



### Construction and layout

The selection or the dimensioning is determined by the customer, since we are not familiar with the construction conditions like the place of application and the type of operation. If desired, we can be of help for the selection and design of the layout, and can generate assembly drawings and calculations for you on the basis of your rating parameters, as suggestions. The gearboxes are conceived in accordance with the load and duty cycle shown in the catalogue, for industrial purposes. We request you to check with us for any requirements over and above these. We generally supply subject to our current terms and conditions of supply.

### Lifting speed

Normal version N:

1 mm stroke per drive shaft revolution  
(exception NSE2-N with 0.8 mm)  
gives, at  $1500 \text{ min}^{-1}$  > 25 mm/s  
or 20 mm/s  
respectively

Slow version L:

0.25 mm stroke per drive shaft revolution  
(exception NSE2-L with 0.2 mm)  
gives, at  $1500 \text{ min}^{-1}$  > 6.25 mm/s  
or 5.00 mm/s  
respectively

### Possibilities of influencing the lifting speeds

Increasing

- > Double-thread spindle (usually not an in-stock item): Doubling the speed (Caution: max. input drive torque, not self locking, brake required)
- > Reinforced spindle for R-version (spindle of the next bigger gearbox): depending on the gearbox size, somewhat greater pitch/lifting speed
- > Ball screw spindle: different pitches available
- > Frequency converter: The motor rotation speed can be increased to more than 1400.

Reduction

- > Motors with a higher number of poles/smaller rotation speed (6-, 8-pole)
- > Frequency converter (Attention: in case of prolonged operation below 25 Hz, sufficient cooling of the motor must be ensured, e.g.: external fan)
- > Geared motor (Attention: maximum input drive torque)
- > Bevel gearbox with reduction (only possible with some arrangements)

### Temperature and duty cycle

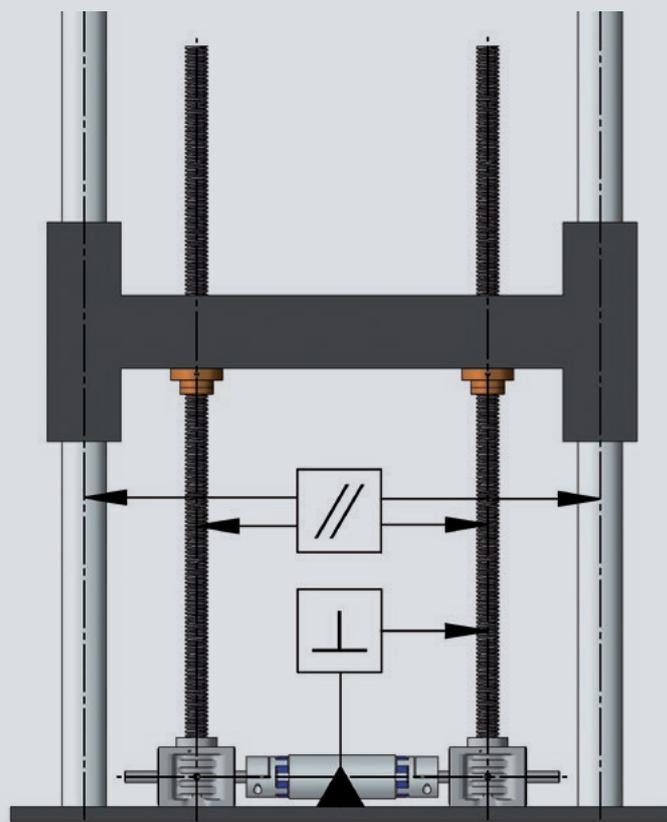
Screw jacks are basically not suitable for continuous operation. In borderline cases, choose a larger gearbox or contact us.

The operating temperature may not exceed  $80^\circ\text{C}$  (higher upon request).

### Parallelism and angularity

Attention must be paid to parallelism and angularity of the screw-on surfaces, gearboxes, nuts and guides with respect to one another. Also, exact alignment of the gearbox, pedestal bearings, connecting shafts and motors to one another.

If lifting jacks are used in machine building, there are hardly ever any problems, since the surfaces are machined. However, in plant construction, with steel structures, there are very frequently errors in the geometry of the welding construction despite meticulous working. Geometric errors can also occur owing to the interplay between different components. Here, the following must be remembered: The parallelism of the spindles to one another and to



the guides must be guaranteed, otherwise, the system can get stuck during operation. Also, the fastening surfaces of the gearbox must be exactly at right angles to the guides, otherwise jamming can occur. This results in faster wear and/or destruction. Basically, mounting surfaces for the nuts must also be at an angle. To save time and costs in this respect, the compensating nuts can be used. Another possibility of balancing out certain inaccuracies in the design is the use of Cardan adapters.

### Guides

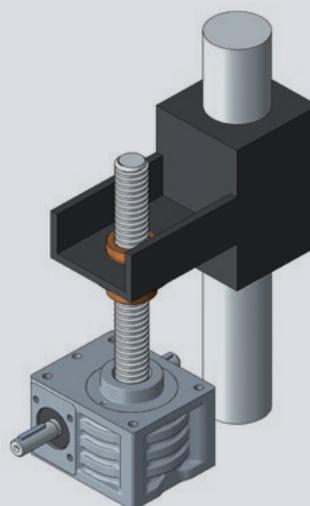
The play of the guide bushing in the gearbox neck is tolerated between 0.2 and 0.6 mm depending on the size. This is a secondary support and does not replace a guidance system for absorbing lateral forces.

