

Model AT – Modular Linear Anode

Typical Applications:

- Underground and aboveground storage tanks, buried pipelines, marine structures

Featuring:

- Design flexibility - modular design permits multitude of anode configurations
- Rapid installation - no field splices or weldments
- Light weight - very easy to ship and handle



The **Model AT** is an impressed current linear anode system that permits maximum design flexibility. It consists of copper-cored titanium flat wire coated with mixed metal oxide and attached to a #14 AWG HMW/PE insulated bus wire. A flexible plastic mesh surrounds the wire pair. Individual anodes are 50 feet (15 m) long and are easily connected in the field to form a secure sealed joint. This allows the design engineer to choose a layout that is best suited for the application.

Perhaps the most significant feature of the **Model AT** is its unique connector system. Each anode is supplied with a pin connector on one end and a socket connector on the opposite end that can be mated either to another anode section to form a string or to a power feed cable. Specially developed "tee" connectors allow intermediate current feeds on long strings. These connectors are designed for underwater cable connections and are being used successfully on other EDI products in turbulent aqueous solutions. All connections are factory made and sealed so there are no splices or weldments required in the field. The mating ends are simply pressed together and secured with the locking ring. Installation can be completed in substantially less time than any other system. For example, an AT anode system can be installed in a 60 foot (18 m) diameter tank in less than 6 man-hr.

electrochemical devices, inc.

PO Box 789, Middlefield, OH 44062 440-632-5616

info@edi-cp.com

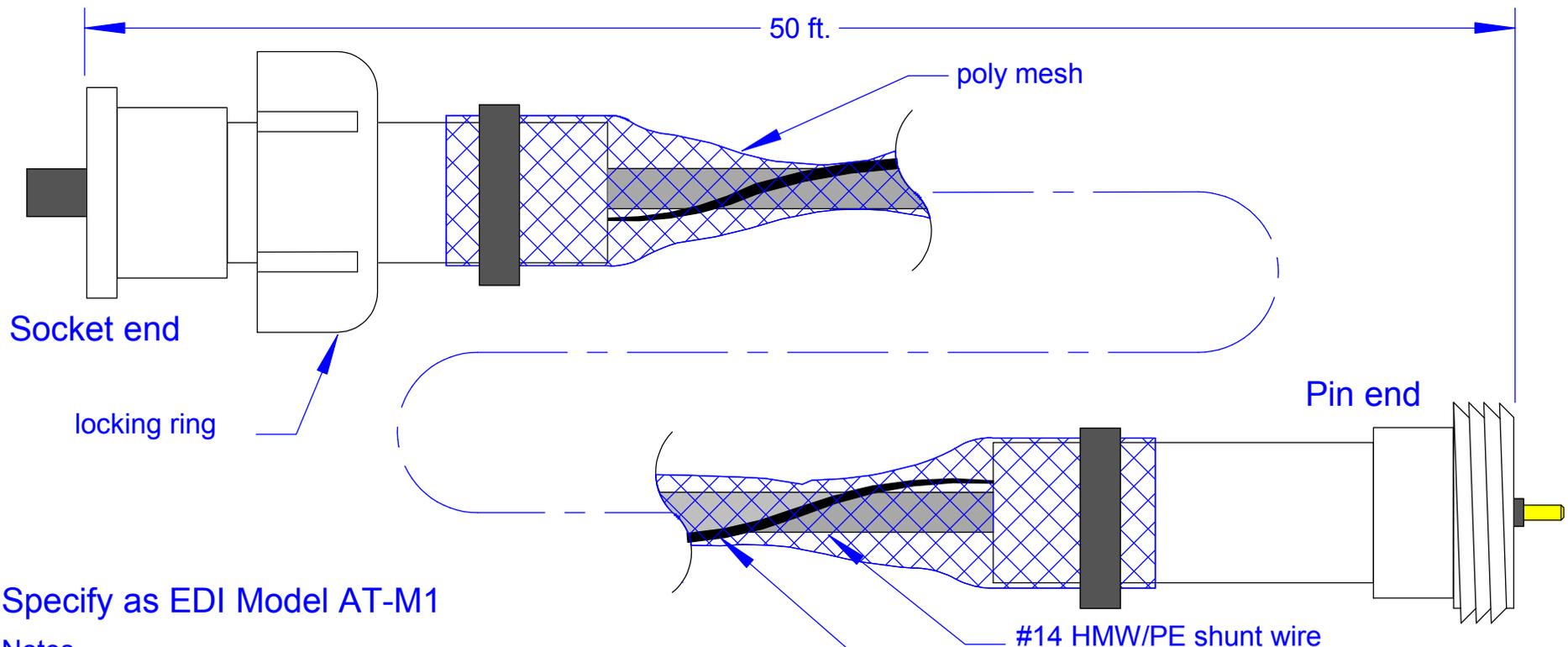
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*A Series
Impressed
Current Anodes*

