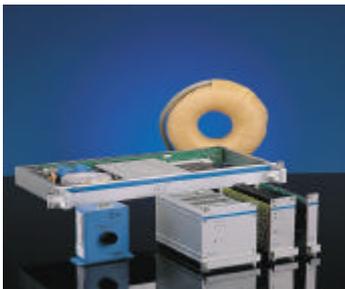


Zero-fluxä DC & AC current measuring systems for scientific research

Institutes and laboratories that are concerned with fundamental and applied scientific research set very high requirements for their technical equipment. High-energy physics research centres do this, for example, with regard to rectification systems supplying the currents that generate the magnetic fields for the focussing and deflection of elementary particles or for the containment of plasma. A characteristic of these power supplies is in many cases the exceptional stability and reproducibility of the output current. A current measuring device used for such an application must, just like the other equipment for control and safety, at least meet equally stringent requirements.

About 30 years ago, Hitec Power Protection, formerly Holec Power Protection, was the first to introduce a revolutionary high precision measuring system, based on the zero flux principle. The bipolar Zero-fluxä measuring systems optimise the concept of a galvanically separated system for the measurement of direct and alternating currents with exceptionally high precision. Today many thousands of these systems have found their way all over the world and have earned the reputation of being the ultimate systems for measuring DC currents.



international IQNet registration.

Innovation and creativity are the key words in describing the way Hitec Power Protection thinks about product development. Hitec Power Protection stays well informed about the ever-changing needs and demands and keeps on up-dating their products accordingly.

Hitec Power Protection offers modern technology, developed by the best specialists in this field.

The highest standards of quality are maintained throughout production of the Zero-flux™ measuring systems.

Besides the NEN-ISO 9001 certificate to prove this, the company also holds an

Product overview Zero-fluxä measuring systems

Some features of the Zero-fluxä measuring systems

- Wide variety of types and versions available
- No temperature control devices, so no warming-up time
- Temperature stability always better than 1ppm/K
- Low noise and ripple
- Can be switched on with main current already present
- A standard measurement range up to 60 kA.
- True bipolar operation
- Unequaled accuracy
- Automatic reset after overload
- High temperature and long time stability

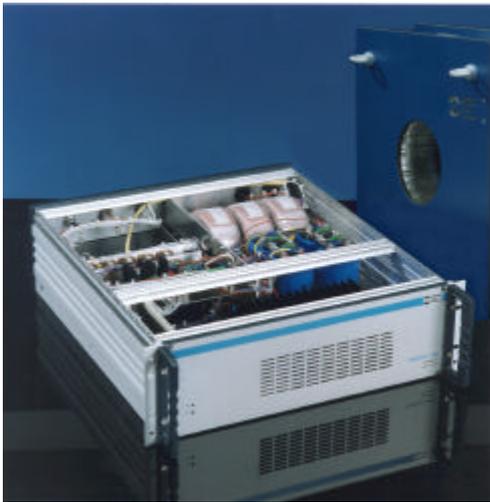
Available types

Types with current output

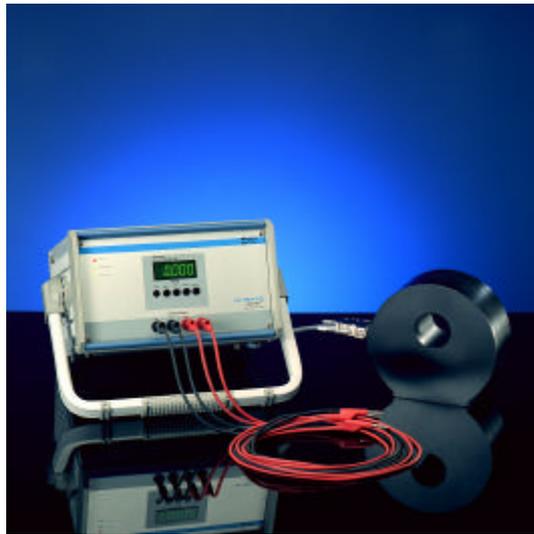
1. Macc^{PLUS} - Low cost and compact. I_{max} 600A. Linearity better than 4 ppm,
2. Curacc - High accuracy system. I_{max} 6000A. Linearity better than 2 ppm

Types with voltage output

1. Stacc - General purpose. I_{max} 6000A. Linearity better than 10 ppm.
2. Stacc -HC - High current. I_{max} 60.000A. Linearity better than 10 ppm.
3. Topacc - High end. I_{max} 6000A. Linearity better than 2.5 ppm.
4. Topacc -HC - High end/High current. I_{max} 30.000A. Linearity better than 2.5 ppm.
5. Ultracc - Multi-range workbench instrument. Linearity better than 2.5 ppm.



