

# HSG screw jack (cubic design)



**INKOMA - GROUP**   

## Product description

### Precision screw jack HSG lifting force 2.5 kN to 500 kN

INKOMA-precision screw jacks are high quality engineering products for precise lifting, lowering and pivoting of loads, and are, under normal operation, maintenance free. The use of high quality grey cast iron and aluminium in the production of the housings guarantees a long life and a high operating margin. All housings have a cubic form and are machined on all faces.

Motor and screw jack assemblies may be mounted in any attitude. Compressive, tensile and offset loadings can be tolerated even under extreme operating conditions.

The worm gearing in the INKOMA-precision screw jacks has a special gear form. A concave profile and cylindrical worm with an enveloping wheel results in low specific tooth pressure giving a long working life.

The worm gear is manufactured from quality alloy steel and is ground and ion-nitrided. Sealed angular contact ball bearings on both ends of the worm shaft carry the resultant axial loads from the drive. The gearing, the gear module and the helix angle are optimised to allow transmission of the largest possible proportion of the nominal torque. The special worm wheel is produced from high performance bearing bronze.

The precise location diameter and the use of ball thrust bearings accurately position the worm wheel.

Using a centrally guided threaded flanged nut in the gear housing and the cover, the worm gearset backlash can be adjusted to a very low level and locked in position. Above and below the worm wheel a bronze bush is located to carry the high reactive loads on the translating spindle.

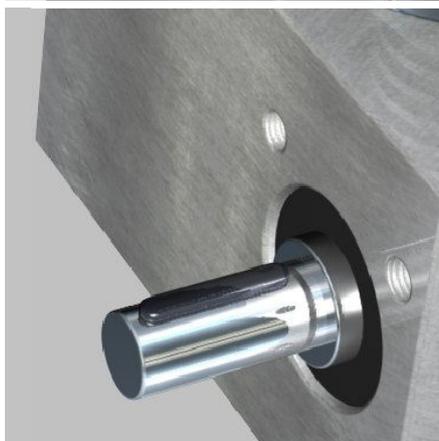
Normally the gear ratios and the spindle pitch are matched. The trapezoidal spindle is a precision component rolled to tight tolerances. Single start rolled trapezoidal spindles are self locking, however it is recommended that an end-stop, motor brake or similar is employed in order to ensure that operational safety standards are met.

**Precision screw jack with ball screw spindle**  
 Precision screw jacks can be equipped with a range of ball screws (KGS). For versions see table. The use of ball screws allows higher lifting speeds. Higher efficiency (ca. 90%) reduces the required input power and increases the available duty.

Note: The maximum lifting capacity for each size is reduced. Please note the dynamic lifting force  $F_{dyn}$ . [kN]. Screw jacks fitted with ball screws (KGS) are not self-locking. For this reason the motor must be fitted with a brake.

To ensure the most careful matching of your requirements we have developed a comprehensive range of accessories.

If you have questions or problems, regarding power, special designs, corrosion resistance, spindles or modified gear housings, contact our engineers and sales personnel. We are always ready to assist in the correct selection of our products and with the design of lifting systems. Please make use of our wide experience.



# Accessories for rotating spindle version R

## Page references

The comprehensive range of accessories for high capacity screw jacks type HSG allows the designer the flexibility to tailor the use of the screw jack precisely to the application. All accessories are manufactured to the same exacting standards as the rest of the INKOMA product range.

In addition to this comprehensive selection, customers special requirements can be accommodated.

Please consult our engineering staff.

### Duplex nut - DFM

connection of two bellows adaption for lubrication  
see page 194

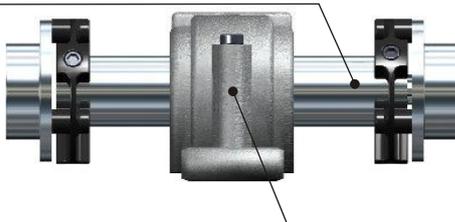
**Automatic lubrication device**  
allows continuous grease supply  
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**Mounting feet - BP**  
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**Cardan shafts - GX/GE**  
provide torsionally stiff resilient connections  
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**Support bearings - SNH**  
to support extended cardan shafts  
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**Trunnion adaptor - KA/KAS**  
allows articulating fitting of flanged nut  
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**Bearing block/ flange - LB/LF**  
base mounting bearing unit for KA, KAS or SL  
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**Motor adaptor - MG**  
for positive and efficient  
mounting of motors  
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**Elaflex coupling - EFK**  
flexible shaft coupling  
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**Gear coupling - M**  
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**Bearing plate - GL**  
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**Flanged nut - FMS/FM**  
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**Trapezoidal spindle nut - TM/ST**  
for applications where space is critical  
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**Self aligning nut flange - SL**  
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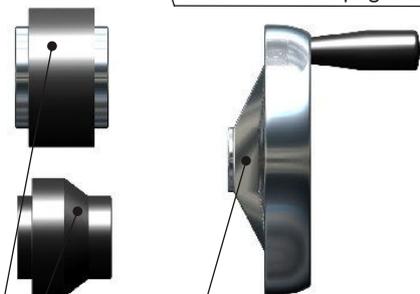
**Folding bellows - FB**  
provide spindle protection  
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**Spiral protective sleeve - SF**  
provide spindle protection  
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**3 phase motor**  
flange or foot mounting  
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**Handwheel - HR**  
for manual actuation  
of the screw jack  
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# Accessories for translating spindle versions S, SA, SV, SVA

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**Rod end bearing - GSK**  
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**Clevis - GK**  
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**Mounting feet - BP**  
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**Cardan shafts - GX/GE**  
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**Trunnion adaptor - KA/KAS**  
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**Bearing block - LB**  
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**Bearing flange - LF**  
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**Setting ring and limit switch with roller follower**  
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**Setting ring and inductive proximity switch**  
for monitoring of the spindle position  
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**Safety nut - SFM-S**  
allows wear monitoring  
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**Mounting flange - BF**  
for simple attachment  
of the spindle end  
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**Spiral protective sleeve - SF**  
provide spindle protection  
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**Folding bellows - FB**  
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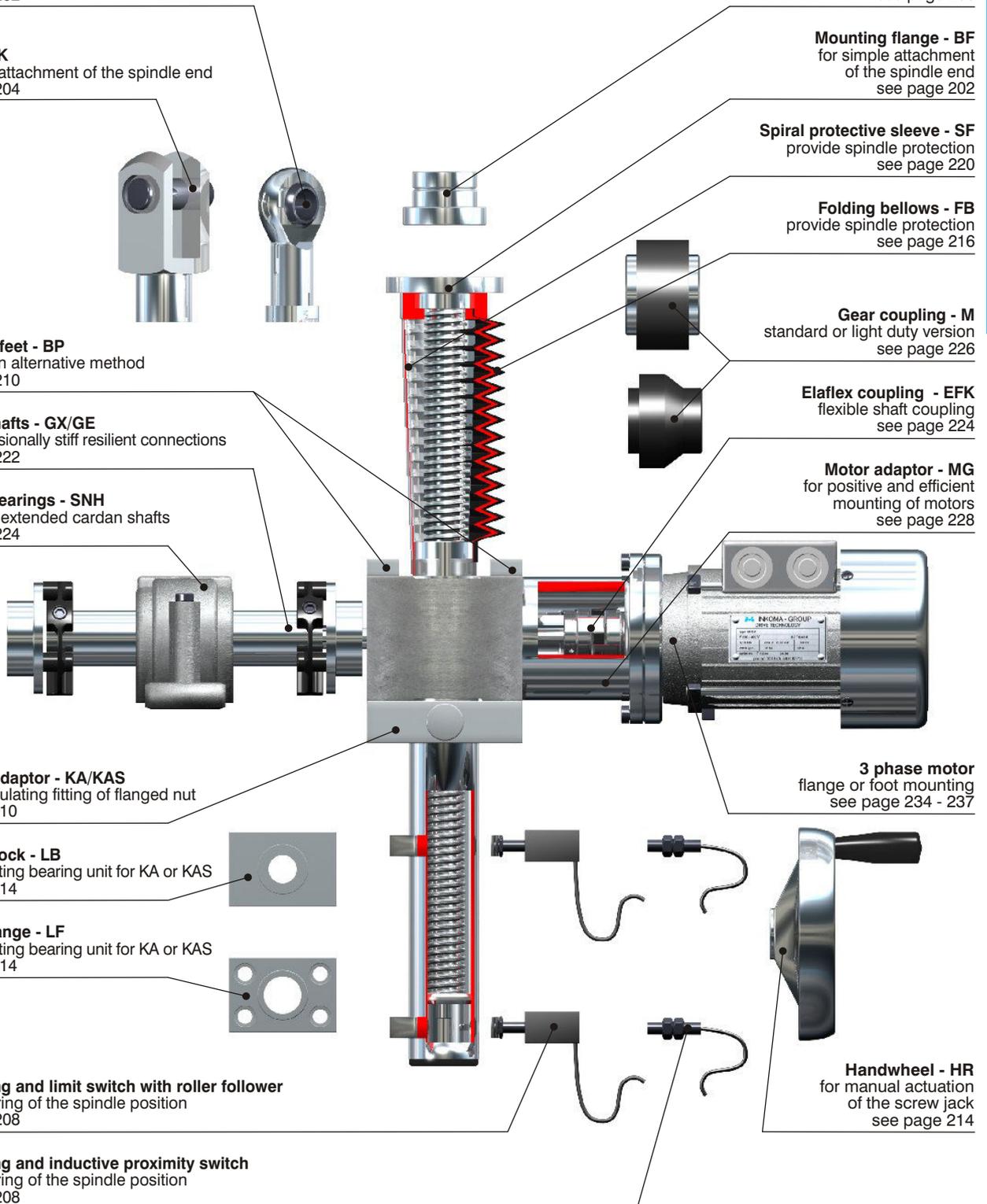
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mounting of motors  
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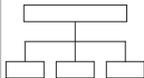
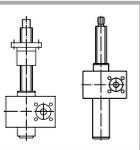
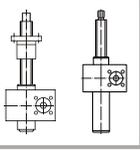
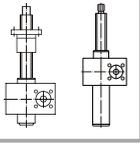
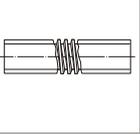
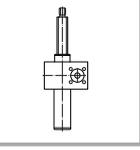
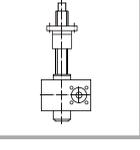
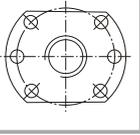
**3 phase motor**  
flange or foot mounting  
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**Handwheel - HR**  
for manual actuation  
of the screw jack  
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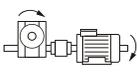
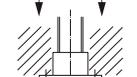
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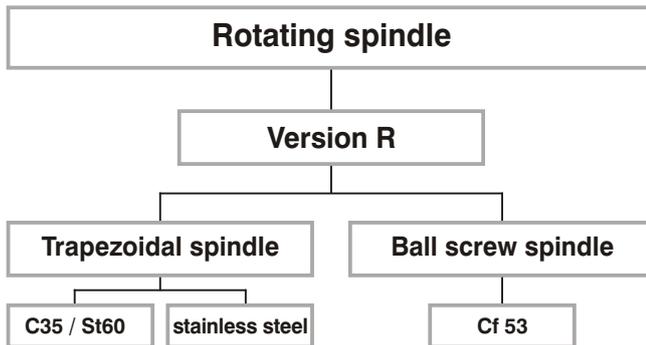
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## Versions

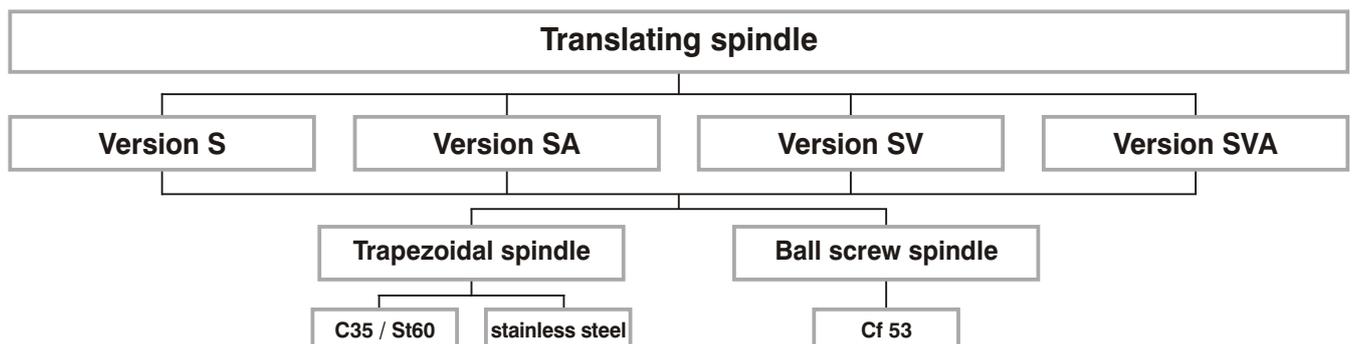
### Rotating version (R)

In rotating version (R) linear motion of the nut results from rotational motion in the spindle.  
In this version the spindle is axially fixed in the gear housing.



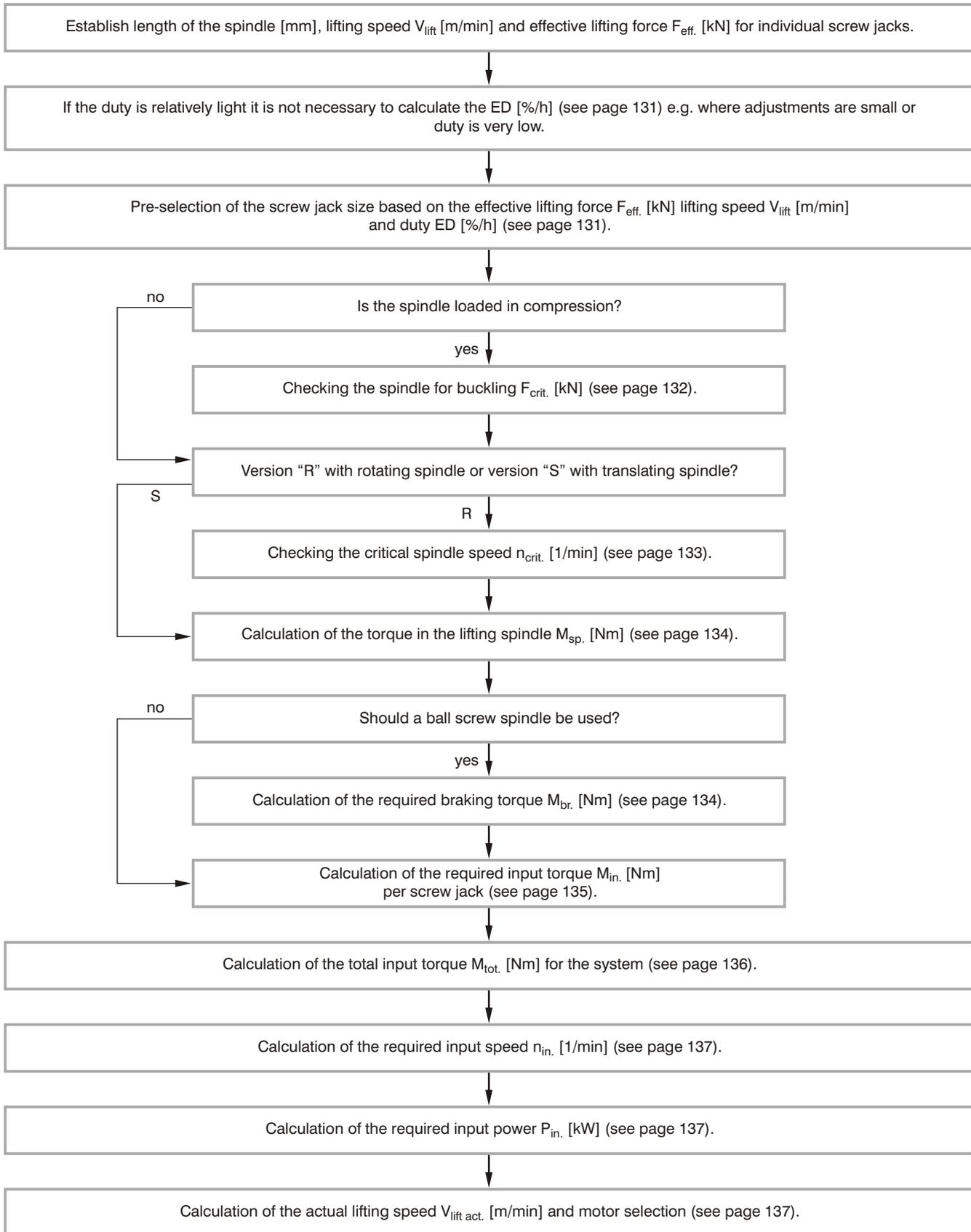
### Translating version (S)

In translating version (S) linear motion results from the movement of the non rotating spindle through a rotating integral nut. The spindle is guided through the screw jack housing and must not be allowed to rotate. Over-travel of the spindle is prevented by a travel limiter (version SA). Spindle rotation can be prevented by the use of a rotation prevention device (SV). These two functions can be combined (version SVA).



# Design of the lifting system

## Method



# Dimensions HSG-0 to HSG-2

## Trapezoidal spindle - rotating and translating versions (R, S, SA, SV, SVA)

All versions have an input shaft on side A and B as standard.  
Single shaft versions can be optionally specified.

**Versions:**

- R:** Rotating spindle
- S:** Translating spindle
- SA:** Translating spindle with travel limiter
- SV:** Translating spindle with rotation prevention
- SVA:** Translating spindle with rotation prevention and travel limiter

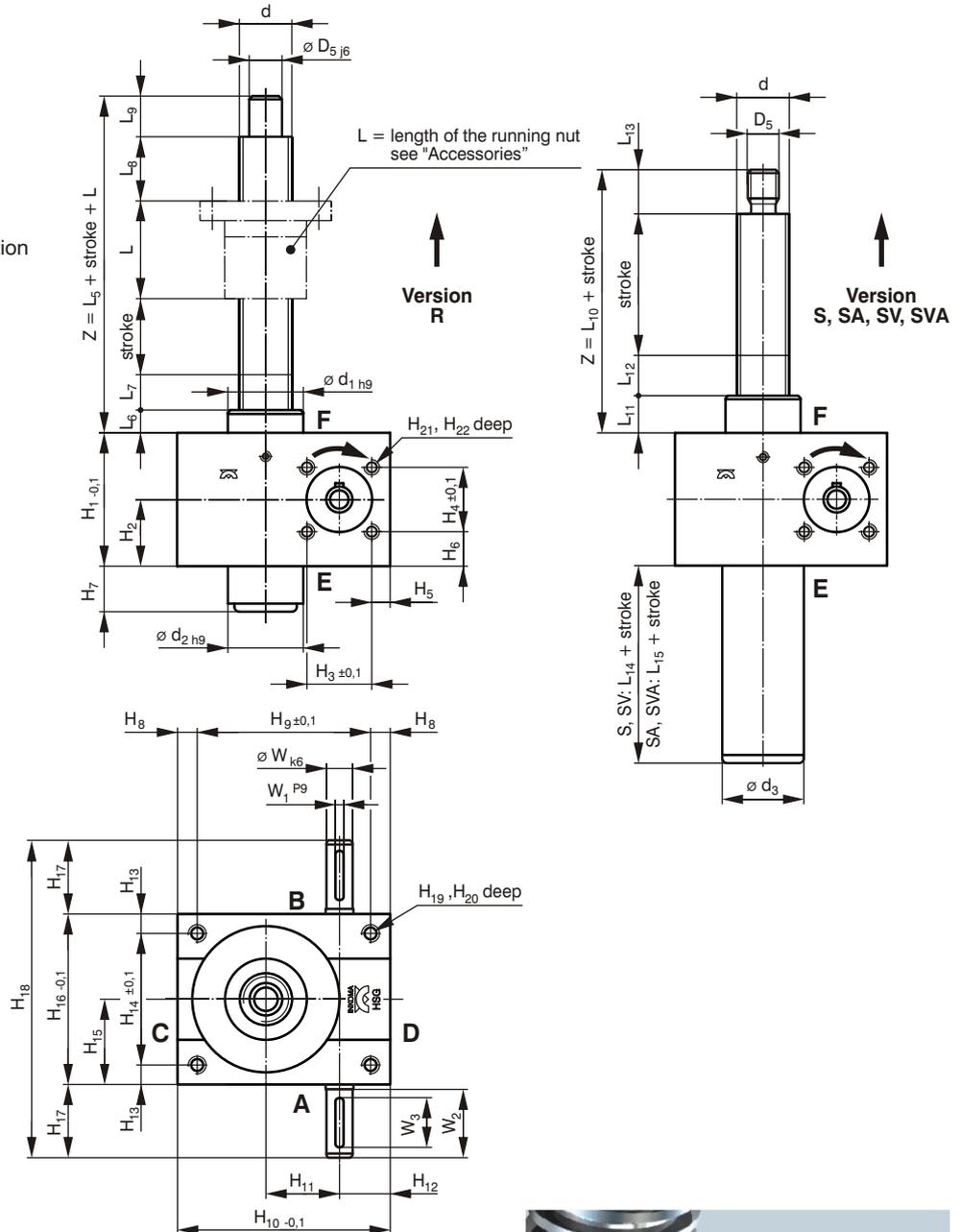
**Ratio:** N: normal, L: slow

**Lubrication:** Grease

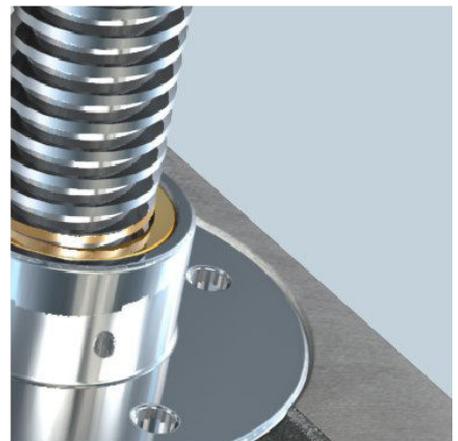
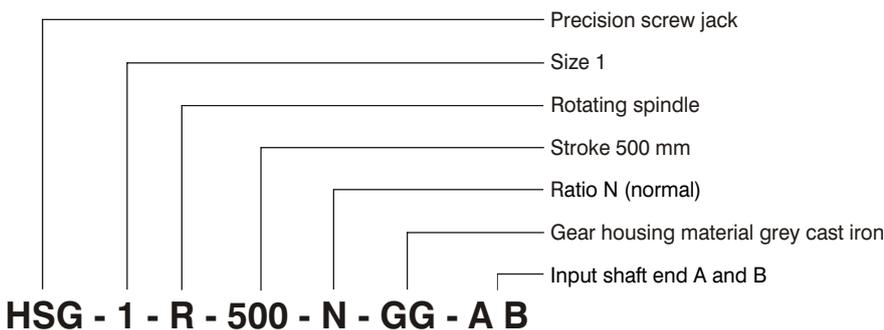
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### Ordering example:



| Order code           | max. static lifting force <sup>2)</sup><br>[kN] | Lift per revolution<br>N / L<br>[mm] | Ratio<br>N / L<br>i | Mass<br>[kg] | Dimensions [mm] |                |                |                              |                |                |                |                |                |                |                 |                 |                 |                 |                 |                 |                |                |
|----------------------|-------------------------------------------------|--------------------------------------|---------------------|--------------|-----------------|----------------|----------------|------------------------------|----------------|----------------|----------------|----------------|----------------|----------------|-----------------|-----------------|-----------------|-----------------|-----------------|-----------------|----------------|----------------|
|                      |                                                 |                                      |                     |              | d               | D <sub>5</sub> | d <sub>1</sub> | d <sub>2</sub> <sup>1)</sup> | d <sub>3</sub> | L <sub>5</sub> | L <sub>6</sub> | L <sub>7</sub> | L <sub>8</sub> | L <sub>9</sub> | L <sub>10</sub> | L <sub>11</sub> | L <sub>12</sub> | L <sub>13</sub> | L <sub>14</sub> | L <sub>15</sub> | H <sub>1</sub> | H <sub>2</sub> |
| HSG-0-R-stroke-N/L   | 2,5                                             | 1 / 0,25                             | 4:1 / 16:1          | 0,8          | Tr16x4          | 10             | 26             | 26                           | -              | 44             | 12             | 10             | 10             | 12             | -               | -               | -               | -               | -               | -               | 50             | 25             |
| HSG-0-S-stroke-N/L   | 2,5                                             | 1 / 0,25                             | 4:1 / 16:1          | 0,8          | Tr16x4          | M10            | 26             | -                            | 28             | -              | -              | -              | -              | -              | 30              | 12              | 3               | 15              | 25              | -               | 50             | 25             |
| HSG-0-SA-stroke-N/L  | 2,5                                             | 1 / 0,25                             | 4:1 / 16:1          | 0,8          | Tr16x4          | M10            | 26             | -                            | 28             | -              | -              | -              | -              | -              | 30              | 12              | 3               | 15              | -               | 45              | 50             | 25             |
| HSG-0-SV-stroke-N/L  | 2,5                                             | 1 / 0,25                             | 4:1 / 16:1          | 0,8          | Tr16x4          | M10            | 26             | -                            | 28             | -              | -              | -              | -              | -              | 30              | 12              | 3               | 15              | 25              | -               | 50             | 25             |
| HSG-0-SVA-stroke-N/L | 2,5                                             | 1 / 0,25                             | 4:1 / 16:1          | 0,8          | Tr16x4          | M10            | 26             | -                            | 28             | -              | -              | -              | -              | -              | 30              | 12              | 3               | 15              | -               | 45              | 50             | 25             |
| HSG-1-R-stroke-N/L   | 5                                               | 1 / 0,25                             | 4:1 / 16:1          | 2,4          | Tr18x4          | 12             | 30             | 30                           | -              | 65             | 12             | 19             | 19             | 15             | -               | -               | -               | -               | -               | -               | 62             | 31             |
| HSG-1-S-stroke-N/L   | 5                                               | 1 / 0,25                             | 4:1 / 16:1          | 2,4          | Tr18x4          | M12            | 30             | -                            | 33             | -              | -              | -              | -              | -              | 35              | 12              | 4               | 19              | 25              | -               | 62             | 31             |
| HSG-1-SA-stroke-N/L  | 5                                               | 1 / 0,25                             | 4:1 / 16:1          | 2,4          | Tr18x4          | M12            | 30             | -                            | 33             | -              | -              | -              | -              | -              | 35              | 12              | 4               | 19              | -               | 45              | 62             | 31             |
| HSG-1-SV-stroke-N/L  | 5                                               | 1 / 0,25                             | 4:1 / 16:1          | 2,4          | Tr18x4          | M12            | 30             | -                            | 33             | -              | -              | -              | -              | -              | 35              | 12              | 4               | 19              | 25              | -               | 62             | 31             |
| HSG-1-SVA-stroke-N/L | 5                                               | 1 / 0,25                             | 4:1 / 16:1          | 2,4          | Tr18x4          | M12            | 30             | -                            | 33             | -              | -              | -              | -              | -              | 35              | 12              | 4               | 19              | -               | 45              | 62             | 31             |
| HSG-2-R-stroke-N/L   | 10                                              | 1 / 0,25                             | 4:1 / 16:1          | 3,4          | Tr20x4          | 15             | 39             | 39                           | -              | 79,5           | 18,5           | 21             | 20             | 20             | -               | -               | -               | -               | -               | -               | 75             | 37,5           |
| HSG-2-S-stroke-N/L   | 10                                              | 1 / 0,25                             | 4:1 / 16:1          | 3,4          | Tr20x4          | M14            | 39             | -                            | 42             | -              | -              | -              | -              | -              | 45              | 16              | 9               | 20              | 35              | -               | 75             | 37,5           |
| HSG-2-SA-stroke-N/L  | 10                                              | 1 / 0,25                             | 4:1 / 16:1          | 3,4          | Tr20x4          | M14            | 39             | -                            | 42             | -              | -              | -              | -              | -              | 45              | 16              | 9               | 20              | -               | 55              | 75             | 37,5           |
| HSG-2-SV-stroke-N/L  | 10                                              | 1 / 0,25                             | 4:1 / 16:1          | 3,4          | Tr20x4          | M14            | 39             | -                            | 42             | -              | -              | -              | -              | -              | 45              | 16              | 9               | 20              | 35              | -               | 75             | 37,5           |
| HSG-2-SVA-stroke-N/L | 10                                              | 1 / 0,25                             | 4:1 / 16:1          | 3,4          | Tr20x4          | M14            | 39             | -                            | 42             | -              | -              | -              | -              | -              | 45              | 16              | 9               | 20              | -               | 55              | 75             | 37,5           |

<sup>1)</sup> also supplied without locating diameter

<sup>2)</sup> The values for max. load apply only for initial jack selection.

