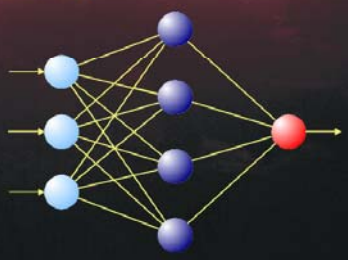
FERROTRON

A MiNTEQ DIVISION

High precision
current measuring with Rogowski coils

PC with software for electrode control system



Optional Neural Power

DECTEQ™
DIGITAL ELECTRODE CONTROL

DECTEQ™
Digital Electrode Control

The DECTEQ™ is a further development of the DOS based DEC PC, which is part of the equipment in many steel making furnaces around the world. Many years of experience have lead to the new DECTEQ™, which is developed for Microsoft Windows platforms and based on new hardware technologies. The DECTEQ™ differs from usual analogue electrode controls not only by its design but also from the larger range of performance and an increased capacity.
The most important features of the DECTEQ™ are:

Universal Control

The DECTEQ™ is a digital electrode control system and can be operated in current control mode as well as in impedance control mode. The DECTEQ™ can be used for different types of AC-arc furnaces (EAF, LHF) with triple and mono arm design.

New Technologies

The DECTEQ™ uses new technologies to achieve maximum performance of the controller. The measurement system can be equipped either with Rogowski coils for high precision current measurements or with current transmitters. All process signals are sampled time resolved with high accuracy and processed by a digital signal processor. (DSP)
The optional available DECTEQ™ “P-Melt+” module is based on a neural network, which affects the controller functions to achieve an optimum heating power. Furthermore hot spots can be avoided by the prediction of the furnace panel temperature.

Process Visualization

All acquired and calculated process values can be displayed graphically in trend curves. This enables an effective watching and analyzing of the heating process. Possible malfunctions and irregular heating events can be recognized very fast and easy.

Database Support

The DECTEQ™ supports the storage of the process data in a Microsoft Access database. All recorded data can be displayed graphically at any time. This is a powerful feature for analyzing heats, effective troubleshooting and the support of quality management.

Network Communication

The DECTEQ™ supports the data exchange with other computers and automation systems (PLC). The kind of communication system depends on the response time and the predefined protocol of the interface in the basic furnace automation system. Supported systems are

- ArcNet
- Serial link RS232/422
- Ethernet

Supported protocols are

- ArcNet for data exchange with Simatic S5
- H1 Softnet with Simatic S7
- TCP/IP
- MODBus

Help Functions

The DECTEQ™ is equipped with different online help functions, which facilitate and reduce the commissioning time. The complicated adaptation of the electrode movement control to the proportional valves is simplified by automatic procedures. The commissioning is supported by the extensive and comfortable visualization functions of the DECTEQ™. All important data are displayed as values and trend curves. Each value can be printed out on common printers.

Benefits

The DECTEQ™ is a powerful tool, which can:

- **reduce the electrode consumption**
- **reduce the energy consumption**
- **reduce the commissioning times**
- **extend the maintenance intervals**
- **reduce the tap to tap time**
- **reduce consumption of refractory**

Under economical view the DECTEQ™ can:

- **reduce the production costs and**
- **increase the productivity and efficiency of Electric Arc Furnaces**

DECTEQ™ Hardware

The DECTEQ™ electrode control system is equipped with high quality hardware components to achieve an optimum performance of the heating process. The well chosen relation between commercial available components and Ferrotron own components enables a powerful hardware system at lower costs and with a better support.

Rogowski Coils

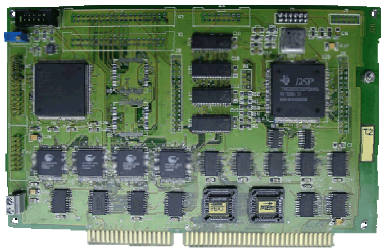
Rogowski coil current transducers are used for the high precision measurement of alternating currents. They consist of a toroidal winding on a non-magnetic core, fitting around the current conductors to be measured. The output of the Rogowski coil is a voltage proportional to the changing rate of the current. This voltage is integrated electronically on the measurement card to get a signal proportional to the current. Rogowski coils have many advantages compared to conventional current transmitters with iron core.

