BAC®
CORROSION CONTROL

SWITCH MODE POWER SUPPLIES

"COMPACT, RELIABLE POWER"

MEMBER OF
MIDROC EUROPE

Introduction

BAC Corrosion Control Ltd has developed a range of Switch Mode Power Supply Units (SMPSU) which meet the ever more demanding requirements for impressed current cathodic protection systems in various applications worldwide.

SMPSU technology addresses the need for extremely efficient, accurate and low ripple control of both current and voltage at low levels and allows a reliable, compact and lightweight approach to converting mains alternating currents (AC) into a highly controllable and suitable direct current (DC).

The system moves away from traditional transformer rectifiers by using high frequency pulse width modulated switching to control the output which reduces component size and weight. The control system uses a clear and precise keypad control system with dedicated displays for voltage, current and reference cell potential.

The units can be used as either a voltage or current controller, or as a combined unit to control both. The units can be operated locally or from external control signals.

With the integration of GPS remote switching is it now possible to take readings of instantaneous-off potential for entire pipeline networks supplied by multiple Cathodic Protection (CP) systems. This allows for greater accuracy when evaluating the levels of protection being provided.

General Arrangement

The units are primarily designed to be housed inside an IP 55, Glass-fibre Reinforced Plastic (GRP), lockable roadside kiosk complete with:

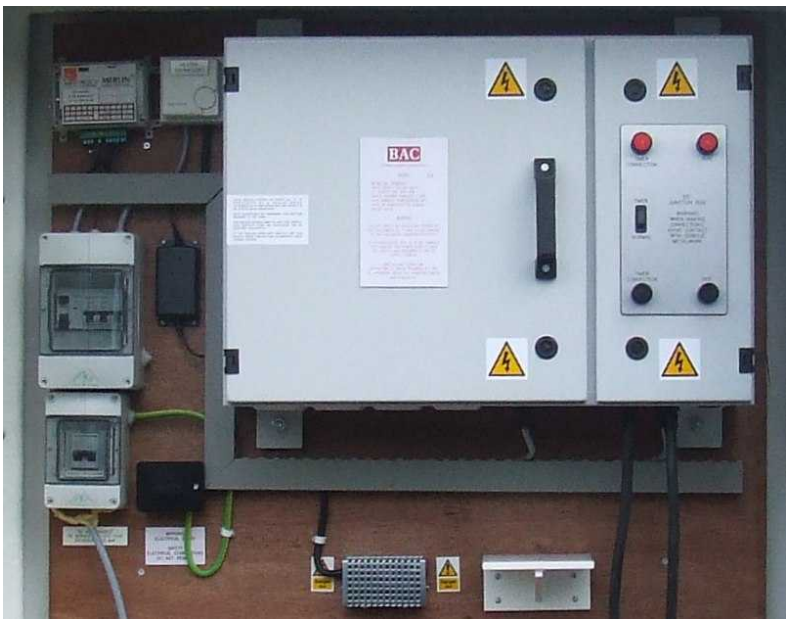
- Rating plate
- Kiosk isolator
- Earth block
- A dedicated Mains Circuit Breaker (MCB) for each internal circuit
- Residual Current Device (RCD) for earth leakage protection
- Connections for optional remote monitoring unit and power supply
- Anti-condensation heater
- DC output junction box – part of main enclosure
- Equipment shelf
- Main enclosure housing the SMPSU, control and indication

The units can also be supplied in kit form to allow for wall mounting within a building or suitable environment.

Flexibility

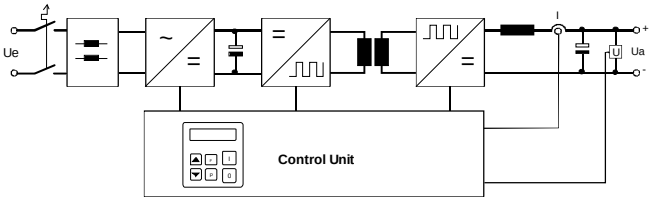
Optional extras available include:

- Internal non-synchronous timer
- GPS synchronous timer
- Blocking diode
- 4-20mA output for SCADA monitoring



Electrical Circuit

Power is passed through an Electro Magnetic Compatibility (EMC) filter and rectified to a high tension DC voltage (approximately 320V DC). This voltage is switched as high frequency and applied to the input of a planar transformer which steps down the voltage and steps up the current. The output from the planar transformer is then full wave rectified and smoothed before being presented at the output of the module.



Control of the output is achieved by adjusting the mark space ratio of the high frequency drive to the high frequency control switches. These switches produce no current when switched off and no voltage when switched on meaning that very little power is lost as heat. This results in a highly efficient power supply.

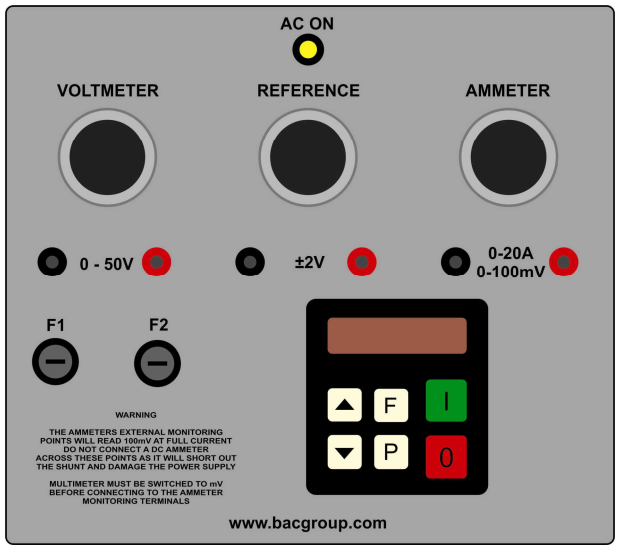
Protection

The SMPSU is provided with the following devices for protection against over voltage and over current conditions:

- DC Surge device on DC side to protect against voltage surges coming into the unit
- 2 x 0.5A 20mm anti surge voltmeter fuses (F1 and F2) to protect the voltmeter or monitoring outputs against shorting out
- 1 x 2A 20mm anti surge control fuse (F3) to protect the small XP SMPSU powering the meters on the door
- 1 x 32mm 16A anti surge 250V AC Fuse protects the input to the unit

Control Panel Features

The standard control panel contains a voltmeter, reference cell meter and ammeter, all of which have a 1999 full scale display with bright red 8mm, 7-segment LEDs. Each of the meters are accompanied by a pair of 4mm jack plugs for use with external multi-meters. All scaling for the meters is carried out on a separate Printed Circuit Board (PCB) meaning they are easily interchangeable or replaceable.



The DC output is manually variable from 0 – 100% using the integrated keypad found on the main control panel. The F, P and cursor buttons are used for parameter adjustments. Parameters can be set using menu controls which are called up by entering operator codes.

Testing

Prior to dispatch, all units are rigorously tested. Factory tests are conducted to ensure operation in accordance to a number of standards including (but not limited to) BS EN 50178:1998 - Electronic equipment for use in power installations and BS EN 60076-1:2007 - Power transformers - General

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