The actual permitted lifting force depends on the version of the jack and the operating conditions.

| Order code           | Dimensions [mm] |                |                |                |                              |                |                |                 |                 |                 |                 |                 |                 |                 |                 |                 |                 |                 |                 |                 |    |                |                |                |
|----------------------|-----------------|----------------|----------------|----------------|------------------------------|----------------|----------------|-----------------|-----------------|-----------------|-----------------|-----------------|-----------------|-----------------|-----------------|-----------------|-----------------|-----------------|-----------------|-----------------|----|----------------|----------------|----------------|
|                      | H <sub>3</sub>  | H <sub>4</sub> | H <sub>5</sub> | H <sub>6</sub> | H <sub>7</sub> <sup>1)</sup> | H <sub>8</sub> | H <sub>9</sub> | H <sub>10</sub> | H <sub>11</sub> | H <sub>12</sub> | H <sub>13</sub> | H <sub>14</sub> | H <sub>15</sub> | H <sub>16</sub> | H <sub>17</sub> | H <sub>18</sub> | H <sub>19</sub> | H <sub>20</sub> | H <sub>21</sub> | H <sub>22</sub> | W  | W <sub>1</sub> | W <sub>2</sub> | W <sub>3</sub> |
| HSG-0-R-stroke-N/L   | 25              | 25             | 5,5            | 12,5           | 16                           | 6              | 48             | 60              | 20              | 18              | 6               | 38              | 25              | 50              | 21              | 92              | M6              | 10              | M5              | 5               | 9  | 3              | 20             | 16             |
| HSG-0-S-stroke-N/L   | 25              | 25             | 5,5            | 12,5           | -                            | 6              | 48             | 60              | 20              | 18              | 6               | 38              | 25              | 50              | 21              | 92              | M6              | 10              | M5              | 5               | 9  | 3              | 20             | 16             |
| HSG-0-SA-stroke-N/L  | 25              | 25             | 5,5            | 12,5           | -                            | 6              | 48             | 60              | 20              | 18              | 6               | 38              | 25              | 50              | 21              | 92              | M6              | 10              | M5              | 5               | 9  | 3              | 20             | 16             |
| HSG-0-SV-stroke-N/L  | 25              | 25             | 5,5            | 12,5           | -                            | 6              | 48             | 60              | 20              | 18              | 6               | 38              | 25              | 50              | 21              | 92              | M6              | 10              | M5              | 5               | 9  | 3              | 20             | 16             |
| HSG-0-SVA-stroke-N/L | 25              | 25             | 5,5            | 12,5           | -                            | 6              | 48             | 60              | 20              | 18              | 6               | 38              | 25              | 50              | 21              | 92              | M6              | 10              | M5              | 5               | 9  | 3              | 20             | 16             |
| HSG-1-R-stroke-N/L   | 32              | 32             | 8              | 15             | 17                           | 10             | 60             | 80              | 25              | 24              | 10              | 52              | 36              | 72              | 24              | 120             | M8              | 12              | M5              | 10              | 10 | 3              | 22             | 18             |
| HSG-1-S-stroke-N/L   | 32              | 32             | 8              | 15             | -                            | 10             | 60             | 80              | 25              | 24              | 10              | 52              | 36              | 72              | 24              | 120             | M8              | 12              | M5              | 10              | 10 | 3              | 22             | 18             |
| HSG-1-SA-stroke-N/L  | 32              | 32             | 8              | 15             | -                            | 10             | 60             | 80              | 25              | 24              | 10              | 52              | 36              | 72              | 24              | 120             | M8              | 12              | M5              | 10              | 10 | 3              | 22             | 18             |
| HSG-1-SV-stroke-N/L  | 32              | 32             | 8              | 15             | -                            | 10             | 60             | 80              | 25              | 24              | 10              | 52              | 36              | 72              | 24              | 120             | M8              | 12              | M5              | 10              | 10 | 3              | 22             | 18             |
| HSG-1-SVA-stroke-N/L | 32              | 32             | 8              | 15             | -                            | 10             | 60             | 80              | 25              | 24              | 10              | 52              | 36              | 72              | 24              | 120             | M8              | 12              | M5              | 10              | 10 | 3              | 22             | 18             |
| HSG-2-R-stroke-N/L   | 35              | 35             | 10,5           | 20             | 21                           | 11             | 78             | 100             | 32              | 28              | 11              | 63              | 42,5            | 85              | 27,5            | 140             | M8              | 15              | M6              | 10              | 14 | 5              | 25             | 20             |
| HSG-2-S-stroke-N/L   | 35              | 35             | 10,5           | 20             | -                            | 11             | 78             | 100             | 32              | 28              | 11              | 63              | 42,5            | 85              | 27,5            | 140             | M8              | 15              | M6              | 10              | 14 | 5              | 25             | 20             |
| HSG-2-SA-stroke-N/L  | 35              | 35             | 10,5           | 20             | -                            | 11             | 78             | 100             | 32              | 28              | 11              | 63              | 42,5            | 85              | 27,5            | 140             | M8              | 15              | M6              | 10              | 14 | 5              | 25             | 20             |
| HSG-2-SV-stroke-N/L  | 35              | 35             | 10,5           | 20             | -                            | 11             | 78             | 100             | 32              | 28              | 11              | 63              | 42,5            | 85              | 27,5            | 140             | M8              | 15              | M6              | 10              | 14 | 5              | 25             | 20             |
| HSG-2-SVA-stroke-N/L | 35              | 35             | 10,5           | 20             | -                            | 11             | 78             | 100             | 32              | 28              | 11              | 63              | 42,5            | 85              | 27,5            | 140             | M8              | 15              | M6              | 10              | 14 | 5              | 25             | 20             |

<sup>1)</sup> also supplied without locating diameter



## Dimensions HSG-3 to HSG-5

### Trapezoidal spindle - rotating and translating versions (R, S, SA, SV, SVA)

All versions have an input shaft on side A and B as standard.  
Single shaft versions can be optionally specified.

**Versions:**

- R:** Rotating spindle
- S:** Translating spindle
- SA:** Translating spindle with travel limiter
- SV:** Translating spindle with rotation prevention
- SVA:** Translating spindle with rotation prevention and travel limiter

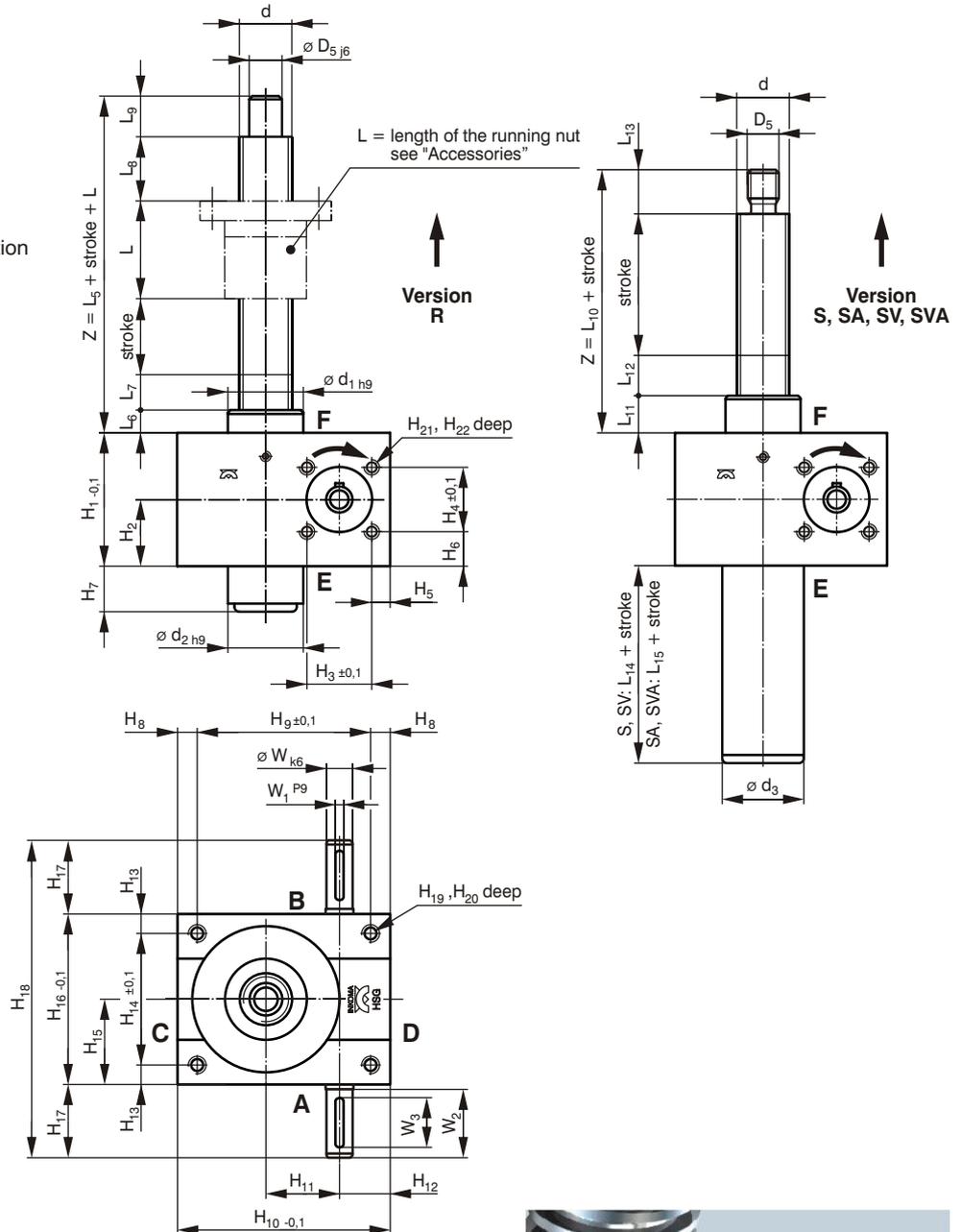
**Ratio:** N: normal, L: slow

**Lubrication:** Grease

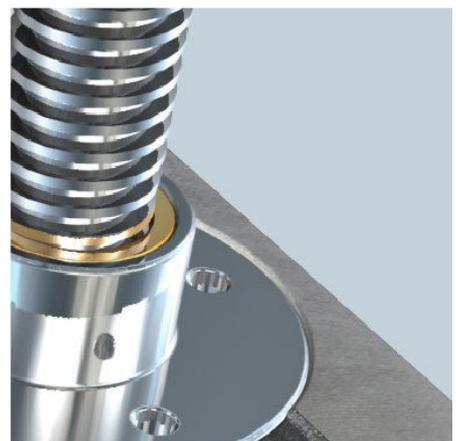
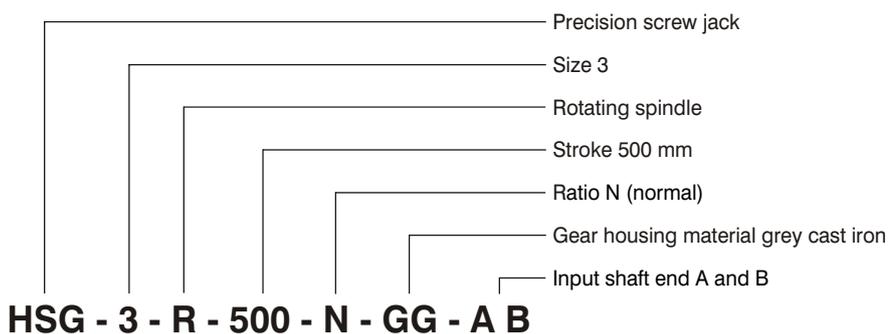
**Material:** see page 138

**Accessories:** see "Accessories" page 185 - 238

**Questionnaire:** see page 140 - 142



### Ordering example:



| Order code           | max. static lifting force <sup>2)</sup><br>[kN] | Lift per revolution<br>N / L<br>[mm] | Ratio<br>N / L<br>i | Mass<br>[kg] | Dimensions [mm] |                |                |                              |                |                |                |                |                |                |                 |                 |                 |                 |                 |                 |                |                |   |   |     |     |      |
|----------------------|-------------------------------------------------|--------------------------------------|---------------------|--------------|-----------------|----------------|----------------|------------------------------|----------------|----------------|----------------|----------------|----------------|----------------|-----------------|-----------------|-----------------|-----------------|-----------------|-----------------|----------------|----------------|---|---|-----|-----|------|
|                      |                                                 |                                      |                     |              | d               | D <sub>5</sub> | d <sub>1</sub> | d <sub>2</sub> <sup>1)</sup> | d <sub>3</sub> | L <sub>5</sub> | L <sub>6</sub> | L <sub>7</sub> | L <sub>8</sub> | L <sub>9</sub> | L <sub>10</sub> | L <sub>11</sub> | L <sub>12</sub> | L <sub>13</sub> | L <sub>14</sub> | L <sub>15</sub> | H <sub>1</sub> | H <sub>2</sub> |   |   |     |     |      |
| HSG-3-R-stroke-N/L   | 25                                              | 1 / 0,25                             | 6:1 / 24:1          | 6,2          | Tr30x6          | 20             | 46             | 46                           | -              | 80             | 14             | 21             | 20             | 25             | -               | -               | -               | -               | -               | -               | -              | -              | - | - | -   | 82  | 41   |
| HSG-3-S-stroke-N/L   | 25                                              | 1 / 0,25                             | 6:1 / 24:1          | 6,2          | Tr30x6          | M20            | 46             | -                            | 50             | -              | -              | -              | -              | -              | 50              | 23              | 5               | 22              | 35              | -               | -              | -              | - | - | -   | 82  | 41   |
| HSG-3-SA-stroke-N/L  | 25                                              | 1 / 0,25                             | 6:1 / 24:1          | 6,2          | Tr30x6          | M20            | 46             | -                            | 50             | -              | -              | -              | -              | -              | 50              | 23              | 5               | 22              | -               | -               | -              | -              | - | - | 58  | 82  | 41   |
| HSG-3-SV-stroke-N/L  | 25                                              | 1 / 0,25                             | 6:1 / 24:1          | 6,2          | Tr30x6          | M20            | 46             | -                            | 50             | -              | -              | -              | -              | -              | 50              | 23              | 5               | 22              | 35              | -               | -              | -              | - | - | -   | 82  | 41   |
| HSG-3-SVA-stroke-N/L | 25                                              | 1 / 0,25                             | 6:1 / 24:1          | 6,2          | Tr30x6          | M20            | 46             | -                            | 50             | -              | -              | -              | -              | -              | 50              | 23              | 5               | 22              | -               | -               | -              | -              | - | - | 58  | 82  | 41   |
| HSG-4-R-stroke-N/L   | 50                                              | 1 / 0,25                             | 7:1 / 28:1          | 16,5         | Tr40x7          | 25             | 60             | 60                           | -              | 127            | 34             | 32             | 31             | 30             | -               | -               | -               | -               | -               | -               | -              | -              | - | - | -   | 117 | 58,5 |
| HSG-4-S-stroke-N/L   | 50                                              | 1 / 0,25                             | 7:1 / 28:1          | 16,5         | Tr40x7          | M30            | 60             | -                            | 65             | -              | -              | -              | -              | -              | 65              | 32              | 4               | 29              | 50              | -               | -              | -              | - | - | -   | 117 | 58,5 |
| HSG-4-SA-stroke-N/L  | 50                                              | 1 / 0,25                             | 7:1 / 28:1          | 16,5         | Tr40x7          | M30            | 60             | -                            | 65             | -              | -              | -              | -              | -              | 65              | 32              | 4               | 29              | -               | -               | -              | -              | - | - | 75  | 117 | 58,5 |
| HSG-4-SV-stroke-N/L  | 50                                              | 1 / 0,25                             | 7:1 / 28:1          | 16,5         | Tr40x7          | M30            | 60             | -                            | 65             | -              | -              | -              | -              | -              | 65              | 32              | 4               | 29              | 50              | -               | -              | -              | - | - | -   | 117 | 58,5 |
| HSG-4-SVA-stroke-N/L | 50                                              | 1 / 0,25                             | 7:1 / 28:1          | 16,5         | Tr40x7          | M30            | 60             | -                            | 65             | -              | -              | -              | -              | -              | 65              | 32              | 4               | 29              | -               | -               | -              | -              | - | - | 75  | 117 | 58,5 |
| HSG-5-R-stroke-N/L   | 100                                             | 1 / 0,25                             | 9:1 / 36:1          | 34           | Tr60x9          | 40             | 85             | 85                           | -              | 157            | 40             | 36             | 36             | 45             | -               | -               | -               | -               | -               | -               | -              | -              | - | - | -   | 160 | 80   |
| HSG-5-S-stroke-N/L   | 100                                             | 1 / 0,25                             | 9:1 / 36:1          | 34           | Tr60x9          | M36            | 85             | -                            | 90             | -              | -              | -              | -              | -              | 95              | 40              | 7               | 48              | 60              | -               | -              | -              | - | - | -   | 160 | 80   |
| HSG-5-SA-stroke-N/L  | 100                                             | 1 / 0,25                             | 9:1 / 36:1          | 34           | Tr60x9          | M36            | 85             | -                            | 90             | -              | -              | -              | -              | -              | 95              | 40              | 7               | 48              | -               | -               | -              | -              | - | - | 105 | 160 | 80   |
| HSG-5-SV-stroke-N/L  | 100                                             | 1 / 0,25                             | 9:1 / 36:1          | 34           | Tr60x9          | M36            | 85             | -                            | 90             | -              | -              | -              | -              | -              | 95              | 40              | 7               | 48              | 60              | -               | -              | -              | - | - | -   | 160 | 80   |
| HSG-5-SVA-stroke-N/L | 100                                             | 1 / 0,25                             | 9:1 / 36:1          | 34           | Tr60x9          | M36            | 85             | -                            | 90             | -              | -              | -              | -              | -              | 95              | 40              | 7               | 48              | -               | -               | -              | -              | - | - | 105 | 160 | 80   |

<sup>1)</sup> also supplied without locating diameter

<sup>2)</sup> The values for max. load apply only for initial jack selection.

The actual permitted lifting force depends on the version of the jack and the operating conditions.

| Order code           | Dimensions [mm] |                |                |                |                              |                |                |                 |                 |                 |                 |                 |                 |                 |                 |                 |                 |                 |                 |                 |    |                |                |                |
|----------------------|-----------------|----------------|----------------|----------------|------------------------------|----------------|----------------|-----------------|-----------------|-----------------|-----------------|-----------------|-----------------|-----------------|-----------------|-----------------|-----------------|-----------------|-----------------|-----------------|----|----------------|----------------|----------------|
|                      | H <sub>3</sub>  | H <sub>4</sub> | H <sub>5</sub> | H <sub>6</sub> | H <sub>7</sub> <sup>1)</sup> | H <sub>8</sub> | H <sub>9</sub> | H <sub>10</sub> | H <sub>11</sub> | H <sub>12</sub> | H <sub>13</sub> | H <sub>14</sub> | H <sub>15</sub> | H <sub>16</sub> | H <sub>17</sub> | H <sub>18</sub> | H <sub>19</sub> | H <sub>20</sub> | H <sub>21</sub> | H <sub>22</sub> | W  | W <sub>1</sub> | W <sub>2</sub> | W <sub>3</sub> |
| HSG-3-R-stroke-N/L   | 44              | 44             | 9              | 19             | 28                           | 12             | 106            | 130             | 45              | 31              | 12              | 81              | 52,5            | 105             | 45              | 195             | M10             | 15              | M8              | 12              | 16 | 5              | 43             | 36             |
| HSG-3-S-stroke-N/L   | 44              | 44             | 9              | 19             | -                            | 12             | 106            | 130             | 45              | 31              | 12              | 81              | 52,5            | 105             | 45              | 195             | M10             | 15              | M8              | 12              | 16 | 5              | 43             | 36             |
| HSG-3-SA-stroke-N/L  | 44              | 44             | 9              | 19             | -                            | 12             | 106            | 130             | 45              | 31              | 12              | 81              | 52,5            | 105             | 45              | 195             | M10             | 15              | M8              | 12              | 16 | 5              | 43             | 36             |
| HSG-3-SV-stroke-N/L  | 44              | 44             | 9              | 19             | -                            | 12             | 106            | 130             | 45              | 31              | 12              | 81              | 52,5            | 105             | 45              | 195             | M10             | 15              | M8              | 12              | 16 | 5              | 43             | 36             |
| HSG-3-SVA-stroke-N/L | 44              | 44             | 9              | 19             | -                            | 12             | 106            | 130             | 45              | 31              | 12              | 81              | 52,5            | 105             | 45              | 195             | M10             | 15              | M8              | 12              | 16 | 5              | 43             | 36             |
| HSG-4-R-stroke-N/L   | 55              | 55             | 11,5           | 31             | 37                           | 15             | 150            | 180             | 63              | 39              | 15              | 115             | 72,5            | 145             | 47,5            | 240             | M12             | 16              | M10             | 12              | 20 | 6              | 45             | 36             |
| HSG-4-S-stroke-N/L   | 55              | 55             | 11,5           | 31             | -                            | 15             | 150            | 180             | 63              | 39              | 15              | 115             | 72,5            | 145             | 47,5            | 240             | M12             | 16              | M10             | 12              | 20 | 6              | 45             | 36             |
| HSG-4-SA-stroke-N/L  | 55              | 55             | 11,5           | 31             | -                            | 15             | 150            | 180             | 63              | 39              | 15              | 115             | 72,5            | 145             | 47,5            | 240             | M12             | 16              | M10             | 12              | 20 | 6              | 45             | 36             |
| HSG-4-SV-stroke-N/L  | 55              | 55             | 11,5           | 31             | -                            | 15             | 150            | 180             | 63              | 39              | 15              | 115             | 72,5            | 145             | 47,5            | 240             | M12             | 16              | M10             | 12              | 20 | 6              | 45             | 36             |
| HSG-4-SVA-stroke-N/L | 55              | 55             | 11,5           | 31             | -                            | 15             | 150            | 180             | 63              | 39              | 15              | 115             | 72,5            | 145             | 47,5            | 240             | M12             | 16              | M10             | 12              | 20 | 6              | 45             | 36             |
| HSG-5-R-stroke-N/L   | 70              | 70             | 11             | 45             | 45                           | 17             | 166            | 200             | 71              | 46              | 17              | 131             | 82,5            | 165             | 67,5            | 300             | M20             | 30              | M12             | 15              | 25 | 8              | 65             | 56             |
| HSG-5-S-stroke-N/L   | 70              | 70             | 11             | 45             | -                            | 17             | 166            | 200             | 71              | 46              | 17              | 131             | 82,5            | 165             | 67,5            | 300             | M20             | 30              | M12             | 15              | 25 | 8              | 65             | 56             |
| HSG-5-SA-stroke-N/L  | 70              | 70             | 11             | 45             | -                            | 17             | 166            | 200             | 71              | 46              | 17              | 131             | 82,5            | 165             | 67,5            | 300             | M20             | 30              | M12             | 15              | 25 | 8              | 65             | 56             |
| HSG-5-SV-stroke-N/L  | 70              | 70             | 11             | 45             | -                            | 17             | 166            | 200             | 71              | 46              | 17              | 131             | 82,5            | 165             | 67,5            | 300             | M20             | 30              | M12             | 15              | 25 | 8              | 65             | 56             |
| HSG-5-SVA-stroke-N/L | 70              | 70             | 11             | 45             | -                            | 17             | 166            | 200             | 71              | 46              | 17              | 131             | 82,5            | 165             | 67,5            | 300             | M20             | 30              | M12             | 15              | 25 | 8              | 65             | 56             |

<sup>1)</sup> also supplied without locating diameter



# Dimensions HSG-200 to HSG-500

## Trapezoidal spindle - rotating and translating versions (R, S, SA, SV, SVA)

All versions have an input shaft on side A and B as standard.  
Single shaft versions can be optionally specified.

