



Capac[®] Impressed Current Cathodic Protection (ICCP) Systems for the Ultimate in Corrosion Protection

Water Technologies

SIEMENS





Marine Applications

- Naval vessels
- LNG carriers
- Oil tankers
- Container vessels
- Bulk carriers – grain ships
- Cruise ships
- Ferries
- Commercial and pleasure crafts
- Offshore oil structures

Capac[®] systems fight galvanic corrosion at the source

Siemens Water Technologies is a leading producer of cathodic protection systems, providing solutions for the galvanic corrosion problems normally associated with ships and floating offshore structures. Founded in 1950 as part of Engelhard and acquired by Siemens in 2004, our Electrocatalytic business offers technical solutions and support services worldwide.

A division of the Siemens Industrial Solutions and Services Group, Siemens Water Technologies capitalizes on the world-class experience, technology, R&D support and manufacturing facilities of the group, which provides innovative solutions and services for improved life cycle costs in processing and manufacturing industries and in infrastructure.

Industry standard Capac[®] impressed current cathodic protection (ICCP) systems provide automatic, permanent protection that prevents electrolysis and galvanic corrosion from attacking the submerged surfaces of a broad range of sea-going vessels and fixed or mobile offshore structures. Capac[®] systems combine our in-house state-of-the-art anode and electrode technologies with excellent engineering, design, manufacturing and quality control to produce superior, reliable solutions. There are more than 3,000 Capac[®] systems installed around the world.



Capac® systems use highly reliable platinum or mixed metal oxide anodes and silver/silver chloride reference electrodes.



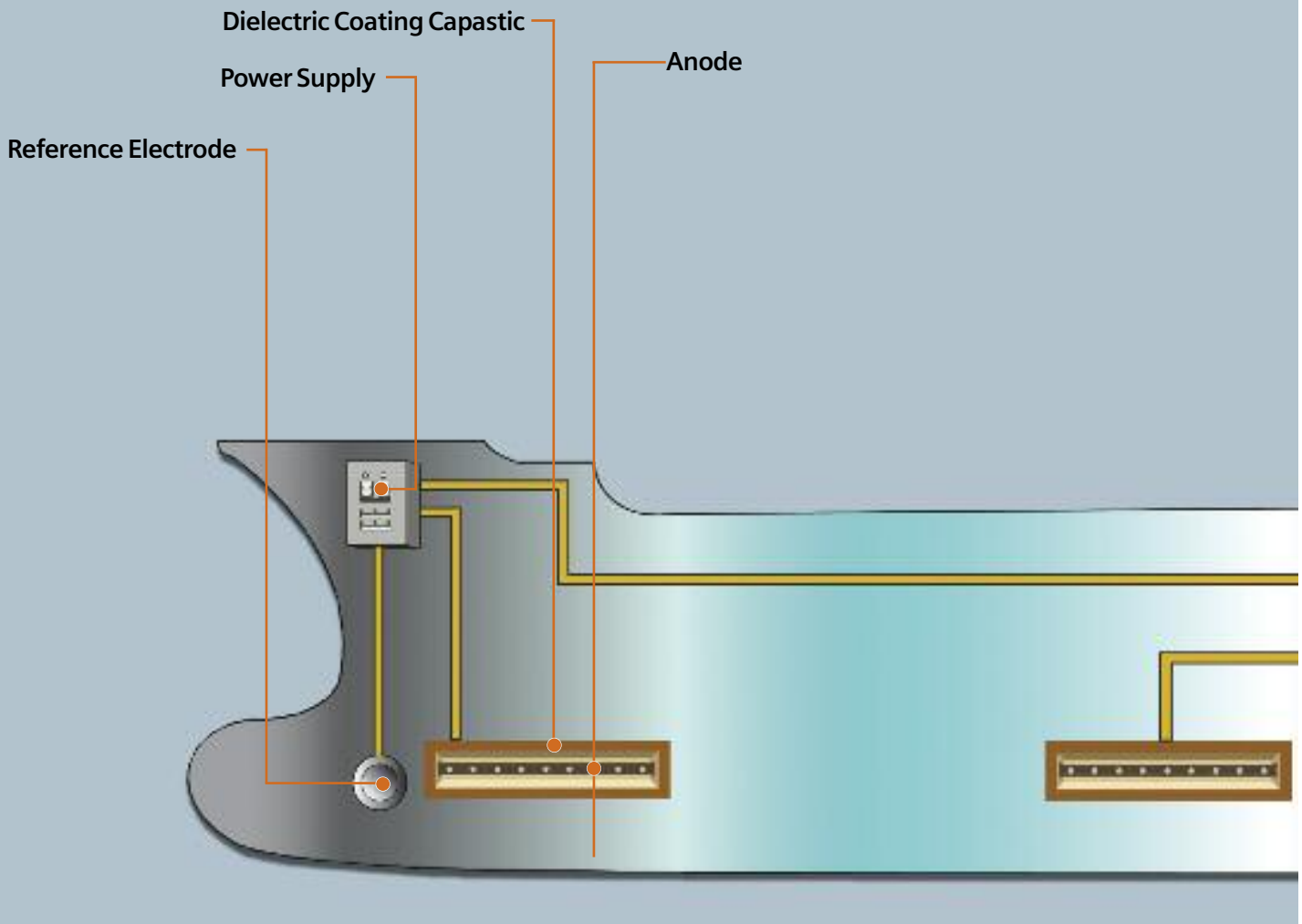
Capac® system high frequency switch mode type power supply / rectifier (wall mount)