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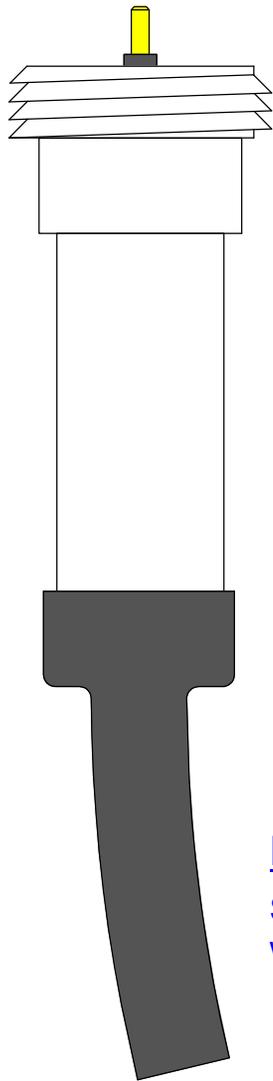
Specify as EDI Model AT-M1

Notes

1. Current output must not exceed 500 mA per 50 ft. anode. Rectifier voltage must not exceed 25 volts.
2. Individual anodes may be interconnected to form strings of any desired length. Power feeds must be no more than 1,000 feet apart.
3. Current must be fed into the anode from both ends. Anode strings over 1,000 feet must have additional intermediate feeds.
4. Assemble individual anodes into strings by pressing pin end fully into socket end. Secure the joint by threading the locking ring hand tight.

0.012 in. x 0.060 in Cu cored Ti flat wire with mixed metal oxide coating

Internal connector specifications
 Pin and socket are brass alloy 360
 Connector body is Neoprene
 Power rating is 15 amps
 Insulation rating is 750 volts
 Contact resistance is <0.01 ohm
 Pressure rating is 20 kpsi
 Outer shroud is PVC

