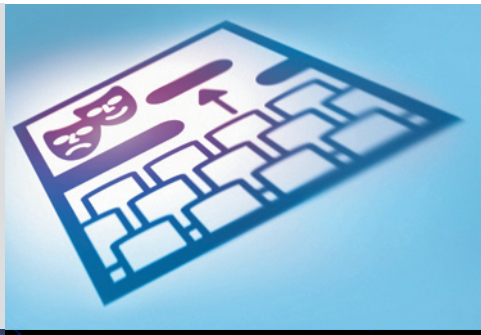
Electric Drives and Controls | Hydraulics | Linear Motion and Assembly Technologies | Pneumatics | Service

Rexroth
Bosch Group

Stage Technology
Horizontal Hydraulic Linear Drives for Lower Stage Machinery

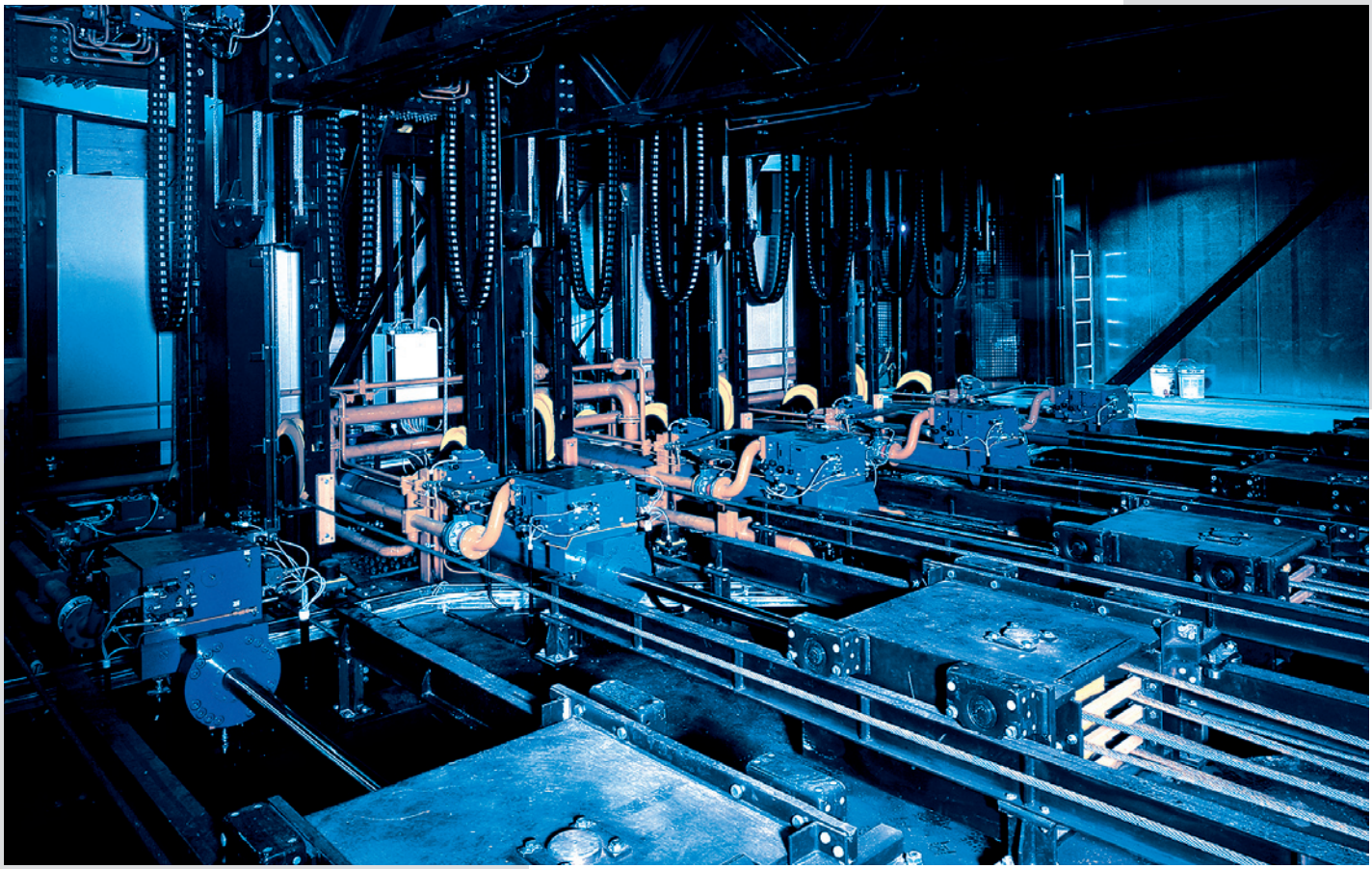


The Drive & Control Company

Realizing the Vision

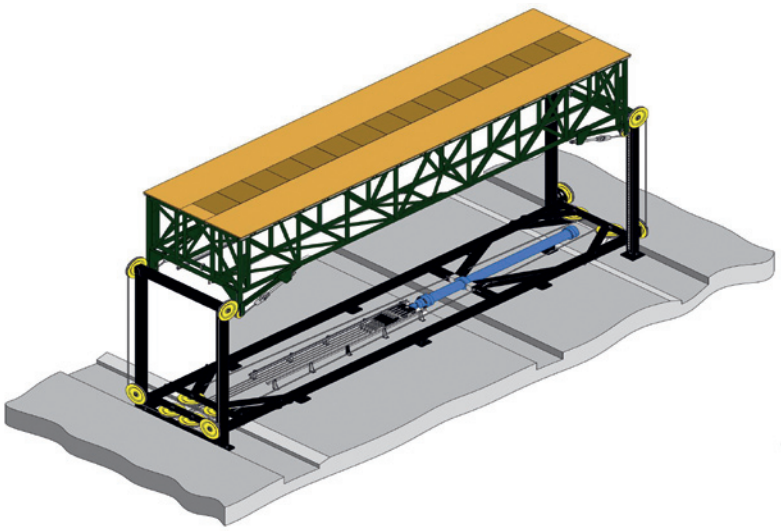
The Hungarian National Theater – situated on the banks of the Danube – is one of the most modern stages in Europe and is a new national symbol.

Horizontal Hydraulic Linear Drives for Lower Stage Machinery



The scope of supply will depend on customer requirements and may, for example, also include the following:

- Base frame
- Guides
- Locking towers
- Podium structure
- Hydraulic drive technology
- Rope tensioning system
- Stage control system
- Engineering (inc. budgeting, project design)
- Assembly, commissioning, acceptance test
- Maintenance



Bosch Rexroth has developed a wide range of drive concepts for stage technology. Working together with the customer, electric or hydraulic drive solutions can be selected and Bosch Rexroth is able to supply both technologies.

The drive presented here is used in the lower stage machinery. If converted it can also be used in the upper stage machinery. A relevant flyer is available to this purpose. The horizontal hydraulic drive has already proved a great success in orchestra pit, stage and compensating elevators. Reference systems are to be found in the State Theater, Stuttgart, the New Playhouse in Copenhagen, the Warsaw National Theater, the Bayreuth Festival Theater, Gärtnerplatz Theater in Munich and soon also in the Bolshoi Theater, Moscow.

Mechanical Construction and Installation

A base frame is mounted onto the base of the stage pit, inside which the hydraulic cylinder is installed. A guide pulley block is fixed to the cylinder rod, forming a block and tackle together with the stationary pulley and lifting cables. Normal transmission ratios are 1:2 or 1:3; i.e. the cylinder stroke amounts to only half or a third of the distance to the podium. The elevating cables are diverted vertically around the corners of the frame by guide rollers, then being further diverted beneath the stage floor to the elevating podium. The podium guides should preferably be connected at the bottom to the base frame and secured horizontally to the wall or steel structure. The upper pulleys are usually located at the upper end of the guides. Additional locking supports connected to the base frame enable the locking of the podium. A cable-tensioning device is available as an option for larger strokes and the long cables thus required; it is also used for high eccentric loads. With the cable-tensioning device each cable is individually tensioned and the podium leveled horizontally with high precision.