### Lateral forces

Lateral forces acting on the spindle are to be absorbed by additional guides (1 N lateral force > 4 N more lifting force). Loads must be led externally as far it is possible.

### Anti-rotation lock

In the case of non-rotating version S, the spindle is loosely screwed into the gearbox (worm wheel). Because the spindle would also rotate owing to the friction in the worm wheel, it must be locked against rotation. This can be achieved by the spindle linkage to your construction (e.g. external guide) or by means of an anti-rotation lock in the protection tube.





### Fastening

A plane-machined base surface is required. The fastening screws are designed for the static nominal load of the gearbox for tension and compression. Additional impact loads etc. must be taken into account. The screw-in depth must be maintained. For the main load direction, the fastening screws should be mounted for «Pressure». In case of unknown factors like impact and vibration, we recommend an additional securing of the lifting jack by means of beams and threaded rods. This will secure the maximum load for tension and compression.

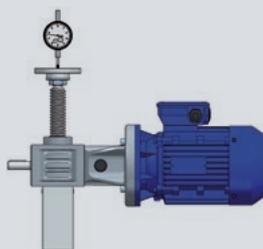
### Safety distance

The safety distance between the movable and the fixed components must not be underrun, otherwise, there is a danger of jamming. A lifting system must never come to a mechanical stop.

### Accuracy

The repeat accuracy of the gearbox is up to 0.05 mm, when moving to the same position again under the same circumstances. This requires drive-side measures such as the use of a three-phase braking motor in conjunction with a frequency converter and rotary pulse transmitter or a servomotor with resolver, etc.

The pitch accuracy is  $\pm 0.2$  mm over a spindle length of 300 mm in the case of trapezoidal spindles, and with ball screw spindles, 0.05 mm over 300 mm spindle length. With alternating loads, the axial play can be up to 0.4 mm in the case of trapezoid threads and 0.08 mm in the case of ball screws.



### Direction of Rotation and Movement

Note the direction of rotation of the system and indicate it in the drawing or select one of our standard arrangements (page 20). In the case of T-bevel gear drives with a through-drive shaft, the direction of rotation can be changed by simply inverting the gearbox

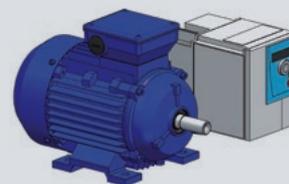
### Self-locking/overrun

Screw jacks with a single-start trapezoid thread spindle are self-locking to a limited extent and that too, not always reliably in case of impact loads or vibrations (brake recommended).

The overrun, after switching off the motor, is different depending on the application. To reduce the overrun to a minimum, we recommend using a braking motor. In case of double-thread spindles or ball screws, a braking motor is necessary, as these are not self locking.

### Drive

For uniform starting and braking ramps, we recommend the use of a frequency converter. This increases the life of the system and the starting noises are minimised.



### Trial operation

To ensure safe working, a test run at no-load and under load in real-time operation is required. It is necessary to run the trials at your premises, to achieve an impeccable geometry through exact assembly, as well as to eliminate influences that could disturb the working.

### Spare Parts

For protection from production downtimes, in case of a long duty cycle or a high load, we recommend stocking a gearbox set (incl. threaded spindles and accessories) either with you or your customer.

### Stage construction

We supply lifting jack systems according to the current stage building specifications.

### Land-, air and water vehicles

Our machine elements, used in all vehicles that run on land or water or in the air, are generally exempted from the product liability. Individual agreements can be drawn up with us.

### Ambient conditions

If your ambient conditions are not similar to those of a normal industrial workshop, please specify accordingly.



### Operation

The loads, rotation speeds, duty cycles and operating conditions assumed for the screw jacks and attached elements may not be exceeded – not even for a short time – (even a one-off excess can result in permanent damage). Good spindle lubrication ensures optimum operating and wear conditions.

### Maintenance

In screw jack systems, good, permanent lubrication between the spindle and the spindle nut (worm wheel) is essential. They must be kept free of grease residues. After a short operating time, all the fastening screws should be tightened. At intervals that are laid down according to the prevailing operating conditions, the wear of the spindle nut (safety trap nut) should be checked on the basis of the thread play. If the thread play is more than 1/4th the thread pitch, the spindle nut (worm wheel) should be replaced.

For ensuring reliable lubrication of the spindle or in case of prolonged duty cycles of the gearbox, we recommend an automatic grease dispenser.

The gearboxes are lubricated for life under standard conditions, no grease nipples available for future use.

### Lubrication of screw jacks type NSE

Lubrication is done with grease, option oil. The gearboxes are lubricated for life under standard conditions.

### Lubricants for spindles:

Klüber: Microlube GBU Y 131

Other lubricants provided upon request.

### CAD-files

To support you in your design, you can download our components in the form of CAD files from our homepage [www.nozag.ch](http://www.nozag.ch).

### Data sheets

For every screw jack, a summary is available under the product data sheets in the downloads section at [www.nozag.ch](http://www.nozag.ch).