

Slide On In! EPILUBE Puller Packs

A recent addition to the line-up of Electropar products is the unique, non-toxic and non-allergenic cable pulling lubricant, Epilube. Until recently the product has been available in 20 litre and 1 litre plastic drums for "by-hand" application to cables being pulled into ducts, but the new Epilube Puller Pack makes this sometimes messy job clean, easy and painless.

The convenient Epilube Puller Pack has a pulling eye on each end for ease of attachment to the cable end, or to attach the packs in sequence for longer pulls. Epilube reactivates with water, has anti-static properties and is non-gritty. It will not cause damage to cable sheaths and does not crystallize. Our product dries to a less than 1% residue, and is suitable for applications in both power and telecom/fibre areas. It can be used in concrete or PVC ducts, as well as the assembly of rubber-sealed water and sewage systems. Being chemically inert, it will not attack rubber, polyethylene or plastics. Manual application of cable lube as the cable is being pulled is no longer necessary. Our



product simply attaches to the pulling sock at the beginning of the cable, lubricating the cable by bleeding out of the plastic packaging as it is pulled. Just slit the Epilube pack after it has been attached to the cable end when you are ready to begin pulling the cable through the conduit, and it does the job for you!

Epilube is just what you need to eliminate wasted product and the messy job of manually pouring lube onto the cable as it is being pulled. Our easy to use Epilube Puller Pack means cost savings, plus the assurance that the lube is being applied where it's needed, along the length of the conduit. Contact Electropar on john@electropar.co.nz

Safety First: Temporary Earthing of Indoor Switchgear

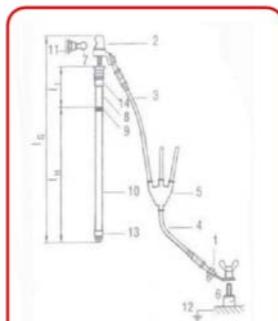
Specifically designed for temporary connection of indoor switchgear in Substations to earth during outages for maintenance, Dehn and Sohne (Germany) manufacture one of the best and widest ranges of equipment available. Electropar can assist engineers and contractors in selecting a temporary earthing system, based on expected fault levels.

A typical system for temporary earthing of indoor switchgear using the Dehn product would consist of the following: (1) a fixed point/ball point, (2) single or three-pole lead, (3) fixed earthing point, and, (4) a fibreglass earth set application stick (see diagram).

The short-circuit current at the installation location determines the rating for the earthing and short-circuiting system. Selection of the fibreglass earth stick is determined by the Minimum Approach Distance (MAD) weight of the earth lead and type of short-circuiting device to be used.

The fixed or rotating ball head system of connecting the switchgear to the earth lead achieves the highest possible short-circuit strength. In addition, use of the rotating type ball head enables the operator to move the earth set to a convenient working position by adjusting the ball head cap in the event where access inside the HV cabinet is difficult.

An important point to note is that all Dehn Earth sets are designed for loading **once** at the maximum permissible rated current time. Cable lengths deflect strongly in the event of a short-circuit, and should not be unnecessarily long. As a guide, lengths of earthing cables should be at least 1.2 times the distance between two connection points. Contact Steve Deverick at Electropar on steved@electropar.co.nz



Freely movable equipment for earthing and short-circuiting

1. Connection to earthing system
2. Connection to conductor
3. Short-circuiting cable
4. Earthing cable
5. Ball head connection
6. Connection point to earthing system
7. Connection point to conductor
8. Insulating element of length l₁
9. Black ring
10. Handle of length l₂
11. Conductor
12. Earthing system
13. Rod endpiece
14. Coupling

New Faces at Electropar!

Please join us in welcoming Doug Hook, Patti Newlin and Simon Pratt to the Electropar staff.

