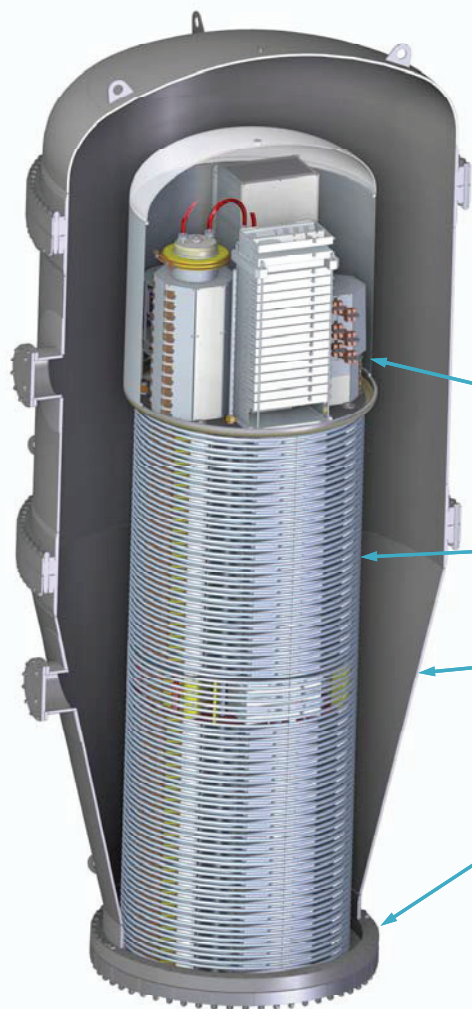


HIGH VOLTAGE POWER SUPPLY SYSTEM OF ELECTRON COOLER FOR NICA

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**2.5 MEV ELECTRON ACCELERATING
COLUMN FOR NICA COOLER**

High Voltage terminal

High Voltage sections

High pressure SF₆ tank

Support flange

The 2.5 MeV electron cooler for the NICA collider (JINR, Dubna) is being assembled at BINP. The electrostatic accelerating column generates a high-energy electron beam. The power supply for the accelerating column of the electron cooling system created by modular principle, and consists of 42 controlled modules, distributed by the accelerating potential. Each module has a precision controlled voltage source for 60 kV, 1mA and an additional supply for the solenoids of the magnetic system with a maximum current of 3.0 A. All the systems are controlled through the wireless ZIGBEE network.

ACCELERATING COLUMN MAIN FEATURES

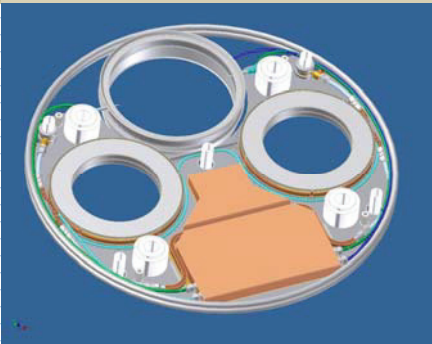
Parameter	Units	Value
Electron energy	MeV	0.2 - 2.5
Energy instability, less than		10^{-5}
Magnetic field of the transport line	G	500
Field instability		10^{-3}
External power supply	V	600
Carrier frequency of supply source	kHz	20
Power consumption, one column	kW	40 - 50
Height of the accelerating line	m	2.7