**Versions:**

- R:** Rotating spindle
- S:** Translating spindle
- SA:** Translating spindle with travel limiter
- SV:** Translating spindle with rotation prevention
- SVA:** Translating spindle with rotation prevention and travel limiter

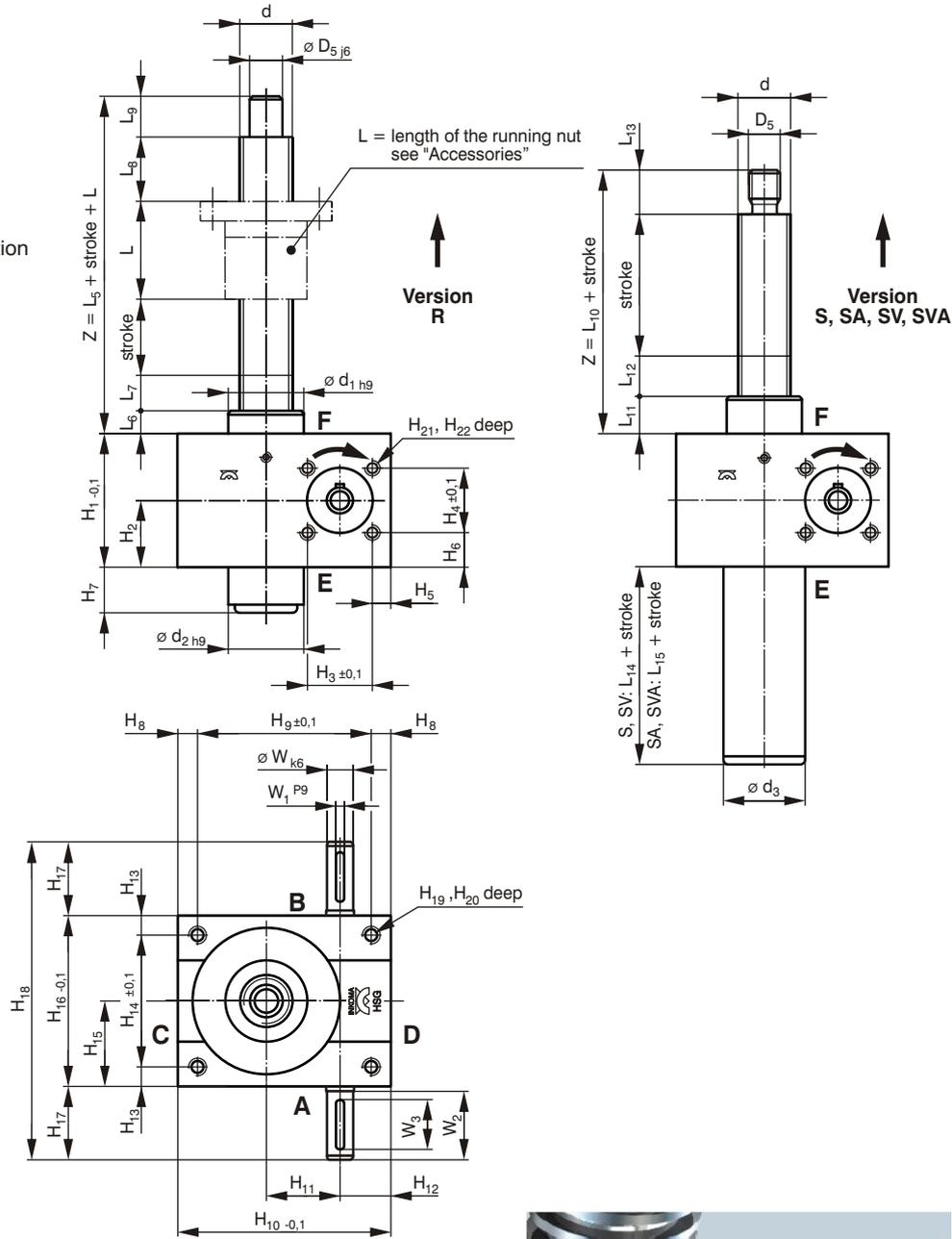
**Ratio:** N: normal, L: slow

**Lubrication:** Grease

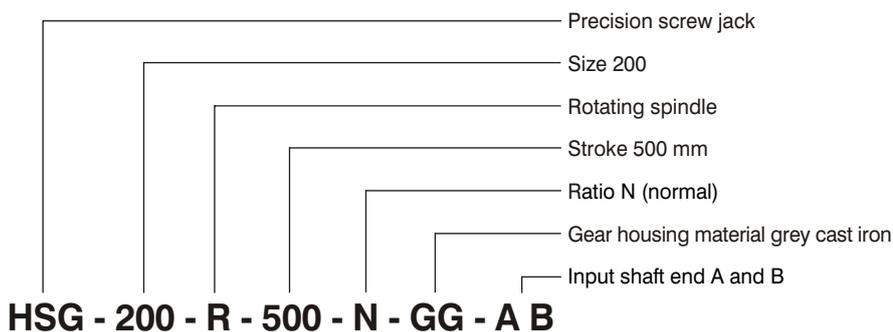
**Material:** see page 138

**Accessories:** see "Accessories" page 185 - 238

**Questionnaire:** see page 140 - 142



### Ordering example:



| Order code             | max. static lifting force <sup>2)</sup><br>[kN] | Lift per revolution<br>N / L<br>[mm] | Ratio<br>N / L<br>i | Mass<br>[kg] | Dimensions [mm] |                |                |                 |                |                |                |                |                |                |                 |                 |                 |                 |                 |                 |                |                |
|------------------------|-------------------------------------------------|--------------------------------------|---------------------|--------------|-----------------|----------------|----------------|-----------------|----------------|----------------|----------------|----------------|----------------|----------------|-----------------|-----------------|-----------------|-----------------|-----------------|-----------------|----------------|----------------|
|                        |                                                 |                                      |                     |              | d               | D <sub>5</sub> | d <sub>1</sub> | d <sub>2</sub>  | d <sub>3</sub> | L <sub>5</sub> | L <sub>6</sub> | L <sub>7</sub> | L <sub>8</sub> | L <sub>9</sub> | L <sub>10</sub> | L <sub>11</sub> | L <sub>12</sub> | L <sub>13</sub> | L <sub>14</sub> | L <sub>15</sub> | H <sub>1</sub> | H <sub>2</sub> |
| HSG-200-R-stroke-N/L   | 200                                             | 1 / 0,25                             | 10:1 / 40:1         | 57           | Tr70x10         | 55             | 120            | 105             | -              | 160            | 40             | 25             | 25             | 70             | -               | -               | -               | -               | -               | -               | 165            | 82,5           |
| HSG-200-S-stroke-N/L   | 200                                             | 1 / 0,25                             | 10:1 / 40:1         | 57           | Tr70x10         | M56x2          | 120            | -               | 110            | -              | -              | -              | -              | -              | 110             | 40              | 12              | 58              | 60              | -               | 165            | 82,5           |
| HSG-200-SA-stroke-N/L  | 200                                             | 1 / 0,25                             | 10:1 / 40:1         | 57           | Tr70x10         | M56x2          | 120            | -               | 110            | -              | -              | -              | -              | -              | 110             | 40              | 12              | 58              | -               | 115             | 165            | 82,5           |
| HSG-200-SV-stroke-N/L  | 200                                             | 1 / 0,25                             | 10:1 / 40:1         | 57           | Tr70x10         | M56x2          | 120            | -               | 110            | -              | -              | -              | -              | -              | 110             | 40              | 12              | 58              | 60              | -               | 165            | 82,5           |
| HSG-200-SVA-stroke-N/L | 200                                             | 1 / 0,25                             | 10:1 / 40:1         | 57           | Tr70x10         | M56x2          | 120            | -               | 110            | -              | -              | -              | -              | -              | 110             | 40              | 12              | 58              | -               | 115             | 165            | 82,5           |
| HSG-300-R-stroke-N/L   | 300                                             | 1 / 0,25                             | 12:1 / 48:1         | 75           | Tr90x12         | 70             | 145            | - <sup>1)</sup> | -              | 180            | 50             | 25             | 25             | 80             | -               | -               | -               | -               | -               | -               | 220            | 110            |
| HSG-300-S-stroke-N/L   | 300                                             | 1 / 0,25                             | 12:1 / 48:1         | 75           | Tr90x12         | M70x1,5        | 145            | -               | 150            | -              | -              | -              | -              | -              | 135             | 50              | 15              | 70              | 85              | -               | 220            | 110            |
| HSG-300-SA-stroke-N/L  | 300                                             | 1 / 0,25                             | 12:1 / 48:1         | 75           | Tr90x12         | M70x1,5        | 145            | -               | 150            | -              | -              | -              | -              | -              | 135             | 50              | 15              | 70              | -               | 135             | 220            | 110            |
| HSG-300-SV-stroke-N/L  | 300                                             | 1 / 0,25                             | 12:1 / 48:1         | 75           | Tr90x12         | M70x1,5        | 145            | -               | 150            | -              | -              | -              | -              | -              | 135             | 50              | 15              | 70              | 85              | -               | 220            | 110            |
| HSG-300-SVA-stroke-N/L | 300                                             | 1 / 0,25                             | 12:1 / 48:1         | 75           | Tr90x12         | M70x1,5        | 145            | -               | 150            | -              | -              | -              | -              | -              | 135             | 50              | 15              | 70              | -               | 135             | 220            | 110            |
| HSG-400-R-stroke-N/L   | 400                                             | 1 / 0,25                             | 12:1 / 48:1         | 75           | Tr100x12        | 80             | 155            | - <sup>1)</sup> | -              | 200            | 50             | 25             | 25             | 100            | -               | -               | -               | -               | -               | -               | 250            | 125            |
| HSG-400-S-stroke-N/L   | 400                                             | 1 / 0,25                             | 12:1 / 48:1         | 75           | Tr100x12        | M80x2          | 155            | -               | 160            | -              | -              | -              | -              | -              | 160             | 50              | 16              | 94              | 100             | -               | 250            | 125            |
| HSG-400-SA-stroke-N/L  | 400                                             | 1 / 0,25                             | 12:1 / 48:1         | 75           | Tr100x12        | M80x2          | 155            | -               | 160            | -              | -              | -              | -              | -              | 160             | 50              | 16              | 94              | -               | 140             | 250            | 125            |
| HSG-400-SV-stroke-N/L  | 400                                             | 1 / 0,25                             | 12:1 / 48:1         | 75           | Tr100x12        | M80x2          | 155            | -               | 160            | -              | -              | -              | -              | -              | 160             | 50              | 16              | 94              | 100             | -               | 250            | 125            |
| HSG-400-SVA-stroke-N/L | 400                                             | 1 / 0,25                             | 12:1 / 48:1         | 75           | Tr100x12        | M80x2          | 155            | -               | 160            | -              | -              | -              | -              | -              | 160             | 50              | 16              | 94              | -               | 140             | 250            | 125            |
| HSG-500-R-stroke-N/L   | 500                                             | 1 / 0,25                             | 14:1 / 56:1         | 165          | Tr120x14        | 95             | 170            | - <sup>1)</sup> | -              | 240            | 60             | 30             | 30             | 120            | -               | -               | -               | -               | -               | -               | 266            | 133            |
| HSG-500-S-stroke-N/L   | 500                                             | 1 / 0,25                             | 14:1 / 56:1         | 165          | Tr120x14        | M100x3         | 170            | -               | 180            | -              | -              | -              | -              | -              | 200             | 60              | 22              | 118             | 115             | -               | 266            | 133            |
| HSG-500-SA-stroke-N/L  | 500                                             | 1 / 0,25                             | 14:1 / 56:1         | 165          | Tr120x14        | M100x3         | 170            | -               | 180            | -              | -              | -              | -              | -              | 200             | 60              | 22              | 118             | -               | 155             | 266            | 133            |
| HSG-500-SV-stroke-N/L  | 500                                             | 1 / 0,25                             | 14:1 / 56:1         | 165          | Tr120x14        | M100x3         | 170            | -               | 180            | -              | -              | -              | -              | -              | 200             | 60              | 22              | 118             | 115             | -               | 266            | 133            |
| HSG-500-SVA-stroke-N/L | 500                                             | 1 / 0,25                             | 14:1 / 56:1         | 165          | Tr120x14        | M100x3         | 170            | -               | 180            | -              | -              | -              | -              | -              | 200             | 60              | 22              | 118             | -               | 155             | 266            | 133            |

<sup>1)</sup> locating diameter to customer specification

<sup>2)</sup> The values for max. load apply only for initial jack selection.

The actual permitted lifting force depends on the version of the jack and the operating conditions.

| Order code             | Dimensions [mm] |                |                |                |                 |                |                |                   |                 |                 |                 |                 |                 |                 |                 |                 |                 |                 |                 |                 |    |                |                |                |
|------------------------|-----------------|----------------|----------------|----------------|-----------------|----------------|----------------|-------------------|-----------------|-----------------|-----------------|-----------------|-----------------|-----------------|-----------------|-----------------|-----------------|-----------------|-----------------|-----------------|----|----------------|----------------|----------------|
|                        | H <sub>3</sub>  | H <sub>4</sub> | H <sub>5</sub> | H <sub>6</sub> | H <sub>7</sub>  | H <sub>8</sub> | H <sub>9</sub> | H <sub>10</sub>   | H <sub>11</sub> | H <sub>12</sub> | H <sub>13</sub> | H <sub>14</sub> | H <sub>15</sub> | H <sub>16</sub> | H <sub>17</sub> | H <sub>18</sub> | H <sub>19</sub> | H <sub>20</sub> | H <sub>21</sub> | H <sub>22</sub> | W  | W <sub>1</sub> | W <sub>2</sub> | W <sub>3</sub> |
| HSG-200-R-stroke-N/L   | 80              | 80             | 20             | 42,5           | 45              | 25             | 190            | 240 <sup>2)</sup> | 80              | 60              | 25              | 170             | 110             | 220             | 67,5            | 355             | M30             | 36              | M16             | 20              | 30 | 8              | 65             | 56             |
| HSG-200-S-stroke-N/L   | 80              | 80             | 20             | 42,5           | -               | 25             | 190            | 240 <sup>2)</sup> | 80              | 60              | 25              | 170             | 110             | 220             | 67,5            | 355             | M30             | 36              | M16             | 20              | 30 | 8              | 65             | 56             |
| HSG-200-SA-stroke-N/L  | 80              | 80             | 20             | 42,5           | -               | 25             | 190            | 240 <sup>2)</sup> | 80              | 60              | 25              | 170             | 110             | 220             | 67,5            | 355             | M30             | 36              | M16             | 20              | 30 | 8              | 65             | 56             |
| HSG-200-SV-stroke-N/L  | 80              | 80             | 20             | 42,5           | -               | 25             | 190            | 240 <sup>2)</sup> | 80              | 60              | 25              | 170             | 110             | 220             | 67,5            | 355             | M30             | 36              | M16             | 20              | 30 | 8              | 65             | 56             |
| HSG-200-SVA-stroke-N/L | 80              | 80             | 20             | 42,5           | -               | 25             | 190            | 240 <sup>2)</sup> | 80              | 60              | 25              | 170             | 110             | 220             | 67,5            | 355             | M30             | 36              | M16             | 20              | 30 | 8              | 65             | 56             |
| HSG-300-R-stroke-N/L   | -               | -              | -              | -              | - <sup>1)</sup> | 30             | 225            | 285               | 100             | 60              | 30              | 190             | 125             | 250             | 67,5            | 385             | M36             | 49              | -               | -               | 32 | 10             | 65             | 56             |
| HSG-300-S-stroke-N/L   | -               | -              | -              | -              | -               | 30             | 225            | 285               | 100             | 60              | 30              | 190             | 125             | 250             | 67,5            | 385             | M36             | 49              | -               | -               | 32 | 10             | 65             | 56             |
| HSG-300-SA-stroke-N/L  | -               | -              | -              | -              | -               | 30             | 225            | 285               | 100             | 60              | 30              | 190             | 125             | 250             | 67,5            | 385             | M36             | 49              | -               | -               | 32 | 10             | 65             | 56             |
| HSG-300-SV-stroke-N/L  | -               | -              | -              | -              | -               | 30             | 225            | 285               | 100             | 60              | 30              | 190             | 125             | 250             | 67,5            | 385             | M36             | 49              | -               | -               | 32 | 10             | 65             | 56             |
| HSG-300-SVA-stroke-N/L | -               | -              | -              | -              | -               | 30             | 225            | 285               | 100             | 60              | 30              | 190             | 125             | 250             | 67,5            | 385             | M36             | 49              | -               | -               | 32 | 10             | 65             | 56             |
| HSG-400-R-stroke-N/L   | -               | -              | -              | -              | - <sup>1)</sup> | 35             | 265            | 335               | 125             | 70              | 30              | 240             | 150             | 300             | 85              | 470             | M36             | 49              | -               | -               | 42 | 12             | 83             | 70             |
| HSG-400-S-stroke-N/L   | -               | -              | -              | -              | -               | 35             | 265            | 335               | 125             | 70              | 30              | 240             | 150             | 300             | 85              | 470             | M36             | 49              | -               | -               | 42 | 12             | 83             | 70             |
| HSG-400-SA-stroke-N/L  | -               | -              | -              | -              | -               | 35             | 265            | 335               | 125             | 70              | 30              | 240             | 150             | 300             | 85              | 470             | M36             | 49              | -               | -               | 42 | 12             | 83             | 70             |
| HSG-400-SV-stroke-N/L  | -               | -              | -              | -              | -               | 35             | 265            | 335               | 125             | 70              | 30              | 240             | 150             | 300             | 85              | 470             | M36             | 49              | -               | -               | 42 | 12             | 83             | 70             |
| HSG-400-SVA-stroke-N/L | -               | -              | -              | -              | -               | 35             | 265            | 335               | 125             | 70              | 30              | 240             | 150             | 300             | 85              | 470             | M36             | 49              | -               | -               | 42 | 12             | 83             | 70             |
| HSG-500-R-stroke-N/L   | -               | -              | -              | -              | - <sup>1)</sup> | 35             | 290            | 360               | 135             | 75              | 35              | 260             | 165             | 330             | 100             | 530             | M42             | 56              | -               | -               | 48 | 14             | -              | 90             |
| HSG-500-S-stroke-N/L   | -               | -              | -              | -              | -               | 35             | 290            | 360               | 135             | 75              | 35              | 260             | 165             | 330             | 100             | 530             | M42             | 56              | -               | -               | 48 | 14             | -              | 90             |
| HSG-500-SA-stroke-N/L  | -               | -              | -              | -              | -               | 35             | 290            | 360               | 135             | 75              | 35              | 260             | 165             | 330             | 100             | 530             | M42             | 56              | -               | -               | 48 | 14             | -              | 90             |
| HSG-500-SV-stroke-N/L  | -               | -              | -              | -              | -               | 35             | 290            | 360               | 135             | 75              | 35              | 260             | 165             | 330             | 100             | 530             | M42             | 56              | -               | -               | 48 | 14             | -              | 90             |
| HSG-500-SVA-stroke-N/L | -               | -              | -              | -              | -               | 35             | 290            | 360               | 135             | 75              | 35              | 260             | 165             | 330             | 100             | 530             | M42             | 56              | -               | -               | 48 | 14             | -              | 90             |

<sup>1)</sup> locating diameter to customer specification

<sup>2)</sup> Tolerance ±0,5

## Trapezoidal spindles for HSG-1 to HSG-500

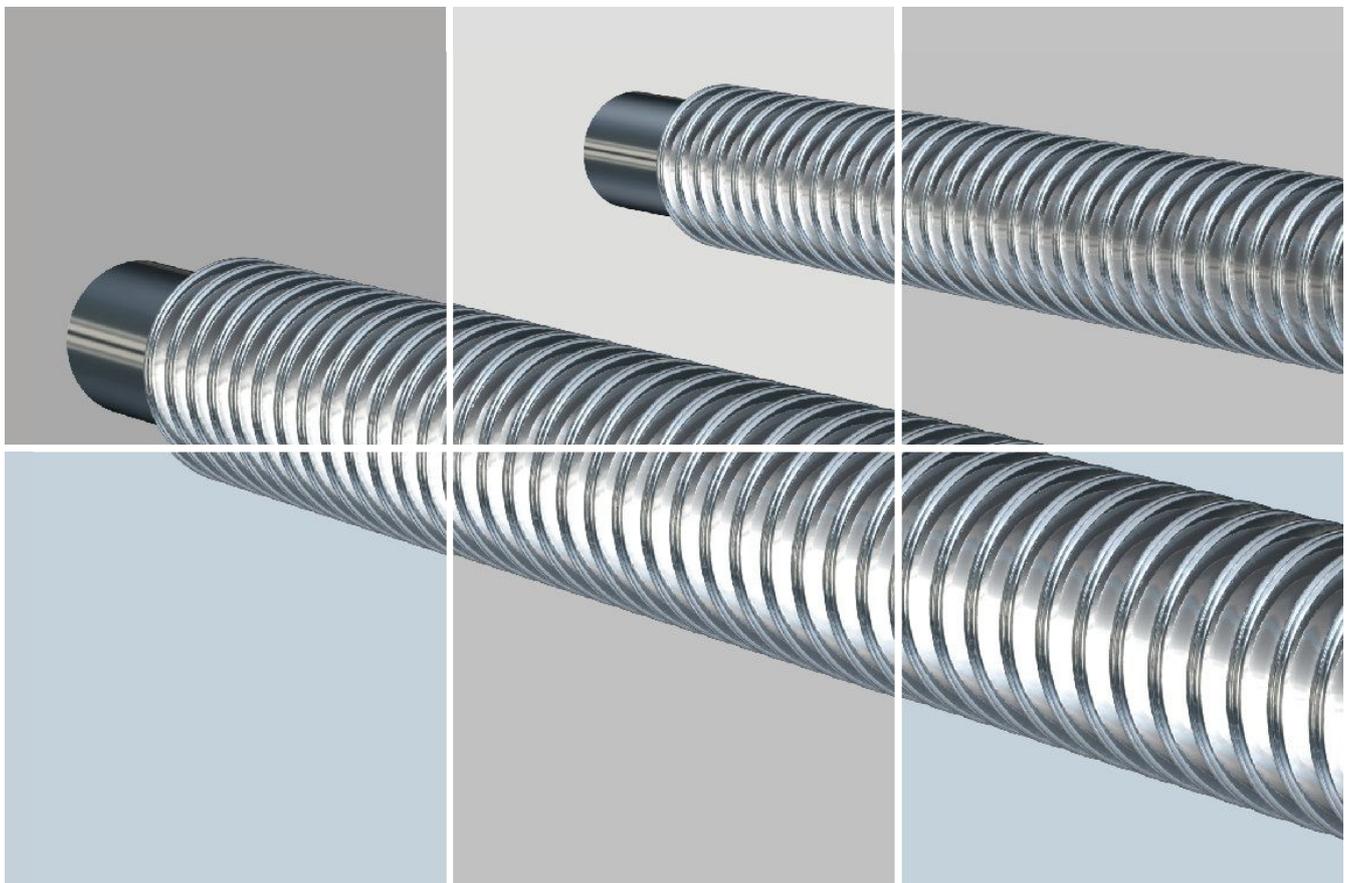
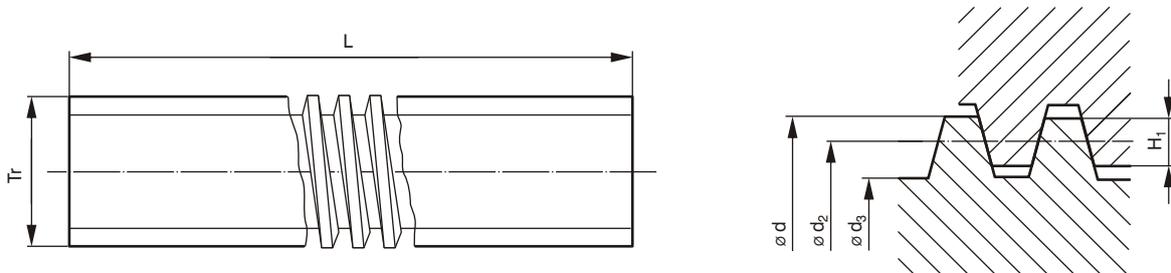
### Standard dimensions

The trapezoidal spindles are rolled to the highest standard of precision.

Metric ISO trapezoidal spindles are manufactured in compliance with DIN 103. To achieve a larger thread root radius, the core diameter for our spindles is fractionally smaller than standard. Reworking of the outer diameter is carried out in soft jaws.

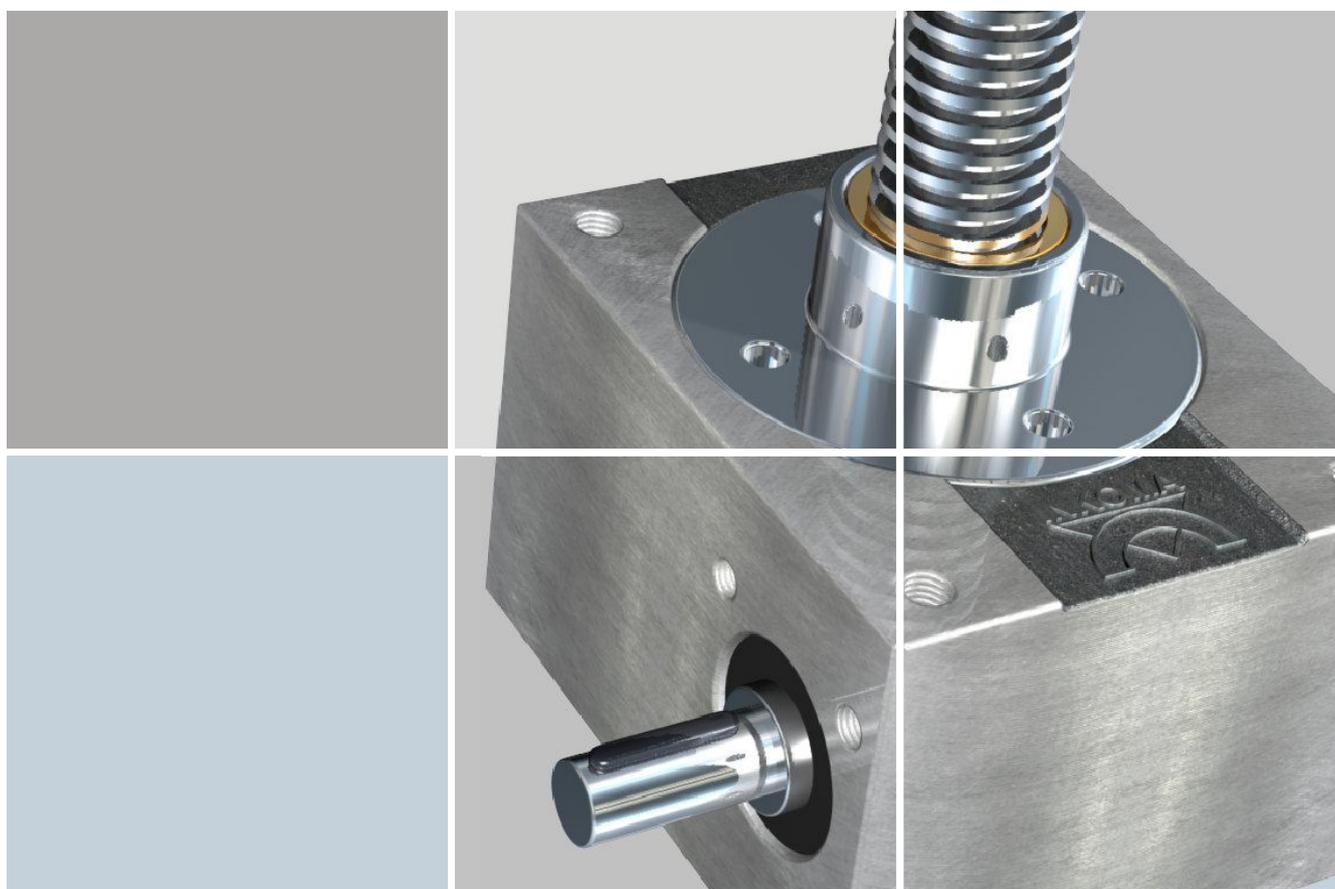
Our standard spindles are manufactured from St 60 or C 35. They can also be supplied in stainless steel.