Doug Hook

Doug Hook started in the electrical industry as an apprentice electrician in Lower Hutt, and has been involved in the industry ever since. Doug has undertaken a variety of positions in the Hutt Valley and Auckland areas as electrician, electrical inspector, tutoring at AUT, metering supervisor, commercial engineer and power systems engineer. Doug has now joined the Electropar team in the position of Project Estimator, and we welcome his expertise in the HV and EHV area. Doug will be working primarily on larger line and station projects in NZ and Australia can be contacted on DDI (09) 274 2006 or dough@electropar.co.nz.



Patti Newlin

Patti Newlin comes to Electropar from Young Power Equipment, an electric equipment manufacturer's representative, where she worked for nearly 20 years. She has recently moved to Christchurch from the desert in Phoenix, Arizona, and is still getting used to our cold climate (and the New Zealand accent)! Patti is very familiar with S&C Electric and the PDT industry in general. She worked mainly with Arizona Public Service Company, Phoenix's largest power company, in both outside and inside sales roles for the last several years. Having spent the last several weeks in training in Auckland, Patti now joins our Christchurch branch as a Sales Engineer, where she can be contacted at (03) 338 5165 or pattin@electropar.co.nz.



Simon Pratt

Simon Pratt has returned to work at Electropar after a four year OE in the UK. During his time in England, Simon was involved with fibre optics in the telecommunications industry. He was employed for two years with Comacc, a designer, manufacturer and installer of fibre optic management products. He was primarily involved with Nortel Networks and Cable & Wireless for the rollout of the C&W Pan European Network. Simon was also involved with AEI cables, installing power and communications cables for wind farms and Shell Oil in the North Sea. Comacc was purchased by Tyco in 2001 and merged with the Electronics Division of the Telecom Outside Plant, where he was involved with Raychem, Pinacl and AMP passive fibre optic products. Simon left Tyco in early 2004 to travel back to New Zealand via Africa, India, Nepal and Peru with his wife Suzanne, managing not to get lost, robbed or converted along the way!



Simon has returned to Electropar to take up the role of Sales Manager for the Components Division. Focused on the original equipment manufacturing (OEM) sector, this division offers a wide range of specialised materials and components. Brands include DuPont Nomex and Mylar insulations, Dow Corning silicones and Grafoplast cable marking. The sales team also specialises in firestopping compounds, high temperature cables and sleeveings, electrical resins and varnishes, electrical tapes and copper magnet wire. We wish him well in his new role. For any queries please contact Simon on 09-274-2027 or simonp@electropar.co.nz

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High Voltage & Extra High Voltage: Cranbourne 66 / 220 / 500kV

When AREVA T&D Ltd. secured a large turnkey contract in May, 2003, with SPI Powernet, the Grid Operator in Victoria, Australia, little did Electropar know of the fantastic HV and EHV engineering challenge and opportunity it would present for the company in late 2003 and 2004.

The contract scope of works for AREVA T&D broadly consisted of engineering, design, procurement, construction and delivery to the asset owner of greenfields 66kV, 220kV and 500kV substations located on adjacent sites in Melbourne's south east.

Electropar became involved with the project as the result of making a successful offer to AREVA T&D (Sydney) to provide all of the buswork and conductor fittings required to connect items for the primary plant in the three yards. Introducing a new twist, the scope of work issued to Electropar by AREVA also included provision of overhead line tension and V-string assemblies for the switchyards.



After tender of award, Electropar worked closely with AREVA T&D to engineer the bus system for the 220/66kV, as this was the first construction to begin. Main bus in the 220kV station is 200mm OD x 10mm WT aluminium alloy with bay bus 120mm OD x 10mm WT, both in 6101 T6 Alloy. Electropar's scope included provision of all busworks, bus supports and expansion joints as well as means of connection to CB's, Transformers, Disconnectors, VT's, CT's and Surge Arrestors. Most of the flexible connections between equipment are quad Sulphur (61/3.75 AAAC, 33.80mm OD) which in itself presents challenges as the conductor is large and difficult to lay up in quad format.