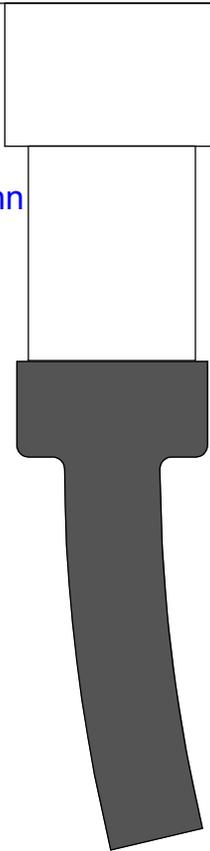


Tee End Lead Wire

Specify as EDI Model AT-TEE-nnn
where nnn = wire length in feet

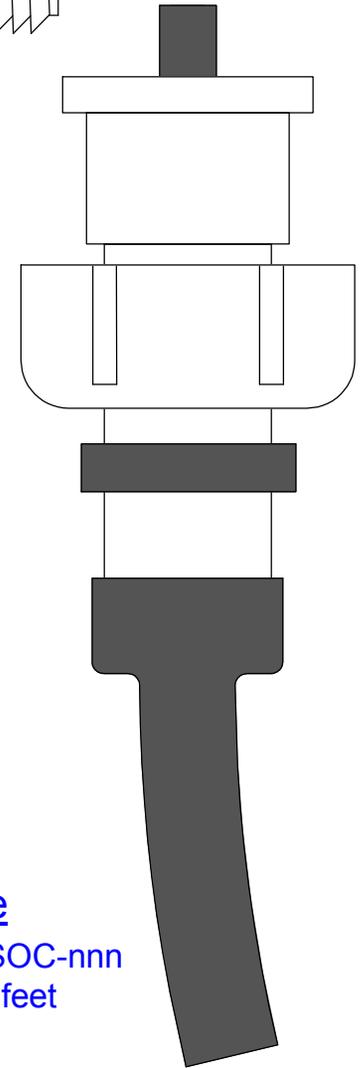
Pin End Lead Wire

Specify as EDI Model AT-PIN-nnn
where nnn = wire length in feet



Socket End Lead Wire

Specify as EDI Model AT-SOC-nnn
where nnn = wire length in feet



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AT Anode Power Feeds

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www.edi-cp.com

info@edi-cp.com

SCALE FULL

DRAWN BY

FJA

DATE 26 DEC 2013

DRAWING NUMBER

ATASY - 4



Installation beneath aboveground storage tanks with secondary containment

Anode Layout

The anode should be placed as deep as possible, preferably, directly on the polymer liner. Shallower placements will reduce the spread of CP current. Begin the layout at the ring wall next to the access port and work toward the center of the tank. When using a stepped spiral array, the first loop will be a complete circle located at half the anode spacing distance, s , away from the ring wall. At the end of this loop, the anode steps over to start the second loop located a distance s from the first loop. The radius of the bend between the loop and the step shall be no smaller than 6 inches (15 cm) to avoid damaging the anode. The step does not have to be perpendicular to the anode; an offset of 30° to 45° is optimum. When using other array designs, layout details should be as specified by the CP system designer. Embedded reference electrodes should be placed mid-way between anode strings. Other sensors, such as 4-wire resistivity probes or ER probes, should be located close to the reference electrodes.

Anode power leads are connected to both ends of the anode strings. Tee-end lead wires are used to provide intermediate power feeds. Distance between power feeds must not exceed 1000 feet (300 m). Remove the protective vinyl caps when ready to connect individual anode sections or power feeds. Press the ends firmly together to ensure the connector is fully seated; the PVC housing flanges should be about 1 – 2 mm apart. Tighten the securing nut hand tight. Anodes can be held in position by either directly taping the joints to the polymer liner or using small sandbags. Cover the anode by pouring fine dry sand directly on the mesh and ensuring that it penetrates to encapsulate the anode. The sand should be finer than 0.6 mm (#30 sieve) and cover the mesh by about $\frac{1}{2}$ inch (1.5 cm). When doing end-to-end continuity checks, each anode has a resistance of about $\frac{1}{4} \Omega$; lead wire resistance is about $\frac{1}{2} \Omega$ per 100 ft. (30 m).

Backfilling and Installing Tank Floor

The anode array is covered with sand to the depth specified by the CP system designer. If the sand is too dry, this can cause problems during commissioning because the resistivity will be too high to permit passage of adequate current to polarize the tank bottom. Adding moisture to the sand after it has been graded but before the floor has been installed will make it possible to properly commission the system.

All cathodic protection systems can be easily damaged at this stage of construction. If mechanized equipment is used, extreme care must be taken to ensure that the system is not damaged. Wires can be severed, reference electrodes can be crushed, and sections of the anode can be dragged out of their intended position. *The CP installer should continuously monitor electrical continuity on the anode circuits during sand installation so that any damage can be located and quickly corrected.*

