

ExPG



Corrosion Control Company



AUTHORIZED AGENT IN MALAYSIA

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Corrosion Control Company

Welcome to 3C Corrosion Control Company

Your complete specialist when it comes to Cathodic Protection Systems!

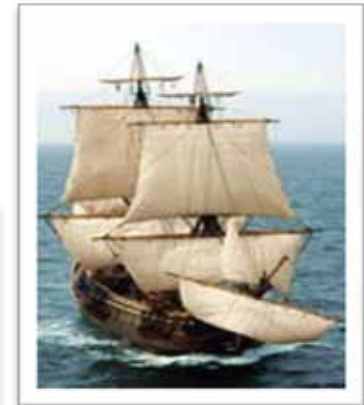


3C is a highly specialised company with extensive know-how in corrosion protection services and technology and with a strong international focus.

"Our mission is to offer concepts and products that deliver unique customer value through practical solutions that secure high operational reliability for the end user. Our customers are mainly international industrial contractors with whom we build long-term partnerships by offering our expertise and reliability. Our core skills are cathodic protection systems, project efficiency and performance in harsh environments".

3C supplies complete corrosion protection systems for:

- Power plants
- Tank farms
- Pipelines
- Concrete structures
- Harbours & jetties
- Refineries



Welcome to explore our website!

3C are sponsoring The East Indiaman Götheborg, one of the more spectacular trade and culture projects that has been carried out in Sweden in many years.

It is the world's largest sailing wooden ship in modern time.

modern time
sailing wooden ship in
It is the world's largest



SS-EN ISO 9001

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Introduction

Corrosion Control Company AB



The Company

3C Corrosion Control Company AB, founded in 1996, has quickly established itself as a company that provides the industry with high quality, innovative solutions for detecting, preventing and controlling corrosion. 3C was set up specifically to provide practical expertise, cost effective solutions and innovative equipment for cathodic protection systems. 3C systems are designed for all types of buried and submerged structures as well as for process equipment and concrete structures in the power, gas, oil, petrochemical and water industries.

The company has grown constantly since 1996 and is today well established on the market with customers all over the world, handling all types of projects, regardless their size and complexity.

Quality Assurance

3C Corrosion Control Company AB is approved to ISO 9001-2000, certificate No. 2003-SKM-AQ-1859. Quality is considered to be a key factor in the company's success, and the certification shows our commitment to quality and customer satisfaction. The quality level is assured by two major aspects, one: the company's quality control manager conducts assurance investigations of raw materials and all levels of the company's manufacturing activities. The second major aspect lies in the fact that the reporting functions for this department are directly to the managing director.

- The company is assessed and approved by Det Norske Veritas (DNV) against the requirements of the International Standard ISO 9001:2000.
- A copy of the company quality manual is available upon request.

Quality Policy

- 3C's corrosion protection systems shall always assist customers to gain competitive advantages on their markets.
- 3C's customers and their needs is the main interest in every project that the company takes on.
- 3C shall be a leader of the development of new solutions and technological advances in the electrochemical corrosion protection industry.
- 3C products and materials shall always be of the best quality and have the highest class quality performance.



Professional Memberships

Corrosion Control Company AB is a member of the following professional organisations:

- NACE National Association of Corrosion Engineers
- European Standardisation Committee
- Swedish Standardisation Committee

Range of Activities

The company's range of activities includes projects for the:

- Power generation industry in terms of cathodic protection for cooling water systems and any other system or structures involved in the operation of a power plant.
- Oil and gas industry in terms of cathodic protection and corrosion monitoring of buried pipe-lines as well as buried or above ground storage tanks.
- Chemical industry in terms of cathodic protection and corrosion monitoring of process systems including cooling water systems.
- Water Industry in terms of cathodic protection and corrosion monitoring of water pipes, water tanks and water towers.

3C support their customers by developing and implementing cost effective corrosion control systems that helps to protect the customers' valuable capital assets in plant and field facilities. These systems provide 3C's customers with lower maintenance costs, longer equipment life and fewer service interruptions.



The Products

When it comes to the manufacturing of products 3C only work together with manufacturers that have a reputation of excellence and that guarantees quality construction. 3C provides a complete range of cathodic protection products and equipment for corrosion control. The different products are here presented briefly.

Rectifiers

3C has developed a unique rectifier system based on the Primary Switch Mode technique which is exclusive for 3C in the cathodic protection industry. The Primary Switch Mode operates on an extremely high efficiency rate allowing the rectifier to be very small in dimension and easy to cool. The rectifiers are supplied either as air cooled or oil cooled depending on location and use.

Thor™ control system

The 3C unique Thor™ control system has been developed to meet the industry's requirements for effective control and monitoring either as stand alone or as remote operation. The idea behind the Thor™ system comes from the need to allow one system to control a large number of rectifiers instead of having individual systems for each rectifier. This gives an advantage from both an installation and operation point of view. Each Thor™ system can control up to 20 rectifiers with a total of 96 reference electrodes connected to the system.

The complete system, consisting of rectifiers combined with the Thor™ control system, incorporates features such as: manual IR-drop measurement, built in data loggers and complete alarm systems with remote annunciation. The system allows for a total remote operation of all parameters and can be linked through intranet, Internet or any SCADA system.

Anodes

3C provides both sacrificial anodes and impressed current anode designs, in both standard and customized, always accurately to customers' specifications.

3C designs and manufactures the anodes taking into consideration the location and installation of the anode as well as the operational conditions prevailing for a specific application.



Impressed Current

For the impressed current system, the products are specially designed to meet the specific site's operational conditions to minimize the need of maintenance and replacements. The 3C impressed current system provides a cost effective, long term cathodic protection solution.

Mixed Metal Oxide coated titanium anodes have proven to be the most reliable anode material and this is the most highly preferred material in 3C anodes. Mixed Metal Oxide anodes have an extremely low consumption rate. The titanium substrate remains constant throughout the design life of the anode. Strict quality control procedures are followed throughout the coating process to insure proper coating adhesion and loading.



3C supplies the full range of rod, string, mesh and disc shape anodes, both in bare and pre-packaged. Other materials such as silicon iron, graphite etc. is also available upon request.

Sacrificial

3C supplies sacrificial anodes made from zinc, aluminium or magnesium that are available in all shapes and sizes.

Reference Electrodes

3C manufacture and supply the company's own range of reference electrodes. The range consists of different types and standards such as box/wall mounted, flange mounted, threaded and pre-packaged for buried applications. These types come in different element materials and shapes depending on customer specifications. The reference element materials vary from copper/copper sulphate to silver/silver chloride and in some cases zinc. No matter the type all of 3C's reference electrodes will provide extremely stable potential measurements throughout their complete service life.

Range of Services

3C Corrosion Control Company AB provides the whole range of services required for a successful corrosion protection system including conceptual and detailed design, supply of components, installation, commissioning and periodical maintenance on a world wide basis. 3C performs all of its services under quality assurance guidelines and offers the following services:

- Site investigations
- Planning and project designs
- Project management
- Cost estimates, specifications and bills of materials
- Installation supervision, commission, maintenance and monitoring
- Consultancy and specialist advice
- General engineering and fabrication

Engineering

Handles the individual design, manufacture, supply, installation and commissioning of both sacrificial and impressed current cathodic protection systems world wide. All engineering is carried out in a fully computerised environment based on the latest technology available.



Standards

All engineering is carried out in accordance with International standards such as:

- EN 13509 Cathodic Protection Measurement Techniques
- EN 12954 Cathodic Protection of Buried and Immersed Metallic Structures
- EN 13636 Cathodic Protection of Buried Tanks and Related Metallic Piping
- EN 12696 Cathodic Protection of Steel in Concrete
- EN 12473 General Principles of Cathodic Protection in Seawater
- EN 12495 Cathodic Protection of Fixed Steel Offshore Structures
- EN 12474 Cathodic Protection of Submarine Pipeline
- EN 12496 Sacrificial Anodes for Cathodic Protection in Seawater
- EN 13173 Cathodic Protection for Steel Floating Structure
- EN 13174 Cathodic Protection for Harbour Installation
- NACE RP 0169-96 Control of External Corrosion on Underground or Submerged Pipeline Systems

3C supplies complete cathodic protection systems for:

- Power plants
- Refineries
- Tank farms
- Harbours and jetties
- Pipelines
- Concrete structures



Engineering Services Division

3C engineers will install commission and maintain all systems supplied by 3C. The company's team of engineers visits sites all around the world to advise on all aspects of our products. 3C are able to provide long term agreements covering spares and maintenance, relieving the customer of costly overheads by providing trained personnel wherever and whenever they need them.

Consultation

3C engineers are available for discussion and advice on all aspects of cathodic protection and corrosion control activities at any time. These services are supported by design and engineering capabilities to carry proposals through to realization. 3C can recommend suitable systems for your needs today and in the future.

Training

As a supplier of cathodic protection systems it is natural for 3C to also offer customers' personnel training on cathodic protection and corrosion topics in any location. The company has skilled engineers available that can train your personnel in all aspects of equipment use.