Thread quality : 7 e



| Size        | Dimensions [mm] |                    |                    |                |                | Precision<br>[μm/300mm] | Straightness<br>[mm/300mm] |
|-------------|-----------------|--------------------|--------------------|----------------|----------------|-------------------------|----------------------------|
|             | d               | d <sub>2 min</sub> | d <sub>2 max</sub> | d <sub>3</sub> | H <sub>1</sub> |                         |                            |
| Tr 16 x 4   | 16              | 13,640             | 13,905             | 10,80          | 2              | 50                      | 0,1                        |
| Tr 18 x 4   | 18              | 15,640             | 15,905             | 12,80          | 2              | 50                      | 0,1                        |
| Tr 20 x 4   | 20              | 17,640             | 17,905             | 14,80          | 2              | 50                      | 0,1                        |
| Tr 24 x 5   | 24              | 21,094             | 21,394             | 17,50          | 2,5            | 50                      | 0,1                        |
| Tr 30 x 6   | 30              | 26,547             | 26,882             | 21,90          | 3              | 50                      | 0,1                        |
| Tr 40 x 7   | 40              | 36,020             | 36,375             | 30,50          | 3,5            | 50                      | 0,1                        |
| Tr 60 x 9   | 60              | 54,935             | 55,360             | 48,15          | 4,5            | 200                     | 0,3                        |
| Tr 70 x 10  | 70              | 64,425             | 64,850             | 57,00          | 5              | 200                     | 0,3                        |
| Tr 90 x 12  | 90              | 83,355             | 83,830             | 77,00          | 6              | 200                     | 0,5                        |
| Tr 100 x 12 | 100             | 93,330             | 93,830             | 86,215         | 6              | 200                     | 0,5                        |
| Tr 120 x 14 | 120             | 112,290            | 112,820            | 103,157        | 7              | 200                     | 0,5                        |

| Size        | Lead angle at flank diameter | Theoretical efficiency (for μ=0,1) η [-] | Mass [kg/m] | Geometric moment of inertia [cm <sup>4</sup> ] | Section modulus [cm <sup>3</sup> ] | Polar moment of inertia [cm <sup>3</sup> ] | Mass moment of inertia [kg m <sup>2</sup> /m] |
|-------------|------------------------------|------------------------------------------|-------------|------------------------------------------------|------------------------------------|--------------------------------------------|-----------------------------------------------|
| Tr 16 x 4   | 5° 11'                       | 0,46                                     | 1,21        | 0,067                                          | 0,124                              | 0,248                                      | 2,96 x 10 <sup>-5</sup>                       |
| Tr 18 x 4   | 4° 32'                       | 0,43                                     | 1,58        | 0,132                                          | 0,206                              | 0,412                                      | 5,05 x 10 <sup>-5</sup>                       |
| Tr 20 x 4   | 4° 2'                        | 0,40                                     | 2,00        | 0,236                                          | 0,318                              | 0,637                                      | 8,10 x 10 <sup>-5</sup>                       |
| Tr 24 x 5   | 4° 14'                       | 0,41                                     | 2,85        | 0,460                                          | 0,526                              | 1,052                                      | 1,65 x 10 <sup>-4</sup>                       |
| Tr 30 x 6   | 4° 2'                        | 0,40                                     | 4,50        | 1,130                                          | 1,030                              | 2,060                                      | 4,10 x 10 <sup>-4</sup>                       |
| Tr 40 x 7   | 3° 29'                       | 0,37                                     | 8,00        | 4,250                                          | 2,790                              | 5,580                                      | 1,37 x 10 <sup>-3</sup>                       |
| Tr 60 x 9   | 2° 57'                       | 0,33                                     | 18,00       | 26,400                                         | 11,000                             | 22,000                                     | 7,30 x 10 <sup>-3</sup>                       |
| Tr 70 x 10  | 2° 48'                       | 0,32                                     | 26,00       | 51,800                                         | 18,200                             | 36,400                                     | 1,40 x 10 <sup>-2</sup>                       |
| Tr 90 x 12  | 2° 36'                       | 0,30                                     | 43,75       | 172,470                                        | 44,797                             | 89,595                                     | 3,86 x 10 <sup>-2</sup>                       |
| Tr 100 x 12 | 2° 20'                       | 0,27                                     | 54,78       | 281,078                                        | 64,616                             | 129,231                                    | 6,05 x 10 <sup>-2</sup>                       |
| Tr 120 x 14 | 2° 15'                       | 0,26                                     | 84,00       | 573,962                                        | 110,377                            | 220,755                                    | 13,4 x 10 <sup>-2</sup>                       |



# Dimensions HSG-1 to HSG-5

## Ball screw spindle - translating version (SA, SVA)

All versions have an input shaft on side A and B as standard.  
Single shaft versions can be optionally specified.

**Versions:**

**SA:** Translating spindle with travel limiter

**SVA:** Translating spindle with rotation prevention and travel limiter

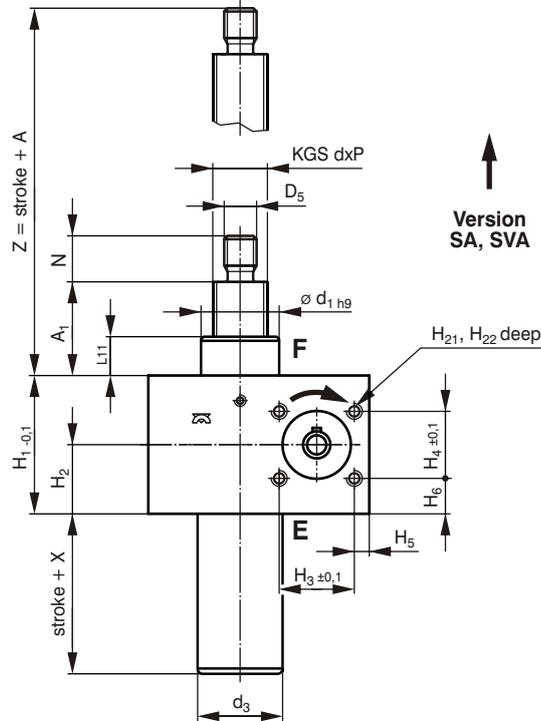
**Ratio:** N: normal, L: slow

**Lubrication:** Grease

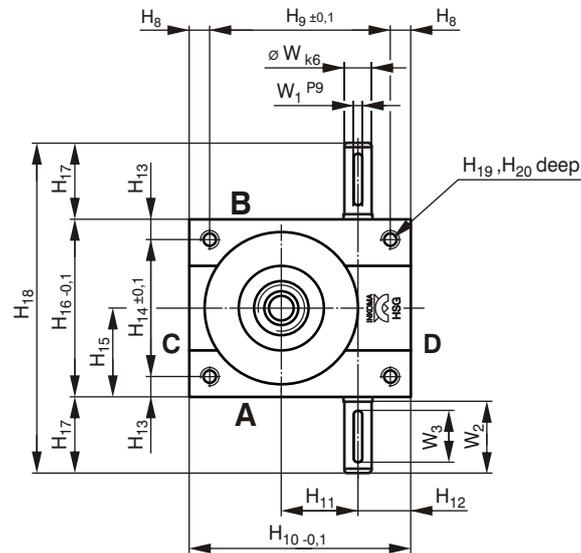
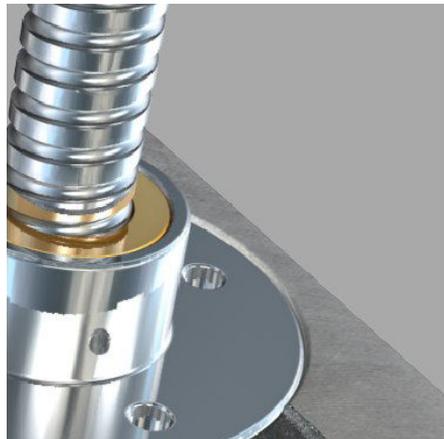
**Material:** see page 138

**Accessories:** see "Accessories" page 185 - 238

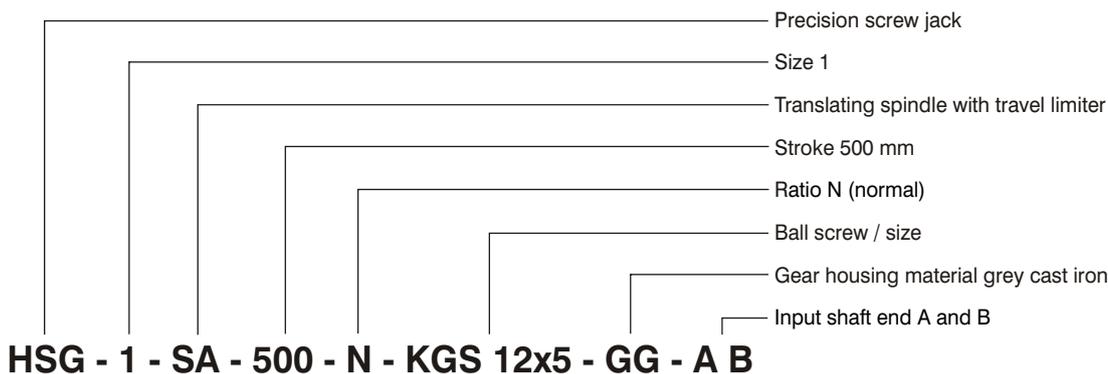
**Questionnaire:** see page 140 - 142



Version SA, SVA



### Ordering example:



| Order code                      | Lifting force<br>F <sub>dyn.</sub><br>[kN] | max. static<br>lifting force <sup>1)</sup><br>F <sub>stat.</sub><br>[kN] | Lift per<br>revolution<br>[mm] | Ratio<br>i | Mass<br>[kg] | Dimensions [mm]                |                |                |                        |                         |         |          |     |                |    |                |                |                |                |    |    |
|---------------------------------|--------------------------------------------|--------------------------------------------------------------------------|--------------------------------|------------|--------------|--------------------------------|----------------|----------------|------------------------|-------------------------|---------|----------|-----|----------------|----|----------------|----------------|----------------|----------------|----|----|
|                                 |                                            |                                                                          |                                |            |              | KGS<br>dxP                     | D <sub>5</sub> | d <sub>1</sub> | SA<br>∅ d <sub>3</sub> | SVA<br>□ d <sub>3</sub> | SA<br>X | SVA<br>X | A   | A <sub>1</sub> | N  | H <sub>1</sub> | H <sub>2</sub> | H <sub>3</sub> | H <sub>4</sub> |    |    |
|                                 |                                            |                                                                          |                                |            |              | HSG-1-SA/SVA-stroke-N-KGS-12x5 | 2,5            | 2,5            | 1,25                   | 4:1                     | 2,4     | 12x5     | M10 | 30             | 33 | 34             | 45             | 50             | 35             | 20 | 15 |
| HSG-1-SA/SVA-stroke-L-KGS-12x5  | 2,5                                        | 2,5                                                                      | 0,31                           | 16:1       | 2,4          | 12x5                           | M10            | 30             | 33                     | 34                      | 45      | 50       | 35  | 20             | 15 | 62             | 31             | 32             | 32             |    |    |
| HSG-2-SA/SVA-stroke-N-KGS-16x5  | 9,3                                        | 10                                                                       | 1,25                           | 4:1        | 3,4          | 16x5                           | M12            | 39             | 42                     | 45                      | 55      | 60       | 45  | 26             | 19 | 75             | 37,5           | 35             | 35             |    |    |
| HSG-2-SA/SVA-stroke-L-KGS-16x5  | 9,3                                        | 10                                                                       | 0,31                           | 16:1       | 3,4          | 16x5                           | M12            | 39             | 42                     | 45                      | 55      | 60       | 45  | 26             | 19 | 75             | 37,5           | 35             | 35             |    |    |
| HSG-3-SA/SVA-stroke-N-KGS-25x5  | 12,3                                       | 22,5                                                                     | 0,83                           | 6:1        | 6,2          | 25x5                           | M14            | 46             | 50                     | 50                      | 58      | 70       | 50  | 30             | 20 | 82             | 41             | 44             | 44             |    |    |
| HSG-3-SA/SVA-stroke-N-KGS-25x10 | 13,2                                       | 25                                                                       | 1,67                           | 6:1        | 6,2          | 25x10                          | M14            | 46             | 50                     | 50                      | 58      | 70       | 50  | 30             | 20 | 82             | 41             | 44             | 44             |    |    |
| HSG-3-SA/SVA-stroke-L-KGS-25x5  | 12,3                                       | 22,5                                                                     | 0,20                           | 24:1       | 6,2          | 25x5                           | M14            | 46             | 50                     | 50                      | 58      | 70       | 50  | 30             | 20 | 82             | 41             | 44             | 44             |    |    |
| HSG-3-SA/SVA-stroke-L-KGS-25x10 | 13,2                                       | 25                                                                       | 0,41                           | 24:1       | 6,2          | 25x10                          | M14            | 46             | 50                     | 50                      | 58      | 70       | 50  | 30             | 20 | 82             | 41             | 44             | 44             |    |    |
| HSG-4-SA/SVA-stroke-N-KGS-32x5  | 21,5                                       | 49,3                                                                     | 0,71                           | 7:1        | 16,5         | 32x5                           | M20            | 60             | 65                     | 70                      | 75      | 85       | 65  | 43             | 22 | 117            | 58,5           | 55             | 55             |    |    |
| HSG-4-SA/SVA-stroke-N-KGS-32x10 | 33,4                                       | 50                                                                       | 1,43                           | 7:1        | 16,5         | 32x10                          | M20            | 60             | 65                     | 70                      | 75      | 85       | 65  | 43             | 22 | 117            | 58,5           | 55             | 55             |    |    |
| HSG-4-SA/SVA-stroke-L-KGS-32x5  | 21,5                                       | 49,3                                                                     | 0,18                           | 28:1       | 16,5         | 32x5                           | M20            | 60             | 65                     | 70                      | 75      | 85       | 65  | 43             | 22 | 117            | 58,5           | 55             | 55             |    |    |
| HSG-4-SA/SVA-stroke-L-KGS-32x10 | 33,4                                       | 50                                                                       | 0,36                           | 28:1       | 16,5         | 32x10                          | M20            | 60             | 65                     | 70                      | 75      | 85       | 65  | 43             | 22 | 117            | 58,5           | 55             | 55             |    |    |
| HSG-5-SA/SVA-stroke-N-KGS-40x5  | 20,3                                       | 59,2                                                                     | 0,55                           | 9:1        | 16,5         | 40x5                           | M30            | 85             | 90                     | 90                      | 105     | 115      | 95  | 66             | 29 | 160            | 80             | 70             | 70             |    |    |
| HSG-5-SA/SVA-stroke-N-KGS-40x10 | 55                                         | 100                                                                      | 1,11                           | 9:1        | 16,5         | 40x10                          | M30            | 85             | 90                     | 90                      | 105     | 115      | 95  | 66             | 29 | 160            | 80             | 70             | 70             |    |    |
| HSG-5-SA/SVA-stroke-N-KGS-50x5  | 22                                         | 75,7                                                                     | 0,55                           | 9:1        | 16,5         | 50x5                           | M36            | 85             | 90                     | 90                      | 105     | 115      | 114 | 66             | 48 | 160            | 80             | 70             | 70             |    |    |
| HSG-5-SA/SVA-stroke-N-KGS-50x10 | 58,7                                       | 100                                                                      | 1,11                           | 9:1        | 16,5         | 50x10                          | M36            | 85             | 90                     | 90                      | 105     | 115      | 114 | 66             | 48 | 160            | 80             | 70             | 70             |    |    |
| HSG-5-SA/SVA-stroke-L-KGS-40x5  | 20,3                                       | 59,2                                                                     | 0,14                           | 36:1       | 16,5         | 40x5                           | M30            | 85             | 90                     | 90                      | 105     | 115      | 95  | 66             | 29 | 160            | 80             | 70             | 70             |    |    |
| HSG-5-SA/SVA-stroke-L-KGS-40x10 | 55                                         | 100                                                                      | 0,28                           | 36:1       | 16,5         | 40x10                          | M30            | 85             | 90                     | 90                      | 105     | 115      | 95  | 66             | 29 | 160            | 80             | 70             | 70             |    |    |
| HSG-5-SA/SVA-stroke-L-KGS-50x5  | 22                                         | 75,7                                                                     | 0,13                           | 36:1       | 16,5         | 50x5                           | M36            | 85             | 90                     | 90                      | 105     | 115      | 114 | 66             | 48 | 160            | 80             | 70             | 70             |    |    |
| HSG-5-SA/SVA-stroke-L-KGS-50x10 | 58,7                                       | 100                                                                      | 0,28                           | 36:1       | 16,5         | 50x10                          | M36            | 85             | 90                     | 90                      | 105     | 115      | 114 | 66             | 48 | 160            | 80             | 70             | 70             |    |    |

<sup>1)</sup> The values for max. load apply only for initial jack selection. The actual permitted lifting force depends on the version of the jack and the operating conditions.

| Order code                      | Dimensions [mm] |                |                |                |                 |                 |                 |                 |                 |                 |                 |                 |                 |                 |                 |                 |                 |                 |    |                |                |                |
|---------------------------------|-----------------|----------------|----------------|----------------|-----------------|-----------------|-----------------|-----------------|-----------------|-----------------|-----------------|-----------------|-----------------|-----------------|-----------------|-----------------|-----------------|-----------------|----|----------------|----------------|----------------|
|                                 | H <sub>5</sub>  | H <sub>6</sub> | H <sub>8</sub> | H <sub>9</sub> | H <sub>10</sub> | H <sub>11</sub> | H <sub>12</sub> | H <sub>13</sub> | H <sub>14</sub> | H <sub>15</sub> | H <sub>16</sub> | H <sub>17</sub> | H <sub>18</sub> | H <sub>19</sub> | H <sub>20</sub> | H <sub>21</sub> | H <sub>22</sub> | L <sub>11</sub> | W  | W <sub>1</sub> | W <sub>2</sub> | W <sub>3</sub> |
| HSG-1-SA/SVA-stroke-N-KGS-12x5  | 8               | 15             | 10             | 60             | 80              | 25              | 24              | 10              | 52              | 36              | 72              | 24              | 120             | M8              | 12              | M5              | 10              | 12              | 10 | 3              | 22             | 18             |
| HSG-1-SA/SVA-stroke-L-KGS-12x5  | 8               | 15             | 10             | 60             | 80              | 25              | 24              | 10              | 52              | 36              | 72              | 24              | 120             | M8              | 12              | M5              | 10              | 12              | 10 | 3              | 22             | 18             |
| HSG-2-SA/SVA-stroke-N-KGS-16x5  | 10,5            | 20             | 11             | 78             | 100             | 32              | 28              | 11              | 63              | 42,5            | 85              | 27,5            | 140             | M8              | 15              | M6              | 10              | 16              | 14 | 5              | 25             | 20             |
| HSG-2-SA/SVA-stroke-L-KGS-16x5  | 10,5            | 20             | 11             | 78             | 100             | 32              | 28              | 11              | 63              | 42,5            | 85              | 27,5            | 140             | M8              | 15              | M6              | 10              | 16              | 14 | 5              | 25             | 20             |
| HSG-3-SA/SVA-stroke-N-KGS-25x5  | 9               | 19             | 12             | 106            | 130             | 45              | 31              | 12              | 81              | 52,5            | 105             | 45              | 195             | M10             | 15              | M8              | 12              | 23              | 16 | 5              | 43             | 36             |
| HSG-3-SA/SVA-stroke-N-KGS-25x10 | 9               | 19             | 12             | 106            | 130             | 45              | 31              | 12              | 81              | 52,5            | 105             | 45              | 195             | M10             | 15              | M8              | 12              | 23              | 16 | 5              | 43             | 36             |
| HSG-3-SA/SVA-stroke-L-KGS-25x5  | 9               | 19             | 12             | 106            | 130             | 45              | 31              | 12              | 81              | 52,5            | 105             | 45              | 195             | M10             | 15              | M8              | 12              | 23              | 16 | 5              | 43             | 36             |
| HSG-3-SA/SVA-stroke-L-KGS-25x10 | 9               | 19             | 12             | 106            | 130             | 45              | 31              | 12              | 81              | 52,5            | 105             | 45              | 195             | M10             | 15              | M8              | 12              | 23              | 16 | 5              | 43             | 36             |
| HSG-4-SA/SVA-stroke-N-KGS-32x5  | 11,5            | 31             | 15             | 150            | 180             | 63              | 39              | 15              | 115             | 72,5            | 145             | 47,5            | 240             | M12             | 16              | M10             | 12              | 32              | 20 | 6              | 45             | 36             |
| HSG-4-SA/SVA-stroke-N-KGS-32x10 | 11,5            | 31             | 15             | 150            | 180             | 63              | 39              | 15              | 115             | 72,5            | 145             | 47,5            | 240             | M12             | 16              | M10             | 12              | 32              | 20 | 6              | 45             | 36             |
| HSG-4-SA/SVA-stroke-L-KGS-32x5  | 11,5            | 31             | 15             | 150            | 180             | 63              | 39              | 15              | 115             | 72,5            | 145             | 47,5            | 240             | M12             | 16              | M10             | 12              | 32              | 20 | 6              | 45             | 36             |
| HSG-4-SA/SVA-stroke-L-KGS-32x10 | 11,5            | 31             | 15             | 150            | 180             | 63              | 39              | 15              | 115             | 72,5            | 145             | 47,5            | 240             | M12             | 16              | M10             | 12              | 32              | 20 | 6              | 45             | 36             |
| HSG-5-SA/SVA-stroke-N-KGS-40x5  | 11              | 45             | 17             | 166            | 200             | 71              | 46              | 17              | 131             | 82,5            | 165             | 67,5            | 300             | M20             | 30              | M12             | 15              | 40              | 25 | 8              | 65             | 56             |
| HSG-5-SA/SVA-stroke-N-KGS-40x10 | 11              | 45             | 17             | 166            | 200             | 71              | 46              | 17              | 131             | 82,5            | 165             | 67,5            | 300             | M20             | 30              | M12             | 15              | 40              | 25 | 8              | 65             | 56             |
| HSG-5-SA/SVA-stroke-N-KGS-50x5  | 11              | 45             | 17             | 166            | 200             | 71              | 46              | 17              | 131             | 82,5            | 165             | 67,5            | 300             | M20             | 30              | M12             | 15              | 40              | 25 | 8              | 65             | 56             |
| HSG-5-SA/SVA-stroke-N-KGS-50x10 | 11              | 45             | 17             | 166            | 200             | 71              | 46              | 17              | 131             | 82,5            | 165             | 67,5            | 300             | M20             | 30              | M12             | 15              | 40              | 25 | 8              | 65             | 56             |
| HSG-5-SA/SVA-stroke-L-KGS-40x5  | 11              | 45             | 17             | 166            | 200             | 71              | 46              | 17              | 131             | 82,5            | 165             | 67,5            | 300             | M20             | 30              | M12             | 15              | 40              | 25 | 8              | 65             | 56             |
| HSG-5-SA/SVA-stroke-L-KGS-40x10 | 11              | 45             | 17             | 166            | 200             | 71              | 46              | 17              | 131             | 82,5            | 165             | 67,5            | 300             | M20             | 30              | M12             | 15              | 40              | 25 | 8              | 65             | 56             |
| HSG-5-SA/SVA-stroke-L-KGS-50x5  | 11              | 45             | 17             | 166            | 200             | 71              | 46              | 17              | 131             | 82,5            | 165             | 67,5            | 300             | M20             | 30              | M12             | 15              | 40              | 25 | 8              | 65             | 56             |
| HSG-5-SA/SVA-stroke-L-KGS-50x10 | 11              | 45             | 17             | 166            | 200             | 71              | 46              | 17              | 131             | 82,5            | 165             | 67,5            | 300             | M20             | 30              | M12             | 15              | 40              | 25 | 8              | 65             | 56             |

# Dimensions HSG-0 to HSG-200

## Ball screw spindle - rotating version (R)

All versions have an input shaft on side A and B as standard. Single shaft versions can be optionally specified.