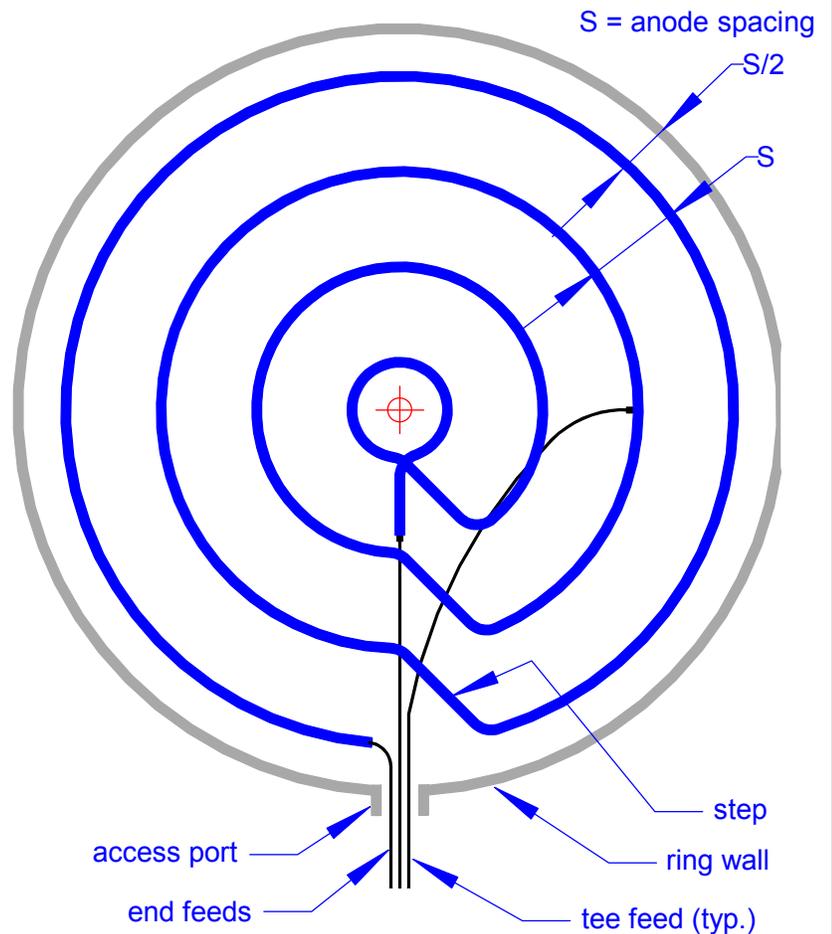
Commissioning

Before commissioning the system, there must be sufficient product in the tank to ensure that the bottom is in complete contact with the sand. If the sand bed is damp enough to conduct current, the system can be commissioned by setting the rectifier to produce the desired shift in the tank floor potential. Once that has been attained, no further adjustment should be made to the rectifier output voltage. Note: rectifier voltage should not exceed 25V. As the system operates, the sand will dry out making the environment less corrosive. When this happens, current output will be reduced. When the sand re-wets due to rain or flooding, the current will return to the level necessary to provide protection.

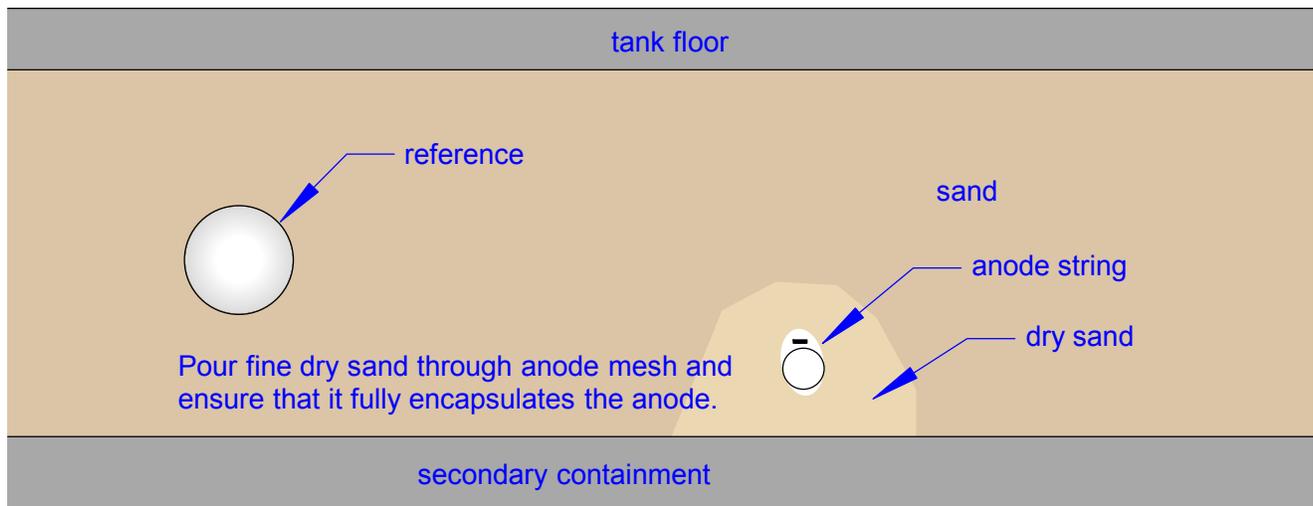
Stepped Spiral Array

Begin anode layout at the ringwall and work toward the center.

Lead wires are connected to both ends of the anode string. Tee End lead wires are used for intermediate power feeds. Distance between power feeds must not exceed 1,000 feet (300 m).



Installation Detail



Undertank Anode Installation

SCALE	NONE
DRAWN BY	FJA
DATE	23 APR 2015
DRAWING NUMBER	ATAPP-3