Product Range

Rectifier Switch Mode SK025

25V 10A



FUNCTION

The SK025 rectifier has been designed to give the best electrical performance as well as superior withstanding against rugged industrial environments.

The design is based on primary switching technology, a technology in which Corrosion Control Company AB is a pioneer in the corrosion protection industry. This technology means that the mains voltage is rectified to be switched at a high frequency ($f=100$ kHz) across a transformer of ferrite material. Through converting the voltage at this high frequency the dimensions of the transformer and filter can be kept very small. The block diagram (on the next page) shows this principle.

TECHNICAL DATA & STANDARD SIZES

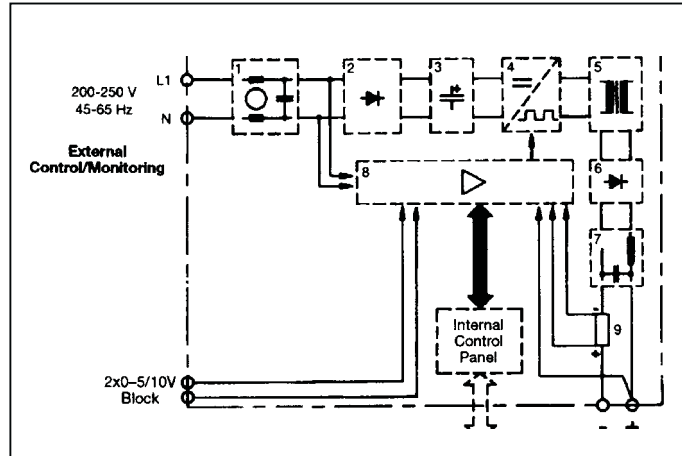
<i>Supply voltage:</i>	Single phase 200 - 250 V AC, 50 - 60 Hz, other voltage on request
<i>Control accuracy:</i>	Voltage/current $\leq \pm 0.5$ %
<i>Ambient temperature:</i>	Max 35° C, (at 45° C max 80 % of nominal output current)
<i>DC ripple:</i>	<1% in the entire regulation range, (typically <0.5 %)
<i>Cooling:</i>	Air cooled, natural or forced convection depending on size (see table on n. p.)
<i>Humidity:</i>	Max 85 % relative
<i>Duty ratio:</i>	Designed for continuous operation at rated load up to 1000 m altitude
<i>Regulation range:</i>	Stepless - constant voltage/current 0 - 100 %
<i>Protections:</i>	Over-current, over-temperature, transient voltage and short circuit protected.

FUNCTION

The mains voltage is connected to the diode bridge (2) via the RFI-filter (1). The rectified voltage is smoothed by means of electrolytic capacitors (3) and is then connected to the transistor switch (4). The transistor switch converts the DC-voltage into high frequency pulses which are applied to the main transformer (5). The transformer provides isolation from the mains and transforms the voltage to the rated output level.

The secondary voltage/current is rectified through the diode bridge (6) and smoothed through the LC-filter.

The internal control unit, measures actual DC-current by means of the shunt (9), actual DC-voltage, and controls the transistor switch (4) until set and actual values correspond.



Nominal DC-voltage V	25	50
Nominal DC-current A	10	5
Connection power kVA	0,25	0,25
Primary current (220 V) A	1,0	1,0
Weight cabinet kg	2,0	2,0
Type of air cooling	Nat	Nat

Dimensions

mm	
Width (W)	230
Depth (D)	105
Height (H)	225

Rectifier Kraft SK075

15V 10-50A, 24V 15-25A



FUNCTION

The SK075 rectifier has been designed to give the best electrical performance as well as superior withstanding against rugged industrial environments.

The design is based on primary switching technology, a technology in which Corrosion Control Company AB is a pioneer in the corrosion protection industry. This technology means that the mains voltage is rectified to be switched at a high frequency ($f=100$ kHz) across a transformer of ferrite material. Through converting the voltage at this high frequency the dimensions of the transformer and filter can be kept very small. The block diagram (on the next page) shows this principle.

TECHNICAL DATA & STANDARD SIZES

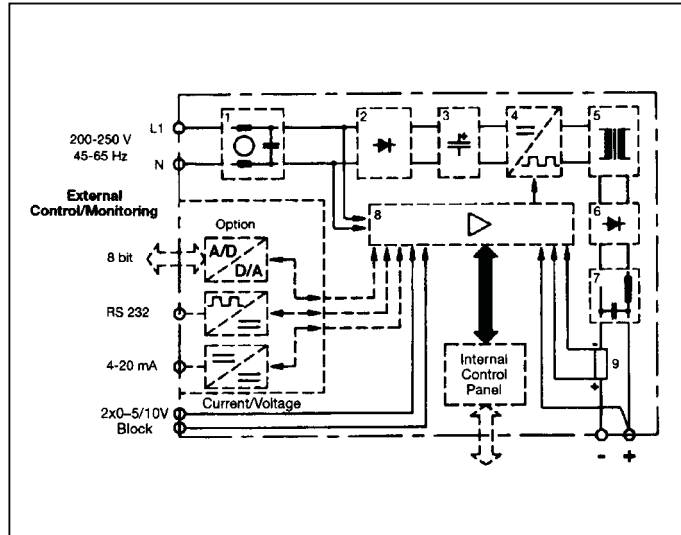
<i>Supply voltage:</i>	Single phase 200 - 250 V AC, 45 - 65 Hz, other voltage on request
<i>Control accuracy:</i>	Voltage/current $< \pm 0.5$ %
<i>Ambient temperature:</i>	Max 35° C, (at 45° C max 80 % of nominal output current)
<i>Radio interference:</i>	Suppressed according to VDE 0871 A, wirebound interference
<i>DC ripple:</i>	< 1 % in the entire regulation range, (typically < 0.5 %)
<i>Cooling:</i>	Air cooled, natural or forced convection depending on size (see table on the n. p.)
<i>Humidity:</i>	Max 85 % relative
<i>Duty ratio:</i>	Designed for continuous operation at rated load up to 1000 m altitude
<i>Regulation range:</i>	Stepless - constant voltage/current 0 - 100 %
<i>Protections:</i>	Over-current, over-temperature, transient voltage and short circuit protected.

FUNCTION

The mains voltage is connected to the diode bridge (2) via the RFI-filter (1). The rectified voltage is smoothed by means of electrolytic capacitors (3) and is then connected to the transistor switch (4). The transistor switch converts the DC-voltage into high frequency pulses which are applied to the main transformer (5). The transformer provides isolation from the mains and transforms the voltage to the rated output level.

The secondary voltage/current is rectified through the diode bridge (6) and smoothed through the LC-filter.

The internal control unit, measures actual DC-current by means of the shunt (9), actual DC-voltage, and controls the transistor switch (4) until set and actual values correspond.



Nominal DC-voltage V	15 V		24 V
Nominal DC-current A	25	50	25
Connection power kVA	0,3	1,5	1,2
Primary current (220 V) A	3,5	7,0	5,5
Weight module kg	5,0	5,0	5,0
Weight cabinet kg	15	15	15
Type of air cooling	Nat	Nat	Nat

Dimensions

mm	Module	Cabinet
Width (W)	335	355
Depth (D)	140	250
Height (H)	330	480

Rectifier Kraft SK3

15V 50-1000A, 24V 50-600A

FUNCTION

The SK3 rectifier has been designed to give the best electrical performance as well as superior withstanding against rugged industrial environments.

The design is based on primary switching technology, a technology in which Corrosion Control Company AB is a pioneer in the corrosion protection industry. This technology means that the mains voltage is rectified to be switched at a high frequency ($f=100$ kHz) across a transformer of ferrite material. Through converting the voltage at this high frequency the dimensions of the transformer and filter can be kept very small. The block diagram (on the next page) shows this principle.



