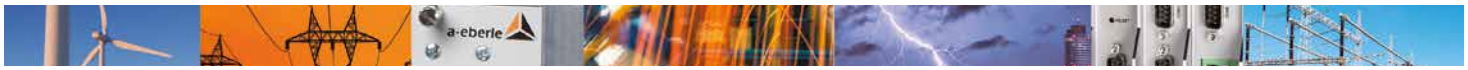
LINE CARD

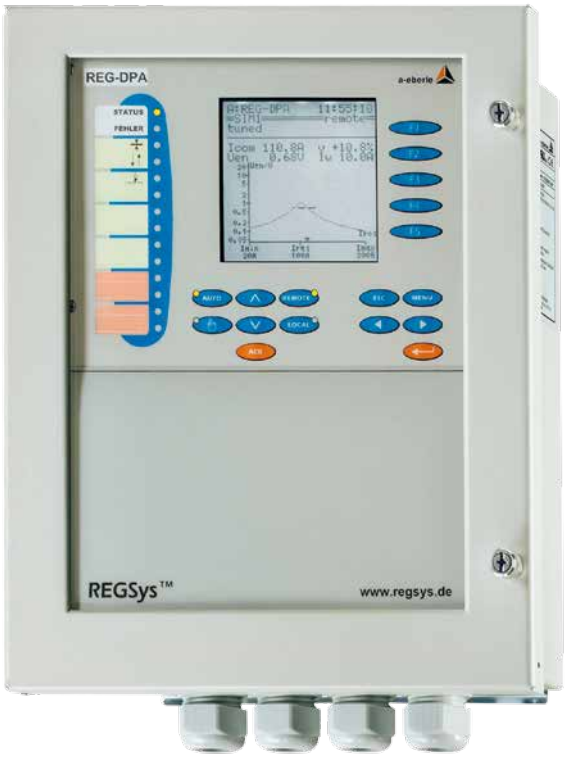
HV POWER

POWER AUTOMATION TECHNOLOGIES

TECHNOLOGY SUPPLIERS TO AUSTRALIAN POWER UTILITIES



This is not your average VRR



Above - it's actually a REG-DPA controller that automatically tunes a Petersen coil at the heart of a Resonant Earthed Network.

HV Power is a technology company supplying IEDs - Intelligent Electronic Devices to Power Utilities throughout Australasia.

Set up in 1994 the company has a solid track record working with customers in the specification, design and implementation stages of protection upgrades, new substations and transformer installations.

The core staff of HV Power have come from Power Utilities. That experience together with specific training from our foreign suppliers and by working daily with a range of devices ensures staff are knowledgeable about the technologies the company supplies.

Since 2004 HV Power's people have been deeply involved in the implementation of IEC 61850 based Substation automation systems.

Our team won't sell a product until we are confident it does what the manufacturer claims and that we can fully support it – locally.

We don't sell black boxes!

Since 1998 HV Power has worked closely with German manufacturer A.Eberle to develop sales of REG-D and REG-DA Tap Changer Controllers, commonly referred to as VRR - Voltage Regulating Relays.

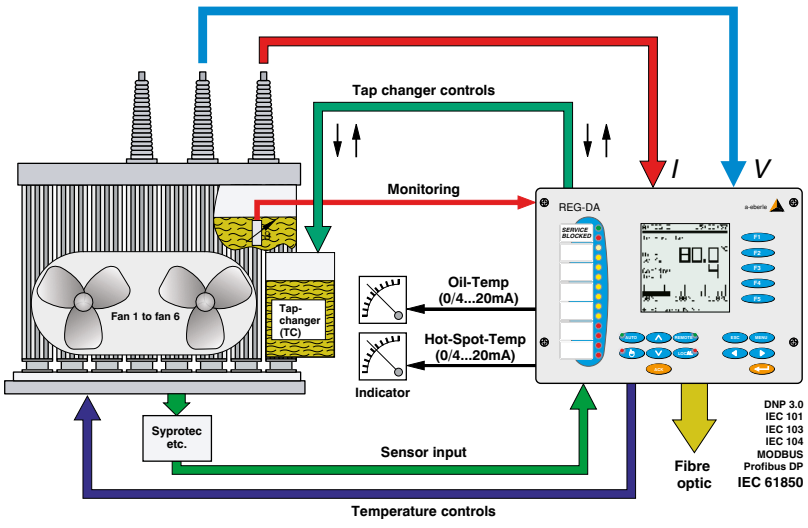
REG-D/- Controllers. Ubiquitous Down Under

With over 1000 installations across Australia and New Zealand combined the **REG-D** & **REG-DA Voltage Regulating Relays** have proven superbly reliable and dependable in service. They're backed by HV Power's team providing the best in local technical support.