**Versions:**

**R:** Rotating spindle

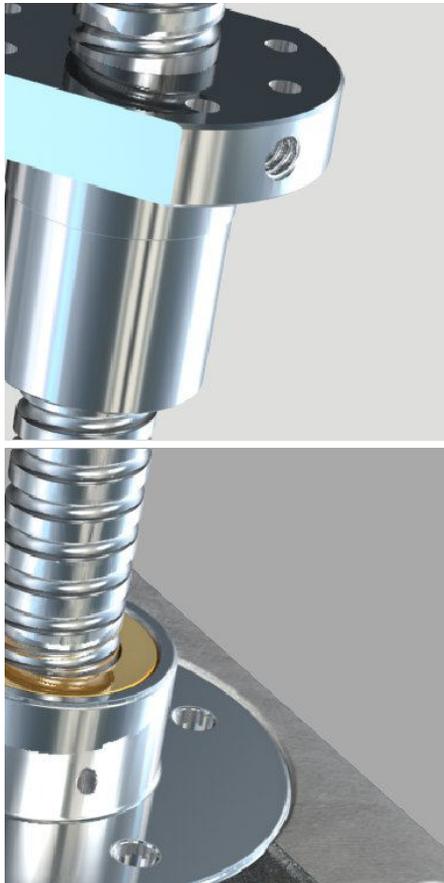
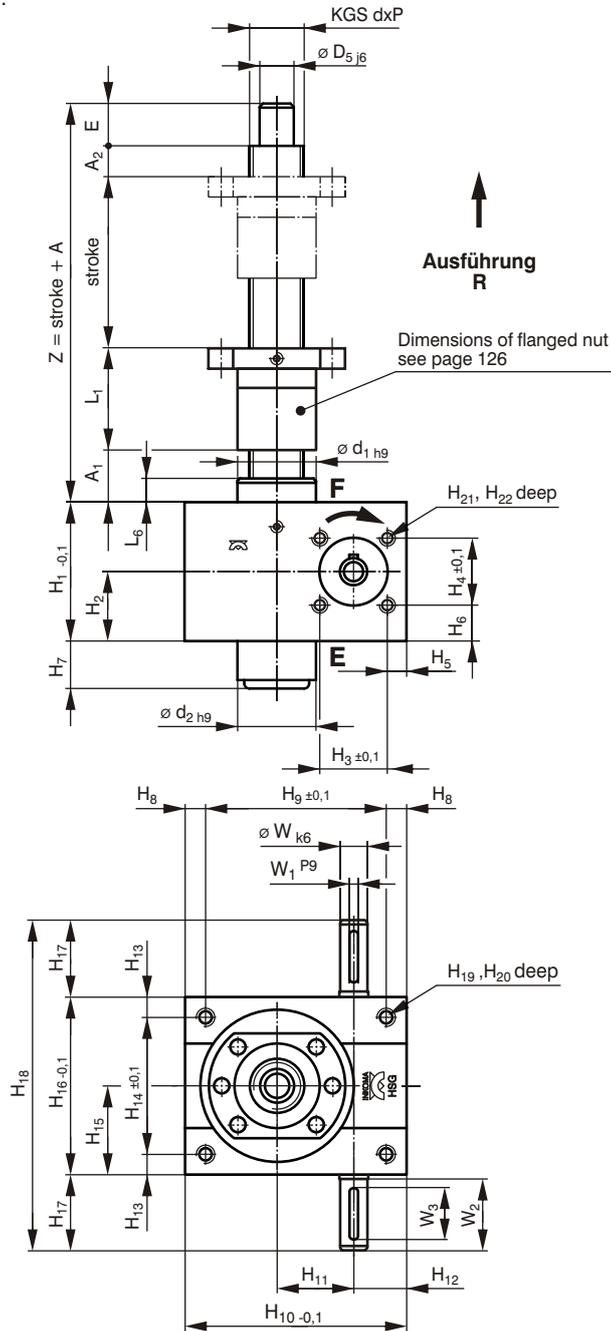
**Ratio:** N: normal, L: slow

**Lubrication:** Grease

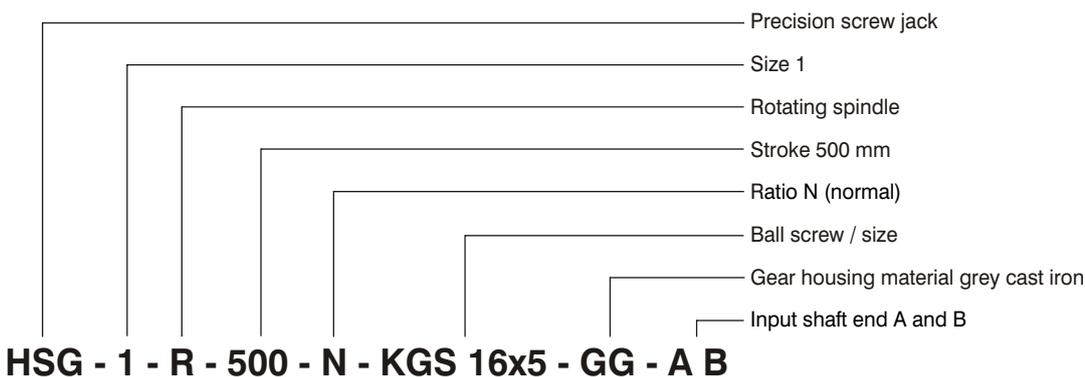
**Material:** see page 138

**Accessories:** see "Accessories" page 185 - 238

**Questionnaire:** see page 140 - 142



**Ordering example:**



| Order code                   | Lifting force<br>F <sub>dyn.</sub> [kN] | F <sub>max. static</sub><br>F <sub>stat.</sub> [kN] | Lift per<br>revolution<br>[mm] | Ratio<br>i | Mass<br>[kg] | Dimensions [mm] |                |                |                |     |                |                |    |                |                   |                    |                |                |                |  |
|------------------------------|-----------------------------------------|-----------------------------------------------------|--------------------------------|------------|--------------|-----------------|----------------|----------------|----------------|-----|----------------|----------------|----|----------------|-------------------|--------------------|----------------|----------------|----------------|--|
|                              |                                         |                                                     |                                |            |              | KGS<br>dxP      | D <sub>5</sub> | d <sub>1</sub> | d <sub>2</sub> | A   | A <sub>1</sub> | A <sub>2</sub> | E  | L <sub>6</sub> | H <sub>1</sub>    | H <sub>2</sub>     | H <sub>3</sub> | H <sub>4</sub> | H <sub>5</sub> |  |
| HSG-0-R-stroke-N-KGS-12x5    | 2,5                                     | 2,5                                                 | 1,25                           | 4:1        | 0,8          | 12x5            | 8              | 26             | 26             | 57  | 20             | 10             | 12 | 12             | 50                | 25                 | 25             | 25             | 5,5            |  |
| HSG-0-R-stroke-L-KGS-12x5    | 2,5                                     | 2,5                                                 | 0,31                           | 16:1       | 0,8          | 12x5            | 8              | 26             | 26             | 57  | 20             | 10             | 12 | 12             | 50                | 25                 | 25             | 25             | 5,5            |  |
| HSG-1-R-stroke-N-KGS-16x5    | 5                                       | 5                                                   | 1,25                           | 4:1        | 2,4          | 16x5            | 12             | 30             | 30             | 95  | 24             | 14             | 15 | 12             | 62                | 31                 | 32             | 32             | 8              |  |
| HSG-1-R-stroke-L-KGS-16x5    | 5                                       | 5                                                   | 0,31                           | 16:1       | 2,4          | 16x5            | 12             | 30             | 30             | 95  | 24             | 14             | 15 | 12             | 62                | 31                 | 32             | 32             | 8              |  |
| HSG-2-R-stroke-N-KGS-20x5    | 10                                      | 10                                                  | 1,25                           | 4:1        | 3,4          | 20x5            | 15             | 39             | 39             | 125 | 39             | 26             | 20 | 18,5           | 75                | 37,5               | 35             | 35             | 10,5           |  |
| HSG-2-R-stroke-N-KGS-25x10   | 10                                      | 10                                                  | 2,5                            | 4:1        | 3,4          | 25x10           | 15             | 39             | 39             | 138 | 35             | 22             | 20 | 18,5           | 75                | 37,5               | 35             | 35             | 10,5           |  |
| HSG-2-R-stroke-L-KGS-20x5    | 10                                      | 10                                                  | 0,31                           | 16:1       | 3,4          | 20x5            | 15             | 39             | 39             | 125 | 39             | 26             | 20 | 18,5           | 75                | 37,5               | 35             | 35             | 10,5           |  |
| HSG-2-R-stroke-L-KGS-25x10   | 10                                      | 10                                                  | 0,63                           | 16:1       | 3,4          | 25x10           | 15             | 39             | 39             | 138 | 35             | 22             | 20 | 18,5           | 75                | 37,5               | 35             | 35             | 10,5           |  |
| HSG-3-R-stroke-N-KGS-32x5    | 21,5                                    | 25                                                  | 0,83                           | 6:1        | 6,2          | 32x5            | 20             | 46             | 46             | 139 | 34             | 25             | 25 | 14             | 82                | 41                 | 44             | 44             | 9              |  |
| HSG-3-R-stroke-N-KGS-32x10   | 25                                      | 25                                                  | 1,67                           | 6:1        | 6,2          | 32x10           | 20             | 46             | 46             | 175 | 40             | 25             | 25 | 14             | 82                | 41                 | 44             | 44             | 9              |  |
| HSG-3-R-stroke-L-KGS-32x5    | 21,5                                    | 25                                                  | 0,21                           | 24:1       | 6,2          | 32x5            | 20             | 46             | 46             | 139 | 34             | 25             | 25 | 14             | 82                | 41                 | 44             | 44             | 9              |  |
| HSG-3-R-stroke-L-KGS-32x10   | 25                                      | 25                                                  | 0,42                           | 24:1       | 6,2          | 32x10           | 20             | 46             | 46             | 175 | 40             | 25             | 25 | 14             | 82                | 41                 | 44             | 44             | 9              |  |
| HSG-4-R-stroke-N-KGS-40x5    | 25,9                                    | 50                                                  | 0,71                           | 7:1        | 16,5         | 40x5            | 25             | 60             | 60             | 176 | 65             | 31             | 30 | 34             | 117               | 58,5               | 55             | 55             | 11,5           |  |
| HSG-4-R-stroke-N-KGS-40x10   | 39,8                                    | 50                                                  | 1,43                           | 7:1        | 16,5         | 40x10           | 25             | 60             | 60             | 197 | 67             | 30             | 30 | 34             | 117               | 58,5               | 55             | 55             | 11,5           |  |
| HSG-4-R-stroke-L-KGS-40x5    | 25,9                                    | 50                                                  | 0,18                           | 28:1       | 16,5         | 40x5            | 25             | 60             | 60             | 176 | 65             | 31             | 30 | 34             | 117               | 58,5               | 55             | 55             | 11,5           |  |
| HSG-4-R-stroke-L-KGS-40x10   | 39,8                                    | 50                                                  | 0,36                           | 28:1       | 16,5         | 40x10           | 25             | 60             | 60             | 197 | 67             | 30             | 30 | 34             | 117               | 58,5               | 55             | 55             | 11,5           |  |
| HSG-5-R-stroke-N-KGS-63x10   | 84,7                                    | 100                                                 | 1,11                           | 9:1        | 34           | 63x10           | 40             | 85             | 85             | 255 | 60             | 30             | 45 | 40             | 160               | 80                 | 70             | 70             | 11             |  |
| HSG-5-R-stroke-N-KGS-63x20   | 100                                     | 100                                                 | 2,22                           | 9:1        | 34           | 63x20           | 40             | 85             | 85             | 300 | 70             | 35             | 45 | 40             | 160               | 80                 | 70             | 70             | 11             |  |
| HSG-5-R-stroke-L-KGS-63x10   | 84,7                                    | 100                                                 | 0,28                           | 36:1       | 34           | 63x10           | 40             | 85             | 85             | 255 | 60             | 30             | 45 | 40             | 160               | 80                 | 70             | 70             | 11             |  |
| HSG-5-R-stroke-L-KGS-63x20   | 100                                     | 100                                                 | 0,56                           | 36:1       | 34           | 63x20           | 40             | 85             | 85             | 300 | 70             | 35             | 45 | 40             | 160               | 80                 | 70             | 70             | 11             |  |
| HSG-200-R-stroke-N-KGS-80x10 | 93,4                                    | 200                                                 | 1,00                           | 10:1       | 57           | 80x10           | 55             | 120            | 105            | 280 | 60             | 30             | 70 | 40             | 165 <sup>2)</sup> | 82,5 <sup>3)</sup> | 80             | 80             | 20             |  |
| HSG-200-R-stroke-N-KGS-80x20 | 135                                     | 200                                                 | 2,00                           | 10:1       | 57           | 80x20           | 55             | 120            | 105            | 335 | 70             | 35             | 70 | 40             | 165 <sup>2)</sup> | 82,5 <sup>3)</sup> | 80             | 80             | 20             |  |
| HSG-200-R-stroke-L-KGS-80x10 | 93,4                                    | 200                                                 | 0,25                           | 40:1       | 57           | 80x10           | 55             | 120            | 105            | 280 | 60             | 30             | 70 | 40             | 165 <sup>2)</sup> | 82,5 <sup>3)</sup> | 80             | 80             | 20             |  |
| HSG-200-R-stroke-L-KGS-80x20 | 135                                     | 200                                                 | 0,50                           | 40:1       | 57           | 80x20           | 55             | 120            | 105            | 335 | 70             | 35             | 70 | 40             | 165 <sup>2)</sup> | 82,5 <sup>3)</sup> | 80             | 80             | 20             |  |

<sup>1)</sup> The values for max. load apply only for initial jack selection. The actual permitted lifting force depends on the version of the jack and the operating conditions.

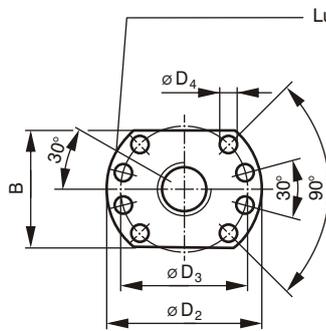
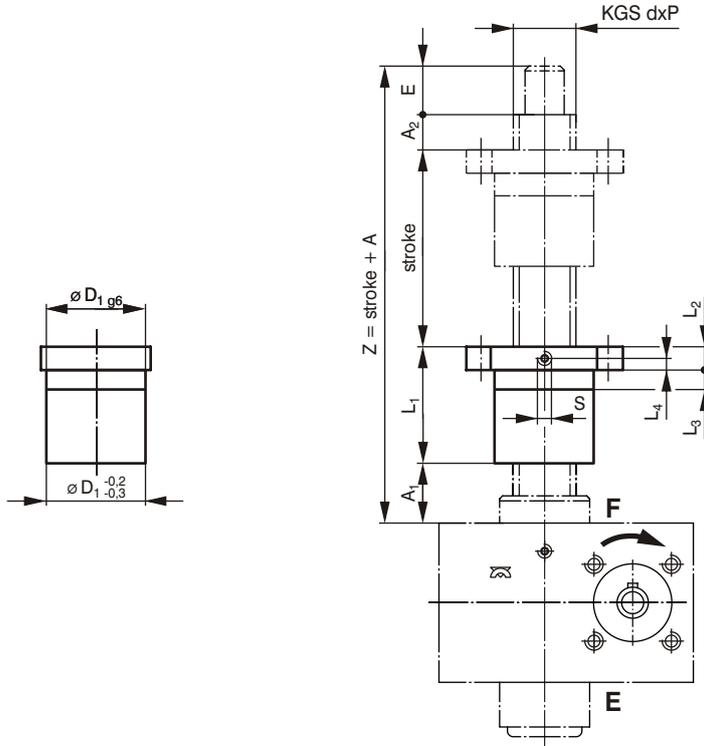
| Order code                   | Dimensions [mm] |                |                |                   |                   |                 |                 |                 |                   |                 |                 |                 |                 |                 |                 |                 |                 |    |                |                |                |
|------------------------------|-----------------|----------------|----------------|-------------------|-------------------|-----------------|-----------------|-----------------|-------------------|-----------------|-----------------|-----------------|-----------------|-----------------|-----------------|-----------------|-----------------|----|----------------|----------------|----------------|
|                              | H <sub>6</sub>  | H <sub>7</sub> | H <sub>8</sub> | H <sub>9</sub>    | H <sub>10</sub>   | H <sub>11</sub> | H <sub>12</sub> | H <sub>13</sub> | H <sub>14</sub>   | H <sub>15</sub> | H <sub>16</sub> | H <sub>17</sub> | H <sub>18</sub> | H <sub>19</sub> | H <sub>20</sub> | H <sub>21</sub> | H <sub>22</sub> | W  | W <sub>1</sub> | W <sub>2</sub> | W <sub>3</sub> |
| HSG-0-R-stroke-N-KGS-12x5    | 12,5            | 16             | 6              | 48                | 60                | 20              | 18              | 6               | 38                | 25              | 50              | 21              | 92              | M6              | 10              | M5              | 5               | 9  | 3              | 20             | 16             |
| HSG-0-R-stroke-L-KGS-12x5    | 12,5            | 16             | 6              | 48                | 60                | 20              | 18              | 6               | 38                | 25              | 50              | 21              | 92              | M6              | 10              | M5              | 5               | 9  | 3              | 20             | 16             |
| HSG-1-R-stroke-N-KGS-16x5    | 15              | 17             | 10             | 60                | 80                | 25              | 24              | 10              | 52                | 36              | 72              | 24              | 120             | M8              | 12              | M5              | 10              | 10 | 3              | 22             | 18             |
| HSG-1-R-stroke-L-KGS-16x5    | 15              | 17             | 10             | 60                | 80                | 25              | 24              | 10              | 52                | 36              | 72              | 24              | 120             | M8              | 12              | M5              | 10              | 10 | 3              | 22             | 18             |
| HSG-2-R-stroke-N-KGS-20x5    | 20              | 21             | 11             | 78                | 100               | 32              | 28              | 11              | 63                | 42,5            | 85              | 27,5            | 140             | M8              | 15              | M6              | 10              | 14 | 5              | 25             | 20             |
| HSG-2-R-stroke-N-KGS-25x10   | 20              | 21             | 11             | 78                | 100               | 32              | 28              | 11              | 63                | 42,5            | 85              | 27,5            | 140             | M8              | 15              | M6              | 10              | 14 | 5              | 25             | 20             |
| HSG-2-R-stroke-L-KGS-20x5    | 20              | 21             | 11             | 78                | 100               | 32              | 28              | 11              | 63                | 42,5            | 85              | 27,5            | 140             | M8              | 15              | M6              | 10              | 14 | 5              | 25             | 20             |
| HSG-2-R-stroke-L-KGS-25x10   | 20              | 21             | 11             | 78                | 100               | 32              | 28              | 11              | 63                | 42,5            | 85              | 27,5            | 140             | M8              | 15              | M6              | 10              | 14 | 5              | 25             | 20             |
| HSG-3-R-stroke-N-KGS-32x5    | 19              | 28             | 12             | 106               | 130               | 45              | 31              | 12              | 81                | 52,5            | 105             | 45              | 195             | M10             | 15              | M8              | 12              | 16 | 5              | 43             | 36             |
| HSG-3-R-stroke-N-KGS-32x10   | 19              | 28             | 12             | 106               | 130               | 45              | 31              | 12              | 81                | 52,5            | 105             | 45              | 195             | M10             | 15              | M8              | 12              | 16 | 5              | 43             | 36             |
| HSG-3-R-stroke-L-KGS-32x5    | 19              | 28             | 12             | 106               | 130               | 45              | 31              | 12              | 81                | 52,5            | 105             | 45              | 195             | M10             | 15              | M8              | 12              | 16 | 5              | 43             | 36             |
| HSG-3-R-stroke-L-KGS-32x10   | 19              | 28             | 12             | 106               | 130               | 45              | 31              | 12              | 81                | 52,5            | 105             | 45              | 195             | M10             | 15              | M8              | 12              | 16 | 5              | 43             | 36             |
| HSG-4-R-stroke-N-KGS-40x5    | 31              | 37             | 15             | 150               | 180               | 63              | 39              | 15              | 115               | 72,5            | 145             | 47,5            | 240             | M12             | 16              | M10             | 12              | 20 | 6              | 45             | 36             |
| HSG-4-R-stroke-N-KGS-40x10   | 31              | 37             | 15             | 150               | 180               | 63              | 39              | 15              | 115               | 72,5            | 145             | 47,5            | 240             | M12             | 16              | M10             | 12              | 20 | 6              | 45             | 36             |
| HSG-4-R-stroke-L-KGS-40x5    | 31              | 37             | 15             | 150               | 180               | 63              | 39              | 15              | 115               | 72,5            | 145             | 47,5            | 240             | M12             | 16              | M10             | 12              | 20 | 6              | 45             | 36             |
| HSG-4-R-stroke-L-KGS-40x10   | 31              | 37             | 15             | 150               | 180               | 63              | 39              | 15              | 115               | 72,5            | 145             | 47,5            | 240             | M12             | 16              | M10             | 12              | 20 | 6              | 45             | 36             |
| HSG-5-R-stroke-N-KGS-63x10   | 45              | 45             | 17             | 166               | 200               | 71              | 46              | 17              | 131               | 82,5            | 165             | 67,5            | 300             | M20             | 30              | M12             | 15              | 25 | 8              | 65             | 56             |
| HSG-5-R-stroke-N-KGS-63x20   | 45              | 45             | 17             | 166               | 200               | 71              | 46              | 17              | 131               | 82,5            | 165             | 67,5            | 300             | M20             | 30              | M12             | 15              | 25 | 8              | 65             | 56             |
| HSG-5-R-stroke-L-KGS-63x10   | 45              | 45             | 17             | 166               | 200               | 71              | 46              | 17              | 131               | 82,5            | 165             | 67,5            | 300             | M20             | 30              | M12             | 15              | 25 | 8              | 65             | 56             |
| HSG-5-R-stroke-L-KGS-63x20   | 45              | 45             | 17             | 166               | 200               | 71              | 46              | 17              | 131               | 82,5            | 165             | 67,5            | 300             | M20             | 30              | M12             | 15              | 25 | 8              | 65             | 56             |
| HSG-200-R-stroke-N-KGS-80x10 | 42,5            | 45             | 25             | 190 <sup>2)</sup> | 240 <sup>4)</sup> | 80              | 60              | 25              | 170 <sup>2)</sup> | 110             | 220             | 67,5            | 355             | M30             | 36              | M16             | 20              | 30 | 8              | 65             | 56             |
| HSG-200-R-stroke-N-KGS-80x20 | 42,5            | 45             | 25             | 190 <sup>2)</sup> | 240 <sup>4)</sup> | 80              | 60              | 25              | 170 <sup>2)</sup> | 110             | 220             | 67,5            | 355             | M30             | 36              | M16             | 20              | 30 | 8              | 65             | 56             |
| HSG-200-R-stroke-L-KGS-80x10 | 42,5            | 45             | 25             | 190 <sup>2)</sup> | 240 <sup>4)</sup> | 80              | 60              | 25              | 170 <sup>2)</sup> | 110             | 220             | 67,5            | 355             | M30             | 36              | M16             | 20              | 30 | 8              | 65             | 56             |
| HSG-200-R-stroke-L-KGS-80x20 | 42,5            | 45             | 25             | 190 <sup>2)</sup> | 240 <sup>4)</sup> | 80              | 60              | 25              | 170 <sup>2)</sup> | 110             | 220             | 67,5            | 355             | M30             | 36              | M16             | 20              | 30 | 8              | 65             | 56             |

<sup>2)</sup> Tolerance ±0,4   <sup>3)</sup> Tolerance ±0,2   <sup>4)</sup> Tolerance ±0,5

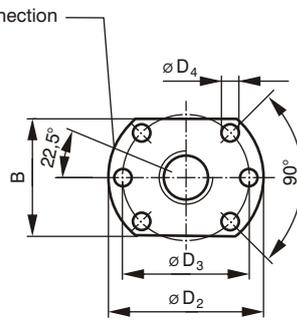
# Flanged nut dimensions

## Ball screw spindle - rotating version (R)

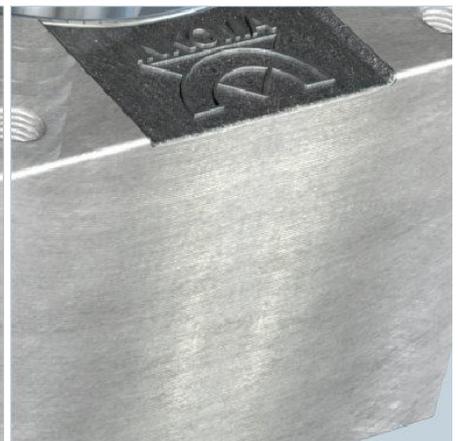
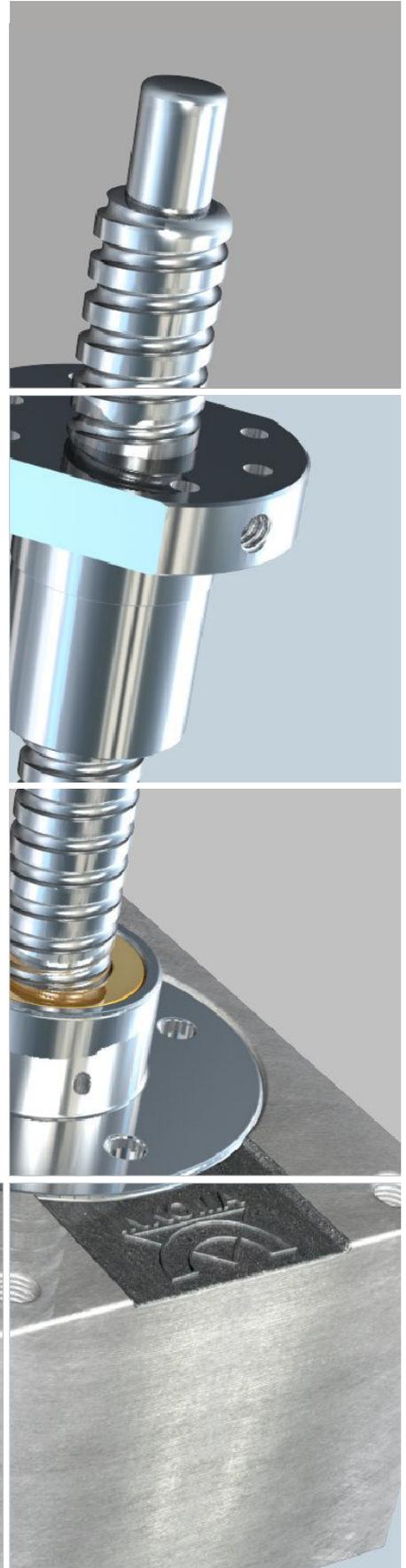
INKOMA-flanged nut to DIN 69051, for all normal connections of the screw jack to the moving element.