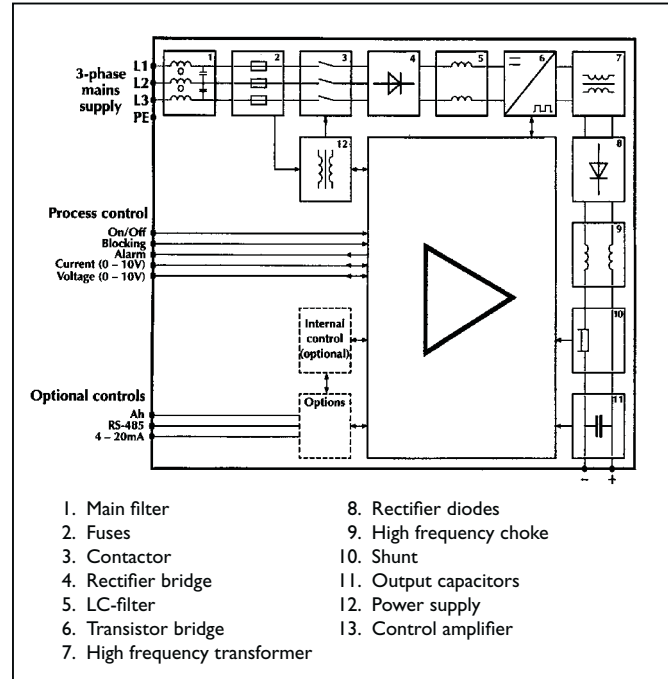
TECHNICAL DATA & STANDARD SIZES

<i>Supply voltage:</i>	3x400 V, ± 10 %, 50 - 60 Hz, other voltage on request
<i>Control accuracy:</i>	Voltage/current $< \pm 0.5$ %
<i>Ambient temperature:</i>	Max 40° C
<i>EMC-Conformity:</i>	EN 50081-2, EN50082-2,
<i>LVD-Conformity:</i>	EN 90950
<i>Power factor:</i>	$\leq 0,92$ at rated load
<i>Cooling:</i>	Air cooled, natural or forced convection
<i>Humidity:</i>	Max 85 % relative, non-condensing
<i>DC ripple:</i>	$< 0,3$ % between 10 - 100 % of output current at CC mode (typically $< 0,1$ %)
<i>Duty ratio:</i>	Designed for continuous operation at rated load up to 1000 m altitude
<i>Efficiency:</i>	$> 0,9$ % depending on size and load
<i>Regulation range:</i>	Stepless - constant voltage/current 0 - 100 %

FUNCTION

The mains voltage is connected to the diode bridge via the RFI-filter and main contactor. The main voltage is rectified and smoothed by a filter and then connected to the transistor switch. The transistor switch converts the DC-voltage into high frequency pulses which are applied to the main transformer. The transformer provides isolation from the mains and transforms the voltage to the rated output level.

The secondary voltage/current is rectified through the diode bridge and smoothed through the LC-filter. The control unit, which is supplied by the control transformer, measures actual DC-current by means of the shunt, actual DC-voltage, and controls the transistor switch until set and actual values correspond.



Nominal DC-voltage	V	15V							24V					
		Nominal DC-current	A	200	300	400	500	600	800	1000	200	300	400	500
Connection power	kVA		4,0	6,0	7,7	9,6	12,0	15,0	20,0	6,3	9,2	12,0	15,0	18,5
Primary current (220V)	A		6,0	9,0	12,0	14,5	18,0	23,0	29,0	9,6	14,0	19,0	23,0	28,0
Weight module	kg		36	37	43	43	43	43	43	36	43	43	43	43
Weight cabinet	kg		44	45	51	51	51	51	51	44	51	51	51	51

Dimensions

mm	Module	Cabinet
Width (W)	450	455
Depth (D)	250	280
Height (H)	70	600

Disc Anodes



3C Corrosion Control Company AB manufactures Mixed Metal Oxide (MMO) disc anodes for cathodic protection.

The standard disc anode consists of a solid titanium disc that has been coated with MMO coating.

The titanium substrate meets ASTM Standard B348, Grade 1 or Grade 2.

Disc anodes are available in standard diameters of 25, 60, 100 and 150 mm. Other sizes and current ratings are available upon request.

The MMO coating applied to the titanium disc has been designed for use in all cathodic protection applications. The coating consists of IrO_2/RuO . MMO coating is generally accepted by the cathodic protection industry to be satisfactory for both chlorine and oxygen evolving electrolytes.

Based on accelerated life testing conducted by an independent laboratory, the coating has proven to be superior or equivalent to other MMO coatings currently being used. A copy of this test report is available upon request.

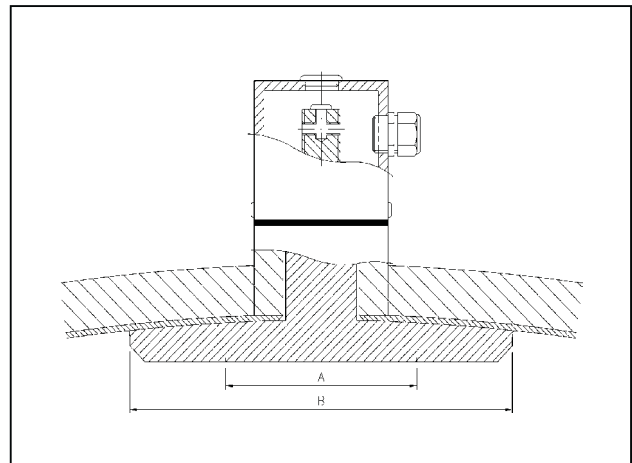
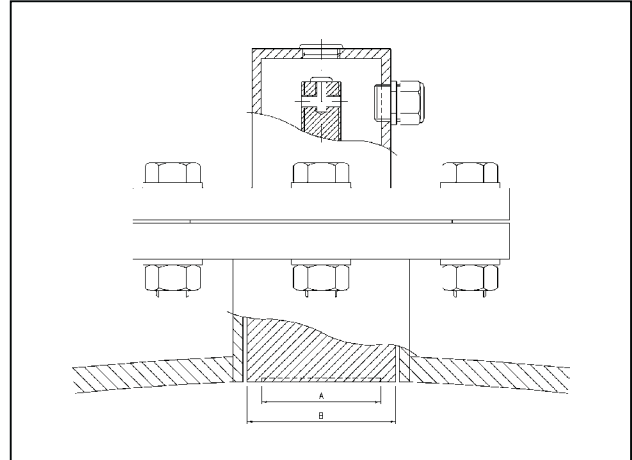
Strict quality control procedures are followed throughout the coating process to insure proper coating adhesion and loading. Production of a quality product makes every step of the manufacturing process fundamental.

MMO anodes have an extremely low consumption rate. The titanium substrate remains constant throughout the design life of the anode.

The anode house is made of uPVC and the cable can be terminated in both radial and axial direction.

The disc anodes have the following operating characteristics for standard coating loadings:

Electrolyte	Max current density*
Fresh water	100 A/m ²
Brackish water**	100 – 300 A/m ²
Sea water	600 A/m ²



Disc anode Model	A (mm)	B (mm)	I (A)
Ø 25 mm	25	42	0,3
Ø 60 mm	60	75	1,7
Ø 100 mm	100	200	4,7
Ø 150 mm	150	250	10,6

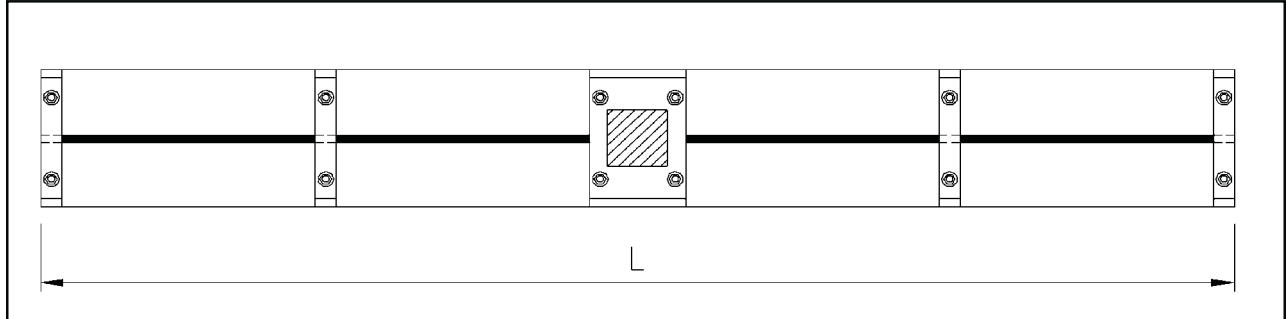
*Coating loadings can be increased or decreased depending on particular life/current density requirements.

**Current density should be determined in accordance with fresh water resistivity.

Copies of the five year product warranty are available upon request.

Ribbon Anodes

for use in water



3C Corrosion Control Company AB manufactures Mixed Metal Oxide (MMO) ribbon anodes for cathodic protection.

The standard band anode consists of a titanium ribbon that has been coated with mixed metal oxide coating.

The titanium substrate meets ASTM standard B348, grade 1 or grade 2.

Ribbon anodes are available in standard length's of 1 and 2 meters. Other sizes and current ratings are available upon request.

The MMO coating applied to the titanium ribbon has been designed for use in all cathodic protection applications. The coating consist of IrO_2/RuO . MMO coating is generally accepted by the cathodic protection industry to be satisfactory for both chlorine and oxygen evolving electrolytes.

Based on accelerated life testing conducted by an independent laboratory, the coating has proven to be supe-

rior or equivalent to other mixed metal oxide coating currently being used. A copy of this test report is available upon request.

Strict quality control procedures are followed throughout the coating process to insure proper coating adhesion and loading. Production of a quality product makes every step of the manufacturing process fundamental.

MMO anodes have an extremely low consumption rate. The titanium substrate remains constant throughout the design life of the anode.

The 3C ribbon anode is suitable for operations in fresh water, brackish water and sea water. The ribbon anodes have the following operation characteristics for standard coating loadings in sea water:

Ribbon anode length	Maximum current output
1 meter	5,6
2 meters	11,1

Rod Anodes



3C Corrosion Control Company AB manufactures Mixed Metal Oxide (MMO) rod anodes for cathodic protection.

