

Mono-block Approach for a Refrigeration Technical Application (MARTA) –a cooling system based on the CO₂ I-2PACL technology

In the context of its High Energy Physics related activities, CERN in collaboration with NIKHEF has developed the Transportable Refrigeration Apparatus for CO₂ Investigation (TRACI).

TRACI is an evaporative CO₂ cooling system for scientific and industrial R&D equipment based on I-2PACL (Integrated 2 Phase Accumulator Controlled Loop) technology. The I-2PACL is the method that can instantly control the evaporative conditions in an experimental set-up vary from room temperature down to -35 °C. This technology is therefore an ideal way of controlling set-ups with a high demand on thermal stability and flexibility with a minimum of added hardware.

Cracow University of Technology (CUT) in collaboration with industrial partners: PONAR Wadowice S.A. and CEBEA Bochnia have undertaken mission of production and development of a new cooling system MARTA (Monoblock Approach for a Refrigeration Technical Application) based on TRACI. In the MARTA project there have been some new technologies applied and tested, eg. a mono-block concept, new dedicated CO₂ valves. Moreover optimization has been made in power consumption, applicable range of temperature and control system. MARTA offers many optional features in order to make it more user friendly and easily operated. The coolers MARTA are characterized by significantly higher cooling capacity (up to 350W) in comparison to TRACI.

In the presentation the new enhanced system MARTA, based on monoblock concept will be shown, as well as experience and lessons learned during development, production and operation of the system. A feedback from first MARTA users is expected and it will be discussed.

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