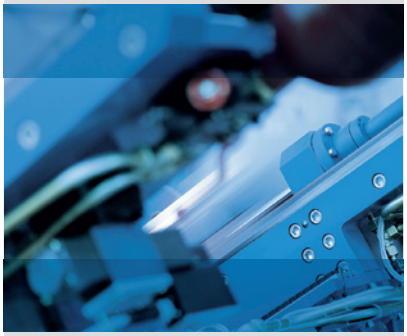
Advantages of the Drive Concept

Hydraulic cylinders operate across a wide range of speeds and completely jerk-free. Podium speeds of up to 0.7m/s are not uncommon. The drives are extremely compact due to the very high power density. Thanks to their low height they can easily be mounted below the podia, without requiring any further excavations of the stage pit. These drives are therefore also ideal for use in revolving stages. Drives for stages are not normally used continuously, so high power is only required for brief periods. Hydraulics offers a very easy and efficient way of storing energy.

A piston moves within a hydraulic accumulator, separating the oil side from the gas side. The gas – normally nitrogen – acts like a strong spring, pretensioning the oil in the accumulator to provide sufficient energy. This energy is also available in the event of a power cut or if the closed-loop control electronics breaks down, and even then it allows the podium to move.

An open stage pit can, for example, be immediately closed i.e. an emergency operation can still be undertaken. If the stage control system can no longer be used, the travel motion can easily be carried out manually by means of a simple hand-operated hydraulic valve. Between the travel motions the hydraulic accumulator is refilled via a pump. Depending on the accumulator loading time this pump may be of compact dimensions, so that the total installed electric power will generally be considerably lower than with a comparable podium system with electric drive technology. Considerable savings can be made here depending on the method applied by the energy supplier to calculate the consumption.

The Drive & Control Company
Rexroth is unique. No other brand on the world market can offer all drive and control technologies, both on a specialized and integrated basis. With approximately 28,000 employees in more than 80 countries around the world, Rexroth has an infrastructure designed with partnership and customer proximity in mind. Over 500,000 customers worldwide utilize the know-how of the technology leader.



Intelligent Hydraulics in New Dimensions
Whether it's a case of raising or lowering loads smoothly, undertaking linear or rotational movements, achieving even acceleration or accurate positioning, maintaining preset speeds, transmitting power or linking motion sequences – in fact, wherever economical power is required, this is where hydraulics comes into its own.

Using hydraulic drive and control technology from Rexroth will help you become more competitive than ever.

Rexroth
Bosch Group

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Printed in Germany
RE 09927/06.07