For ships at sea and floating offshore structures, the cost of corrosion can be substantial. Port engineers know only too well the expenses incurred in maintenance, fuel costs and downtime when a ship is taken out of service and drydocked because of premature corrosion. Structural corrosion can also wreak havoc on the condition of floating offshore structures, necessitating unexpected, costly repairs.

Capac® systems are the standard for permanent, on-board or on-site automatic systems that prevent electrolysis and galvanic corrosion from attacking the submerged surfaces of vessels and mobile offshore production and drilling platforms. Our systems work by supplying a controlled amount of DC current to submerged surfaces using highly reliable platinum or mixed metal oxide anodes and silver/silver chloride reference electrodes. This electrical current is constantly monitored and regulated by the system itself to prevent the electrochemical action of galvanic corrosion before it begins.

Our high-tech Capac® ICCP system is the ultimate state-of-the-art, long-term solution to corrosion problems, and is recognized as a superior alternative to sacrificial anode systems, which require frequent replacement. Capac® systems are preferred by ship owners because they reduce fuel cost and maintenance.

For more than 25 years, seagoing vessels of every type and size – oil tankers, LNG carriers, cruise ships, pleasure craft, workboats, semi-submersibles, and more – have benefited from the 24-hour protection provided by Capac® ICCP systems against the costly, corrosive effects of electrolysis. In fact, Capac® systems have become the standard in the shipping industry for automatic controlled impressed current protection systems – a distinction earned as a result of our proven 20-year design life, engineering to the highest standards, dedicated manufacturing, and rigorous quality control. Our Capac® system reliability and functionality have made it the standard of the US Navy for more than 30 years.