Mechanical features

- **Independent of conductor dimensions and geometry**
- **Easy to mount on the conductors**

Electrical features

- **Wide dynamic range**
- **Wide bandwidth**
- **Low phase error**
- **No damage of the coil by large overloads**



DSP BOARD

The digital signal processing (DSP) board is based on a long experience in the development of digital control systems for electrical steel making furnaces. The acquired process signals are conditioned and digitized on the measurement board. This sandwich technology only uses one ISA slot of the computer. This digital signal processor relieves the computer CPU and allows a fast processing and analysis of the measurement signals and a fast calculation of the control signals.

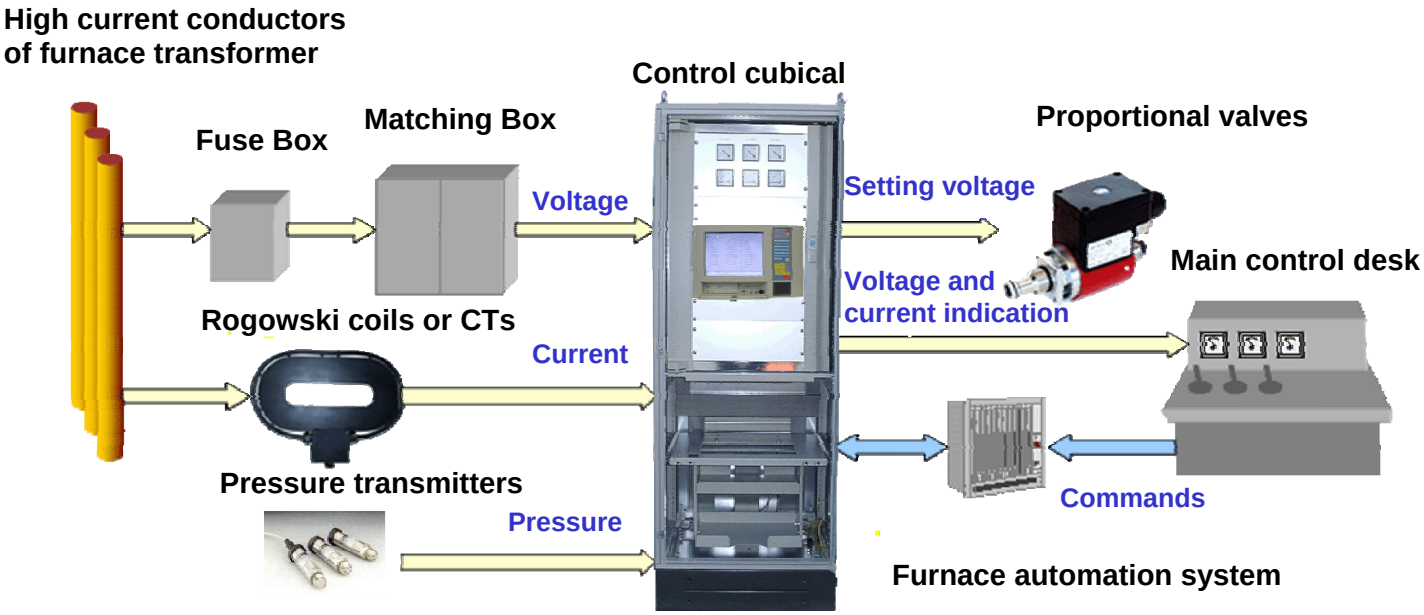
Measurement Board

The measurement board allows a precise acquisition of all important process signals. An additional protection circuit prevents the DECTEQ™ system from being damaged by high voltages and currents. The board supports the measurement of

- secondary phase-to-phase voltages
- secondary phase-to-ground voltages
- electrode currents (via current transmitters or Rogowski coils)
- hydraulic pressures

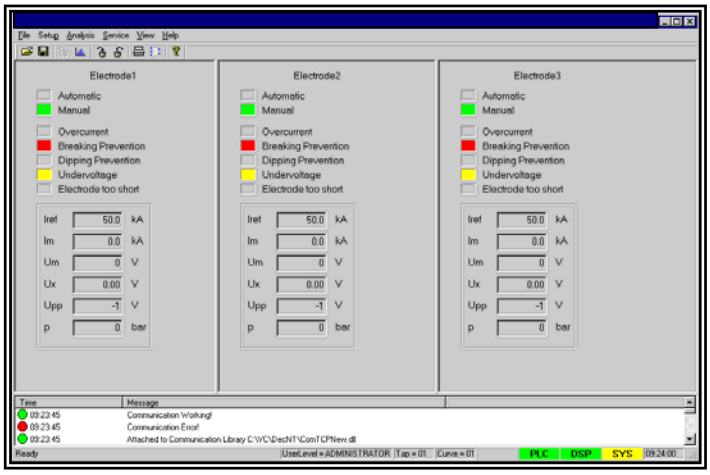
as well as the control of the proportional valves and the indication of additional analog instruments.