The standard rod anode consists of a solid or hollow cylindrical titanium rod/tube that has been coated with mixed metal oxide coating.

The titanium substrate meets ASTM Standard B348, Grade 1 or Grade 2.

Rod anodes are available in standard diameters of 1/8", 1/4", 1/2" and 1". Other sizes and current ratings are available upon request.

The MMO coating applied to the titanium rod has been designed for use in all cathodic protection applications. The coating consists of IrO₂/RuO. MMO coating is generally accepted by the cathodic protection industry to be satisfactory for both chlorine and oxygen evolving electrolytes.

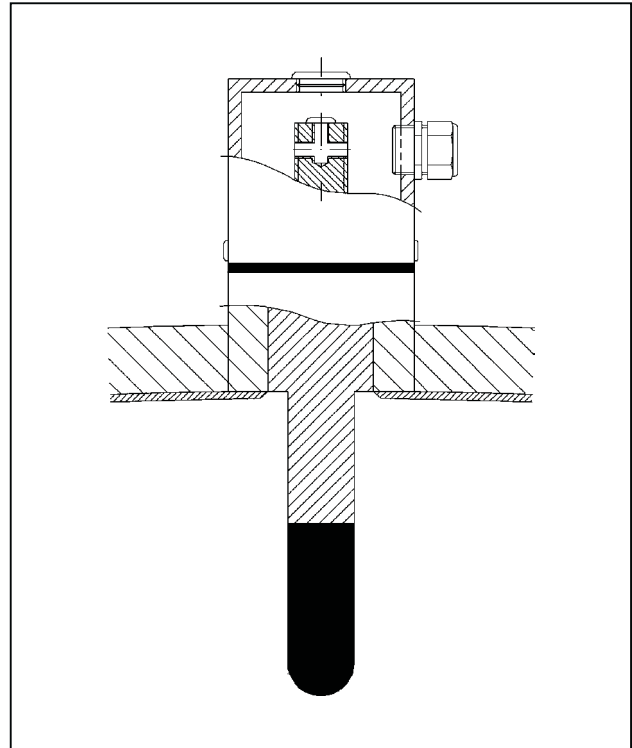
Based on accelerated life testing conducted by an independent laboratory, the coating has proven to be superior or equivalent to other MMO coatings currently being used. A copy of this test report is available upon request.

Strict quality control procedures are followed throughout the coating process to insure proper coating adhesion and loading. Production of a quality product makes every step of the manufacturing process fundamental.

MMO anodes have an extremely low consumption rate. The titanium substrate remains constant throughout the design life of the anode.

The 3C rod anode is suitable for operations in soils, carbonaceous backfill, fresh water, brackish water and seawater. The rod anodes have the following operating characteristics for standard coating loadings:

Electrolyte	Max current density*
Fresh water	100 A/m ²
Brackish water**	300 A/m ²
Sea water	600 A/m ²



*Coating loadings can be increased or decreased depending on particular life/current density requirements.

**Current density should be determined in accordance with fresh water resistivity.

Copies of the five year product warranty are available upon request.

Ribbon Anodes

for use in fine sand and concrete

The ribbon anodes are manufactured using titanium substrate which meets ASTM B265 grade I standards and Mixed Metal Oxide (MMO) coating.

Working environment: Evolution O_2 , Cl_2 or a combination of both.

Nominal Dimensions of solid ribbon:

Width: 6,35 mm

Thickness: 0,635 mm

Standard coil length: 76,2 m

Standard coil weight: 1,12 kgs

Surface area of ribbon: 0,014 m^2/m

Current output of ribbon in fine sand:

42 mA/m when operating at an anode current density of 3 A/m^2

Design life: 50 years + when operating at an anode current density of 3 A/m^2

Current output of ribbon in concrete:

1,5 mA per m when operating at an anode current density of 110 A/m^2

Design life: 100 years + when operating at an anode current density of 110 A/m^2



Titanium conductor bar dimensions:

Width: 12,7 mm

Thickness: 0,9 mm

Coil Length: 76,2 m

Coil Weight: 3,8 kg

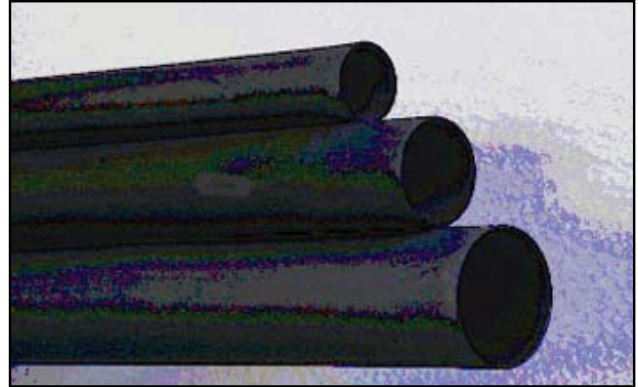
Tubular Anodes

The tubular anodes are manufactured using titanium which meets ASTM B338 Grade 1 or 2 Standards.

The Mixed Metal Oxide Anodes have an extremely low consumption rate. The titanium substrate remains constant throughout the design life of the anode.

Advantages:

- Resin filled and helium tested for an effective seal of the connection.
- Cable end of anode protected with teflon sleeve.
- Center connection is tested for resistance and is less than 0,001 Ohms.
- Variety of cable types and sizes available.



Environment	Anode size	Current output	Lifetime
Coke, Soil and Freshwater	(19mm x 1220mm)	7 amps	20 years
	(25mm x 500mm)	4 amps	20 years
	(25mm x 1000mm)	8 amps	20 years
	(25mm x 1220mm)	3.5 amps*	20 years
	(25mm x 1500mm)	4.5 amps*	20 years
	(31,75mm x 1220mm)	12 amps	20 years
Seawater	(19mm x 1220mm)	45 amps	20 years
	(25mm x 500mm)	25 amps	20 years
	(25mm x 1000mm)	50 amps	20 years
	(31,75mm x 1220mm)	75 amps	20 years

* Current outputs are derated for use in metallurgical coke breeze – 50 A/m²

Tank Anodes - Tank Bottom Protection for new or retrofit bottoms

3C tank anode assemblies are designed for ease of installation and cost savings. Tank anode assemblies use MMO ribbon anodes assembled on HMWPE cable. The anode ribbon is manufactured using titanium to ASTM B265 Grade I specifications and Mixed Metal Oxide coating.

The coating consists of $\text{IrO}_2/\text{Ta}_2\text{O}_5$ and is suitable for use in all cathodic protection applications.

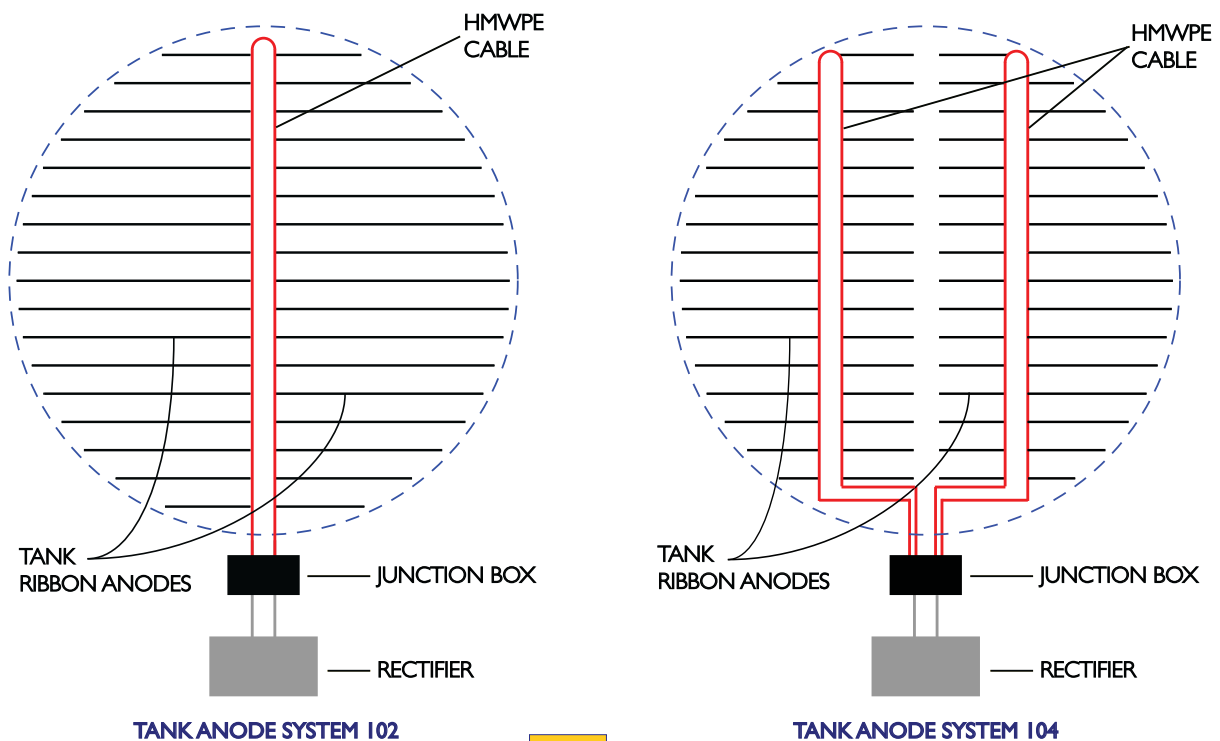
3C tank anodes are assembled to meet customer requirements. Each tank anode system is factory assembled and ready for installation. No field welds are required. All anode to cable connections are sealed

using a moisture resistant resin. The cable connection has been tested to ensure the quality of the seal and to provide long lasting protection.