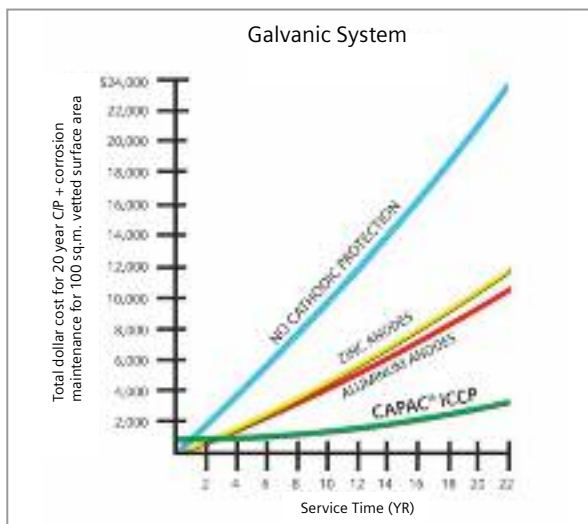
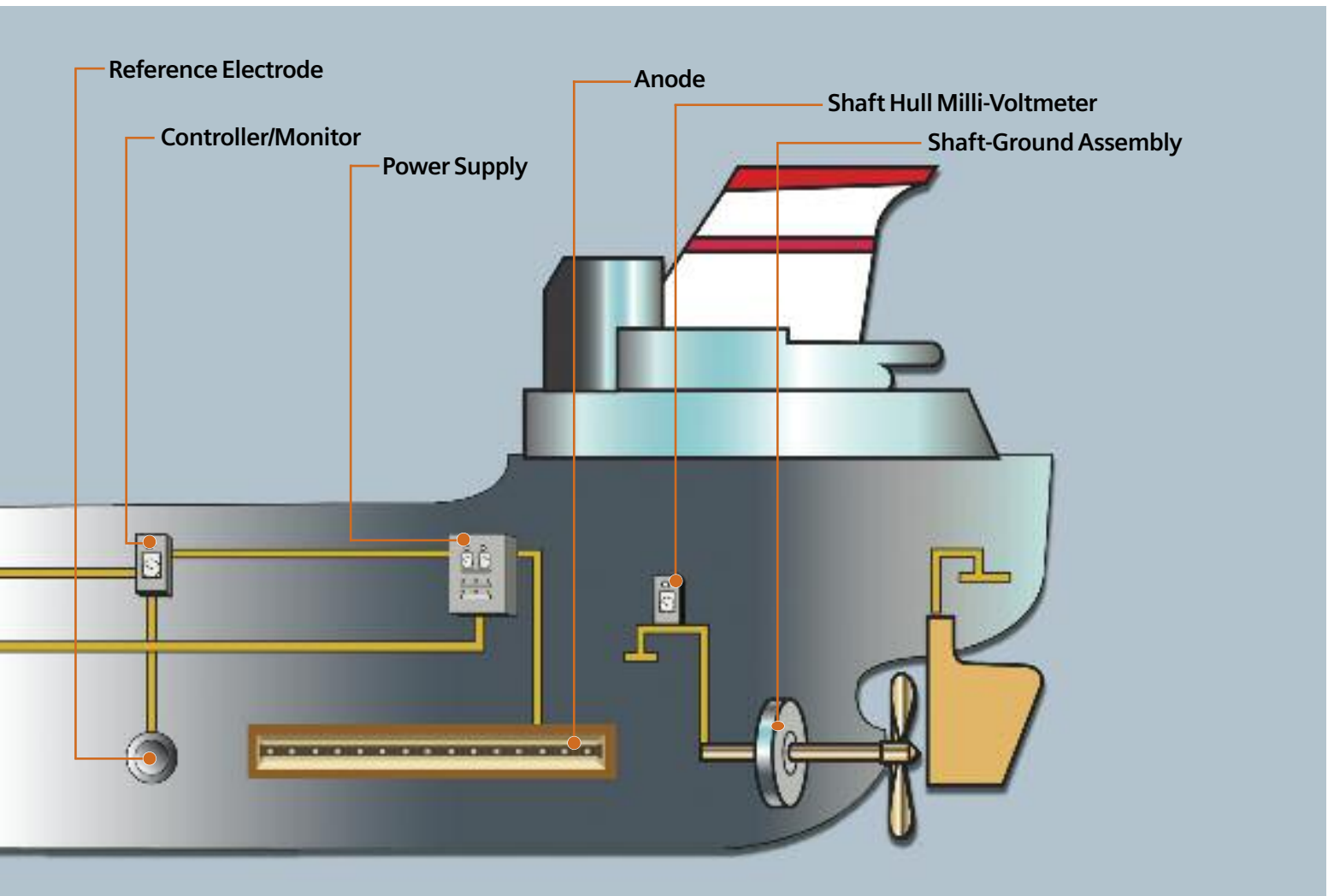


Capac[®] systems offer long-term cost benefits

Capac[®] systems help increase the lives of rudders, shafts, struts and propellers as well as any other underwater parts affected by electrolysis. Capac[®] system anodes, reference cells, and automatic control systems maintain just the right amount of protection for underwater hulls and fittings, unlike standard zinc anodes, which cannot adjust to changes in salinity or compensate for extreme paint loss.

With Capac[®] systems, ship owners get a full range of standard components for corrosion protection tailored to the vessel, under all operating conditions. Our systems have been approved by all classification societies for all types of vessels.