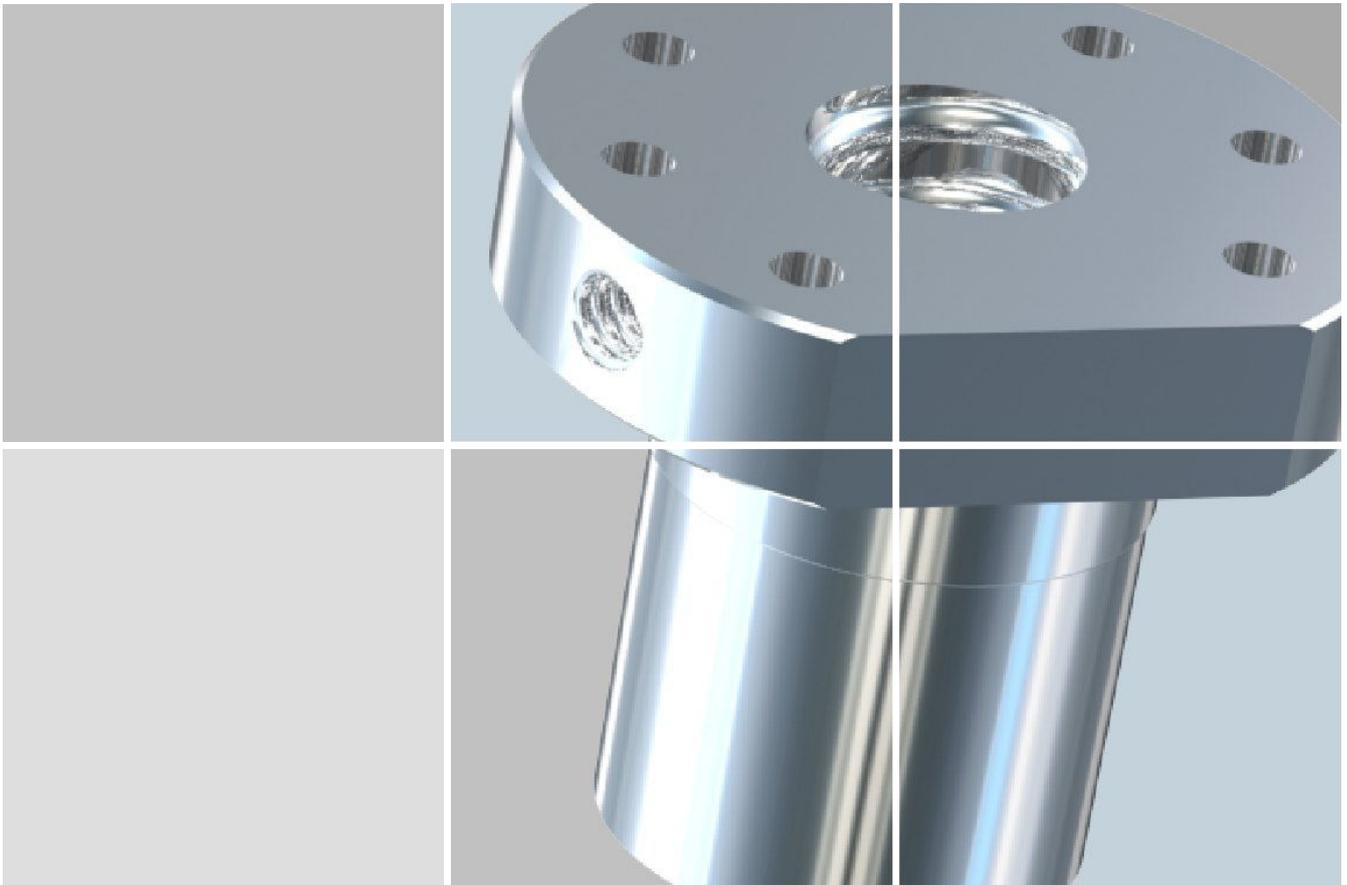


Flanged nut DIN 69051  
(hole pattern 1)



Flanged nut DIN 69051  
(hole pattern 2)





| Order code    | Hole pattern | Dimensions [mm] |     |                |                |     |                |                |                |                |    |                |                |                |                |      |
|---------------|--------------|-----------------|-----|----------------|----------------|-----|----------------|----------------|----------------|----------------|----|----------------|----------------|----------------|----------------|------|
|               |              | KGS dxP         | A   | A <sub>1</sub> | A <sub>2</sub> | B   | D <sub>1</sub> | D <sub>2</sub> | D <sub>3</sub> | D <sub>4</sub> | E  | L <sub>1</sub> | L <sub>2</sub> | L <sub>3</sub> | L <sub>4</sub> | S    |
| HSG-0-R-KGS   | 2            | 12x5            | 57  | 20             | 10             | 32  | 24             | 46             | 35             | 5,5            | 12 | 15             | 10             | 5              | 5              | M6   |
| HSG-1-R-KGS   | 2            | 16x5            | 95  | 24             | 14             | 40  | 28             | 48             | 38             | 5,5            | 15 | 42             | 10             | 10             | 5              | M6   |
| HSG-2-R-KGS   | 2            | 20x5            | 125 | 39             | 26             | 44  | 36             | 58             | 47             | 6,6            | 20 | 40             | 10             | 10             | 5              | M6   |
| HSG-2-R-KGS   | 2            | 25x10           | 138 | 35             | 22             | 48  | 40             | 62             | 51             | 6,6            | 20 | 61             | 10             | 16             | 5              | M6   |
| HSG-3-R-KGS   | 2            | 32x5            | 139 | 34             | 25             | 62  | 50             | 80             | 65             | 9              | 25 | 55             | 12             | 10             | 6              | M6   |
| HSG-3-R-KGS   | 2            | 32x10           | 175 | 40             | 25             | 62  | 50             | 80             | 65             | 9              | 25 | 85             | 12             | 16             | 6              | M6   |
| HSG-4-R-KGS   | 1            | 40x5            | 176 | 65             | 31             | 70  | 63             | 93             | 78             | 9              | 30 | 50             | 14             | 10             | 7              | M8x1 |
| HSG-4-R-KGS   | 1            | 40x10           | 197 | 67             | 30             | 70  | 63             | 93             | 78             | 9              | 30 | 70             | 14             | 16             | 7              | M8x1 |
| HSG-5-R-KGS   | 1            | 63x10           | 255 | 60             | 30             | 95  | 90             | 125            | 108            | 11             | 45 | 120            | 18             | 16             | 9              | M8x1 |
| HSG-5-R-KGS   | 1            | 63x20           | 300 | 70             | 35             | 100 | 95             | 135            | 115            | 13,5           | 45 | 150            | 20             | 25             | 10             | M8x1 |
| HSG-200-R-KGS | 1            | 80x10           | 280 | 60             | 30             | 110 | 105            | 145            | 125            | 13,5           | 70 | 120            | 20             | 16             | 10             | M8x1 |
| HSG-200-R-KGS | 1            | 80x20           | 335 | 70             | 35             | 130 | 125            | 165            | 145            | 13,5           | 70 | 160            | 25             | 25             | 12             | M8x1 |

# Selection of screw jacks

## Examples

In designing screw jack lifting systems it is necessary to establish the operating conditions. The load to be lifted and the stroke length must be determined.

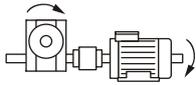
Additional loads, acting non-axially must be taken into account. Following the determination of the number and attitude of the jacks, the load on each individual jack must be calculated. Next determine the drive train for the screw jacks.

The following rules apply for the illustrations below:

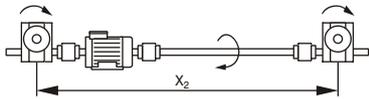
- all jacks in these examples have a common direction of rotation
- the number of transmission elements is as small as possible
- the motor position is closest to the most heavily loaded screw jack HSG / KSH

## Arrangement examples

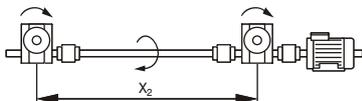
Example 1



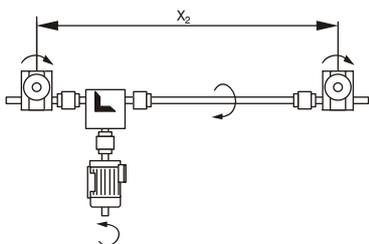
Example 2



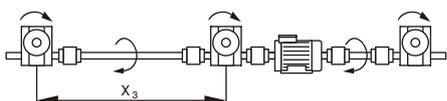
Example 3



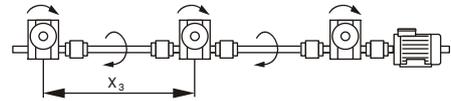
Example 4



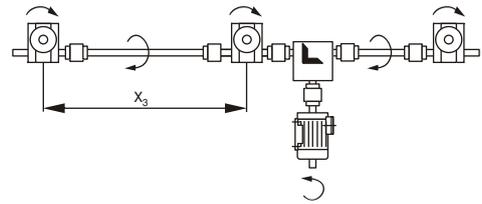
Example 5



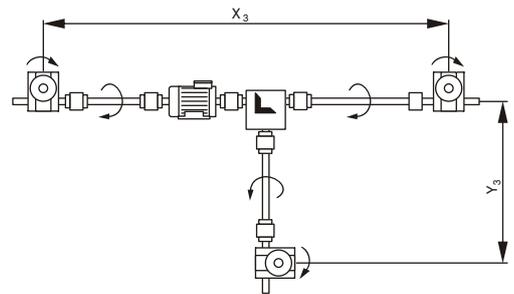
Example 6



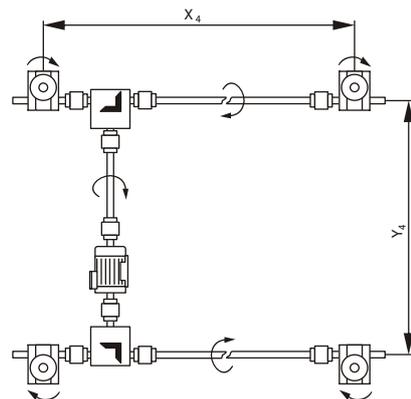
Example 7



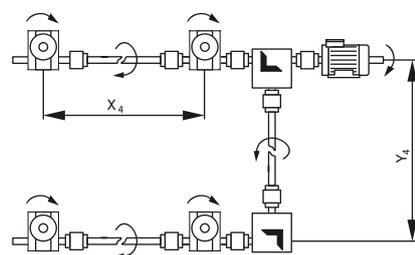
Example 8



Example 9



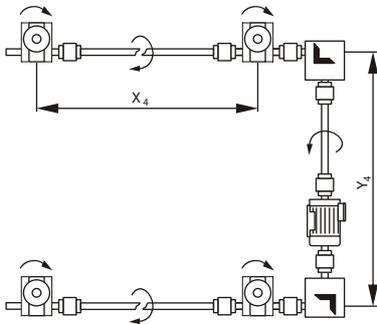
Example 10



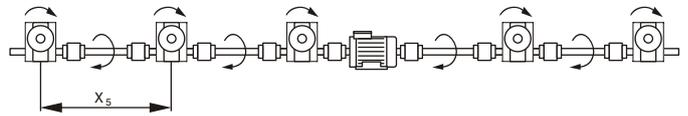
# Selection of screw jacks

## Arrangement examples

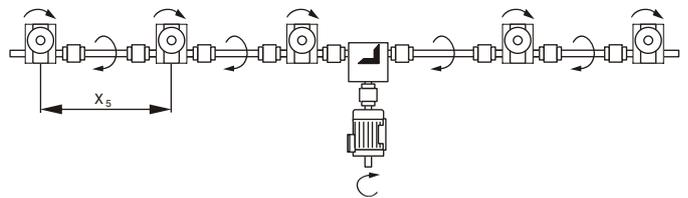
Example 11



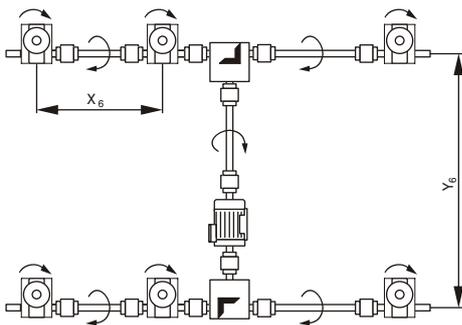
Example 12



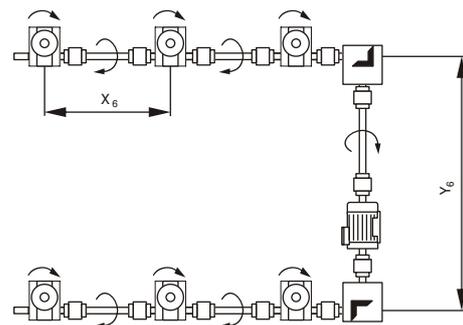
Example 13



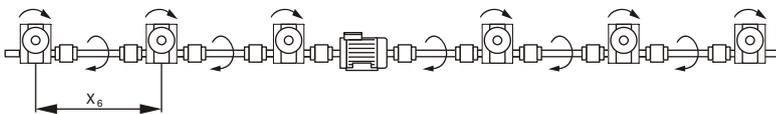
Example 14



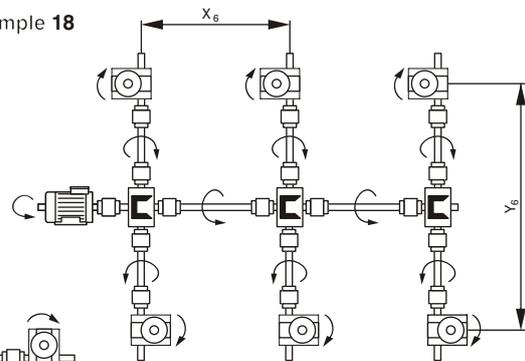
Example 15



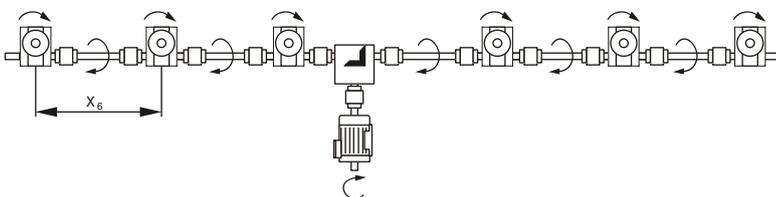
Example 16



Example 18

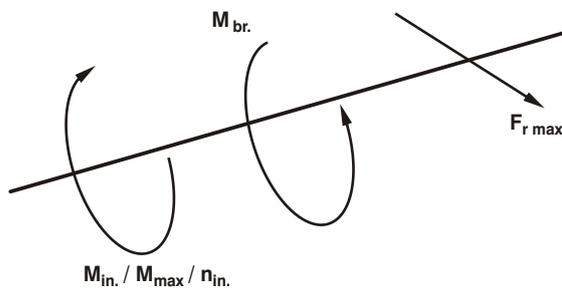
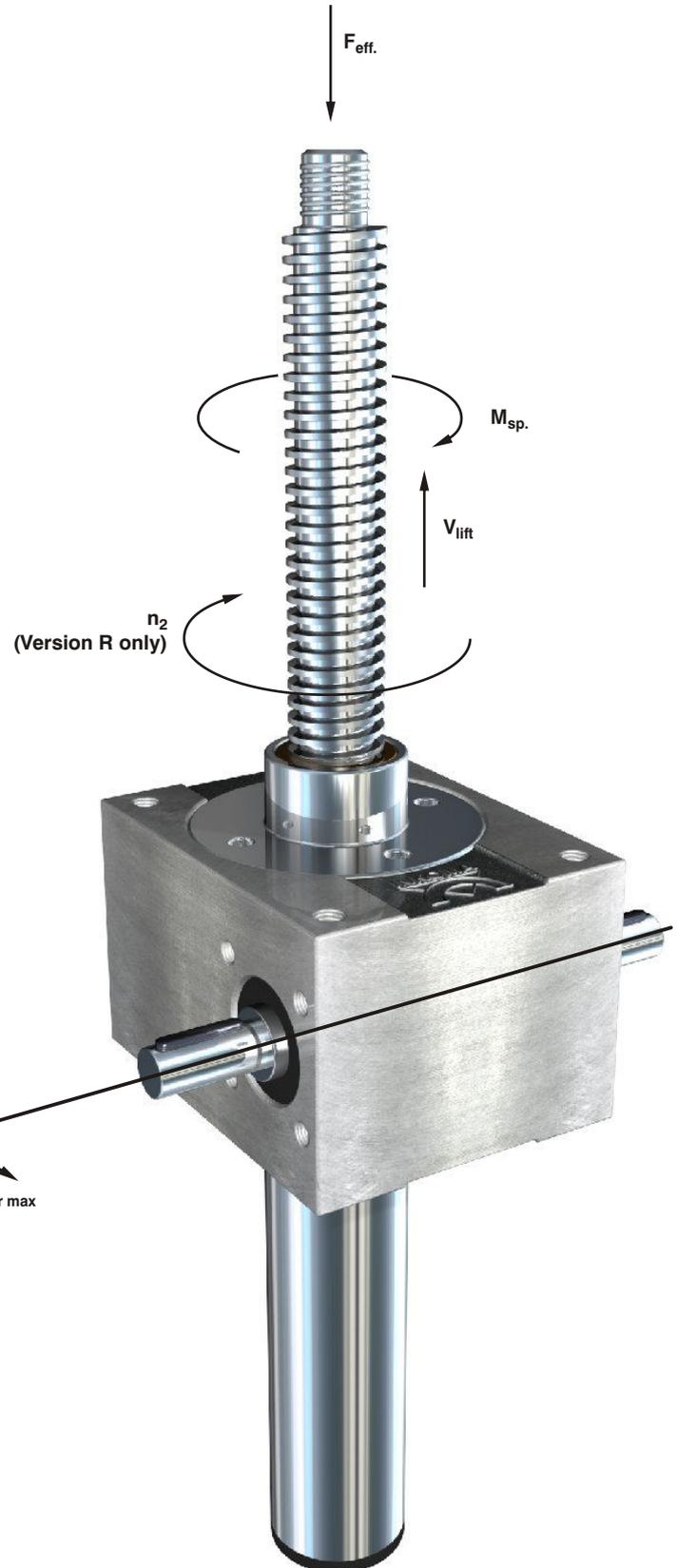


Example 17



## Definition of the applied loads, torques and speeds

|              |         |                                          |
|--------------|---------|------------------------------------------|
| $F_{eff}$    | [kN]    | effective lifting load of the screw jack |
| $F_{r\ max}$ | [kN]    | maximum radial load                      |
| $M_{in.}$    | [Nm]    | input torque                             |
| $M_{br.}$    | [Nm]    | braking torque                           |
| $M_{max}$    | [Nm]    | maximum drive torque                     |
| $M_{sp.}$    | [Nm]    | torque in the lifting spindle            |
| $n_{in.}$    | [1/min] | input speed                              |
| $n_2$        | [1/min] | spindle speed (only for version R)       |
| $V_{lift}$   | [m/min] | lifting speed                            |



# Calculations

## Calculation of the duty ED

The duty ED [%/h] is derived from the time in operation (lifting and lowering) and the inactive time between successive operations.

### Example:

|                               |  |    |     |  |     |     |     |
|-------------------------------|--|----|-----|--|-----|-----|-----|
| Lifting                       |  | 4s |     |  |     |     | 4s  |
| Lowering                      |  |    | 2s  |  | 2s  |     | 4s  |
| Inactive                      |  |    | 10s |  | 10s | 12s | 32s |
| Total cycle = 40s             |  |    |     |  |     |     |     |
| ED per cycle in % = 20%       |  |    |     |  |     |     |     |
| Cycles per operating day = 10 |  |    |     |  |     |     |     |

## Maximum duty ED [%/h]

If the duty is below 5%/h or the screw jack is only used for minor adjustments the following calculation can be omitted.

Friction causes heat build up in screw jacks during operation. This heat must be dissipated to the atmosphere by radiation and convection. To prevent overheating of the screw jack the effective lifting capacity of the screw jack  $P_{lift\ eff.}$  [kNm/min] is limited by the thermal duty capacity ED [%/h].

### Method:

#### 1. Determination of the effective lifting capacity $P_{lift\ eff.}$ [kNm/min]

$$P_{lift\ eff.} \text{ [kNm/min]} = F_{eff.} \text{ [kN]} \cdot V_{lift} \text{ [m/min]}$$

#### 2. Temperature factor $f_T$ [-] can be read from the graph.

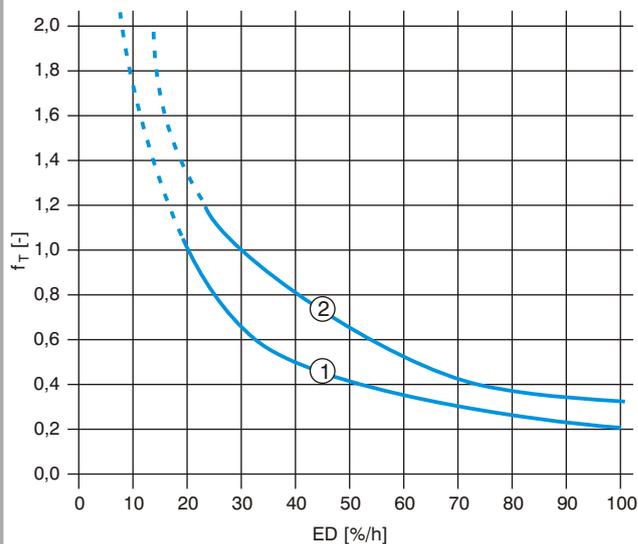
#### 3. $P_{lift\ eff.}$ [kNm/min] $\leq$ $P_{lift\ max.}$ [kNm/min] $\cdot f_T$ [-]

### Explanation:

|                  |           |                                                                                                                               |
|------------------|-----------|-------------------------------------------------------------------------------------------------------------------------------|
| $P_{lift\ eff.}$ | [kNm/min] | effective lifting capacity                                                                                                    |
| $F_{eff.}$       | [kN]      | effective lifting load of the screw jack                                                                                      |
| $V_{lift}$       | [m/min]   | the maximum lifting speed depends on the input speed to the jack.<br>HSG $n_{max} = 1500$ 1/min<br>KSH $n_{max} = 3000$ 1/min |
| $P_{lift\ max.}$ | [kNm/min] | maximum lifting capacity (see table)                                                                                          |
| $f_T$            | [-]       | temperature factor resulting from the relative duty ED[%/h] at an ambient of 20°C.                                            |

### Temperature factor $f_T$ [-]

- ① Screw jack with trapezoidal spindle
- ② Screw jack with ball screw spindle



| Order code | $P_{lift\ max.}$ [kNm/min]              |                                         |
|------------|-----------------------------------------|-----------------------------------------|
|            | Tr<br>Trapezoidal spindle <sup>1)</sup> | KGS<br>Ball screw spindle <sup>2)</sup> |
| HSG-0-N    | 1,7                                     | 2,9                                     |
| HSG-0-L    | 0,66                                    | 1,35                                    |
| HSG-1-N    | 2,8                                     | 5,3                                     |
| HSG-1-L    | 1,43                                    | 3,1                                     |
| HSG-2-N    | 4,5                                     | 9,2                                     |
| HSG-2-L    | 1,9                                     | 4,45                                    |
| HSG-3-N    | 10,1                                    | 19,7                                    |
| HSG-3-L    | 4,6                                     | 10,2                                    |
| HSG-4-N    | 20,2                                    | 44,2                                    |
| HSG-4-L    | 12,0                                    | 18,2                                    |
| HSG-5-N    | 36,0                                    | 78,8                                    |
| HSG-5-L    | 14,2                                    | 38,5                                    |
| HSG-200-N  | 57,0                                    | 138,5                                   |
| HSG-200-L  | 23,2                                    | 66,2                                    |
| HSG-300-N  | 72,0                                    | 169,0                                   |
| HSG-300-L  | 28,3                                    | 83,5                                    |
| HSG-400-N  | 90,0                                    | -                                       |
| HSG-400-L  | 33,0                                    | -                                       |
| HSG-500-N  | 104,0                                   | -                                       |
| HSG-500-L  | 37,5                                    | -                                       |
| KSH-1 2:1  | 27,3                                    | 53,8                                    |
| KSH-1 3:1  | 24,4                                    | 49,2                                    |
| KSH-2 2:1  | 59,5                                    | 126,3                                   |
| KSH-2 3:1  | 48,6                                    | 101,1                                   |
| KSH-3 2:1  | 73,0                                    | 168,7                                   |
| KSH-3 3:1  | 58,8                                    | 135,2                                   |

1) maximum lifting capacity at ED 20 %/h

2) maximum lifting capacity at ED 30 %/h

# Calculations

## Critical buckling loads on the lifting spindle $F_{crit.}$ [kN]

When loaded in compression lifting spindles are subject to radial buckling. They must therefore be checked for permitted load  $F_{perm.}$  [kN] using an installation factor  $f_k$  [-].

### Method:

1. The critical buckling force  $F_{crit.}$  [kN] is read from the table using the spindle size and buckling length  $L_b$  [mm].

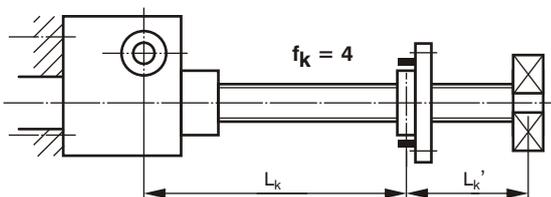
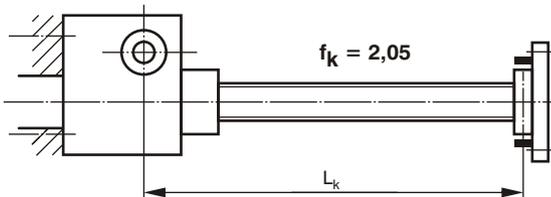
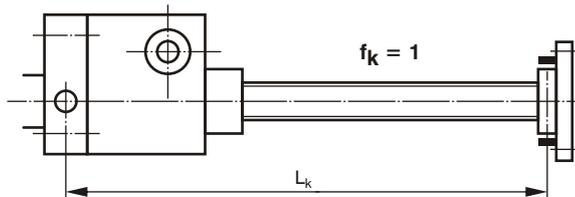
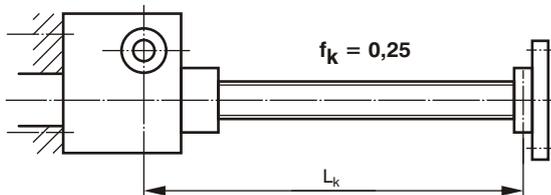
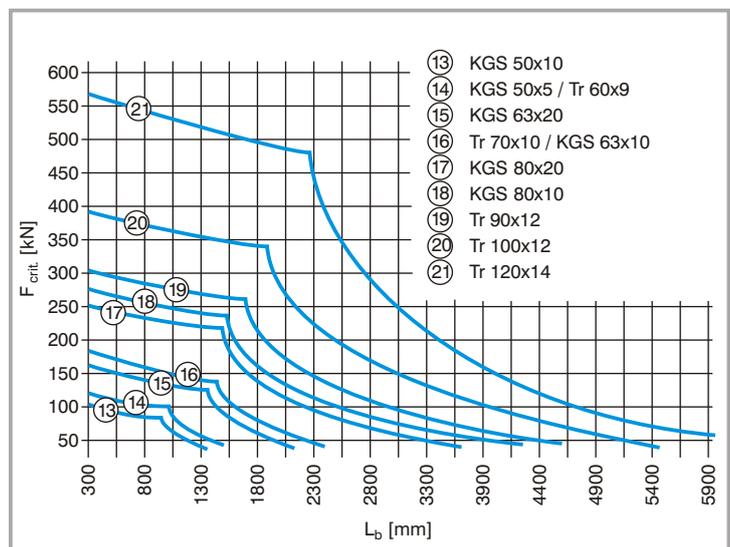
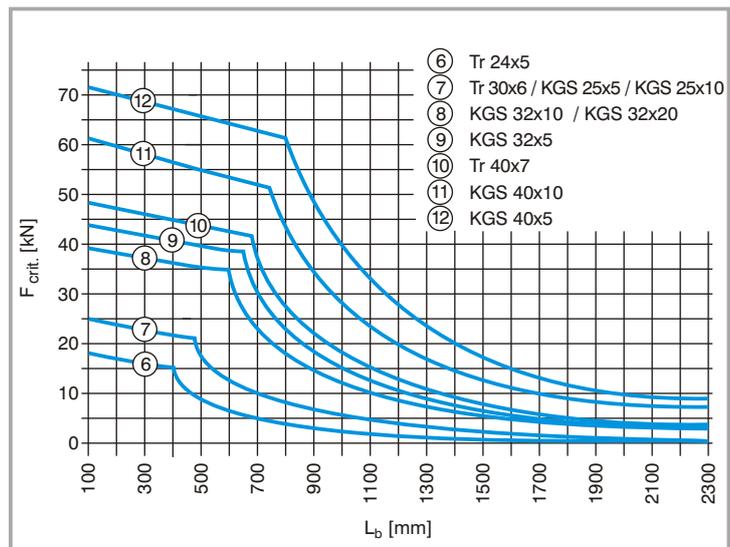
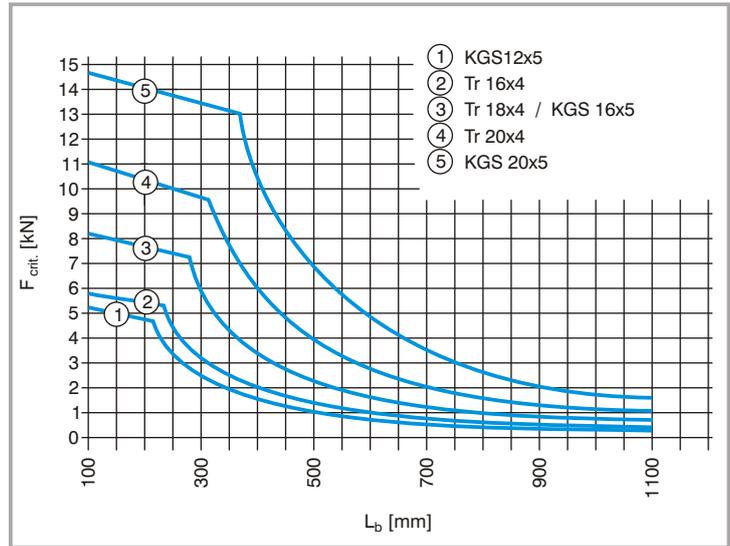
### Note:

The buckling graphs contain a safety factor of 5.