Based on accelerated life testing conducted by an independent laboratory, MMO coating has proven to be superior or equivalent to other mixed metal oxide coatings currently being used. A copy of the test report is available upon request.

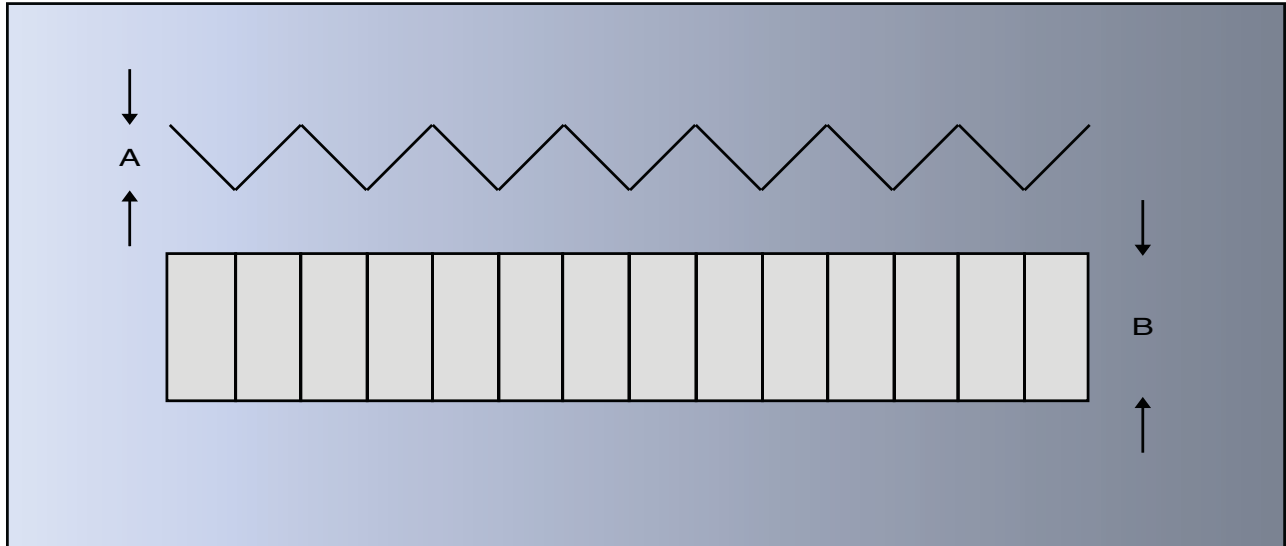
Current output of ribbon in fine sand: 42 mA/meter when operating at an anode current density of $3\text{A}/\text{m}^2$.

Design life: 50 years plus when operating at an anode current density of $3\text{A}/\text{m}^2$.



Sawtooth Ribbon Anodes

for use in concrete



Sawtooth Ribbon Anodes are manufactured using Titanium which meets ASTM B265 Grade 1, that has been coated with Mixed Metal Oxide (MMO) coating.

The MMO coating consists of $\text{IrO}_2/\text{Ta}_2\text{O}_5$ and is suitable for use in all cathodic protection applications.

Based on accelerated life testing conducted by an independent laboratory, MMO coating has proven to be superior or equivalent to other mixed metal oxide coatings currently being used. A copy of the test report is available upon request.

Strict quality control procedures are followed throughout the coating process to insure proper coating adhesion and loading. The production of a quality product is fundamental in every step of the manufacturing process.

MMO Anodes have an extremely low consumption rate. The titanium substrate remains constant throughout the design life of the anode.

Ribbon nominal dimensions:

Height (A)	mm	3.0	3.0
Width (B)	mm	6.35	12.7
Thickness of Titanium	mm	0.3	0.3
Coil length	m	76.2	76.2
Coil weight	kg	1.36	2.72
Surface area of ribbon	m ² /m	0.0287	0.0573

Conductor bar dimensions:

Width: 12.7 mm Coil length: 76.2 m
 Thickness: 0.9 mm Coil weight: 4.5 kg

Mixed Metal Oxide

The Mixed Metal Oxide (MMO) coating has been designed for use in all cathodic protection applications. MMO coating consists of $\text{IrO}_2/\text{Ta}_2\text{O}_5$ and is suitable for use in soils, carbonaceous backfill, fresh and brackish water, concrete or IrO_2/RuO for use in sea water. Mixed metal oxide coating is generally accepted by the cathodic protection industry to be satisfactory for both chlorine and oxygen evolving electrolytes.

Based on accelerated life testing conducted by an independent laboratory, the MMO coating has proven to be

superior to other mixed metal oxide coatings currently being used on the market. A copy of this test report is available upon request.

Strict quality control procedures are followed throughout the coating process to insure proper coating adhesion and loading. Production of a quality product makes every step of the manufacturing process fundamental.

The operating characteristics for MMO coating loadings are shown below:

Environment	Maximum current density	Lifetime
Carbonaceous backfill	(50 A/m ²)	20 years
Calcined Petroleum backfill	(100 A/m ²)	20 years
Fresh water	(100 A/m ²)	20 years
Brackish water	(100-300A/m ²)	20 years
Sea water	(600A/m ²)	20 years

Coating loadings can be increased or decreased depending on particular life/current density requirements. Current density should be determined in accordance with brackish water resistivity.

Thor System



The Thor system has been specially developed to control and monitor cathodic protection systems in plant areas where multiple systems are installed.

The basic idea is to allow one system to control a large number of rectifiers instead of having individual systems, which is an advantage from an installation and operation point of view. The separate rectifier modules can be located up to 500 m away from the control panel and will be connected via a CAN (Controller Area Network) bus.

The Thor system can control up to 20 rectifiers in constant current-, voltage- and potential-mode. A total of 96 reference electrodes can be connected to the system and any of them can be used as controlling reference.

The Thor system has, for each sub system, Hi/Lo alarms for current, voltage and potentials.

The system also has a built in data logger function that

can sample all operational data at intervals between 1 per minute and 1 per 24 hours. The data can then be downloaded to a palm computer, laptop or through the internet for further analysis.

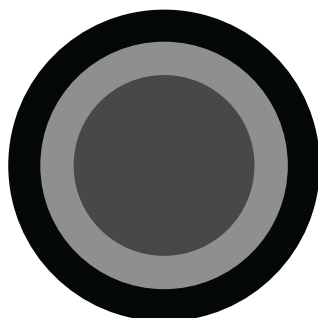
The system in the standard version is operated from the local control panel where all configuration and operation is carried out. From the panel simultaneous IR-drop measurement can be carried out for all installed reference electrodes.

As an alternative to operation from the local control panel a remote control can be used. The remote system can be connected to the common cabinet either via modem, RS232, TCP/IP or via internet.

All functions that can be done on the local control panel can also be done remotely.

Download of data is presented as numerics or graphs.

Cable RBBE 1kV



Application field

Zero halogen, produce minimal obscuration smoke and acidic gas in case of fire. Adapted for fixed laying in pipes, apparatus, etc.

Max 70° C continuous conductor temperature.

Designation:	RBBE
Standard:	Based on HD 21,7 (except material), HD 604 (halogen free material), IEC 60754 (corrosiveness of combustion gases), IEC 61034 (smoke density)
Fire propagation class:	IEC 60332-I and F2 according to SS 424 14 75
Temperature range:	Flexing 0°C to +60° C (Fixed installation -15 to +70° C)
Min. bending radius:	10 x cable diameter, (by final termination 6 x cable diameter, 20±10° C).
Conductor:	Flexible annealed cooper, IEC 60228 class 5.
Insulation:	Halogen free polymer.
Sheath:	Halogen free polymer.

Cross-section	Conductor		Conductor insulation		Weight kg/100 m	Package length/drum type
	max resistance ohm/km at 20°C	nom. diameter (mm)	colour	nom. overall diameter (mm)		
2,5	7,98	2,0	black	6,5	5,7	500m/S4
10	1,91	4,1	black	9,0	15	500m/K4
16	1,21	5,1	black	10,0	21	500m/K6
25	0,78	6,5	black	12,0	30	500m/K7
35	0,55	7,5	black	13,0	40	500m/K7
50	0,39	9,8	black	15,5	55	500m/K7
70	0,27	11,8	black	17,5	75	500m/K8
95	0,21	13,5	black	20,5	98	500m/K9

Bjuroflex®

HO7RN-F 1x10 mm²

Application: A highly flexible oil- and weather resistant cable for connection to moveable items and motors, indoors and outdoors, in rooms with corrosive contents and in hostile surroundings, e. g. in industry and agriculture. Also for fixed installation in temporary buildings and cabins.