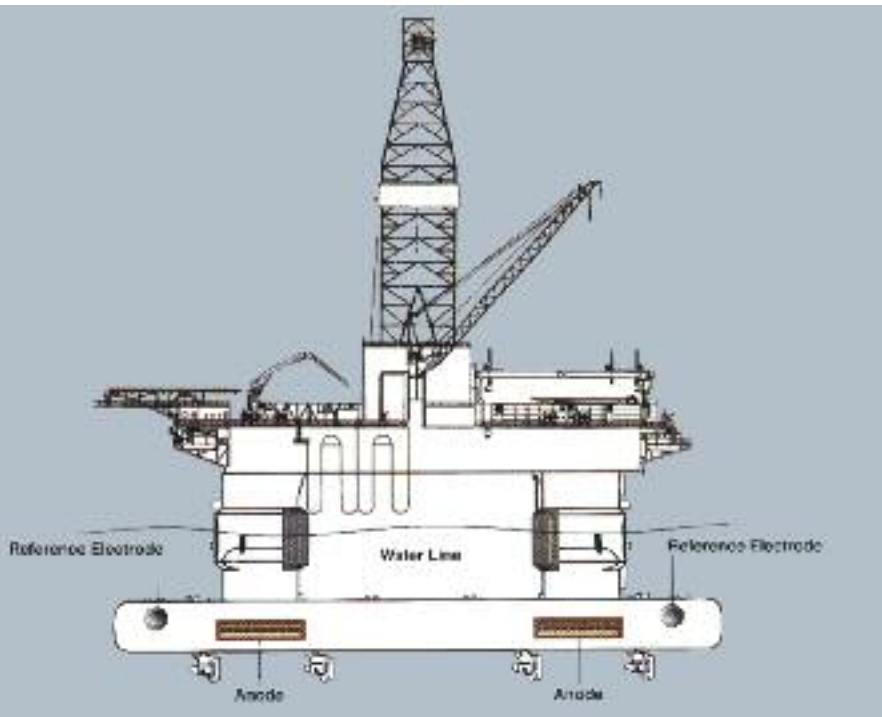




The Capac® system brings long-term cost benefits when compared to sacrificial anodes and ships with no cathodic protection.

Capac® system advantages:

- Designed to provide a 20 plus year service life
- Anodes are light, sturdy and compact for easy shipping, storage and installation
- Automatic control equipment ensures reliable, simple operation
- Optimum documented corrosion protection at minimum overall cost
- Only one installation required for the life of the vessel or structure
- Increased drydock interval



Semi-submersible drilling unit with diver serviceable anodes and reference electrodes.

Capac[®] systems offer reliable long-term off-shore protection

Offshore protection

The long-term benefits of Capac[®] systems realized on ships of every type for more than 30 years are finding a welcome home at more and more mobile offshore structures. Capitalizing on decades of experience gained from more than 3,000 successful shipboard installations, we offer a wide range of Capac[®] system component designs suitable for unique systems that our engineers can select and recommend to address your specific fixed and offshore needs.

Offshore structures

Capac[®] systems can be designed to protect a wide range of mobile offshore production and drilling platforms. Our customers recognize the long-term benefits of our DS, or Diver Serviceable, anode designs.

Capac[®] systems avoid the disadvantages of galvanic protection:

- Self-sacrificing anodes that normally require replacement at every second drydocking
- Ineffective operation limited in scope
- Heavy, bulky anodes that are expensive to ship, store and handle in the shipyard
- Unreliable performance
- Temporary corrosion protection over the life of a vessel or structure – and up to seven times as expensive as Capac[®] impressed current systems



Capac[®] systems are the number one choice of customers worldwide

Recognized global leadership

- Over 3,000 shipboard Capac[®] systems are currently in use around the world – more than all of our competition combined
- Complete systems are designed in-house
- Anode and system development are our strengths
- Siemens offers customers a single-source supply and manufacture of all major Capac[®] system components
- First choice of the US Navy for more than 30 years

Unparalleled quality

- Professional factory QA staff assures product quality the first time
- Total Quality Management is our philosophy

Worldwide service

- Our worldwide network of strategically located service centers, one of the best and largest in the world, is stocked with quality factory parts and staffed by factory-trained service technicians
- Installation, commissioning and on-site staff maintenance services are available worldwide, 24 hours a day, every day
- Factory parts are stocked worldwide, available for timely delivery

Maximum protection for your ship

- Siemens also offers Chloropac[®] systems designed to prevent marine growth and biological fouling in a ship's seawater piping, heat exchangers and sea chests

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