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Spying on the heavens with Grob linear drives

Grob GmbH Antriebstechnik was still just a small handicrafts company when Prince Charles officially put the Anglo-Australian reflecting telescope AAT into operation in the observatory on Siding Spring Mountain in Australia on 16 October 1974. The reflecting telescope installed there was one of the first telescopes in the southern hemisphere and at that time the largest in Australia with a mirror diameter of 3.9 metres.

The Anglo-Australian AAT in Australia

What do reflecting telescopes do? They are used in observatories for observational astronomy. Scientists use them to observe celestial bodies by means of the radiation that they emit.

In order for reflecting telescopes to be able take precise pictures of distant regions of space, they must be exactly aligned to those regions. A sophisticated mechanical system is required in order to move the telescope's 16.2-tonne mirror precisely, especially for maintenance work.

The "Grob solution" for the Australian observatory

When the complete system was overhauled in 2012, the commissioned service provider, the **PM Design Group** http://www.pmdesign.com.au/**, opted for a system from Grob GmbH Antriebstechnik.** First and foremost, the new system had to be long-lasting, virtually non-wearing and positionable with great precision. They didn't have to search long - the solution from Grob GmbH Antriebstechnik was ideally suited.

Ultimately three BJ5 linear drives were installed, each with a **maximum lifting capacity of 500,000 N**. Grob's scope of delivery was:

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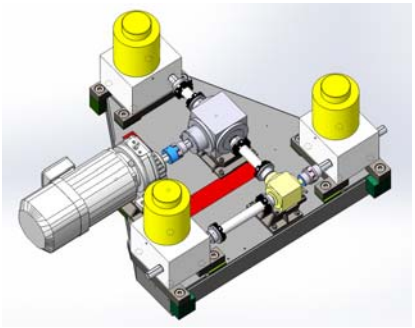
three BJ5 linear drives, each with a maximum lifting capacity of 500,000 N, which are driven via two transfer gearboxes and three Cardan shafts by a drive motor with a drive output of 15,000 W (from SEW Eurodrive).

Special feature of this solution: the linear drives are equipped with ball screws. This allows more precise positioning, there is less wear and the spindles last longer. The stroke speed is 0.52 m/min.



The Grob solution: 1 Drive motor, 2 Transfer gearbox, 3 Linear drive

What has proven itself in Australia will also work perfectly in Chile

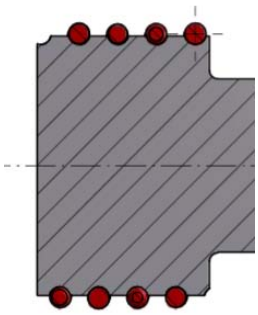
Because this system has proven its worth ever since and the Australians have nothing but praise for this solution, a further observatory has now opted for the proven "Grob solution".

The **Cerro Tololo Inter-American Observatory (CTIO)** in Chile http://www.ctio.noao.edu/noao/ has now ordered from Grob GmbH Antriebstechnik a similar solution to that described in the observatory in Australia for the Blanco telescope with a diameter of 4 metres.

The solution for Chile: the previously installed linear drives (not supplied by Grob) were designed for a lifting capacity of 227,000 N each. Due to the high wear, Grob recommended larger linear drives with a maximum lifting capacity of 500,000 N. Grob GmbH Antriebstechnik has now delivered three BJ5 linear drives, each with a lifting capacity of 500,000 N, an electric motor with an output of 15,000 W, two transfer gearboxes and three Cardan shafts. The stroke speed is 0.5 m/min.

It's about long life and higher positioning accuracy

In the past, the observatory in Chile had experienced high wear in the installed linear drives. Therefore, Grob recommended a **version of the linear drive with a ball screw.** In this case, balls move between the spindle and the nut. Instead of sliding friction, rolling friction now occurs. The efficiency is considerably improved and



Rolling friction considerably improves efficiency

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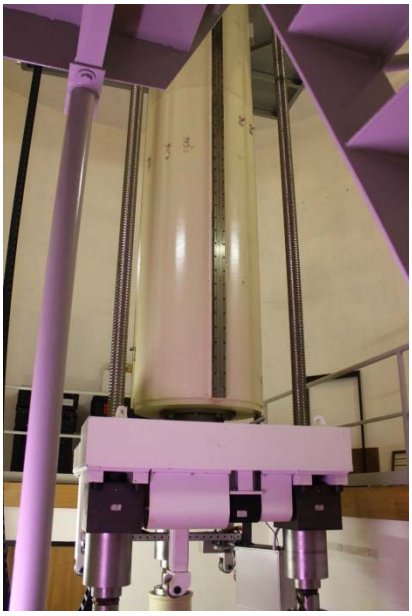
that means: less drive power is required, which in turn has a beneficial effect on the investment costs.

Linear drives from Grob



Linear drive "climbs" up and down the spindle – the spindle rotates

Maximum loads of 2,500 to 2,000,000 N can be handled with linear drives from Grob. In this case there are three BJ5 drives, each with a lifting capacity of 500,000 N. Linear drives are normally equipped with trapezoidal threaded spindles. Ball screws are used in this installation.

The drives used are the basic versions. In this case it is a special form of the basic version: It is a "**climbing**" linear drive. The ball screw is fixed in the system. As soon as the drive motor starts, the linear drive "climbs" up or down the spindle together with the load.

What Grob GmbH Antriebstechnik stands for

Grob GmbH Antriebstechnik (http://www.grob-antriebstechnik.de/de/start.html) is an internationally leading company in linear drive technology. Its core competence is its high level of technical consulting expertise, which is groundbreaking in this industry. The most important product is the linear drive in innumerable variants. Further products are electrical cylinders, transfer gearboxes, linear actuators, screw jacks and complete lifting systems. The company's most innovative product is the linear chain, which can both push and pull and needs very little space. The company has published its own reference book, entitled "Principles of linear drive technology", through the Springer Verlag publishing house.