



## Reaching for the stars, close to the sun: SAUTER in an astronomer's dream world.

*A pleasant atmosphere for the world's largest and most expensive telescope.*



H.H. Heyer/ESO

The Chilean Andes provide a terrain that is extraordinarily well-suited to celestial observation – and a telescope system that is equally extraordinary: the Very Large Telescope (VLT). This largest instrument of its kind in the world is situated at an altitude of 2,635 metres on the Cerro Paranal mountain. To develop its almost inconceivably powerful 'vision' – four billion times that of the human eye – the VLT is dependent on a constant climate inside the observatory. And this is why SAUTER has become a small – yet vital – cog in the field of astronomical research.

For many thousands of years, man has been eagerly attempting to unravel the secrets of the stars and planets. Astronomy may justly be termed the oldest science – a science based on observation. Its tools are, therefore, subject to constant improvement, and an observatory location that provides optimum meteorological and climatic conditions is a further vital prerequisite.

### An astronomer's delight.

Finding an optimum site was an obvious priority for the European Organisation for Astronomical Research in the Southern Hemisphere (or ESO for short). The ESO finally pinpointed a suitable location for two observatories with state-of-the-art telescopes on the Cerro Paranal and La Silla mountains, where the air is extremely dry and calm. This is quite probably the most desirable travel destination for astronomers throughout the world – a claim supported by the fact that the list of requests for observatory time in the high-altitude Chilean desert is up to four times longer than the capacity available.

### A very lengthy planning process.

The VLT heralded a new chapter in the field of astronomy. It was both a technological and a financial challenge. The decision to build the VLT took all of ten years to finalise, despite the fact that astronomers everywhere had long been dreaming of a 'super-telescope', a unique visual gateway into space. Technical barriers kept cropping up: for example, the fact that the telescope mirror cannot be too heavy, otherwise it would simply collapse under its own weight. Then came the VLT.

The unique technological feature of the VLT is the fact that its light-gathering capacity is spread over four separate optical telescopes, each with a mirror of 8.20 metres diameter. The system is supplemented by three smaller, movable telescopes of 1.80 metres diameter. The instruments are arranged in a manner that allows the light of all the stations to be combined into an observation tool equivalent to a mirror with a diameter of 200 metres.

### So what has all this to do with SAUTER?

'Confidence' is the magic word. Confidence in the quality of the technical equipment and in the reliability of the experienced project managers. SAUTER provides dependable long-term temperature stability in many of the ESO telescopes, including the VLT. This is crucial because material constancy and, therefore, the accuracy of measurements and observations is dependent on the temperature inside the telescope. Automatic systems by SAUTER regulate and control the temperatures of instruments of various types and generations at the La Silla and Cerro Paranal observatories – with an accuracy of up to  $\pm 0.1^\circ\text{C}$ . A similar constancy of humidity and water pressure is achieved through control and monitoring systems applied to pumps and fans.

### An international commitment

The observatories continue to benefit from technical progress. SAUTER already provides the value-preserving climate in four different telescope units, and a fifth is under construction. Whilst SAUTER Italy was entrusted with the engineering and outfitting



*Clemente Chappuzeau,  
Managing Director, Climatrol*

work, the Chilean SAUTER agent *Climatrol* – headed by Clemente Chappuzeau – and its successor company *Proyectos de Climatización Ltda.* are responsible for commissioning, maintenance and replacement parts. Unsurprisingly, perfection is their declared goal – after all, SAUTER is by no means averse to reaching for the stars!

### For a clear view into outer space – this is where SAUTER regulates and controls:

#### La Silla

*New Technology Telescope (NTT):* automation station, stand-alone, approx. 80 data points

*Telescope 3.6 with Project HARPS* (to discover new planets in other solar systems): automation station, stand-alone, with 25 data points

#### Cerro Paranal

*Four Very Large Telescopes (VLT):* each with five automation stations with approx. 150 data points each, connecting to external system (ESO sub-station)

*Visible & Infra-red Survey Telescope for Astronomy (VISTA):* three modular automation stations with approx. 100 data points

*VLT Survey Telescope* (under construction): Three modular automation stations, approx. 80 data points, connecting to external system (ESO substation)