A.Eberle's **REG-DP** and **REG-DPA** use the same trusted hardware as the VRR models.

Transformer Controls

REG-D & REG-DA are innovative Tap Changer Controllers with Integrated Transformer Monitoring and Temperature Control System



- Large display and intuitive front panel
- ParaGramer mode for easy paralleling of transformers with differing properties
- Multi-channel recorder and logbook
- Tap position statistics optimise maintenance scheduling of Tap Changer
- TMM -Transformer Monitoring Mode provides complete temperature control of fans and pumps
- Comprehensive library of SCADA communication protocols including IEC 61850, DNPi and more
- Multi-master system architecture
- Highly configurable for customer-specific requirements

a-eberle

Resonant Earthing & Earth-fault Detection Systems

RE+DS

- Traditional ASC Petersen coil approach. No invertor/power electronics
- Accepted best practice European approach for Compensated Networks
- Very high reliability,availability and stability under fault conditions
- Resonant earthed networks offer improved SAIDI and CAIDI
- Applicable to 11 kV and 33 kV and higher voltage networks
- Highly cost effective
- Suitable for overhead and cable, rural or urban networks
- Advanced fault finding and location technology

Petersen coils are used in ungrounded 3-phase systems to limit arcing currents during earth faults. The coil was first developed by Waldemar Petersen in 1916. However the use of modern electronics has revolutionised the performance of these classical solutions.

The prime reason for adopting Resonant Earthing is the significant reduction in outages particularly in rural overhead networks which are highly susceptible to trippings caused by Earth Faults. The reduction in step and touch voltages which these systems bring is also proving a significant benefit in areas where poor ground conditions make achieving a low resistance earth difficult and expensive.

The move to adopt Resonant earthing in Australia received a boost in 2015 with the Victorian Bush Fire report recommending that ***Rapid Earth Fault Current Limiting (REFCL)*** devices be deployed in bushfire prone areas across Victoria.

HV Power's RE+DS system offers a cost effective approach to Resonant Earthing combining a modern steplessly adjustable Petersen coil and micro-processor controller along with advanced permanently installed earth fault detection solutions.

RE+DS is based on the classical Petersen Coil and uses an A.Eberle REG-DP controller. The ASC Arc Suppression Coil is an adjustable reactor installed between the zone substation transformer neutral point and ground. The system self-adjusts (tunes) to resonate with the total distribution network capacitance at 50Hz so that the neutral voltage can float. This allows the voltage of any wire anywhere on the network to be set to zero with respect to the ground.

HV Power's approach to supply Compensated Networks is supported by our European suppliers A.Eberle and EGE.

Their engineers are recognised as experts in the practical application of this technology around the world.

a-eberle

EGE

Earthfault Detection – Compensated Networks

A.Eberle's EOR-3D combines earth fault and short circuit detection in a package the size of a panel meter. It's a state of the art IED with waveform event capture and log book.

Conventional earth fault relays are designed to operate on non-intermittent low ohmic faults on solidly grounded networks. In contrast EOR-3D is designed to detect earth faults on compensated networks and its key advantage to other Fault passage indicator devices lies in the use of 4 different detection algorithms that provide excellent sensitivity.

EOR-3D are now in service in Victoria and have proven to operate reliably on feeders on a network using NERs at the substation.

The EOR-3D Compact version has been designed specifically for use in Ring Main units. There's models to connect to non-conventional sensors or to conventional CT's and VTs. Several choices of protocols ensure straight forward connectivity to SCADA.

Connectivity to all SCADA Systems

REG COMMS is a family of protocol interfaces that provide the right connection between any **A.Eberle** device and a SCADA or DCS system.

The list of supported protocols includes DNP 3.00, DNPi, MODBUS TCP, IEC 61850 and more. REG-PE(X) Interfaces are available in a variety of hardware platforms - as a plug in modular card, DIN rail mount housing or integrated into the A.Eberle Regulator, PQ or Controller device. Choose from copper, fibre and serial or Ethernet connections.

WinConfig is the universal software tool that's used for the set-up of mapping and other interface parameters for all supported protocols.

Check out the library page on our website for the latest WinConfig software.

WinConfig provides a step by step mode for beginners and an advanced mode for control system and SCADA experts.

HV POWER

POWER AUTOMATION TECHNOLOGIES

HV Power Measurements and Protection Ltd
ABN 62 113 118 536

Monitoring - Power Transformers

MTE's HYDROCAL range are permanently-installed multi-gas-in-oil analysis systems with transformer monitoring functions.

They provide the measurement of moisture and each of the key gases that are dissolved in transformer oil.

