

The mesytec **MPR-HV-Series** provides a set of state of the art multichannel preamplifier modules, capable of supplying bias voltages of up to  $\pm 4000$  V. It is specially well suited for amplification of signals from He3 detector tubes which are used for thermal neutron detection. The MPR16-HV series can easily be combined with the mesytec MDPP-16/32 pulse processor or MSCF-16 shaping- / timing filter / discriminator module.

## Features:

- 16 channel compact module
- Sensitivity switch, factor 5
- Input protection
- Unipolar or differential Header output
- Pulser input
- Bias voltage up to  $\pm 2500$  V or  $\pm 4000$  V
- Input and Bias connectors: SHV



## Technical Data

### Charge range

The MPR series provides a switch to amplify the output signal by a factor of 5. This helps to provide large output signals even at low charge depositions and thus provides good noise immunity.

### Input stage

- Input connector(s): 16 x SHV connector
- Positive and negative charge can be amplified equally.

### Output stage

- Unipolar or differential header output
- Output amplitude for unipolar header:  $\pm 4$  V (terminated)
- Output amplitude for differential header output  $\pm 3$  V terminated.
- Pin assignment of output connector:  
Pin 1, 2 channel 1, pin 3, 4 channel 2.....  
pin 33, 34 output ground

### Rise and decay time

Decay time: 25  $\mu$ s.

Rise time(10 % to 90 %) is 20 ns for 0 pF input capacity.

### Bias filter

The bias voltage is filtered by a  $10\text{ M}\Omega + 6.8\text{ nF}$  RC filter, and then distributed by  $50\text{ M}\Omega$  resistors to the 16 channel inputs.

### Input protection

As default the MPR16-HV provides strong input protection for positive bias. It even allows to survive a sparc at 2000 V bias.

Rise time and noise are increased by this unit, but will not have a negative effect when reading out 3 He tubes.

For noise sensitive, timing critical or detectors with high capacitance, the input protection can be reduced or removed at production.

### Noise

shaping time	MPR-16-HV-2PC (= "25 MeV" type, works up to 50 MeV)
$\sigma$ / FWHM [us]	noise [electrons] FWHM
1 / 2.5	(1000e <sup>-</sup> + 10e <sup>-</sup> /pF)

The MPR16-HV includes an MPR-16 preamplifier. For available sensitivities see MPR-16 data sheet.

Some noise contribution will come from decoupling capacitors at high voltage. To minimise this effect, apply bias voltage some hours before precision measurement.

### Pulsar input

The pulser is internally distributed to individual charge termination capacities. Tolerances  $\pm 10$  %.

<b>MPR-16-HV-2 pC (50 MeV)</b>
0.7 pF
(0.7 pC/V) = 15 MeV/V

### Detector bias input

- SHV connector
- Maximum voltage  $\pm 4000$  V

### Power connector

SubD9 connector:

- 1, 2 = gnd
- 3 = +6 V (+80 mA)
- 4 = +12 V (+100 mA)
- 5 = -6 V (-60 mA)

### Dimensions

Box including SHV input connectors:

- Length : 270 mm
- Width : 194 mm
- High : 36 mm

Ground plate:

- Length : 243 mm
- Width : 221 mm