As of June 2004, construction of the 220kV and 66kV switchyards is almost complete and the asset is almost ready for commissioning and delivery to SPI Powernet. Civil works are well underway for the construction of the 500kV switchyard and on July 23rd the first 40 foot container of 500kV buswork and fittings departed Electropar for the Cranbourne site. Again the scope of works for the 500kV switchyard included the design of all buswork and supports, connections between primary plant and equipment, and tension and V-string assemblies for triple and quad AAAC conductor inside the station.

The engineering challenge of designing, manufacturing and delivering 500kV equipment is an interesting one, and the EHV experience valuable, as the design elements influence fittings applied at lower voltages. Electrical discharge or corona is a major factor in the design of bus fittings and conductor assemblies at 500kV. Electropar has completed RIV testing at 500kV, as well as independent design ratification of its fittings and assemblies. In addition, the Electropar production team has had the challenge of mastering new techniques associated with the manufacture of the new fittings and assemblies, so that discharge is not a problem.



Many of the new EHV fittings and assemblies will appear in Electropar's new "Tubular Aluminium Busbars for Substation" Catalogue, which is due to be released by the end of 2004. For more information, contact Cam Wallace at Electropar on DDI (09) 274 2011 or cameronw@electropar.co.nz

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A Revolutionary Transformer Protection Device S&C Electric Trans-Rupter II® Transformer Protector

The S&C Electric Trans-Rupter II® Transformer Protector is a space-saving device which is easy to install and provides primary side protection of 66kV and 110kV small to medium sized power transformers.

Unlike circuit breakers, which provide the most sophisticated protection capabilities, the Trans-Rupter II offers a less expensive solution. Most transformer protection devices (i.e., circuit breakers) are multi-purpose, and, as such, include features necessary for applications such as line and capacitor switching. Since these features aren't needed for a transformer protector, they've been eliminated, and so have their costs.

The S&C Trans-Rupter II's transformer protection capabilities are as comprehensive as those of circuit breakers, providing reliable transformer protection. Each pole-unit has its own operating mechanism sealed in SF₆, providing a maintenance free device and excellent protection from the external environment. There are two models available, EX and SE.

The Model EX is ideal for applications where protection relays and control power are already in place at the substation. The Model SE features a self-powered overcurrent protection relay, which is activated by current transformers on the primary bushings of the substation.

The Model EX Trans-Rupter II is the base model, which comes without any relays or integral protection capability. It is compatible with virtually any differential, sudden-pressure, or overcurrent relay. Pole-units are field-wired to a low-voltage connection enclosure for connection to relays and control power. The Model EX requires a 48-Vdc or 125-Vdc control-power source.

If the EX Model is the "Falcon", the Model SE is the "Fairmont" in the range of Trans-Rupter II Transformer Protector offerings. The Model SE comes with its own overcurrent protection system, self-powered overcurrent relays and a trip-energy supply spring mechanism that eliminates many of the costs associated with more expensive transformer-protective devices. These are all housed in a weatherproof control cabinet that mounts on the substation structure. There's no need for external relays, substation batteries, or a control house. For a greenfields or brownfields rural zone sub, this can spell serious savings in dollars.

The Trans-Rupter II is not intended for any other switching duties, such as line and capacitor switching. The pole-units are electrically linked. It is a resettable device but will not auto-reclose. After three-phase trip of SF₆-filled pole-units, an operator must manually close each phase by recharging the stored energy mechanism. The load is picked up on close of disconnecter. Motor operators, which run on dc control power, are available for the Model EX.

Trans-Rupter II Transformer Protector is available with integral disconnect/isolator. This saves space and cost in the substation as only one structure and one set of structure earthing is required. The use of composite-polymer silicone insulators in lieu of porcelain makes the pole-units very lightweight and shatterproof.

Trans-Rupter II offers the same high-speed fault-clearing time and fault-interrupting rating of most circuit breakers at a reduced cost, both in terms of the device itself, and in terms of installation savings. Contact Steve Deverick at Electropar on steved@electropar.co.nz for a complete set of Trans-Rupter II information, ratings and prices.

