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Ultra-clean four cylinder magnetically-coupled piston pump for noble gas experiments

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The ultra-clean radon-free four cylinder magnetically-coupled piston pump is a high performance gas displacement pump interesting for the usage in low background experiments dealing with noble gases as target material. Due to its low radon emanation and special cleanliness in terms of out-gassing, in addition to the high and stable performance, the four cylinder pump is currently operated as a xenon gas compressor at the novel radon removal system of the dark matter experiment XENONnT.

The four cylinder pumps connected in parallel feature a phase-shifted synchronization of their movements in order to increase the flow and to provide long-term performance combined with low output pressure and flow fluctuations. A custom-made programming of the synchronization gives the possibility to operate the system with different configurations and to monitor the status of each pump during the operation. In this poster, the function and the operation experience with this magnetically-coupled piston compressor are presented. This research was partially supported by BMBF under the contract 05A20PM1.

Submitted on behalf of a Collaboration?

Yes

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