Topacc-HC Zero-flux measuring system



Ultracc Zero-flux measuring system

Where the Zero-flux measuring systems are used

Zero-flux™ measuring systems can be used wherever high demands are placed on current measurement systems for scientific purposes. For example for:

- Nuclear research projects making use of particle accelerators,
- Plasma physics experiments in nuclear fusion reactors,
- Experimental set-ups for producing high currents and voltages in laboratories for applied scientific research.

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Fax.: +31 74 246 2678**

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Web site:

<http://www.hitecsms.com>



VONK-SYSTEMS, POWER CONVERTERS

Vonk Systems B.V. is a member of Imtech, the technical division of the Internatio-Müller Group with over 10,000 employees. Vonk Systems has a long-standing reputation as supplier of complex control systems. The company is based on an organisation with a high level of technological excellence.

Power Electronics

The Power Electronics division of Vonk Systems is acquired in 1999 from formerly Holec Projects/QtecQ B.V. and has an unique experience in the field of design, construction, assembly, factory testing, installation and commissioning of special **Power Converters** for scientific research and industrial applications such as:

- Magnet Power Supplies
- High Voltage Power Supplies

- Frequency Converters
- Pulsed Power Supplies
- Specialised Switched Mode Power Supplies



Vonk Systems has delivered power supplies with voltages up to 100 kV, currents up to 100 kA, power up to 100 MW and with ripple and stability down to 10 ppm.

Applied technologies in the power circuits are: thyristor, GTO, IGBT and FET in combination with tailor-made control electronics e.g. with 18 bit (20-bit with S ?) DAC/ADC converters and microprocessors. The application of IGCT's is one of the new technologies under development.

References:

High Energy physics:	CERN(CH), DESY(D), ESRF(F), ZFJ(D), SRRC(Taiwan)
Fusion Research:	FZJ(D), JET(UK), Max Planck(D), UKAEA(UK), FOM(NL)
High Magnetic Field:	FNWI(NL)
Industry:	URENCO(NL), Dutch Rail(NL), Thales (NL)

System Integration

As a System Integrator our main activities are also the complete engineering, procurement, assembly, and integration of **Electrical and Instrumentation Systems**. This includes but is not limited to integrated testing, erection supervision, commissioning, start-up and training activities. We possess the following special skills:

- Safeguarding Systems
- Fire and Gas
- Explosion safety engineering

Commissioning & After Sales Service

As a Commissioning and Service organisation, Vonk Systems is specialised in commissioning and servicing of all common Process Control Systems, Safety Systems, Electrical Systems, Power Electronics and Modularised / Containerised Switchgear and Control Buildings.

The services by Vonk Systems can be offered worldwide on a 24-hour basis.

Quality certificates

ISO 9001 Certificate, BVQI Certificate No. 44563D

Address details

Mail address: **Vonk Systems B.V.**
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7740 AB Coevorden, The Netherlands