Integral Disconnecter

Trans-Rupter II



The Dirt on a NEW Earthing Connector

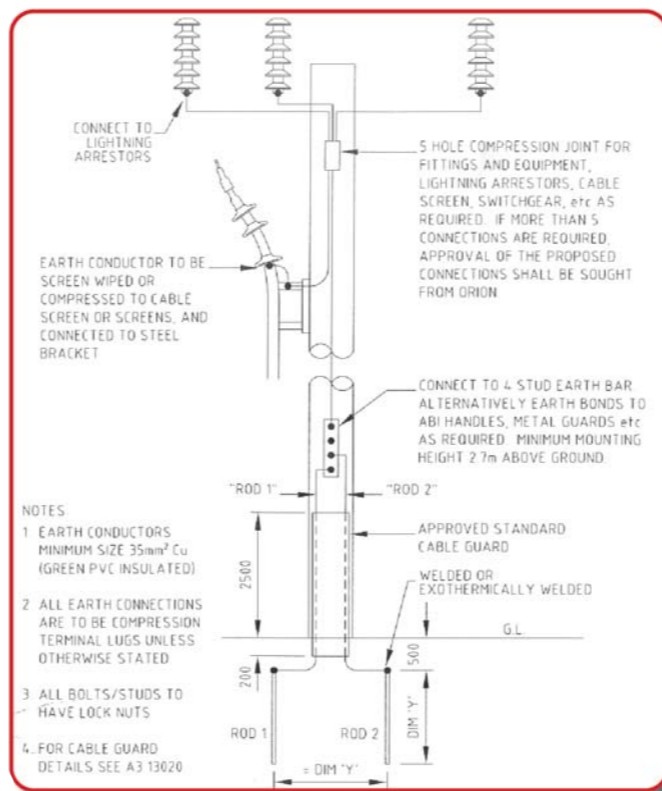
Christchurch based Orion New Zealand's regular programme of engineering design review for operational and safety improvements caused system earthing to become a focus for Network Planning. As a result, the organisation made a decision to re-evaluate existing earthing practices and equipment to improve network operational safety and ensure the system was robust enough to withstand the impact of higher fault currents.

Electropar became involved in the project when Merv McKay of Orion came up with an idea for a new type of earthing connector. His idea was that a single connector should be able to accommodate a compressed connection of the three Surge Arrestor tails at one end (typically 35mm² copper) and a bonding lead to cable termination support bracket, plus a bonding lead to an earth bar at the other end (also 35mm² copper - see diagram). In addition, the connector had to be able to be compressed with a standard 12 or 14 tonne tool and dies as this equipment was common to Orion's contractors. It was an interesting idea, and Electropar's engineering department took on the challenge!

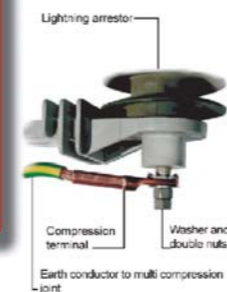
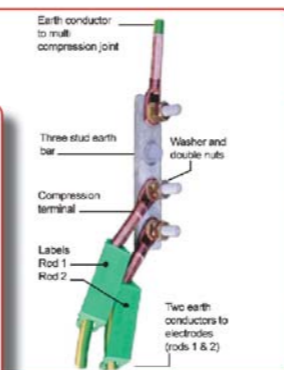
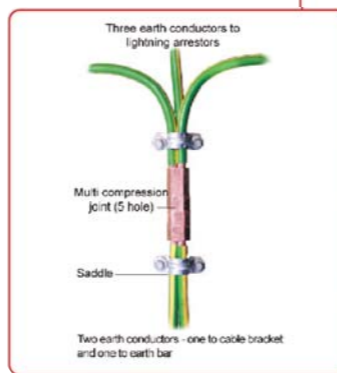
Workshop trials of the connector were promising, so field trials in Christchurch went ahead. After some tweaks to the initial design based on feedback from contractors, Orion decided that based on the engineering process completed, the new connector would be adopted as a network standard. In addition, all above ground termination and bonding of earth leads to plant and equipment (including termination of HV cable screens)

would be completed using Electropar's heavy-duty copper earthing terminals.

