



**HOCKWAY™**

## Cathodic protection for In Plant Piping



**HOCKWAY**  
IN PLANT PIPING

[www.hockway.com](http://www.hockway.com)

## In Plant Piping

We supply Cathodic Protection to protect carbon steel and stainless steel buried in plant piping from corrosion and as a powerful secondary defence to factory and field applied coatings.

### Planning the Ideal In Plant Piping CP System

Damage to pipelines coatings occur during movement, installation or simply general coating deterioration leaving exposed areas that can only be protected by CP.

As in plant piping can vary from short sections of pipe to long runs of complex piping, and whether in small stations or large production facilities, we offer site surveys and detailed design to make sure you have the optimum CP system for your needs.

Our CP systems take into consideration:

- Isolation
- Coating system applied
- Age of pipeline/coating system
- Soil type and corrosivity
- Plant congestion
- Pipeline routing
- In-line valves or take-offs
- Power availability

We supply a range of CP systems, to meet your environment and factors. As a rule of thumb however, we can supply for the following circumstances:

Characteristics	Possible Systems
Small pipeline sections	Sacrificial
Short well coated pipes	Sacrificial
Long lengths	Impressed
Multi pipelines	Impressed
Congested areas	Impressed – close distributed
New pipelines	Close anode wire
Retrofit	Multi Deepwells or distributed close anode

Types of systems available:

#### Impressed: Close anode systems

Advantages:

- It maximises the anode's effect regardless of isolation
- You can choose multi-anodes or linear anodes
- You can mix and match depending on piping layouts

Disadvantages:

- The design is subject to piping layout

#### Semi remote distributed ground beds:

Advantages:

- Simple wiring

Disadvantages:

- Several deep boreholes are needed
- Expensive drilling
- Limited effect over plant
- Piping must be isolated

## Sacrificial

Magnesium anodes are typically used on short piping runs and fire hydrants. All piping must be isolated. Typically anode cables are connected through test stations for monitoring purposes. For hydrants a test station is not considered necessary.

### For Permanent Protection:

**“Packaged” 27kg (med potential) magnesium anodes.** These are buried 2m from the pipeline and connected to a test cable above ground for monitoring purposes in a test facility. Life – 10-15 years.

**Recommendation:** We recommend two anodes are installed at any one location, as distribution coverage can be limited. The number of anodes you need to protect pipeline depends on its characteristics. Older pipelines typically need more CP, with more test stations with higher potential (-1-7v) anodes.

### For Temporary Protection:

**Small magnesium anodes or zinc anodes.** These can be circular or ‘d’ shaped ingots or ribbon anodes to suit the construction choice. Ingots are easier to install at test point locations however ribbon are better suited for desert locations (life 2-5 years).



New Plant with MATCOR SPL Anode

## Impressed

Our impressed CP systems typically include:

- Power supply units
- Anodes or groundbeds
- Test facilities
- Single core cable

The power supply generates an adjustable voltage of 0-50Vdc to drive a groundbed of anodes.

Protection levels can be measured and monitored at test stations situated at regular accessible and critical locations along the pipeline route.

### Power Supply

Vary depending on location.

For most Plants AC power is available and we recommend a transformer rectifier:

- Hot environment – oil cooled
- Cool or indoor environment – air-cooled
- Low output – rectifier switch mode units
- Remote monitoring/control – constant current/current voltage/fully automatic



MATCOR Mini Deeps on site

## Anode Types

**Canistered for close distributed** – coke filled MMO titanium tubular anodes.

**Linear for continuous protection** – sock-filled with coke and MMO titanium wire anode.

**Deepwell anodes** – string of MMO Titanium anodes:

- Requires deep borehole
- Casing required
- Limited range and effect
- Interference on adjoining pipelines/structures

### Canistered Anodes:

- Installed vertically or horizontally
- To follow pipeline route anode every 15-50m depending on soil conditions
- Multi cable tails terminated in junction boxes
- Beneficial effect from multi anodes



### Linear Anodes:

- Installed alongside pipeline route
- Follow pipeline route
- Even distribution along pipeline (current limited to pipelines – no interference)

### Junction Boxes:

- **Anode junction box** to terminate anode cables for monitoring and control
- **Negative Junction box** to terminate negative cables for monitoring and control to multi pipeline system and TR
- **Bond Multi pipelines** – Bonding junction boxes away from TR
- **Range of non hazardous** to Exe, Exn and Exd enclosures
- All made with painted steel or stainless steel



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## Monitoring Stations

At Hockway we design and build Test Stations to monitor CP. We tailor our test stations to suit your needs and environment.

Hockway are able to supply a variety of box types including monitoring stations suitable for hazardous areas.

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## Permanent Reference Electrodes

- Improves consistency in comparative data
- To monitor potentials easily
- For remote monitoring
- To control potential on an automatic power unit
- Read potentials in accessible/hard to reach locations
- Saves monitoring time versus portable electrodes
- We supply: Copper Copper Sulphate for low chloride soils and Silver Silver chloride for high chloride areas

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## Coupons

Ideal for monitoring IR Free potentials without switching off all CP systems simultaneously.

- Used in critical areas eg; wet marshy areas, in process plants and foreign crossings
- Used with remote monitoring system



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## Pipeline Isolation

For CP to work effectively the pipeline must be fully isolated. Isolation joints are the most reliable and effective means to isolate the pipeline at above and below ground interfaces.

To prevent flashover during lightning or electrical faults protection devices should be used such as spark gap and overvoltage protection devices. Any inline valves also need to be isolated using isolated cable bushings and dielectric couplers. The valves however must be earthed; this is possible using DC Decouplers. To prevent flashover we supply;

- Spark gap arrestors – DC fault conditions
- Overvoltage devices (OVP) – designed for CP use. Diverts AC and DC fault current conditions
- Earth leakage devices or DC Decoupler. Diverts DC fault and AC steady state and fault conditions

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## Monitoring and managing

All CP systems must be regularly monitored to ensure continued performance. Hockway provide comprehensive monitoring services and CP database and asset management on your behalf.



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## Remote Monitoring and Control

At Hockway we offer the unique capability of incorporating remote monitoring and control units in your equipment.

Our systems are tailored to your needs. Typical units include:

- WatchdogCP™ and CARMS systems
- Internet driven – no need for software; sends data into CPDM
- Inmarsat Satellite communication
- Capability to tie in SCADA system

### Hockway's recommended system with remote control for a hot desert location:

- Constant current/constant voltage oil cooled transformer rectifier with watchdog CP RMU tied into existing SCADA or standalone
- MMO wire with sock carbon backfill along pipeline route
- Anode junction box complete with shunts
- Negative distribution junction box
- Bond junction boxes
- Permanent reference and coupon Test facilities
- Negative and positive 16, 35, 50 or 90mm<sup>2</sup> cable (size on actual design)
- Bonding cable 16mm<sup>2</sup>
- Test Cable 10mm<sup>2</sup>
- Pin brazing cable connections
- Splice kits

### ATEX rated equipment for hazardous environments:

With LNG, GTL, Gas and Petrochemical plants on the rise there is an increase in possible exposure to explosive gases.

Hockway are unique in that we can manufacture and supply all CP equipment ATEX rated for use in hazardous areas.



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## Contact

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