These include hydrogen (H2), carbon monoxide (CO), carbon dioxide (CO2), methane (CH4), acetylene (C2H2), ethylene (C2H4) and ethane (C2H6).

Which gases are measured depends on the particular Hydrocal model.

In practice it's been proven that Hydrogen (H2) is involved in nearly every fault of the insulation system of power transformers while carbon monoxide (CO) is a sign of deterioration of the cellulosic/paper insulation.

The presence of and detected increasing levels of acetylene (C2H2) and ethylene (C2H4) further classifies the nature of a fault as overheating, partial discharge or high energy arcing.

Some Hydrocal models can serve as a compact transformer monitoring system by the integration of other sensors present on a transformer via analogue inputs.

Two major advantages of the Hydrocal are that carrier gases are not required and the mounting of the device does not involve any complex pipework.

MTE

Power Quality Measurement - Class A

- **PQ-Box 100, 150 & 200 Portable Analysers**
- **PQI-DA Smart PQ Interface**

PQ-Box 100 with robust Aussie leads & accessories

- Comply with IEC 61000-4-30 (2008) standard for class A devices
- All 3 PQ devices are rated CAT IV
- Up to 32GB storage - PQI-DA Smart & PQ-Box 200
- 2GB storage on PQ-Box 100
- Powerful recorder trigger functions provided
- Optional Ripple Control Recorder on portable analysers
- 10 ms Recorder and Oscilloscope features for hi-res capture
- WinPQ Mobil software supplied free with PQ-Box 100 & 200
- Extensive choice of voltage leads & accessories

More than 4,000 PQ-Box 100's are in use worldwide

HV Power Services

HV Power Services was established in 2001 to help customers implement the various technologies the company sells. The detailed knowledge held by our staff, of the products and their application, is a valuable resource to others who are involved in the work to install, test and commission them.

As our staff have significant experience in the power industry we offer a range of services to assist project managers, technicians and engineers. These include:

Creating Standard Designs
We run design workshops for utility staff to develop standardised applications.

Training Courses
"Hands on" from basic principles through to in depth specific applications.

Pre-delivery set up
Your settings can be applied, tested and the Comms set up prior to dispatch of devices.

Equipment hire
Portable Power Analysers are available for hire.

HV POWER

POWER AUTOMATION TECHNOLOGIES

HV Power Measurements and Protection Ltd
ABN 62 113 118 536

HV Power

HV Power's business model is based on open communications and close working with customers, especially on their first projects with our products.

We have a vested interest to ensure our customers understand the technologies we supply and are happy using them.

The HV Power team has built a solid reputation for providing comprehensive technical support and hands on assistance to our Power Utility customers, their engineering consultants and contractors throughout Australasia.

We provide support at all levels; in the design phases, in the engineering of the application, through to assistance at installation and during commissioning.

That's a key difference with HV Power. Our tech support team and product specialists are accessible and available to deal with queries promptly, effectively and, most importantly, locally.

We make full use of On-Line tools to support our customers remotely.

Grant Wells
Business Development Manager - Australia

Grant has 13 years experience working for transformer manufacturers in Indonesia and more recently in Australia.

He's now responsible to develop the business for HV Power in Australia providing a local point of contact from his office in Victoria.

Mobile 0447 744311 email grantw@hvpowerautomation.com

Mike Strong
General Manager & Director

Mike joined the team in 2003 bringing practical experience of contracting and project management within the power industry.

Mike's role as HV Power's General Manager is to lead the team and to coordinate and manage the company and its resources.

Marcus Ling
Product Specialist

Marcus has for many years been associated with the sale of primary plant. His role at HV Power is to develop new business opportunities including the supply of Rapid Earth Fault Current Limiting devices used in Compensated or Resonant Earthed Networks.

John Parker
Integration Engineer

John has considerable experience in Industrial Controls and SCADA. His role is to provide tech support for REGulator devices and assist customers with SCADA connection of our products including IEC 61850 and network topology issues.

Vladimir Brijacek
Senior Engineer

Valdimir has 30 years of practical experience working for power utilities in Croatia, and more recently in New Zealand and Australia. At HV Power he's responsible for project management, commissioning support, protection audits and Engineer-to-Contract roles.

Warwick Beech
Sales & Marketing Manager

Originally employed by NZED Warwick's experience includes working as an International Product manager.

At HV Power he's also our Power Quality specialist.

Mohit Phadnis
Support Engineer

Since graduating BE (Hons) in 2012 from the University of Auckland Mohit has worked for HV Power.

His primary focus is providing technical support to customers on voltage regulators, time synch clocks,protection relays and associated software.