



Fig.A.17.2 Photograph of the power supply

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A.18 Four channel ADC board for Indus-2 beam position indicator (BPI) interface

A four channel sampling ADC board for BPI (Beam Position Indicator) interface has been developed for controls related to Indus-2 beam diagnostic sub-system. The salient features are:

- A24, D16 VME Slave
- 4 independent channels of 16-bit, 100 KSPS sampling serial-ADCs
- 4 digital-input channels for reading status
- Onboard DC-DC converters for local isolated power
- Provision for using separate external power source for ADC portion
- Selectable input range: (0-10 V) or (-10 to +10 V)
- Two stage low-pass filter at each input channel.
- Optical isolation from VME bus
- Selectable, interrupt based data transfer control
- Jumper and switch selectable interrupt level and vector ID
- External trigger can be enabled by software to start conversion and generate interrupt
- Facility to read back the conversion status of each ADC
- All the ADC data handling, VME address decoding and interrupt logic implemented in the on-board CPLD

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A.19 Reed RGA, the partial pressure analyzer for Indus-2 vacuum control

Partial pressure monitoring is important for knowing status of vacuum in the Indus-2 ring. This is done using the residual gas analyzers (RGA). There are 16 RGA units, which will be kept in different places in Indus-2 ring for partial pressure monitoring. The software takes data from

field instruments over RS 422 link using DDE between software modules. The data logging of partial pressure and alarm information, generated in the event when partial pressure deviate beyond the set point, was required. The software provides user-friendly controls and scheme for filament protection. It also provides easy setting of 192 channels for different mass number of gas. It provides panels for setting high and low alarm along with hysteresis band, accuracy, and data log rate, log file name, audio and visual alarm indications, user name and event log, user permission etc.

Reed RGA provides easy approach of click over diagram, to view partial pressure of gas in any part of Indus-2. Tabular display of partial pressure provides data display of 16 RGA units on single panel. User name logging and event log feature helps in ensuring instrument protection and fault finding in hardware. Diagnostic controls are also provided which helps the user in changing the unit name and location online, lock-unlock 'RGA for windows' software module, trigger RGA unit, scan progressing etc.

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A.20 10MeV, 10kW Electron linac for food irradiation applications

The 10MeV, 10kW electron linear accelerator facility for food irradiation applications has been developed (fig. A20.1). The most crucial and challenging subsystem of the LINAC, the 6MW peak power 25kW average power microwave system has been designed, developed and tested. The 6MW peak power and 25kW average power multi-beam klystron having permanent magnet focusing system is energized by a 55kV, 270A pulse modulator. A line type modulator for 15MW peak and 70kW average power capability has been developed. The microwave system is tested on a microwave load for full RF pulse width of 12.5 microseconds at 150Hz repetition rate and testing is underway upto 300Hz. The rise time of the modulator pulse is 700 nanoseconds for pulse duration of 14 micro sec with flat top variations less than $\pm 1\%$. The microwave power level flat top variations have been achieved to be within ± 0.1 dB. The modulator has been connected to the electron gun equivalent impedance and the output pulse has been tuned for the klystron impedance as well as the gun impedance. The electron structure has been received from Russia. Magnet power supplies, safety interlock system, access control system using Cori lock has been designed, installed and tested. Commissioning of the LINAC will commence after getting the approval from AERB.