2. Determination of the Installation factor  $f_k$  [-] based on the examples shown below.
3. Calculation of the permitted compressive load:

$$F_{perm.} [kN] = F_{crit.} [kN] \cdot f_k [-]$$

4.  $F_{eff.} [kN] \leq F_{perm.} [kN]$



# Calculations

## Critical spindle speed $n_{crit.}$ - only for rotating version R

Rotating spindles are subject to vibration due to resonance. All rotating spindles should be checked for speed  $n_2$  [1/min] vs permitted speed.

### Method:

1. Determination of the spindle speed  $n_2$  [1/min]

$$n_2 \text{ [1/min]} = \frac{V_{lift} \text{ [m/min]} \cdot 1000}{P \text{ [mm]}}$$

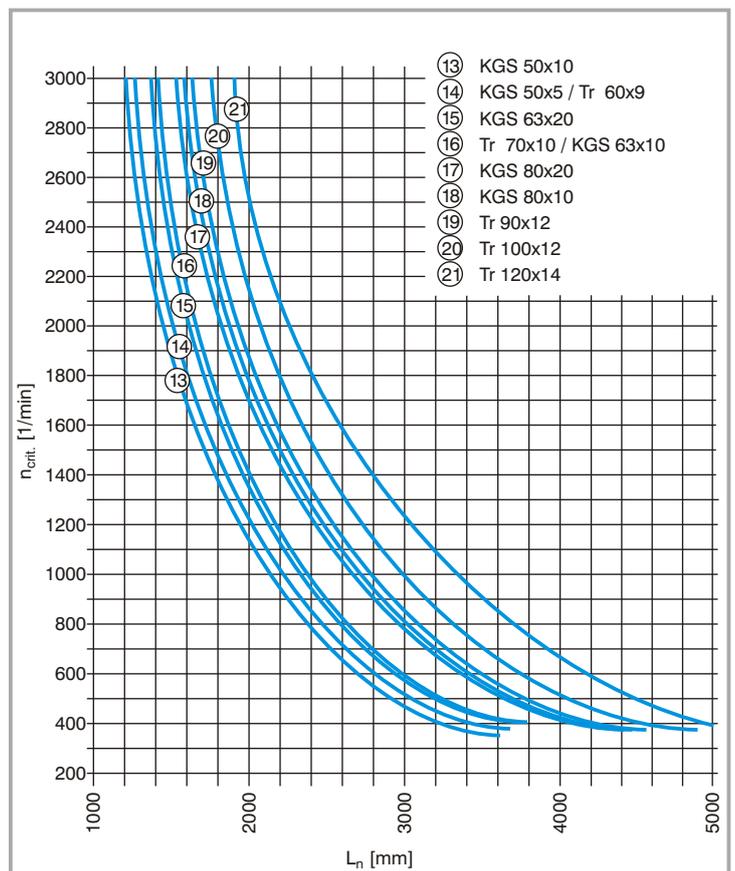
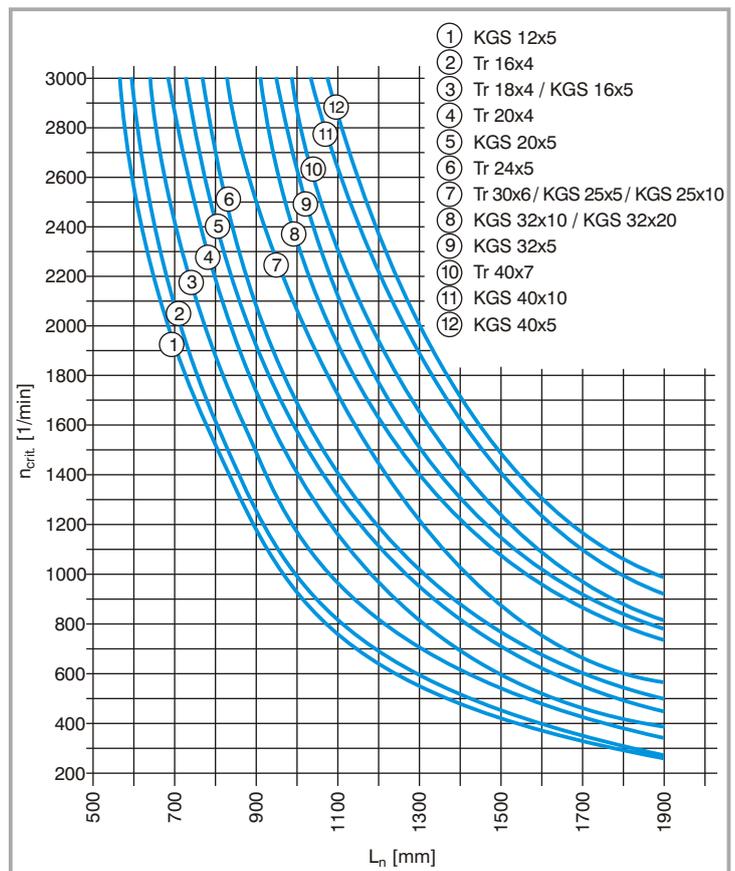
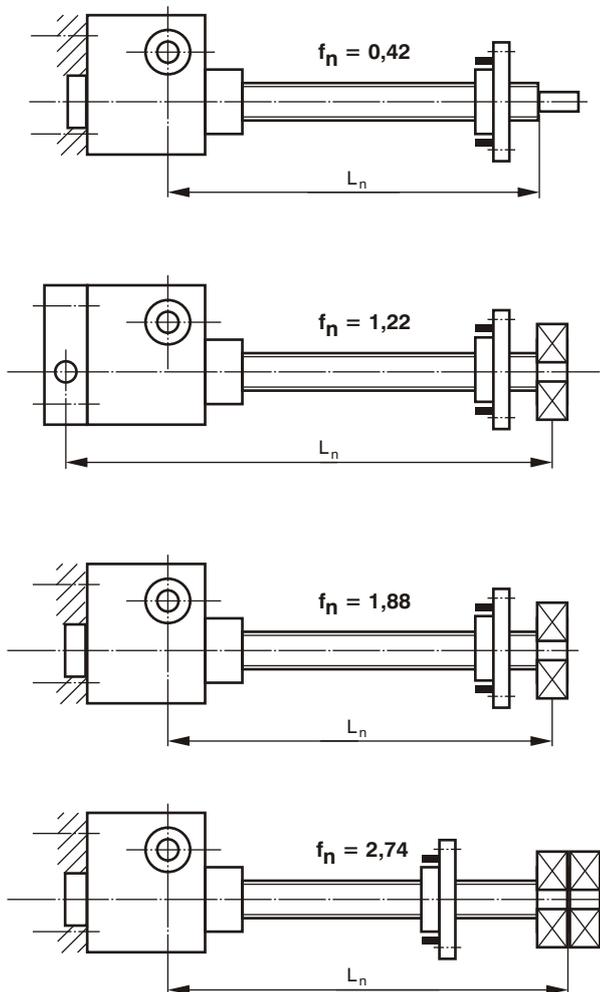
2. Obtain the critical spindle speed  $n_{crit.}$  [1/min] from the graph. The spindle size and the length  $L_n$  [mm] is required.

3. Determination of the permitted spindle speed  $n_{perm.}$  [1/min]:

$$n_{perm.} \text{ [1/min]} = 0,8 \cdot n_{crit.} \text{ [1/min]} \cdot f_n \text{ [-]}$$

4. The permitted spindle speed  $n_{perm.}$  [1/min] must be greater than the actual spindle speed  $n_2$  [1/min]:

$$n_{perm.} > n_2$$



## Calculations

### Torque in the lifting spindle $M_{sp}$ . [Nm]

The torque in the lifting spindle  $M_{sp}$ . [Nm], refers to the torque which the spindle applies to the mounting flange or clevis in versions S and SA.

For version R, the torque in the lifting spindle,  $M_{sp}$ . [Nm], refers to the torque which the spindle applies to the running nut.

$$M_{sp}. [Nm] = F_{eff}. [kN] \cdot f_H [mm]$$

| Trapezoidal spindle | $f_H$ [mm]              |                             |
|---------------------|-------------------------|-----------------------------|
|                     | $\mu=0,1$<br>lubricated | $\mu=0,3$<br>not lubricated |
| Tr 16x4             | 1,40                    | 2,97                        |
| Tr 18x4             | 1,51                    | 3,29                        |
| Tr 20x4             | 1,61                    | 3,61                        |
| Tr 24x5             | 1,96                    | 4,35                        |
| Tr 30x6             | 2,42                    | 10,21                       |
| Tr 40x7             | 3,09                    | 7,11                        |
| Tr 60x9             | 4,43                    | 10,51                       |
| Tr 70x10            | 5,10                    | 12,22                       |
| Tr 90x12            | 6,44                    | 15,62                       |
| Tr 100x12           | 6,97                    | 17,22                       |
| Tr 120x14           | 8,31                    | 20,63                       |

### Braking torque $M_{br}$ . [Nm]

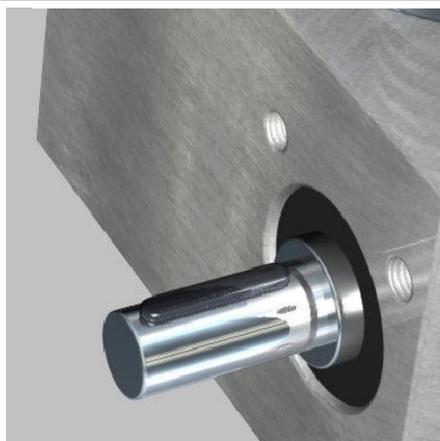
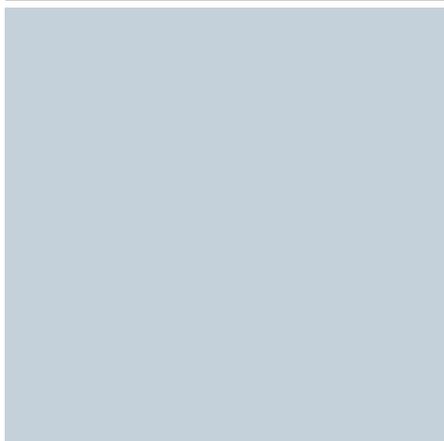
Ball screw spindles (KGS) and depending on the lead, certain trapezoidal spindles (Tr), are not self locking. It is therefore necessary, in such cases, to specify a brake motor. The required braking torque can be calculated as follows:

$$M_{br}. [Nm] = \frac{F_{eff}. [kN] \cdot P [mm] \cdot \eta_{tot}. [-]}{2 \cdot \pi \cdot i [-]}$$

| Ball screw spindle | $f_H$ [mm] |
|--------------------|------------|
| KGS 12x5           | 1,6        |
| KGS 16x5           | 1,6        |
| KGS 20x5           | 1,6        |
| KGS 25x5           | 1,6        |
| KGS 25x10          | 3,2        |
| KGS 32x5           | 1,6        |
| KGS 32x10          | 3,2        |
| KGS 32x20          | 6,4        |
| KGS 40x5           | 1,6        |
| KGS 40x10          | 3,2        |
| KGS 40x20          | 6,4        |
| KGS 50x5           | 1,6        |
| KGS 63x10          | 3,2        |
| KGS 63x20          | 6,4        |
| KGS 80x10          | 3,2        |
| KGS 80x20          | 6,4        |

#### Explanation:

|                |      |                                                                             |
|----------------|------|-----------------------------------------------------------------------------|
| $M_{sp}$ .     | [Nm] | torque in the lifting spindle                                               |
| $F_{eff}$ .    | [kN] | effective lifting load of the screw jack                                    |
| $M_{br}$ .     | [Nm] | braking torque                                                              |
| $f_H$          | [mm] | factor to compensate for spindle geometry and frictional losses (see table) |
| $\eta_{tot}$ . | [-]  | total working efficiency (see table page 135)                               |
| P              | [mm] | pitch of spindle                                                            |
| i              | [-]  | screw jack ratio                                                            |



# Calculations

## Input torque $M_{in}$ . [Nm] for each screw jack

To facilitate calculation of the required input torque  $M_{in}$ . [Nm] use factor  $f_M$  [mm]. This compensates for the overall efficiency  $\eta_{tot}$ . [-], the spindle pitch  $P$  [mm] and the ratio  $i$  [-].

$$M_{in} \text{ [Nm]} = F_{eff} \text{ [kN]} \cdot f_M \text{ [mm]} + M_0 \text{ [Nm]}$$

Determination of the factor  $f_M$  [mm]:

$$f_M \text{ [mm]} = \frac{P \text{ [mm]}}{2 \cdot \pi \cdot \eta_{tot} \text{ [-]} \cdot i \text{ [-]}}$$

### Explanation:

|              |      |                                                 |
|--------------|------|-------------------------------------------------|
| $M_{in}$     | [Nm] | input torque                                    |
| $F_{eff}$    | [kN] | effective lifting load of the screw jack        |
| $f_M$        | [mm] | factor for all standard screw jacks (see table) |
| $M_0$        | [Nm] | no load torque (see table)                      |
| $P$          | [mm] | spindle pitch                                   |
| $\eta_{tot}$ | [-]  | total working efficiency                        |
| $i$          | [-]  | screw jack ratio                                |

| KSH-1 - KSH-3 |       |             |            |            |                  |
|---------------|-------|-------------|------------|------------|------------------|
| Order code    | i [-] | Typ d x P   | $f_M$ [mm] | $M_0$ [Nm] | $\eta_{tot}$ [-] |
| KSH-1 2:1     | 2     | Tr 24 x 5   | 1,16       | 1,70       | 0,34             |
| KSH-1 2:1     | 2     | KGS 25 x 5  | 0,55       | 1,60       | 0,72             |
| KSH-1 2:1     | 2     | KGS 25 x 10 | 1,11       | 1,60       | 0,72             |
| KSH-1 3:1     | 3     | Tr 24 x 5   | 0,79       | 1,60       | 0,33             |
| KSH-1 3:1     | 3     | KGS 25 x 5  | 0,38       | 1,50       | 0,70             |
| KSH-1 3:1     | 3     | KGS 25 x 10 | 0,75       | 1,50       | 0,70             |
| KSH-2 2:1     | 2     | Tr 40 x 7   | 1,67       | 2,20       | 0,33             |
| KSH-2 2:1     | 2     | KGS 32 x 10 | 1,11       | 2,10       | 0,72             |
| KSH-2 2:1     | 2     | KGS 32 x 20 | 2,21       | 2,10       | 0,72             |
| KSH-2 2:1     | 2     | KGS 40 x 5  | 0,55       | 2,10       | 0,72             |
| KSH-2 2:1     | 2     | KGS 40 x 10 | 1,11       | 2,10       | 0,72             |
| KSH-2 2:1     | 2     | KGS 40 x 20 | 2,21       | 2,10       | 0,72             |
| KSH-2 3:1     | 3     | Tr 40 x 7   | 1,14       | 2,10       | 0,33             |
| KSH-2 3:1     | 3     | KGS 32 x 10 | 0,75       | 2,00       | 0,70             |
| KSH-2 3:1     | 3     | KGS 32 x 20 | 1,51       | 2,00       | 0,70             |
| KSH-2 3:1     | 3     | KGS 40 x 5  | 0,38       | 2,00       | 0,70             |
| KSH-2 3:1     | 3     | KGS 40 x 10 | 0,75       | 2,00       | 0,70             |
| KSH-2 3:1     | 3     | KGS 40 x 20 | 1,51       | 2,00       | 0,70             |
| KSH-3 2:1     | 2     | Tr 60 x 9   | 2,41       | 4,20       | 0,30             |
| KSH-3 2:1     | 2     | KGS 63 x 10 | 1,11       | 4,10       | 0,72             |
| KSH-3 2:1     | 2     | KGS 63 x 20 | 2,21       | 4,10       | 0,72             |
| KSH-3 3:1     | 3     | Tr 60 x 9   | 1,64       | 4,10       | 0,29             |
| KSH-3 3:1     | 3     | KGS 63 x 10 | 0,75       | 4,10       | 0,70             |
| KSH-3 3:1     | 3     | KGS 63 x 20 | 1,51       | 4,10       | 0,70             |

| HSG-0 - HSG-500 |       |             |            |            |                  |
|-----------------|-------|-------------|------------|------------|------------------|
| Order code      | i [-] | Typ d x P   | $f_M$ [mm] | $M_0$ [Nm] | $\eta_{tot}$ [-] |
| HSG-0-N         | 4     | Tr 16 x 4   | 0,46       | 0,03       | 0,35             |
| HSG-0-N         | 4     | KGS 12 x 5  | 0,33       | 0,02       | 0,61             |
| HSG-0-L         | 16    | Tr 16 x 4   | 0,12       | 0,02       | 0,32             |
| HSG-0-L         | 16    | KGS 12 x 4  | 0,06       | 0,02       | 0,63             |
| HSG-1-N         | 4     | Tr 18 x 4   | 0,49       | 0,04       | 0,32             |
| HSG-1-N         | 4     | KGS 12 x 4  | 0,26       | 0,04       | 0,62             |
| HSG-1-N         | 4     | KGS 16 x 5  | 0,32       | 0,04       | 0,62             |
| HSG-1-L         | 16    | Tr 18 x 4   | 0,15       | 0,04       | 0,27             |
| HSG-1-L         | 16    | KGS 12 x 5  | 0,10       | 0,03       | 0,52             |
| HSG-1-L         | 16    | KGS 16 x 5  | 0,10       | 0,03       | 0,52             |
| HSG-2-N         | 4     | Tr 20 x 4   | 0,52       | 0,12       | 0,31             |
| HSG-2-N         | 4     | KGS 16 x 5  | 0,32       | 0,11       | 0,62             |
| HSG-2-N         | 4     | KGS 20 x 5  | 0,32       | 0,11       | 0,62             |
| HSG-2-N         | 4     | KGS 25 x 10 | 0,65       | 0,11       | 0,62             |
| HSG-2-L         | 16    | Tr 20 x 4   | 0,15       | 0,11       | 0,26             |
| HSG-2-L         | 16    | KGS 16 x 5  | 0,10       | 0,10       | 0,52             |
| HSG-2-L         | 16    | KGS 20 x 5  | 0,10       | 0,10       | 0,52             |
| HSG-2-L         | 16    | KGS 25 x 10 | 0,19       | 0,10       | 0,52             |
| HSG-3-N         | 6     | Tr 30 x 6   | 0,55       | 0,16       | 0,29             |
| HSG-3-N         | 6     | KGS 25 x 5  | 0,23       | 0,15       | 0,58             |
| HSG-3-N         | 6     | KGS 25 x 10 | 0,46       | 0,15       | 0,58             |
| HSG-3-N         | 6     | KGS 32 x 5  | 0,32       | 0,15       | 0,58             |
| HSG-3-N         | 6     | KGS 32 x 10 | 0,46       | 0,15       | 0,58             |
| HSG-3-L         | 24    | Tr 30 x 6   | 0,17       | 0,14       | 0,24             |
| HSG-3-L         | 24    | KGS 25 x 5  | 0,07       | 0,14       | 0,48             |
| HSG-3-L         | 24    | KGS 25 x 10 | 0,14       | 0,14       | 0,48             |
| HSG-3-L         | 24    | KGS 32 x 5  | 0,07       | 0,14       | 0,48             |
| HSG-3-L         | 24    | KGS 32 x 10 | 0,14       | 0,14       | 0,48             |
| HSG-4-N         | 7     | Tr 40 x 7   | 0,58       | 0,37       | 0,27             |
| HSG-4-N         | 7     | KGS 32 x 5  | 0,19       | 0,35       | 0,59             |
| HSG-4-N         | 7     | KGS 32 x 10 | 0,38       | 0,35       | 0,59             |
| HSG-4-N         | 7     | KGS 40 x 5  | 0,19       | 0,35       | 0,59             |
| HSG-4-N         | 7     | KGS 40 x 10 | 0,38       | 0,35       | 0,59             |
| HSG-4-L         | 28    | Tr 40 x 7   | 0,19       | 0,26       | 0,21             |
| HSG-4-L         | 28    | KGS 32 x 5  | 0,06       | 0,25       | 0,46             |
| HSG-4-L         | 28    | KGS 32 x 10 | 0,12       | 0,25       | 0,46             |
| HSG-4-L         | 28    | KGS 40 x 5  | 0,06       | 0,25       | 0,46             |
| HSG-4-L         | 28    | KGS 40 x 10 | 0,12       | 0,25       | 0,46             |
| HSG-5-N         | 9     | Tr 60 x 9   | 0,73       | 0,90       | 0,22             |
| HSG-5-N         | 9     | KGS 40 x 5  | 0,17       | 0,85       | 0,53             |
| HSG-5-N         | 9     | KGS 40 x 10 | 0,33       | 0,85       | 0,53             |
| HSG-5-N         | 9     | KGS 50 x 5  | 0,17       | 0,85       | 0,53             |
| HSG-5-N         | 9     | KGS 50 x 10 | 0,33       | 0,85       | 0,53             |
| HSG-5-N         | 9     | KGS 63 x 10 | 0,33       | 0,85       | 0,53             |
| HSG-5-N         | 9     | KGS 63 x 20 | 0,67       | 0,85       | 0,53             |
| HSG-5-L         | 36    | Tr 60 x 9   | 0,23       | 0,55       | 0,17             |
| HSG-5-L         | 36    | KGS 40 x 5  | 0,05       | 0,51       | 0,42             |
| HSG-5-L         | 36    | KGS 40 x 10 | 0,11       | 0,51       | 0,42             |
| HSG-5-L         | 36    | KGS 50 x 5  | 0,05       | 0,51       | 0,42             |
| HSG-5-L         | 36    | KGS 50 x 10 | 0,11       | 0,51       | 0,42             |
| HSG-5-L         | 36    | KGS 63 x 10 | 0,11       | 0,51       | 0,42             |
| HSG-5-L         | 36    | KGS 63 x 20 | 0,21       | 0,51       | 0,42             |
| HSG-200-N       | 10    | Tr 70 x 10  | 0,77       | 1,30       | 0,21             |
| HSG-200-N       | 10    | KGS 80 x 10 | 0,31       | 1,15       | 0,52             |
| HSG-200-N       | 10    | KGS 80 x 20 | 0,61       | 1,15       | 0,52             |
| HSG-200-L       | 40    | Tr 70 x 10  | 0,24       | 0,96       | 0,17             |
| HSG-200-L       | 40    | KGS 80 x 10 | 0,10       | 0,90       | 0,42             |
| HSG-200-L       | 40    | KGS 80 x 20 | 0,19       | 0,90       | 0,42             |
| HSG-300-N       | 12    | Tr 90 x 12  | 0,87       | 1,50       | 0,18             |
| HSG-300-L       | 48    | Tr 90 x 12  | 0,27       | 1,10       | 0,15             |
| HSG-400-N       | 12    | Tr100 x 12  | 1,03       | 1,72       | 0,16             |
| HSG-400-L       | 48    | Tr100 x 12  | 0,29       | 1,31       | 0,14             |
| HSG-500-N       | 14    | Tr120 x 14  | 1,00       | 2,10       | 0,16             |
| HSG-500-L       | 56    | Tr120 x 14  | 0,29       | 1,69       | 0,14             |



## Calculations

### Total input torque $M_{tot.}$ [Nm]

The total torque  $M_{tot.}$  [Nm] required for the system comprises the lifting load torque, plus losses due to flexible couplings, cardans, support bearings and bevel gearboxes.

The following example shows the derivation of the total torque  $M_{tot.}$  [Nm].