For more information about the project contact Cam Wallace at Electropar on DDI (09) 274 2011.



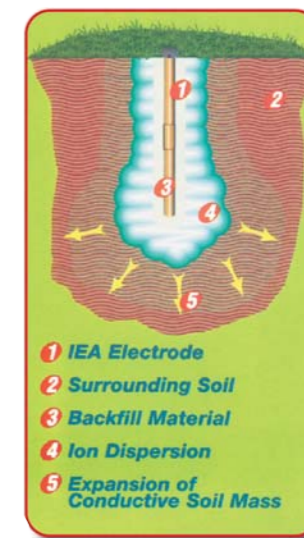
Examples of Application



ZAP Those Earthing Problems With the Ionic Earthing Array

The IEA (Ionic Earthing Array) earthing solution, by ATI Tectoniks, has been created for applications where conventional means of earthing pole-mount and ground-mount power distribution equipment (e.g. transformers, ABS's) will not create a good earth (i.e., less than 10 ohms).

The IEA Electrode consists of a condenser with air intake, an upper segment, lead cable with the TectoWeld® exothermically welded connection (TectoWeld® is also manufactured by ATI Tectoniks), straight coupler, ion moisture release port, lower segment and another ion moisture release port. Suitable for any application requiring stable low ground resistance, the IEA system has been designed to release free ions into the surrounding soil while providing a direct, low resistance path to earth. More traditional methods give only partial and short-term results, resulting in inadequate Earthing protection. Extensive testing has shown that the absence of free ions in the surrounding soil contributes greatly to the problem of high ground resistance. The IEA's copper alloy tube ensures maximum conductivity and prolonged service life. Its ceramic composites, metal alloys and natural ion rich crystalline compounds provide a pro-



active Earthing protection strategy. Inherent air moisture triggers the release of free ions into the soil, enabling the soil to maintain a highly conductive state. The electrode's large current capacity and the highly conductive ion enriched soil mass ensures a low impedance path to ground, effectively resulting in dissipation into the surrounding soil.

This environmentally compliant device has been designed with a special soil-to-electrode interface that expands and contracts when soil conditions change. Soil conductivity is increased through ion dispersion, making a "foundation" upon which an effective site protection system can be built. The versatile IEA can be installed in many varying locations, both inside and outside in stony, sandy or earthy conditions.

A maintenance free device, the Ionic Earthing Array provides stable Earthing performance over its normal service life of over 35 years. It is a modular system, enabling users to build extended grids or an array suitable to their requirements. Once installed, the system is connected to the earth grid. TectoWeld exothermic connections from Electropar are recommended for connection to the IEA to the earth conductor. Contact Electropar for information on IEA on johnd@electropar.co.nz

Te Anau IEA Trial

Powernet Ltd., based in Invercargill, has an ongoing challenge with creating and maintaining good quality earths in specific areas of their network. One such area is in Te Anau, and Maintenance Manager Graeme Webby decided that the Te Anau site was a good one to trial an IEA. As we go to print, specific information regarding the type of installation the IEA is protecting at Te Anau and the approximate fault current expected has been collated. Most importantly, resistivity readings of the soil (including what type of meter was used to take the resistivity values), how many probes were used in the readings and how far apart they were (e.g. 1 metre, 2 metres etc) has also been collected. In conjunction with this data, details of the existing earthing Powernet has already installed and values achieved will be analysed by Electropar and TectoWeld® so that the number and layout of IEA's can be optimized. The next issue of PowerlineNZ will feature the installation of the IEA at Te Anau and results!



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I would like to receive your regular product information by :

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Yes! Don't mind! No!

Please have a Sales Engineer call to discuss my requirements