Setup of the DECTEQ™ Controller System

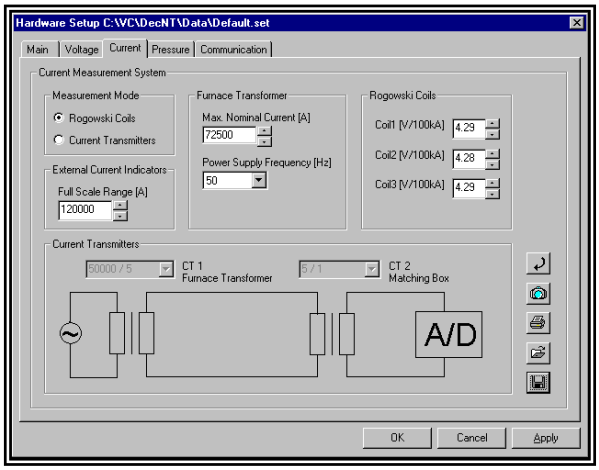


DECTEQ™ Software

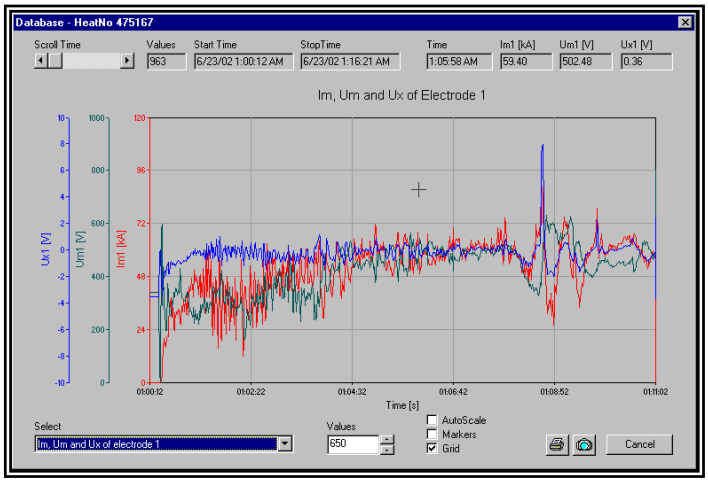
The DECTEQ™ program is a powerful software for commissioning, control parameters adaption and process visualization. The DECTEQ™ uses the MS Windows support for printers, displays and other hardware devices. The user interfaces are easy to handle and provide a lot of graphical tools.



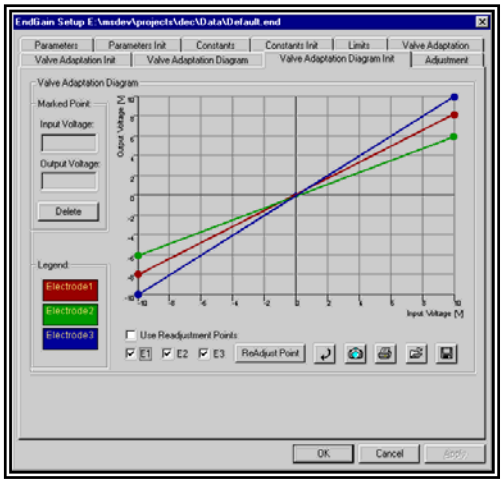
Main screen with indication of all process data and exceptions



Setup dialogs for the furnace system, measurement system and communication hardware



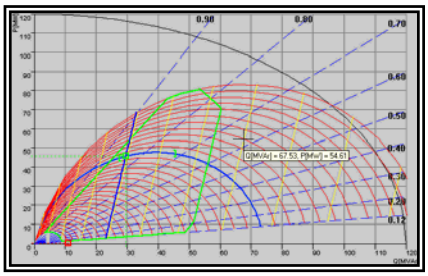
Graphical visualization of process data for online values and database functions



Setup dialogs for control parameters and adaptation of the proportional valves

If good is not good enough for your Electric Arc Furnace:

See our dynamic optimization tool
DECTEQ™ "P-Melt+"



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