

3He/4He Dilution Refrigerator, used to obtain ultra-low temperature (down to 25mK)

3He/4He Dilution Refrigerator is the only device at the moment that allows to obtain an ultra-low temperature (down to 5mK) in a continuous mode (for several months and more). In 1966, one of the world's first 3He/4He dilution refrigerators was created in Dubna under the leadership of B.S. Neganov. Since then, more than 10 3He/4He dilution refrigerators have been created in the Low Temperature Department of the DLNP JINR. At present, 3He/4He dilution refrigerators are widely used in various fields of physics and technology: in elementary particle physics - for cooling a target material; in quantum computers - for cooling qubits; in condensed matter physics - to study the properties of matter at ultralow temperatures; in aerospace industry - for cooling detectors of telescopes; etc.

Typical Dubna Dilution Refrigerator main parameters:

- Mixing chamber temperature <30mK
- Cooling power at 300mK > 30mW
- Liquid 4He consumption <3 L/hr
- Sample dimensions: L=20 mm, Ø=20 mm
- Angle for outgoing particles: $0^\circ < \Theta < 160^\circ$

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