Standard: HD 22.4

Note: SEMKO <HAR>

Flame propagation: IEC 332-1, and F2 according to SS 424 14 75

Operating temp.: Max continuous conductor temperature 60° C

Min. bending radius: 6 x D

Tensile stress (max): Total copper area x 15 (N/mm²)

Design

Conductor: Flexible copper, IEC 60228 class 5

Insulation: EPDM-rubber

Sheat: Weather and oil resistant Bjuroflex™ rubber.

Cross-section mm ²	Cu weight kg/100 m	Overall diameter mm	Weight kg/100 m	Coil	Reel m/size
1x10	8,4	11	16	-	500/K6

EBLR

Control Cables 300/500 V

- Standard: - CENELEC HD 627 part 4 section C-I
 - CENELEC HD 604 (halogen free materials)
 - IEC 60754-1, -2 (no corrosive gases with combustion)
 - IEC 61034 (low smoke density at fire)
- Temperature range: Max. conductor temperature 70° C
 During installation: -10° C, below 0° C special precautions must be taken
- Fire propagation class: IEC 60332-1



Design

- Conductor: Solid and annealed copper
- Insulation: Halogen free compound, black
- Core identification: Numbers
- Common core sheath: Halogen free compound
- Continuity conductor: Tinned copper wires
- Screen: Aluminium with bonded PE
- Sheath: Halogen free compound, grey, metre marked
- Identification: The outer sheath is marked e.g.:
 EBLR 15x2x1,5 300/500 V DRAKA SE "year"

Number of cores x cross-section of conductor mm	Thickness of insulation mm	Thickness of sheath mm	Overall Diameter (approx) mm	Weight (approx) kg/100 m	Resistance measured in loop Ω /km at 20°C
7x1,5	0,7	1,5	13	21	24,2

Letter of Authorization for Agency in Malaysia



Principal:
3C Corrosion Control Company AB (3C)
Stationsplan 5
260 21 Billeberga
Sweden

Representative:
ExPG Engineering Sdn Bhd (ExPG)
Level 2-18, Plaza Seri Setia,
No.1, Jalan SS9/2, Seri Setia,
47300 Petaling Jaya,
Selangor D.E., Malaysia.

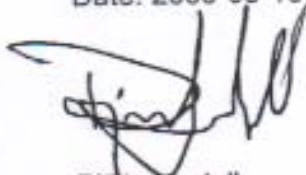
16th June 2006

Re: LETTER OF AUTHORIZATION FOR AGENCY IN MALAYSIA

We, 3C Corrosion Control Company AB, hereby confirm the appointment of ExPG as marketing representative and working partner in Malaysia.
In the event that 3C Corrosion Control Company AB receives an order, it is agreed that a Marketing Assistance Payment (MAP) shall be paid.
The MAP will be determined separately for each project.
Any payment by 3C Corrosion Control Company AB to ExPG will be paid net fifteen (15) days from receipt of applicable progress payment received by 3C from Client.


The above agreement is accepted by :

3C Corrosion Control Company AB
Date: 2006-06-16



Björn Lindell

ExPG Engineering Sdn Bhd
Date: 2006-06-16



K. Kunasegaran



Certificate



DET NORSKE VERITAS

QUALITY MANAGEMENT SYSTEM CERTIFICATE

Certificate No. 2003-SKM-AQ-1859

This is to certify that

THE QUALITY MANAGEMENT SYSTEM
of

3C Corrosion Control Company AB

at

LANDSKRONA in SWEDEN

has been found to conform with the Quality Management System Standard
SS-EN ISO 9001:2000

This Certificate is valid for the following product or service ranges:

DESIGN, SUPPLY AND COMMISSIONING OF
CATHODIC PROTECTION SYSTEMS

Place and date

Stockholm, 2006-05-18

for the Accredited Unit

DNV Certification AB, Sweden

The certificate is valid until

2009-06-30

Company initially certificated

2003-06-18


Anders Wingqvist
Country Manager



*Certification Audit
responsible*

Christian Ahrberg
Lead Auditor



PROJECT REFERENCE LIST

1996

Project: Senoko Power Station
Location: Singapore
Client: Siemens KWU
Scope of work: Design, supply, installation, commissioning and customer training for cooling water system with underground piping, condensers and steel sheet pilings.

Project: Pasir Gudang CCPP
Location: Malaysia
Client: Siemens KWU
Scope of work: Upgrading of existing system for internal cathodic protection of cooling water pipes.

Project: Paka CCPP
Location: Malaysia
Client: Siemens KWU
Scope of work: Inspection & repair of existing cathodic protection system.

Project: Krakatau Power Station
Location: Indonesia
Client: PT Krakatau Steel
Scope of work: Upgrading of existing cathodic protection system for cooling water intake and jetty.

Project: Lumut CCPP
Location: Malaysia
Client: ABB Malaysia
Scope of work: Design, supply and installation of system for internal cathodic protection of cooling water pipes.

Project: Melaka Refinery
Location: Malaysia
Client: HMS Corp/Chiyoda
Scope of work: Supply of transformer rectifiers and junction boxes.

1997

Project: Oceanhamnen
Location: Sweden
Client: Göteborgs Hamn AB
Scope of work: Design, supply, installation and commissioning of sacrificial anode system for 430 m of steel sheet piling.

Project: Rousch Power Station
Location: Pakistan
Client: Siemens KWU
Scope of work: Design and supply of cathodic protection system for cooling water pipelines.

Project: Otahuhu Power Plant
Location: New Zealand
Client: Siemens KWU
Scope of work: Design, supply and commissioning of cathodic protection system for condensers and gas pipelines.

Project: Santa Rita Power Plant
Location: Philippines
Client: Siemens KWU
Scope of work: Design of cathodic protection system for intake structure and condensers.

Project: Asamera
Location: Indonesia
Client: PT Wilson Walton Indonesia
Scope of work: Supply of 7 nos transformer rectifiers.

Project: PetroVietnam
Location: Vietnam
Client: Corpro Companies Asia Pacific
Scope of work: Supply of 1 nos explosion proof transformer rectifier.



PROJECT REFERENCE LIST

1998

Project: Hubco Pipeline
Location: Pakistan
Client: Asia Petroleum Ltd
Scope of work: Pipeline cathodic protection system survey.

Project: Amata Bang Pakong Power Plant
Location: Thailand
Client: Siemens KWU
Scope of work: Design and supply of cathodic protection system for fire water pipelines.

Project: Poryong CCPP
Location: Korea
Client: ABB
Scope of work: Design and supply of cathodic protection system for cooling water pipelines

Project: Private Paiton Phase II
Location: Indonesia
Client: Siemens KWU
Scope of work: Supply and commissioning of cathodic protection system for cooling water.

Project: Cuiaba Power Plant
Location: Brazil
Client: Siemens KWU
Scope of work: Design and supply cathodic protection system for fire water and gas piping.

Project: CSN Power Plant
Location: Brazil
Client: Siemens KWU
Scope of work: Design and supply of cathodic protection system for fire water and gas pipelines.

Project: Skandia Kajen
Location: Sweden
Client: Göteborgs Hamn AB
Scope of work: Design, supply, installation and commissioning of sacrificial system for 300 m of steel sheet pile.

Project: Majnabben
Location: Sweden
Client: Göteborgs Hamn AB
Scope of work: Design, supply, installation and commissioning of sacrificial system for 120 m of steel sheet pile.

1999

Project: Bugok CCPP
Location: Korea
Client: Siemens KWU
Scope of work: Supply and commissioning of system for primary and secondary cooling water system.

Project: Singapore MRT Changi Line
Location: Singapore
Client: AMEC
Scope of work: Design and supply of stray current monitoring and mitigation system.

Project: Singapore MRT North East Line
Location: Singapore
Client: Tekken
Scope of work: Design and supply of stray current monitoring and mitigation system.

Project: Ystad Harbour
Location: Sweden
Client: Ystad Hamn AB
Scope of work: Design, supply, installation and commissioning of sacrificial system for steel sheet pile.



PROJECT REFERENCE LIST

Project: Senoko Re-Powering Phase 1
Location: Singapore
Client: ABB
Scope of work: Design, supply, installation and commissioning of impressed current cathodic protection system for cooling water system.

Project: Colombo Harbour
Location: Sri Lanka
Client: Ceylon Petroleum Corporation
Scope of work: Survey of cathodic protection system.

Project: Waigaoqiao Power Station
Location: China
Client: Siemens KWU
Scope of work: Design supply and commissioning of cathodic protection system for cooling water intake, main cooling water pipes and condensers.

Project: Agoco Loading Terminal, Tobruk
Location: Libya
Client: Agoco
Scope of work: Cathodic protection survey of unloading facility.

2000

Project: Ringhals Nuclear Power Station
Location: Sweden
Client: Ringhals AB
Scope of work: Cathodic protection of cooling water intake.

Project: Stockholm Arlanda International Airport
Location: Sweden
Client: Luftfartsverket
Scope of work: Cathodic protection of fuel hydrant.

