

ebm-papst FanGrids for the Extremely Large Telescope in Chile

AHUs cool the laser systems of the world's largest telescope

The Extremely Large Telescope (ELT) is currently being built in Chile's Atacama Desert. The observatory's goal is to study dark matter, Earth-like planets and extraterrestrial life forms. ebm-papst is supplying 28 FanGrids with 168 RadiPac EC fans for this project. They will be used in the AHUs for the laser systems. Through its participation in this project, ebm-papst is underscoring its position as a technology pioneer and reliable partner for the most demanding applications.

Up to eight guiding star laser systems will be used to ensure that the ELT can take precise images of space. To safeguard their operation, these systems must be supplied around the clock with pure and perfectly temperature-controlled air. OCRAM CLIMA was commissioned to design these highly specialized AHUs and turned to ebm-papst Portugal in search of a highly reliable and efficient solution.

Innovative solutions for complex demands

The conditions of the Cerro Armazones mountain and the telescope itself placed very complex demands on the fan solution. They include the location at an altitude of around 3,000 meters in a region that is subject to frequent earthquakes, fine desert sand and dust, and variable weather conditions. Since the ELT itself is packed with highly sensitive technology, the fan systems must not cause any electronic interference.

ebm-papst developed a tailored plug & play solution that integrates all components and minimizes OCRAM's installation and validation effort. It proposed the use of FanGrids, with six individual EC fans stacked and assembled on top of each other. These redundancies ensure the systems' greater operational reliability, efficiency and service life.

Technology for the future

All the FanGrids are equipped with highly efficient RadiPac EC centrifugal fans. These impressed OCRAM with their economical motors and much lower carbon footprints than the AC fans that were originally planned. Due to the requirements, the ebm-papst team made technical modifications to the fans. To protect them from possible damaging vibration, the RadiPac fans are equipped with automatic resonance detection as standard. Thanks to active PFC (power factor correction), ebm-papst was also able to guarantee a maximum value of 5% to meet the ELT's strict limit value of 10% for current harmonics.

Helping to research the universe

In May 2024, the first units were shipped to Chile and assembled by the OCRAM team. On-site measurements are now being performed to validate the plug & play solution. The successful collaboration between OCRAM and ebm-papst shows that we were working at the cutting edge of technology in this project.

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Fig. 1: Up to eight guiding star laser systems will help the ELT to take sharp images of space with the aid of its 39-meter primary mirror. (Photo credit: ESO/L. Calçada)



Fig. 2: A total of 28 FanGrids are installed in the highly specialized AHUs supplied for the ELT by OCRAM. All the RadiPac fans are equipped as standard with active PFC and automatic resonance detection. (Photo | ebm-papst)

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Characters	approx. 2,800, including headings and sub-headings
Tags	RadiPac, FanGrid
Link	www.ebmpapst.com/radipac

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About ebm-papst

The ebm-papst Group, a family-run company headquartered in Mulfingen, Germany, is the world's leading manufacturer of fans and motors. Since it was founded in 1963, the technological leader has set international industry standards with its core competencies in motor technology, electronics, digitalization, and aerodynamics. ebm-papst offers sustainable, intelligent, and tailor-made solutions for virtually every requirement in ventilation and heating technology.

In the 2023/24 financial year, the Group generated turnover of EUR 2.408 billion. It employs just under 14,000 people at 30 production sites (including in Germany, China, and the U.S.) and in 50 sales offices worldwide. ebm-papst sets the benchmark in almost all sectors, such as ventilation, air conditioning and refrigeration technology, heating technology, information technology, mechanical engineering, intralogistics, and medical technology.

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