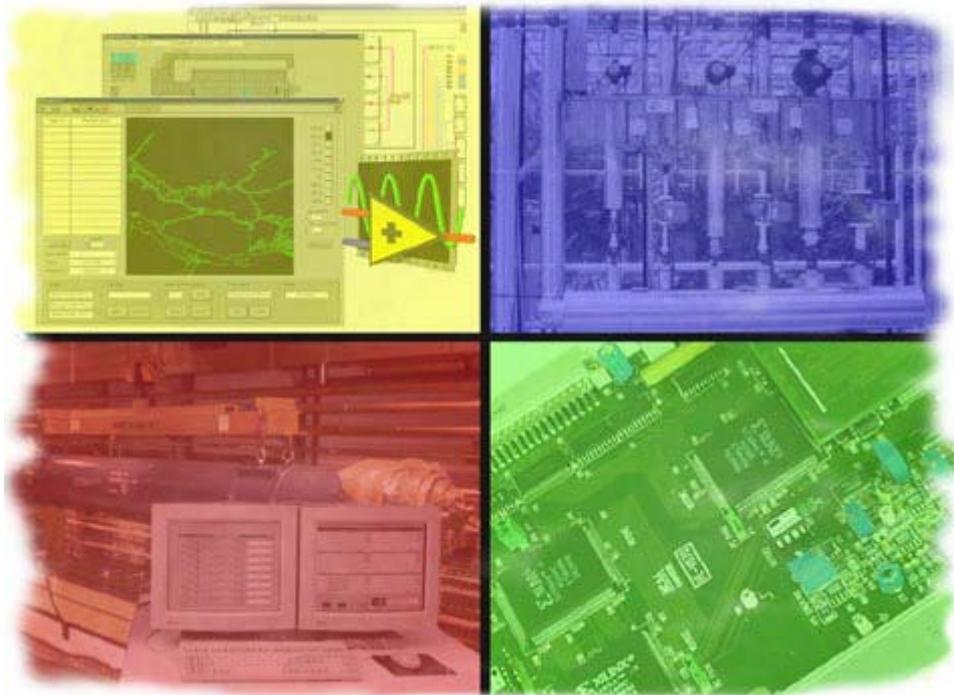
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Web sites: <http://www.vonk-systems.nl> or <http://www.imtech.nl>



COMPUTERS



DESIGN AND MANUFACTURING of Computer systems for Industry and Science

INCAA Computers, located in the centre of the Netherlands, is over 20 years specialized in designing and manufacturing of data acquisition systems and measurement and control systems. The module range includes a wide range for A/D and D/A conversion and transient digitisers from DC to 80 MHz sample rate, 10 to 18 bit, DSP and isolation. Modules are based on PCI/PXI, VME/VXI, and G64. System integration includes modules, crates, cabinets and SCADA, Lab VIEW, Bridge VIEW and OS-9.

The main product groups of INCAA Computers BV are:

VME

CAMAC

TURNKEY PROJECTS

VME

VME is a de-facto standard, which is used for industrial as well as scientific applications. There are a lot of hardware and software manufacturers, so it is possible to build your own system from a large range of hardware and software specifications, which will meet your requirements completely. VME hardware is being delivered in 3HE- and 6HE-Eurocard size. It is even possible to apply 3HE-Eurocards in VME 6HE-housing.

BITBUS

BITBUS is a de-facto field bus standard, which is used for industrial as well as scientific projects. Specifications have been developed by INTEL and are already being applied by a large number of manufacturers for their products. INCAA Computers BV has developed a 19-inch, 3HE-Eurocard BITBUS *modular* NODE, with a large variety of digital and analogue modules. Many of our turnkey projects have been realized, using our BITBUS products.

CAN

CAN (Controller Area Network) is a bus system, originally designed for the automobile-industry. Nowadays, thanks to further design of technology and normalization, there are also applications within industrial automation. INCAA Computers BV has also reacted to these developments, and beside applications specific hard- and software solutions, there are also a number of standard products, such as a CAN interface for VME or PC, software drivers and various I/O modules.

CAMAC

The CAMAC standard has already been used for more than 20 years by scientific institutes for research in the field of plasma- and nuclear physics. It seems like this standard is being pushed aside by the VME standard, but still a lot of institutes have an extensive CAMAC infrastructure, so for new projects they will choose CAMAC once again.

INCOS

INCOS is a 19-inch modular system for 3HE-Eurocard size modules. The applied processor module can be based on a Motorola (680X) or Intel (80XX) type (both 8-bits processors). We can deliver a large number of digital and analogue I/O modules for this system. INCOS has been developed by INCAA Computers BV and the bus specifications are available, so even other people can develop I/O modules.

TURNKEY

In most of our turnkey projects executed by INCAA Computers BV, we deliver a combination of our own products and products from other companies. However, INCAA Computers BV will have the responsibility for the complete system.

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