Project: Tuas A Stage II
Location: Singapore
Client: BVI / Jetway
Scope of work: Cathodic protection of cooling water intake sheet piles.

Project: Seletar Sewage Farm
Location: Singapore
Client: Hyundai
Scope of work: Supply of isolating flange kit.

Project: Iskenderun Sugözü Power Plant
Location: Turkey
Client: Siemens KWU
Scope of work: Design supply and commissioning of cathodic protection system of cooling water intake and condensers.

Project: YTL Pasir Gudang
Location: Malaysia
Client: Siemens KWU
Scope of work: Cathodic protection of cooling water intake sheet piles.

Project: Lumut CAPP
Location: Malaysia
Client: ABB Malaysia
Scope of work: Design, supply and installation of system for internal protection of cooling water pipes.

Project: San Lorenzo CAPP
Location: Philippines
Client: Siemens KWU
Scope of work: Cathodic protection of sheet piles.

PROJECT REFERENCE LIST

2001

Project: Tuas Power Plant
Location: Singapore
Customer: Tuas Power
Scope of work: Supply of spare anodes and reference electrodes.

Project: Malmö harbour - Utökajen
Location: Sweden
Customer: Malmö Hamn AB
Scope of work: Design, supply, installation and commissioning of sacrificial anode system for steel sheet piling.

Project: Widebergs harbour
Location: Sweden
Customer: Ringhals AB
Scope of work: Design, supply, installation and commissioning of cathodic protection of concrete quay deck.

Project: Karlshamn Power Station
Location: Sweden
Customer: Karlshamn Kraft AB
Scope of work: Commissioning of cathodic protection for condenser and auxiliary heat exchangers.

Project: Stockholm Arlanda International Airport
Location: Sweden
Customer: Luftfartsverket
Scope of work: Cathodic protection of fuel hydrant.

Project: Pulau Seraya CAPP
Location: Singapore
Customer: Samsung Corporation
Scope of work: Design, supply and commissioning of cathodic protection system for cooling water intake.

Project: Pulau Seraya CAPP
Location: Singapore
Customer: Siemens
Scope of work: Design, supply and commissioning of cathodic protection system for cooling water pipes, debris filter and tube cleaning equipment.

Project: Siloskajen
Location: Landskrona, Sweden
Customer: Landskrona Hamn AB
Scope of work: Design, supply and installation of cathodic protection system for steel sheet piling.

Project: Panglima CAPP
Location: Malaysia
Customer: Siemens
Scope of work: Design, supply and commissioning of cathodic protection system for cooling water intake and turbine island.

Project: Shell LPG Pasir Gudang
Location: Malaysia
Customer: Shell
Scope of work: Design, supply and installation of cathodic protection system for LPG tanks.

Project: Shell LPG Sepang Bay
Location: Malaysia
Customer: Shell
Scope of work: Design, supply and installation of remote control for cathodic protection system for LPG tanks.

Project: AFAM Power Station
Location: Nigeria
Customer: Siemens
Scope of work: Design, supply and installation of cathodic protection system for pipeline.



PROJECT REFERENCE LIST

Project: Santa Rita CCPP Unit 1/2/3/4
Location: Philippines
Customer: Siemens
Scope of work: Design, Supply and commissioning of cathodic protection system for condensers

Project: San Lorenzo CCPP Unit 1/2
Location: Philippines
Customer: Siemens
Scope of work: Design, supply and commissioning of cathodic protection system for condensers.

2002

Project: Andres Power Station
Location: Dominican Republic
Customer: Hanson Survey
Scope of work: Design, supply and commissioning of cathodic protection system of cooling water intake, cooling water pumps, condenser and auxiliary heat exchanger.

Project: Phu My 3 CCPP
Location: Vietnam
Customer: Siemens PG
Scope of work: Design, supply and commissioning of cathodic protection system for cooling water intake and condensers.

Project: IEC Gezer 3 & 4
Location: Israel
Customer: Siemens PG
Scope of work: Design, supply and commissioning of cathodic protection system for condenser.

Project: Haifa 4
Location: Israel
Customer: Siemens PG
Scope of work: Design, supply and commissioning of cathodic protection system for condenser.

Project: Campo de Gibraltar
Location: Spain
Customer: Siemens
Scope of work: Design, supply and commissioning of cathodic protection system for condenser.

Project: Olefin 9
Location: Iran
Customer: Technip
Scope of work: Design, supply and commissioning of cathodic protection system for underground pipelines.

Project: Emir Kabir Petrochemical Company LLDPE Plant
Location: Iran
Customer: Enerchimi
Scope of work: Supply of cathodic protection system for underground structures.

2003

Project: Total Fina
Location: Philippines
Customer: Shinyo
Scope of work: Design, supply and commissioning of cathodic protection system of pipeline and jetty.

Project: Port Dickson
Location: Malaysia
Customer: Mitsubishi Heavy Industries
Scope of work: Design, supply and commissioning of cathodic protection system of cooling water intake.

Project: Shuweihat
Location: U.A.E
Customer: Siemens
Scope of work: Design, supply and commissioning of cathodic protection system of tank bottoms.

Project: Atherinolakkos



PROJECT REFERENCE LIST

Location: Crete
Customer: Burmeister & Wain Scandinavian Contractors
Scope of work: Design, supply and commissioning of cathodic protection system of cooling water intake and pumps.

Project: Senoko Power
Location: Singapore
Customer: Senoko Power
Scope of work: Design, supply and commissioning of moveable trash rake.

Project: Senoko Repowering Phase II
Location: Singapore
Customer: Alstom Power
Scope of work: Design, supply and commissioning of cathodic protection system of cooling water pumps, pipes, condensers and auxiliary cooling water system.

Project: Tengah Airbase
Location: Singapore
Customer: Singapore Airforce
Scope of work: Design, supply and commissioning of cathodic protection system of fuel hydrants.

Project: Incheon
Location: Korea
Customer: Siemens PG
Scope of work: Design, supply and commissioning of cathodic protection system for condenser, cooling water pipes, auxiliary cooling water system.

Project: Kestrel
Location: Abu Dhabi
Customer: Brackett Green
Scope of work: Design, supply and commissioning of cathodic protection system for cooling water intake.

Project: Palos de Frontera
Location: Spain
Customer: Siemens PG
Scope of work: Design, supply and commissioning of cathodic protection system for condenser.

Project: Tahaddart
Location: Morocco
Customer: Siemens PG
Scope of work: Design and supply of cathodic protection system for condenser.

Project: Shell LPG Sepangar Bay
Location: Malaysia
Customer: Shell
Scope of work: Design, supply and installation of remote control for cathodic protection system for LPG tanks.

Project: Gothenburg – Stenungsund gas pipeline
Location: Sweden
Customer: Nacap
Scope of work: Field test, material supply and installation of cathodic protection system for gas pipe.

Project: Curacao
Location: Curacao
Customer: CEM Resources Inc.
Scope of work: Design of cathodic protection system for cooling water intake and pipes.

Project: Ringhals
Location: Sweden
Customer: Ringhals AB.
Scope of work: Supply of anodes.

Project:
Location: Italy
Customer: Azienda Chimica Genovese S.r.l.
Scope of work: Supply of rectifiers.

Project: Reci

PROJECT REFERENCE LIST

Location: Sweden
Customer: Reci Industri AB
Scope of work: Design and supply of internal cathodic protection system of AST.

2004

Project: Sohar
Location: Oman
Customer: Bahwan Engineering Co LLC
Scope of work: Design, supply and commissioning of cathodic protection system of cooling water intake.

Project: Az Zour
Location: Kuwait
Customer: Siemens
Scope of work: Design, supply and commissioning of cathodic protection system of fuel pipe and oil storage tanks.

Project: Viskan
Location: Sweden
Customer: Södra Cell AB, Väröbruk
Scope of work: Design, supply and commissioning of cathodic protection system of dam gates.

Project: Olkiluoto 3 NPP
Location: Finland
Customer: Siemens/Framatom
Scope of work: Design, supply and commissioning of cathodic protection system of cooling water intake, condensers and auxiliary cooling water system.

Project: Ormen Lange
Location: Norway
Customer: Brackett Green
Scope of work: Design, supply and commissioning of cathodic protection system of cooling water intake.

Project: Haifa 3
Location: Israel
Customer: Siemens PG
Scope of work: Design, supply and commissioning of cathodic protection system of condenser.

Project: Paiton
Location: Indonesia
Customer: PT Jawa Power
Scope of work: Upgrading of existing systems for cooling water intake and condenser.

Project: Al Jubail
Location: Saudi Arabia
Customer: Siemens PG
Scope of work: Design, supply and commissioning of cathodic protection system of fire water pipes.

Project: Samra
Location: Jordan
Customer: Gama
Scope of work: Design and supply of cathodic protection system of fuel oil storage tanks.

Project: General
Location: N/A
Customer: Siemens PG
Scope of work: Development of standard design of cathodic protection system for storage tanks to be used as template within the Siemens/Westinghouse group.