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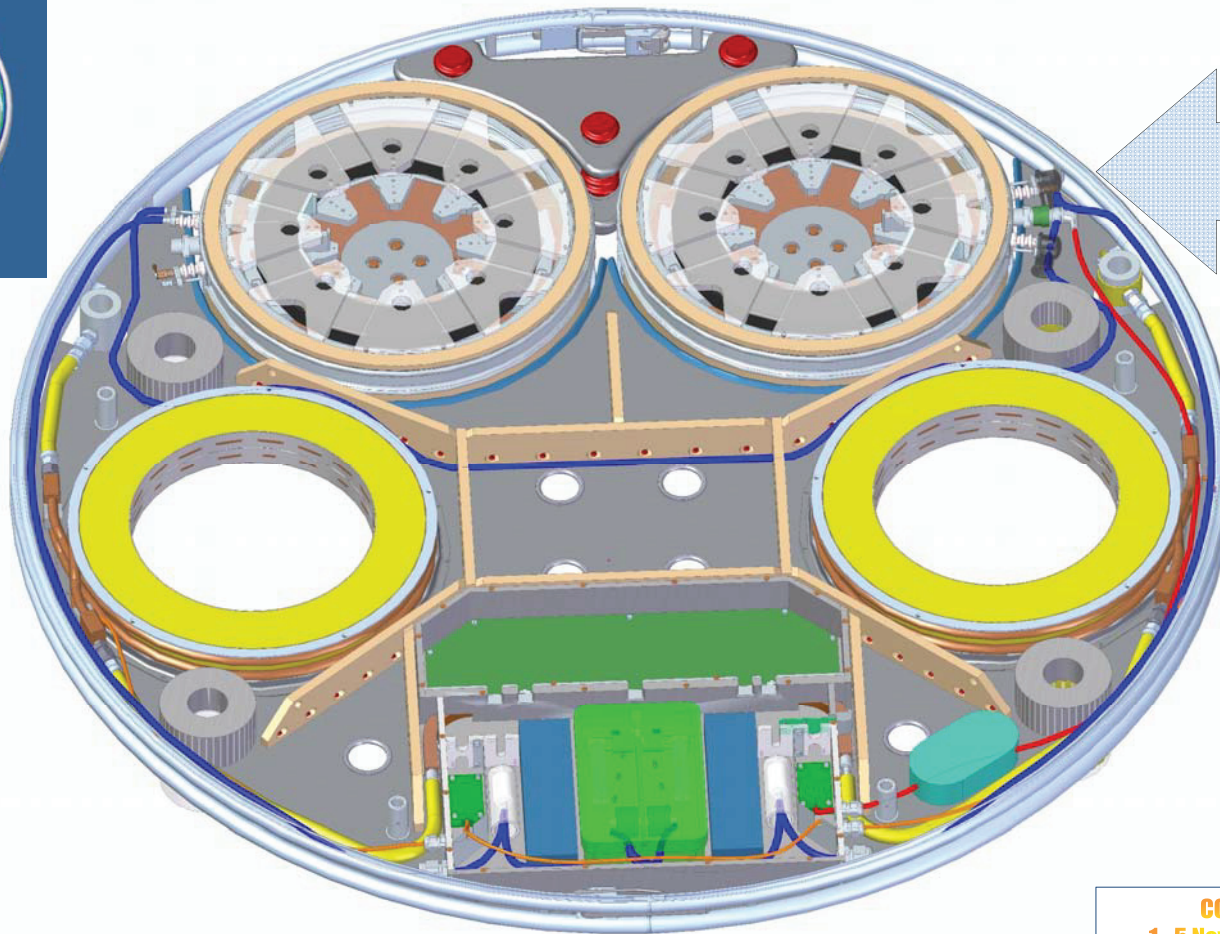


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HIGH VOLTAGE SECTION



COSY High voltage section



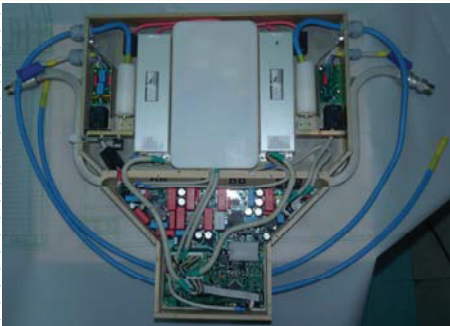
Construction of high voltage section is based on COSY section design. Externally, the section looks like a disc 48 mm height, of 1200 mm in diameter, with a cuts for the cascade transformers and accelerating tubes, closed with screens from above and below. The bottom screen is also a load-bearing element and supports the entire structure. Along the perimeter, the section is shielded with metal bands. A section comprises two solenoids and an electronics unit.