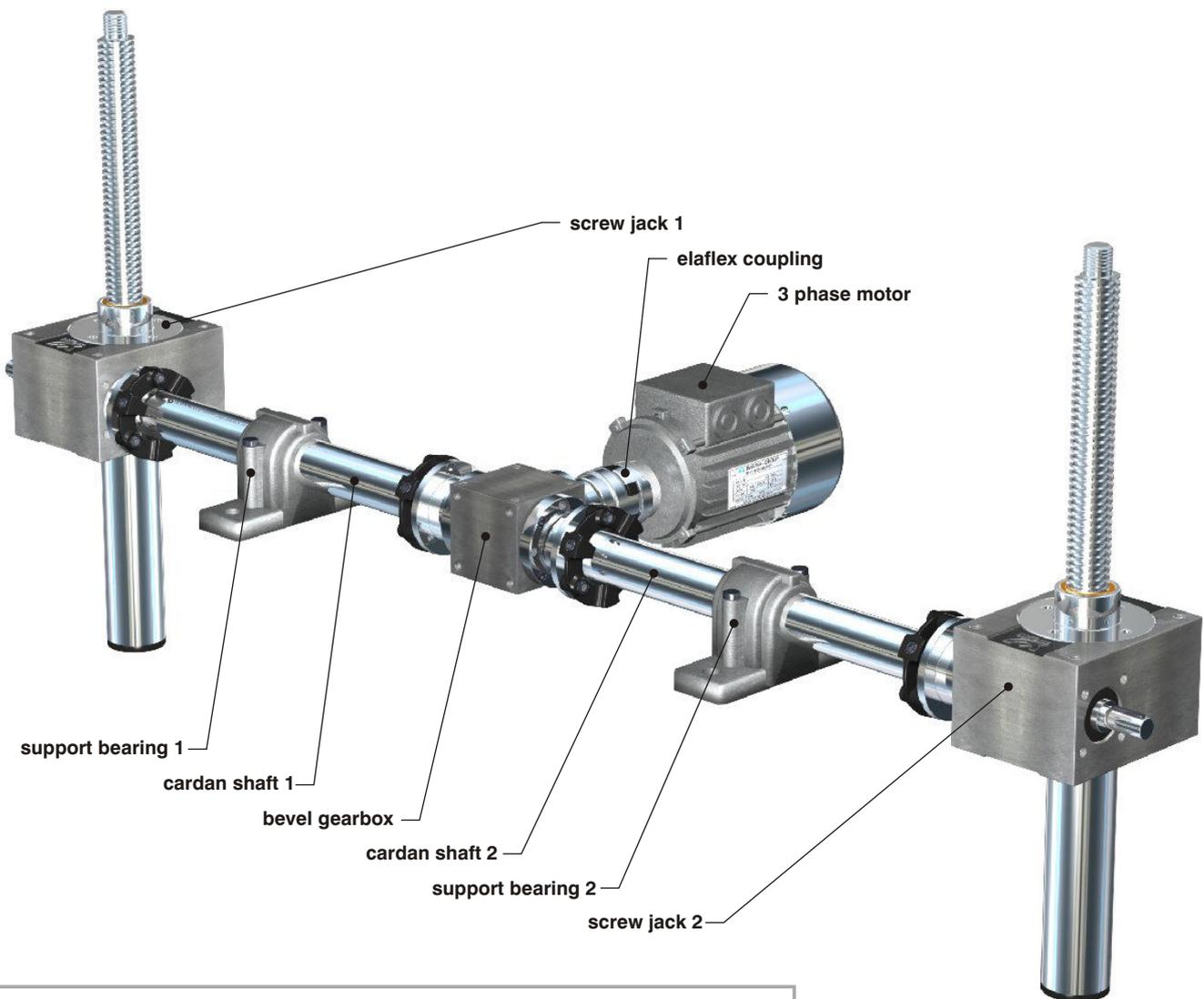
$$M_{tot.} = \left( \frac{M_{in.1}}{\eta_{\text{cardan shaft}}} + \frac{M_{in.2}}{\eta_{\text{cardan shaft}}} \right) \cdot \frac{1}{\eta_k}$$

**Note:**

If a bevel gearbox with a ratio  $i_k$  [-] of greater than 1 is used then the torque and input speed must be modified accordingly.

**Important:**

The breakaway torque of the system can be considerably higher than the calculated input torque. This applies particularly to systems with poor efficiency and long idle periods.



**Explanation:**

|                              |      |                                                                                                                               |
|------------------------------|------|-------------------------------------------------------------------------------------------------------------------------------|
| $M_{tot.}$                   | [Nm] | total input torque                                                                                                            |
| $M_{in.1}$                   | [Nm] | input torque for screw jack 1                                                                                                 |
| $M_{in.2}$                   | [Nm] | input torque for screw jack 2                                                                                                 |
| $\eta_{\text{cardan shaft}}$ | [-]  | efficiency of cardan shaft with support bearing (dependent on the length and the number of support bearings ca. 0.75 to 0.95) |
| $\eta_k$                     | [-]  | efficiency of bevel gearbox (ca. 0.9)                                                                                         |

## Calculations

### Input speed $n_{in}$ . [1/min]

The necessary input speed  $n_{in}$ . [1/min] for a specified lifting speed  $V_{lift}$  [m/min] is determined as follows:

$$n_{in} \text{ [1/min]} = \frac{V_{lift} \text{ [m/min]} \cdot 1000}{P \text{ [mm]}} \cdot i \text{ [-]}$$

**Important:**

The input speed should not exceed the maximum allowable.

**HSG:**  $n_{in, max} = 1500$  1/min

**KSH:**  $n_{in, max} = 3000$  1/min

### Input power $P_{in}$ . [kW]

The required input power  $P_{in}$ . [kW] for a specified lifting system is determined as follows:

$$P_{in} \text{ [kW]} = \frac{M_{tot} \text{ [Nm]} \cdot n_{in} \text{ [1/min]}}{9550}$$

## Selection of the motor

The required motor can be selected from the input power  $P_{in}$ . [kW] and the input speed  $n_{in}$ . [1/min].

**Notes about motor selection:**

- The motor power selected should be adequate to overcome the break away torque of the system which can be considerably higher than the calculated input torque. This relates particularly to systems where there is poor efficiency and long idle periods.
- Following selection of the drive motor it should be checked whether the transmission elements and the screw jacks may be overloaded by the selected motor. For maximum input torque  $M_{max}$ . [Nm] see the adjacent table.
- When using ball screw spindles (KGS) and, depending on the lead certain trapezoidal spindles (Tr), it is necessary to specify a Brake Motor since these systems are not self locking.
- In conditions of heavy vibration the self locking capability of some screw jacks can no longer be guaranteed. In such cases, or where it is possible that such vibration may occur, a brake motor must be specified.
- To minimise the possibility of damage to the screw jack system, end of travel limit switches should be fitted. E.g. limit switch with roller follower or inductive proximity switch.

### Actual lifting speed $V_{lift act}$ . [m/min]

In most cases the required input speed differs from the motor speed.

The actual lifting speed  $V_{lift act}$ . [m/min], which will be achieved based on motor speed  $n_{motor}$ . [1/min] is calculated as follows:

$$V_{lift act} \text{ [m/min]} = \frac{n_{motor} \text{ [1/min]} \cdot P \text{ [mm]}}{1000 \cdot i \text{ [-]}}$$

**Explanation:**

|                |         |                        |
|----------------|---------|------------------------|
| $n_{in}$       | [1/min] | input speed            |
| $V_{lift}$     | [m/min] | required lifting speed |
| P              | [mm]    | spindle pitch          |
| i              | [-]     | screw jack ratio       |
| $P_{in}$       | [kW]    | input power            |
| $M_{tot}$      | [Nm]    | total input torque     |
| $V_{lift act}$ | [m/min] | actual lifting speed   |
| $n_{motor}$    | [1/min] | motor speed            |

### Maximum input torques $M_{max}$ . [Nm]

### Maximum radial load on the screw jack input shaft $F_{r max}$ [kN]

| Order code  | $M_{max}$ [Nm] | $F_{r max}$ [kN] |
|-------------|----------------|------------------|
| HSG-0       | 1,5            | 0,07             |
| HSG-1       | 3,4            | 0,1              |
| HSG-2       | 7,1            | 0,2              |
| HSG-3       | 18             | 0,3              |
| HSG-4       | 38             | 0,5              |
| HSG-5       | 93             | 0,8              |
| HSG-200     | 178            | 1,3              |
| HSG-300     | 280            | 1,5              |
| HSG-400     | 390            | 2,3              |
| HSG-500     | 570            | 3,1              |
| KSH-1 / 2:1 | 16             | 0,3              |
| KSH-1 / 3:1 | 12             | 0,3              |
| KSH-2 / 2:1 | 60             | 0,6              |
| KSH-2 / 3:1 | 40             | 0,6              |
| KSH-3 / 2:1 | 200            | 2,5              |
| KSH-3 / 3:1 | 135            | 2,5              |



# Gear housing material

## Selection table

Gear housings for INKOMA-screw jacks are manufactured from the best possible materials. Alongside the standard materials there are a number of other options.

If the adjacent table does not contain the material you require, please ask.

- - standard
- - option
- - not possible

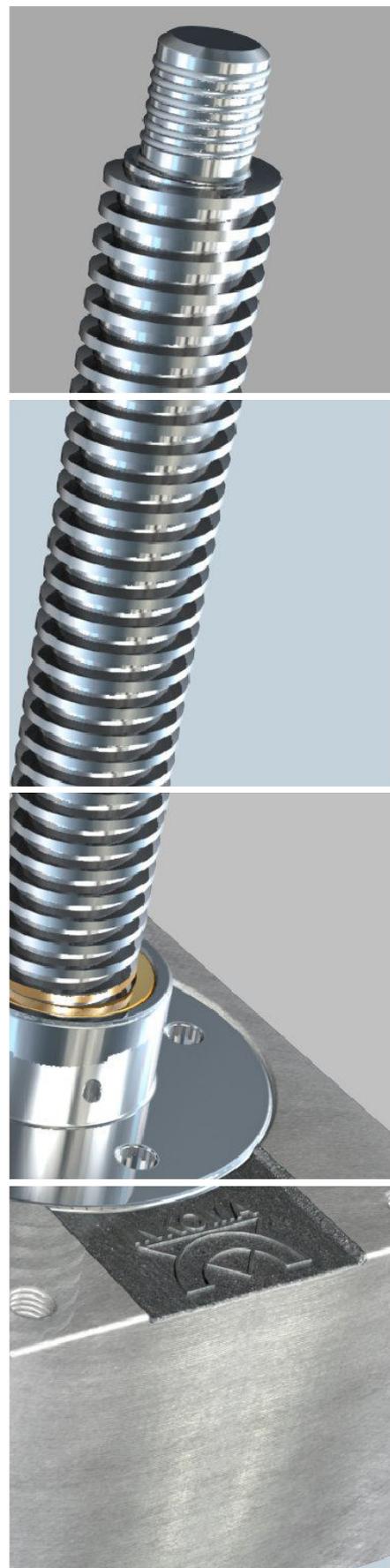
| Screw jack size | Al<br>1) | GG<br>2) | Inox / VA<br>3) | St<br>4) |
|-----------------|----------|----------|-----------------|----------|
| HSG - 0         | ●        | —        | ○               | —        |
| HSG - 1         | ○        | ●        | ○               | —        |
| HSG - 2         | ○        | ●        | ○               | —        |
| HSG - 3         | ○        | ●        | ○               | —        |
| HSG - 4         | ○        | ●        | ○               | —        |
| HSG - 5         | —        | ●        | ○               | —        |
| HSG - 200       | —        | ●        | ○               | —        |
| HSG - 300       | —        | ○        | ○               | ●        |
| HSG - 400       | —        | ○        | ○               | ●        |
| HSG - 500       | —        | ○        | ○               | ●        |
|                 |          |          |                 |          |
| KSH - 1         | —        | ●        | —               | —        |
| KSH - 2         | —        | ●        | —               | —        |
| KSH - 3         | —        | ●        | —               | —        |

1) AlCuMgPb F34

2) HSG 1-5 GG-28, HSG -200 GGG-40, KSH-1, KSH-2, KSH-3 GG-25

3) 1.4305

4) St 52-3



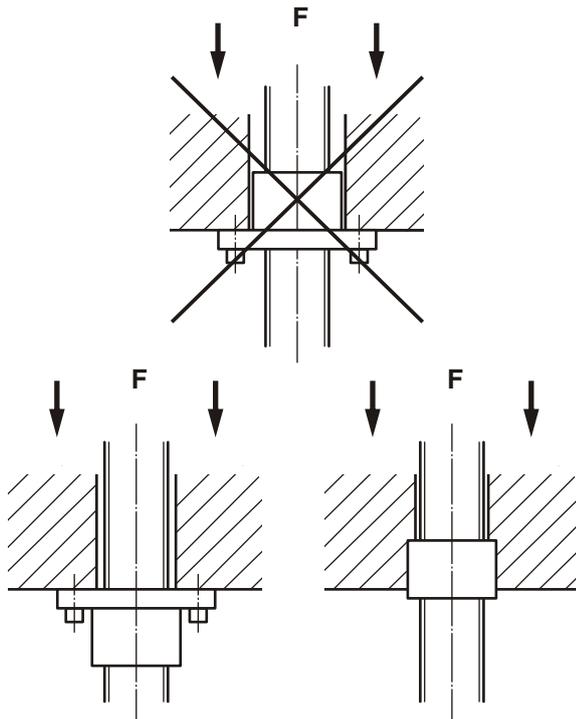
# Installation and maintenance

## Assembly

To achieve the simplest installation, machined mounting surfaces with adequately dimensioned tapped holes should be provided.

### Important:

It should be ensured, wherever possible, that spindle nut fixing screws are compressively loaded.



The screw jack should be aligned using a spirit level. Parallel alignment between the lifting system and the guide mechanism must be carefully checked.

Screw jacks systems should be checked for twisting and for tight spots. To check this the lifting system should be actuated by hand over the entire stroke. The force required should be light and even.

The direction of rotation of the individual screw jacks should carefully checked.

Before test running the spindle(s) must be cleaned and if possible sprayed with an aerosol grease lubricant over the entire stroke length.

### When test running:

1. Check the function and position of any limit switches.
2. Test the lifting system initially without load if possible.
3. Increase the load incrementally, checking for any hot spots and for gearbox temperature rise.
4. Check the tightness of all screwed connections.

### Important:

Do not exceed the permitted loads, duty and input speeds.

Failure to observe this will invalidate your guarantee.

## Maintenance of HSG-0 to HSG-5

The spindle should be regularly cleaned and re-lubricated. Every 700 operating hours or every 18 months the grease in the gear housing should be replaced.

1. Dismount the screw jack and clean
2. Disassemble the spindle and spindle protection tube (only for translating spindle)
3. Remove locking screw for gear housing cover
4. Wash out the gear housing and components with a suitable wash medium
5. Refill with **grease** according to the adjacent table

When maintaining the screw jack the wear on the spindle should also be checked.

In addition the clearance between the spindle and nut should be checked. The limiting values for clearance are shown in the table.

If the limiting value is exceeded the screw jack must be overhauled. Return to our factory for repair may be necessary. After checking, re-assemble the unit in reverse order. The bearing cover should be tightened then loosened. Then the **tightening torque** shown in the table should be applied to the bearing cover. Check that the screw jack can be rotated easily and without axial clearance.

| Order code | Grease quantity [kg] | max. axial play [mm] | Tightening torque <sup>1)</sup> [Nm] |
|------------|----------------------|----------------------|--------------------------------------|
| HSG-0      | 0,012                | 0,8                  | 3                                    |
| HSG-1      | 0,05                 | 1                    | 5                                    |
| HSG-2      | 0,09                 | 1                    | 9                                    |
| HSG-3      | 0,14                 | 1,5                  | 13                                   |
| HSG-4      | 0,45                 | 1,75                 | 32                                   |
| HSG-5      | 0,72                 | 2,25                 | 60                                   |

<sup>1)</sup> Bearing cover assembly

### Recommended greases:

The screw jack is supplied with Klüber MICROLUBE GB 0. The following greases are also suitable:

- DEA Orona FGEP0
- ESSO Fibrax EP 370
- Molycote LM 770/0



# Questionnaire

## for quotation purposes

Our checklist can be found on our homepage  
**www.INKOMA-GROUP.com**  
Category: Screw jacks / HSG screw jack  
Please either complete this online or download this as a word document.

Company: .....

Department: ..... Contact: .....

Date: ..... Tel.: ..... Fax: .....

Address: .....

Project: .....

**Loads:**

No. of screw jacks in system: .....

| Axial load       |              |             |              |             |
|------------------|--------------|-------------|--------------|-------------|
|                  | Total system |             | Per spindle  |             |
|                  | dynamic [kN] | static [kN] | dynamic [kN] | static [kN] |
| Compressive load |              |             |              |             |
| Tensile load     |              |             |              |             |

**Type of loading:**

steady  oscillating  shock  increasing  vibrating

**Stroke:**

Stroke length [mm]: ..... Lifting speed [m/min]: .....

**Application information:**

|                          |                               |                               |                             |                                |
|--------------------------|-------------------------------|-------------------------------|-----------------------------|--------------------------------|
| Usage per day in hours   | <input type="checkbox"/> 8    | <input type="checkbox"/> 16   | <input type="checkbox"/> 24 | <input type="checkbox"/> ..... |
| Working cycle: actual in | <input type="checkbox"/> sec. | <input type="checkbox"/> min. |                             |                                |
| Lifting                  |                               |                               |                             |                                |
| Lowering                 |                               |                               |                             |                                |
| Idle                     |                               |                               |                             |                                |
| Total cycle time         |                               |                               |                             |                                |
| ED per cycle in %        |                               |                               |                             |                                |
| Cycles per working day   |                               |                               |                             |                                |

**Example:**

|                          |                                          |                               |                             |                                |
|--------------------------|------------------------------------------|-------------------------------|-----------------------------|--------------------------------|
| Usage per day in hours   | <input type="checkbox"/> 8               | <input type="checkbox"/> 16   | <input type="checkbox"/> 24 | <input type="checkbox"/> ..... |
| Working cycle: actual in | <input checked="" type="checkbox"/> sec. | <input type="checkbox"/> min. |                             |                                |
| Lifting                  | 4                                        |                               |                             | 4                              |
| Lowering                 |                                          | 2                             | 2                           | 4                              |
| Idle                     | 10                                       | 10                            | 12                          | 32                             |
| Total cycle time         |                                          |                               |                             | 40                             |
| ED per cycle in %        |                                          |                               |                             | 20                             |
| Cycles per working day   |                                          |                               |                             | 10                             |

**Operational conditions:**

Environmental temperature from °C ..... to °C .....

dry  humid  dusty (define material): .....  other effects: .....

**Details about the planned location and attitude**

Attitude:  vertical  horizontal  inverted

Spindle guidance:  without guidance  with guidance

**Requirements:**

Number of sets: ..... Quantity per year: .....

Required delivery: .....

**Accessories:** Please indicate the accessories required on the next page!

**For the best design please provide a drawing!**

# Questionnaire

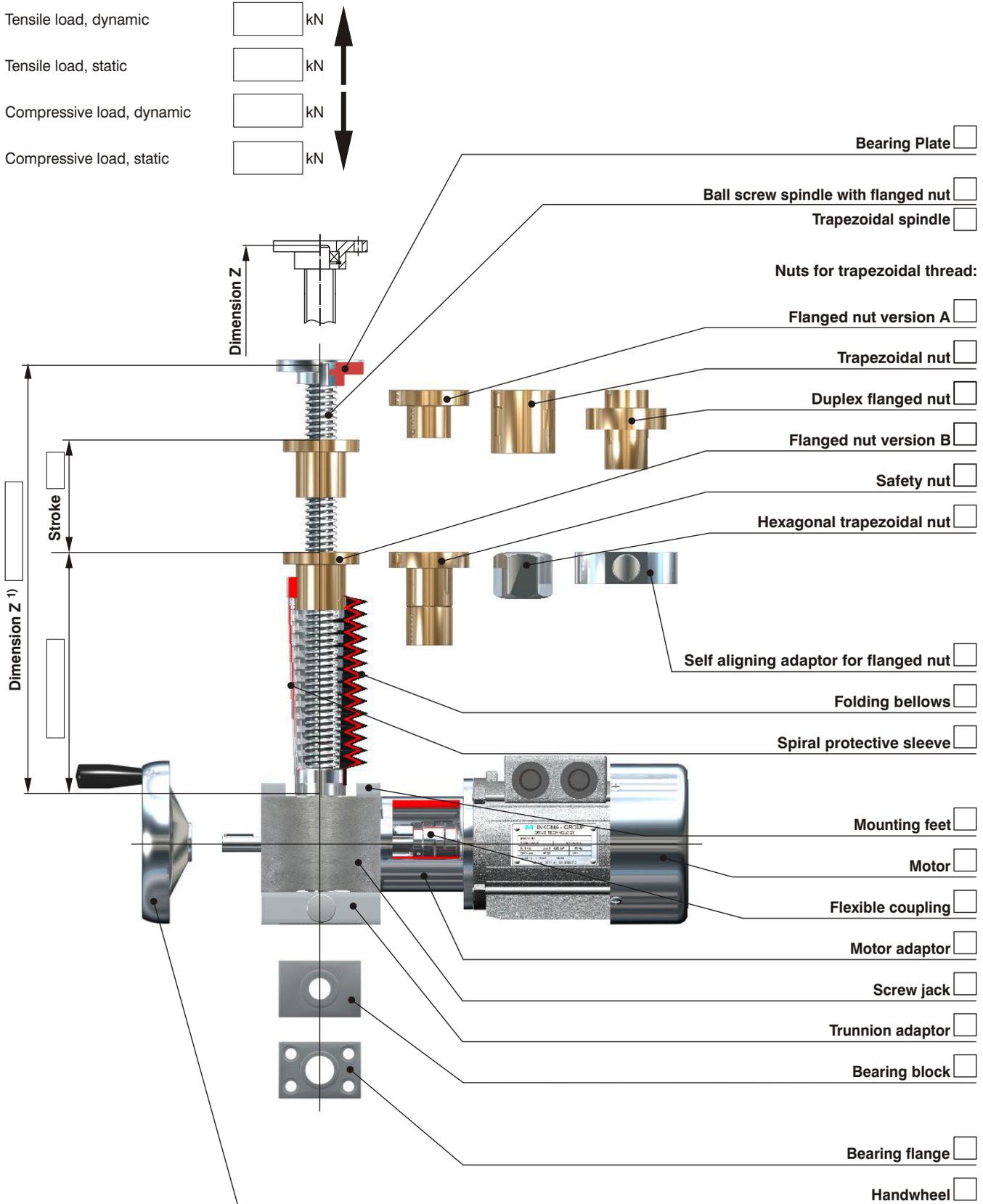
## Accessories for rotating version (R)

Tensile load, dynamic  kN 

Tensile load, static  kN 

Compressive load, dynamic  kN 

Compressive load, static  kN 



**Dimension Z**

**Stroke**

**Dimension Z<sup>1)</sup>**

**Bearing Plate**

**Ball screw spindle with flanged nut**

**Trapezoidal spindle**

**Nuts for trapezoidal thread:**

**Flanged nut version A**

**Trapezoidal nut**

**Duplex flanged nut**

**Flanged nut version B**

**Safety nut**

**Hexagonal trapezoidal nut**

**Self aligning adaptor for flanged nut**

**Folding bellows**

**Spiral protective sleeve**

**Mounting feet**

**Motor**

**Flexible coupling**

**Motor adaptor**

**Screw jack**

**Trunnion adaptor**

**Bearing block**

**Bearing flange**

**Handwheel**

<sup>1)</sup> Dimension Z= Distance from the housing upper surface to the spindle end (1-2 mm allowance from mounting face).



# Questionnaire

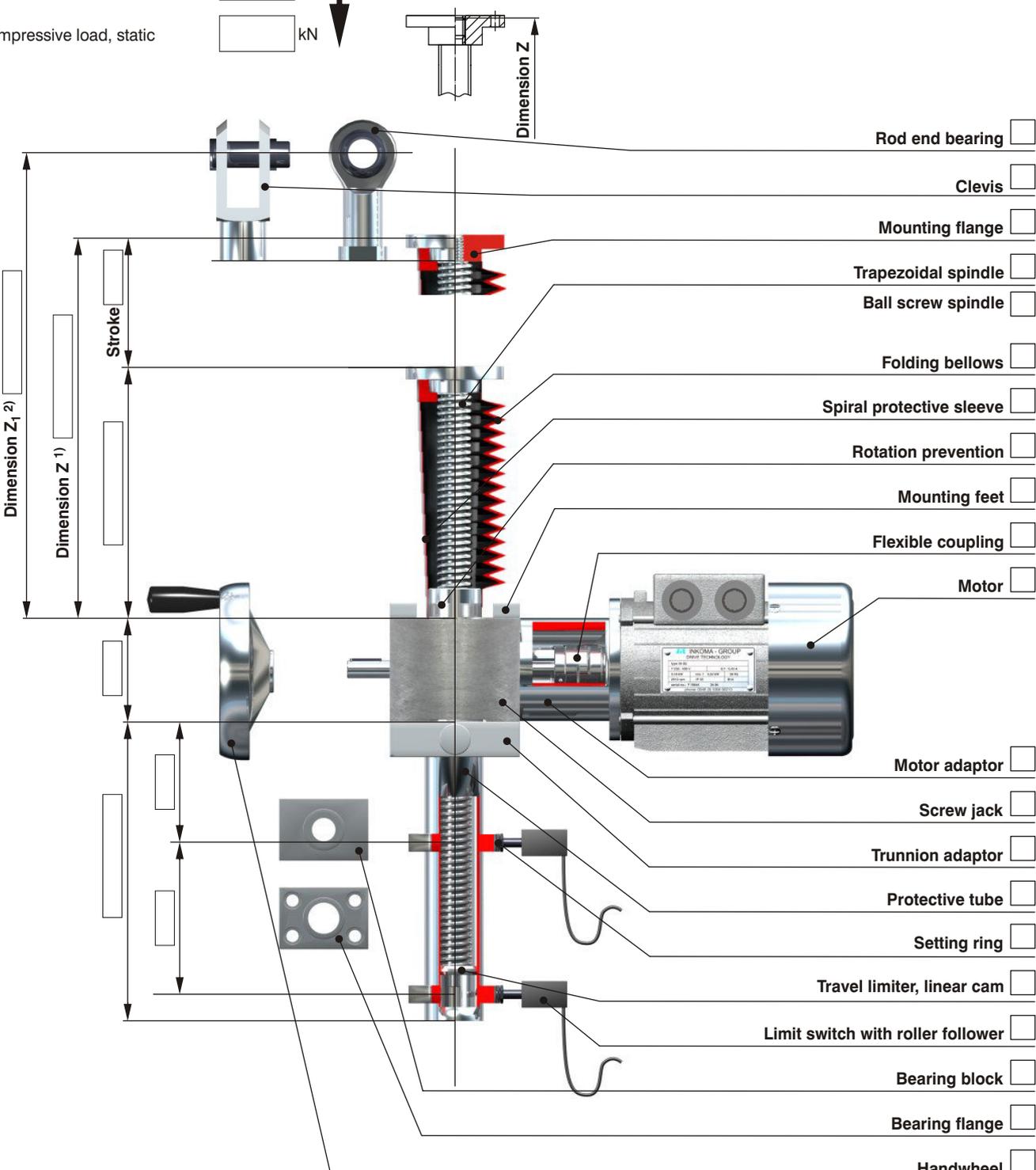
## Accessories for translating version (S, SA, SV, SVA)

Tensile load, dynamic  kN 

Tensile load, static  kN 

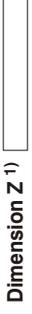
Compressive load, dynamic  kN 

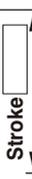
Compressive load, static  kN 



Dimension Z 

Dimension Z<sub>1</sub><sup>2)</sup> 

Dimension Z<sub>1</sub><sup>1)</sup> 

Stroke 

Rod end bearing

Clevis

Mounting flange

Trapezoidal spindle

Ball screw spindle

Folding bellows

Spiral protective sleeve

Rotation prevention

Mounting feet

Flexible coupling

Motor

Motor adaptor

Screw jack

Trunnion adaptor

Protective tube

Setting ring

Travel limiter, linear cam

Limit switch with roller follower

Bearing block

Bearing flange

Handwheel

1) Dimension Z = Distance from the housing upper surface to the spindle end (1-2 mm allowance from mounting face).  
2) Dimension Z<sub>1</sub> = Gear housing upper surface to centre line of connecting link