Project: Ala Abad
Location: Iran
Customer: Siemens PG
Scope of work: Design of cathodic protection system of fuel oil storage tanks.



PROJECT REFERENCE LIST

Project: Gothenburg – Stenungsund gas pipeline
Location: Sweden
Customer: Nova Naturgas
Scope of work: Design, field survey, supply and installation of cathodic protection system.

2005

Project: Al Ezzel
Location: Bahrain
Customer: Siemens PG
Scope of work: Design, supply and commissioning of cathodic protection system of cooling water intake, fuel oil and water storage tanks.

Project: Sagunto
Location: Spain
Customer: Siemens PG
Scope of work: Design, supply and commissioning of cathodic protection system for three condensers.

Project: Senoko CCP1 and 2
Location: Singapore
Customer: Senoko Power
Scope of work: Supply of new rectifier system.

Project: Haifa 3
Location: Israel
Customer: Siemens PG
Scope of work: Design, supply and commissioning of cathodic protection system for condenser.

Project: Ras Laffan
Location: Qatar
Customer: Siemens PG
Scope of work: Design, supply and commissioning of cathodic protection system for storage tanks.

Project: Samra
Location: Jordan
Customer: BVI / Gama Power
Scope of work: Design, supply and commissioning of cathodic protection system for storage tanks and buried pipes.

Project: Paya Lebar
Location: Singapore
Customer: Singapore Airforce
Scope of work: Design, supply and commissioning of cathodic protection system of fuel hydrants.

Project: Thar Jath Central Power plant
Location: Sudan
Customer: Burmeister & Wain Scandinavian Contractors
Scope of work: Internal Protection of tanks.

Project: Gothenburg Stenungsund gas pipeline
Location: Sweden
Customer: Nova
Scope of work: DCGV survey.

Project: Sumgait
Location: Azerbaijan
Customer: Siemens PG
Scope of work: Design, supply and commissioning of cathodic protection system of cooling water intake.

Project: Ras Laffan
Location: Qatar
Customer: Siemens PG
Scope of work: Design of cathodic protection system for gas pipe.



PROJECT REFERENCE LIST

2006

Project: Kestrel 2
Location: Abu Dhabi
Customer: Eimco Water Technologies
Scope of work: Design, supply and commissioning of cathodic protection system for cooling water intake.

Project: Al Taweelah
Location: United Arab Emirates
Customer: Siemens PG
Scope of work: Design, supply and commissioning of cathodic protection system for 3 nos 40 m liquid fuel tanks.

Project: Stockholm Arlanda International Airport
Location: Sweden
Customer: Luftfartsverket
Scope of work: Cathodic protection of fuel hydrant Stage 3 Gate F.

Project: Kaeng Khoi
Location: Thailand
Customer: Alstom
Scope of work: Design of cathodic protection system for fire hydrant.

Project: Kårstø
Location: Norway
Customer: Siemens PG
Scope of work: Design and supply of cathodic protection system for condenser.

Project: Shuaibah
Location: Saudi Arabia
Customer: Siemens PG
Scope of work: Design, supply and commissioning of cathodic protection system for 3 nos 88 m oil tanks.

Project: Tan Son Nhat International Air Port
Location: Vietnam
Customer: WEC Engineering Pte Ltd.
Scope of work: Design, supply and commissioning of cathodic protection system for fuel hydrant

Project: Sumgait
Location: Azerbaijan
Customer: Siemens PG
Scope of work: Design of cathodic protection system for gas pipe.

Project: Loviisa
Location: Finland
Customer: Fortum Nuclear Services
Scope of work: Design of cathodic protection system for sea water intake.

Project: Port Dickson 2
Location: Malaysia
Customer: ExPg
Scope of work: Design, supply and commissioning of cathodic protection system of cooling water intake.

Project: Sugan
Location: India
Customer: Siemens PG
Scope of work: Design, supply and commissioning of cathodic protection system for buried PAB pipes.

Project: Livorno
Location: Italy
Customer: Siemens PG
Scope of work: Design, supply and commissioning of cathodic protection system for buried gas pipe.

Project: Bugok II CCPP
Location: Korea
Client: Siemens PG
Scope of work: Design, supply and commissioning of cathodic protection system for condenser water boxes, cooling water pipes, heat exchanger and PCB pipes.



PROJECT REFERENCE LIST

Project: Hamm-Uentrop
Location: Germany
Customer: Siemens PG
Scope of work: Design, supply and commissioning of cathodic protection system for buried gas pipe.

2007

Project: Shuaibah III
Location: Saudi Arabia
Customer: Siemens PG
Scope of work: Supply of cathodic isolators.
Project: Atherinolakkos
Location: Crete
Customer: Athena S. A.
Scope of work: Design, supply and commissioning of cathodic protection system of cooling water pumps.

Project: Shuaibah III – Sluice Gates
Location: Saudi Arabia
Customer: Siemens PG
Scope of work: Design, supply and commissioning of cathodic protection system for sluice gates.

Project: Halla Harbour
Location: Finland
Customer: CMS Corrosion Management Services
Scope of work: Design of cathodic protection system for Halla Harbour.

Project: SSAB Stålhamn
Location: Sweden
Customer: BAKK Entreprenad
Scope of work: Design, supply and commissioning of cathodic protection system of steel in concrete.

Project: Marchwood
Location: England
Customer: Siemens PG
Scope of work: Design, supply and commissioning of cathodic protection system of condenser, PAB pipes and cooling water intake.

Project: Sloe Centrale
Location: The Netherlands
Customer: Siemens PG
Scope of work: Design, supply and commissioning of cathodic protection system of cooling water intake.

Project: Olkiluoto 3 NPP
Location: Finland
Customer: Areva
Scope of work: Design and supply of cathodic protection system of submerged steel structures.

Project: Incheon II CCPP
Location: Korea
Customer: Siemens PG
Scope of work: Design, supply and commissioning of cathodic protection system for condenser waterboxes, PAB and PCB piping.

Project: Pont Sur Sambre CCPP
Location: France
Customer: Siemens PG
Scope of work: Design, supply and commissioning of cathodic protection system for buried gas pipes.

Project: Az Zour South CC Extension
Location: Kuwait
Customer: Siemens PG
Scope of work: Design, supply and commissioning of cathodic protection system for steel surfaces of the condenser and heat exchanger water boxes in the steam turbine buildings.



PROJECT REFERENCE LIST

2008

Project: Gent
Location: Belgium
Customer: Siemens PG
Owner: Electrabel S.A.
Scope of work: Design, supply and commissioning of cathodic protection system for condenser waterboxes.

Project: Pulau Seraya II
Location: Singapore
Customer: Siemens PG
Owner: PowerSeraya Ltd
Scope of work: Design, supply and commissioning of cathodic protection system for condenser waterboxes, PAB pipe, condenser tube cleaning system and debris filter.

Project: Sloe Centrale EKG pipe
Location: The Netherlands
Customer: Siemens PG
Owner: Delta Energy B.V. and Electricité de France SA.
Scope of work: Design, supply and commissioning of cathodic protection system of buried gas pipes.

Project: Marchwood EKG pipe
Location: England
Customer: Siemens PG
Owner: Marchwood Power Limited
Scope of work: Design, supply and commissioning of cathodic protection system of buried gas pipes.

Project: Aghada CCGT
Location: Ireland
Customer: Eimco Water Technologies
Owner: ESB Power Generation
Scope of work: Design, supply and commissioning of cathodic protection system for of cooling water intake.

Project: Central Emile Huchet
Location: France
Customer: Siemens PG
Owner: La Société National d'Electricité et de Thermique
Scope of work: Design, supply and commissioning of cathodic protection system of buried gas pipes.

Project: Pulau Seraya II
Location: Singapore
Customer: Samsung
Owner: PowerSeraya Ltd
Scope of work: Design, supply and commissioning of cathodic protection system for screening lines, sheetpile, pumps and discharge pipes.

Project: Fos
Location: France
Customer: Alstom Power Centrales
Owner: Electrabel/Suez
Scope of work: Design, supply and commissioning of cathodic protection system for buried gas pipes.

Project: Pego
Location: Portugal
Customer: Siemens PG
Owner: Central Termoelectrica do Pego
Scope of work: Design, supply and commissioning of cathodic protection system for condenser.

Project: Fujairah F2
Location: U.A.E
Customer: Alstom (Switzerland) Ltd
Owner: Fujairah Asia Power Company
Scope of work: Design, supply and commissioning of cathodic protection system for fuel oil and water storage tanks bottoms.

Project: Fujairah F2



PROJECT REFERENCE LIST

Location: U.A.E
Customer: Eimco Water Technologies Ltd
Owner: Fujairah Asia Power Company
Scope of work: Design, supply and commissioning of cathodic protection system cooling water intake.

Project: Intensivmätning Swedegas
Location: Sweden
Customer: Swedegas AB
Owner: Swedegas AB
Scope of work: Field test of gas pipe

Project: Flevo
Location: France
Customer: Alstom Power Centrales
Scope of work: Design, supply and commissioning of cathodic protection system for buried gas pipes.