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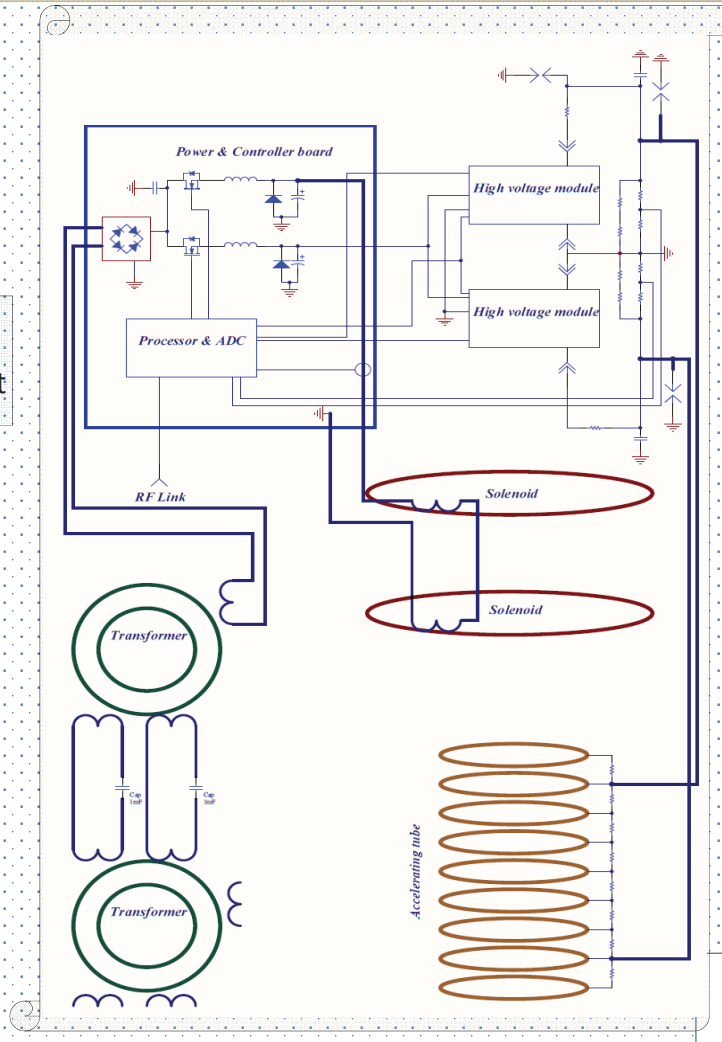
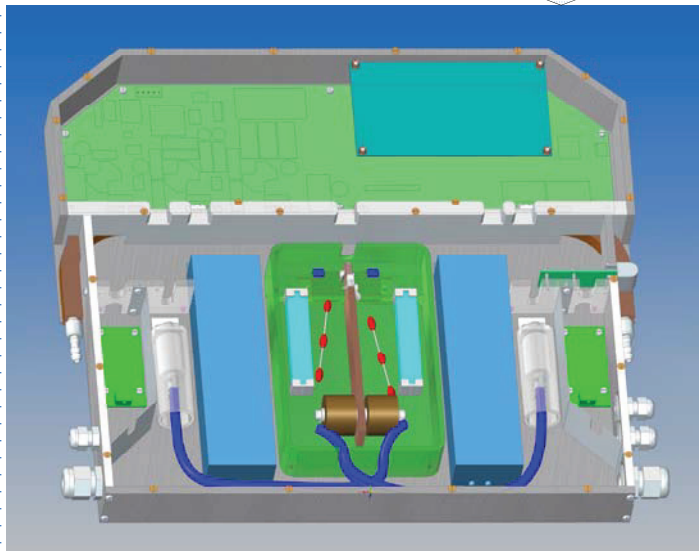
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HIGH VOLTAGE SECTION ELECTRONICS UNIT



COSY High voltage section electronics unit

NICA High voltage section electronics unit



From a user's point of view, the electronics of the high-voltage section is a high-precision regulated high-voltage power supply (1 mA 60 kV) and a regulated current source for powering the solenoids of the magnetic system, integrated into a single housing. The control interface is realized in a ZigBee self-organizing network based on Silabs ZigBee transceivers.

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Thank you for your attention!

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