

Castlet MCS III – Automatic Voltage Controller (AVC)

Product History

Controllers for electrostatic precipitator power supplies are Castlet Ltd's core business. The MCS III automatic voltage controller represents the latest iteration in a long string of controllers for electrostatic precipitator power supplies - production commenced in 2010.

Specifications

Typical values and ratings:

- Input Voltage Rating: 110 Vac $\pm 25\%$ @ 25VA, 47 to 63Hz
- Ambient Temperature:
Operating: 0 to 70 °C, Storage: -20 to 85 °C
- CPU and Memory: 16 Bit 40MHz Near-RISC
- ROM: 64 Kbytes, RAM: 128 Kbytes
- Analogue Inputs / Outputs: 4 x Differential inputs, 1 x 4-20mA or 0-20mA input, 2 x 4-20mA or 0-20mA outputs. All inputs and outputs optically isolated
- Digital Inputs / Outputs: 16 x Configurable optically isolated inputs, 6 x Volt-free relay outputs with changeover contacts
- SCR Drivers: 2 x Mains supply 700V RMS Max
- Communication Ports: 2 x CAN bus Network connection Max 500 kbaud, 1 x USB port, 1 x Fibre Optic ports (Rx & Tx), 1 x I/O Expansion port

EMC Standards:

- Emissions:
EN55011: 1991 Class A Conducted ac power.
EN55011: 1991 Class A Radiated ac power.
- Immunity:
EN61000-4-3: 1997 Class A Radiated Immunity.
ENV5204: 1995 Class A Radiated Immunity.
EN61000-4-6: 1996 Class A Conducted RF.
EN61000-4-2: 1995 Class B ESD.
EN61000-4-4: 1995 Class B EFT/B.



Features

The MCS III automatic voltage controller is the major component of a system designed to increase both the operational and functional efficiency of electrostatic precipitators and associated peripherals. This is achieved through the use of a combination of intelligent control algorithms and the tight integration of key system components. Typical examples are energy saving during reduced boiler output and co-ordinated precipitator optimisation during difficult combustion conditions, reducing or avoiding the need for load shedding in order to maintain emission levels, or saving energy when conditions are easier or at reduced boiler load.

Castlet Ltd has a wealth of experience in precipitator technologies such as wet and dry processes, tubular and plate type with a host of discharge electrode configurations. The MCS III can operate with any of these combinations without the need for application specific software. The use of Flash ROM allows firmware upgrades to be made from an external laptop computer or via the CAN Network, avoiding the need to exchange on board hardware (EPROM's).

The user interface at the local level, employing membrane, keypad and a graphical display provides control, data display and fault finding. For ease of interpretation, operating data is presented in graphical as well as numerical format. Operators require no specialist computer knowledge and multiple language and character set support is provided to allow both commissioning and overseas operational staff to operate the equipment in their own language. A multi-level multi-user password system ensures access to more critical parameters, and functions can be administered and restricted to key personnel.

Controller Area Network (CAN), the communications network employed by MCS III, was originally developed for the automotive industry. It is currently being employed for safety critical actions such as deployment of airbags and operation of the ABS; several million nodes are currently in operation throughout the world. It is the same underlying technology as used by Allen Bradley DeviceNet. Being network based, it is not necessary to fit a keypad for every controller. The MCS III and associated components combine to produce a powerful and modern integrated system capable of satisfying the needs of precipitator operations and maintenance staff.