

MICROPAC DIGITAL MULTIFUNCTIONAL REGULATOR

EXCITATION CONTROL UNIT(UCE)

Since the beginning of 1990, SEPAC developed an analog automatic power regulator used successfully in dozens of synchronous motors for compressors and pumping systems in different industries, particularly for the petroleum industry in Mexico (PEMEX). Based on these experiences and supported by the satisfactory results, SEPAC modified the original design into a totally Digital Multifunctional Excitation Control Unit; giving birth to the UCE-MICROPAC



The structure of the UCE-MICROPAC is very compact, as a wall mounted type. The digital multifunction excitation control unit is designed to control the field of the auxiliary DC and AC excitation units as well as the field of synchronous motors .

For applications in low power systems, the UCE-MICROPAC digital compact regulator is a great solution. It can be supplied as an individual unit for integration in any other control board or in its own cabinet with all the components or peripheral accessories (IHM, auxiliary transformer, conventional commands with selectors and switchers, analogical meters, pilot lights, forced ventilation, etc)

It can be fed directly from the secondary of an excitation transformer that is connected in derivation to the bus of the generator. Or as well it can also be fed from a PMG (Permanent Magnetic Generator) in case of brushless generators.

The design is based in a microcontroller Versamax of the GE family.

The programming of the parameters allows to be used in a wide range of applications

DESCRIPTION

The UCE-MICROPAC compact digital regulator has the following features and capacities:

- Programmable Logical Controller with 64 Kbytes of configurable memory, execution time of 0.5 μ sec by Boolean instruction.
- Data base monitoring facilities through a touch screen (IHM integrated)
- Online adjustment facilities.
- Programs load and download facilities.
- Program and adjustments storage in non volatile memory.(FLASH-EEPROM)
- Operation sequence programming with ladder diagrams
- RS-485 communication serial port
- Ethernet port with 10 base T/TX, RJ 45 interface, connection in 10 Mbps to link TCP/IP.
- MODBUS, SNPX, Ethernet Global Data (EDG), SRT TCP/IP protocol
- Auto diagnosis functions
- Application Licenses included.
- RS-232 series port configurable to RS-485
- Real time clock for the SOE function
- Mixed I/O modules (4 inputs , 4 outputs)



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FUNCTIONS

- Automatic Voltage Regulator (AVR).
- Excitation current regulator (manual) (FCR)
- Power factor regulator (PFR)
- Reactive Voltage Regulator (VAR)
- Volts/hertz limitation
- Over excitation Limitation (OEL)
- Sub-excitation limitation (MEL)
- Voltage excitation limitation with inverse time
- Over excitation voltage protection
- Over excitation current protection
- Automatic follower for transfer from auto to manual
- Initial Excitation (BUILD-UP)



POWER UNIT

- Digital single phase control card range “S”
- Two pulses per cycle with integrated power.
- Power supply :127/220 VCA, 2 phases.
- Output voltage: from 0 to 90VDC./180 VDC
- Maximum output current : 30 ADC
- Four Thyristors
Rectifier circuit for the field flashing from the remnant generator voltage
- RC Suppressing circuits included

AUTOMATIC CHANNEL

- Regulation algorithm configured as principal (Automatic voltage regulator AVR, Current manual regulator FCR,

Reactive power regulator VAR) with an accurate of $\pm 0.2\%$.

- Reference algorithm with: raise , lower ,preset and limits
- Adjustable initial excitation ramp.
- Algorithm of error voltage amplification
- Stabilizer PID algorithm
- Stability adjustment by software
- Algorithm of the angle demand.
- Automatic Following Function algorithm to transfer to manual channel (FCR)
- Facilities to make step response tests
- Operation sequence integrated to the algorithms
Excitation and under excitation sequences.

MANUAL CHANNEL

- Current regulation algorithm (to regulate the power factor in a MANUAL mode)
- Reference algorithm with raise, lower , preset and limits
- Range of 30% of the nominal no load current up to 110 % of nominal current at full load.
- Algorithm of error current amplification
- Stabilizer PI algorithm.
- Stability adjustment by programming.
- Algorithm of the angle demand.
- Automatic Following Function algorithm to transfer to automatic channel (AVR)
Facilities to make current step response tests
- Operation sequence integrated to the algorithms.
- Excitation and under excitation sequences.



DECEMBER 2009