period of routine dry dock. Electrical and auxiliary equipment can be installed simultaneously or when the ship is once again afloat.

Once in service, the operation of a *WWS PRAICOMATIC® v5 System* is completely automatic and does not require any adjustment. However, to confirm that the system is working correctly, record sheets are provided in which the daily recordings of the operational readings of the control unit are made. In addition, our CPUs can be equipped with an automatic read-taking system and can be sent remotely.

Completed log sheets returned to WWI Spain offices are used to evaluate system performance. Possible malfunctions requiring the attention of a service engineer are identified at an early stage.

Although the reliability of the *WWS PRAICOMATIC® v5 System* is well proven, WWI Spain recommends that installations are serviced on a routine basis during dry-docking by their trained personnel.

Stocks of *WWS PRAICOMATIC® v5 System* components are maintained in all WWI Spain offices to ensure delivery at short notice trained when required.

WWI Spain has technicians that can perform technical assistance anywhere in the world.

Principal Customers

Shipyards, National and International Ship-Owners, Spanish, Norway, Australia Venezuela, Turkish Navy, Offshore and Oil & Gas companies, Port facilities, etc...



Area reserved for your Local Wilson Walton International Agent/Office is:

WILSON WALTON INTERNATIONAL, S.A. and its collaborators incorporate companies established in the main shipping centers of the world. This structure facilitates the range of international products and the availability of local experience and system design. The company WILSON WALTON INTERNATIONAL, S.A. It is service oriented and oriented mainly to the Maritime, Military, Offshore, Onshore and Port Facilities with the support of a consolidated. Engineering and Consulting department.

SYSTEMS & PRODUCTS (Marine, Military, Port Facility, Onshore & Offshore Applications)

Sacrificial Anode Systems. **WWI ALONINE®** & **WWI ZINCOLINE®**.

Impressed Current Cathodic Protection Systems, **WWS AQUAMATIC® System**.

Marine Growth Prevention System, **WWS PRAICOMATIC® System**.

WWS ALUMINASA®, WWS ALOLINE®, WWS FERROLINE® & WWS CUPROLINE®.

This publication is one of a series of Technical Product Information brochures on aspects of cathodic protection for Offshore, Onshore, Marine and Port Facilities applications. Further information about the series is available on request through sales@wilsonwaltoninternational.com

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