



T-Series Precision Linear Actuators

Installation and Service Manual

DW110353GB-1018 - EDITION 5

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Version History

| Edition Number | Edition Date | Reason for Revision |
|----------------|--------------|--|
| 1 | 2004 | First edition |
| 2 | 2005-02-10 | Updated with new T90 versions |
| 3 | 2006-05-19 | Figure numbering corrected |
| 4 | 2007-04-17 | Lubrication instructions updated |
| 5 | 2010-05-05 | T60 and T130 with 50 diameter screw added, style updated |

Technical changes to improve the performance of the equipment may be made without notice!

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1. Type designation system

| T60, T90 and T130 | | | | | |
|--|------|---|--|-----|----|
| 1 | 2 | 3 | 4 | 5 | 6 |
| T09-B | 2525 | M | P | 045 | S1 |
| <p>1. Model T06-B = T60 unit T09-B = T90 unit T13-B = T130 unit</p> <p>2. Ball screw diameter, lead and tolerance class 2505 = 25 mm, 05 mm, T7 (only possible for T06-B and T09-B) 2510 = 25 mm, 10 mm, T7 (only possible for T06-B and T09-B) 2525 = 25 mm, 25 mm, T7 (only possible for T06-B and T09-B) 2550 = 25 mm, 50 mm, T7 (only possible for T06-B) 3220 = 32 mm, 20 mm, T7 (only possible for T09-B) 3232 = 32 mm, 32 mm, T7 (only possible for T09-B) 4010 = 40 mm, 10 mm, T7 (only possible for T13-B) 4020 = 40 mm, 20 mm, T7 (only possible for T13-B) 4040 = 40 mm, 40 mm, T7 (only possible for T13-B) 5010 = 50 mm, 10 mm, T7 (only possible for T13-B)</p> <p>3. Engineering unit M = metric</p> | | | <p>4. Type of adapter N = M16 × 1,5 outside thread (only possible for T06-B25 ** and T09-B25 **) P = M16 × 2 inside thread (only possible for T09-B25 **) Q = M20 × 1,5 outside thread (only possible for T09-B32 **) R = M20 × 1,5 inside thread (only possible for T09-B32 **) S = M27 × 2 outside thread (only possible for T13-B40 **) T = M27 × 2 inside thread (only possible for T13-B40 **) U = M33 × 2 outside thread (only possible for T13-B40 ** and T13-B5010) V = M33 × 2 inside thread (only possible for T13-B40 ** and T13-B5010) X = M30 × 2 inside thread (only possible for T13-B40 **)</p> <p>5. Ordering length (L order) *** = distance in cm</p> <p>6. Protection option¹ S1 = wash down protection</p> <p>¹ Leave blank if no protection option required.</p> | | |

Table 1: Type designation system

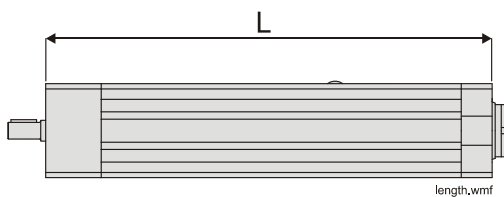
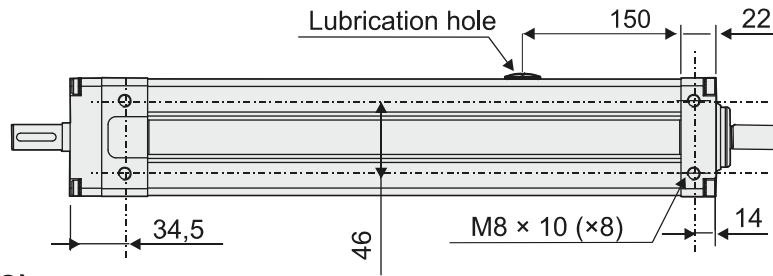
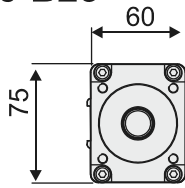


Figure 1: definition of ordering length L

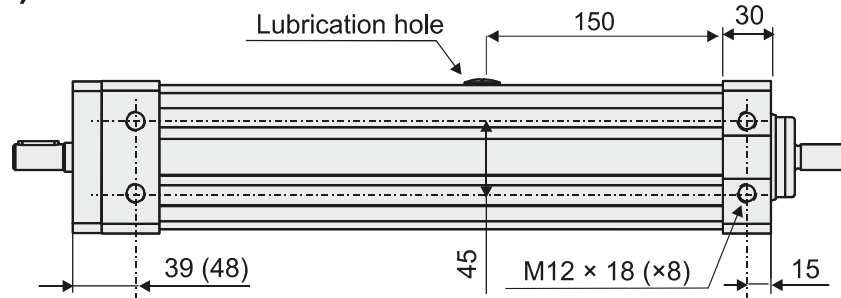
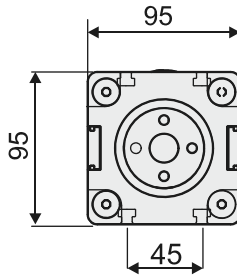
2. Installation

2.1 Mounting instructions

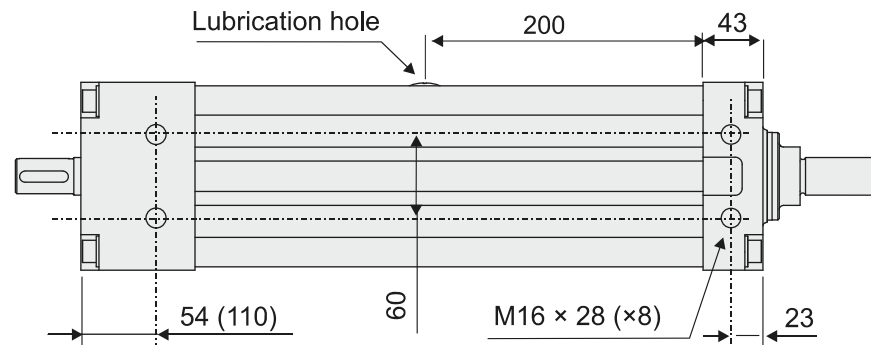
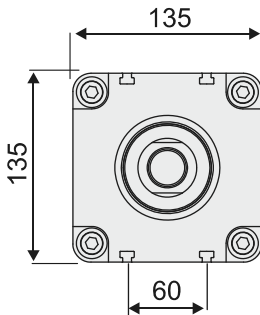
1 T06-B25



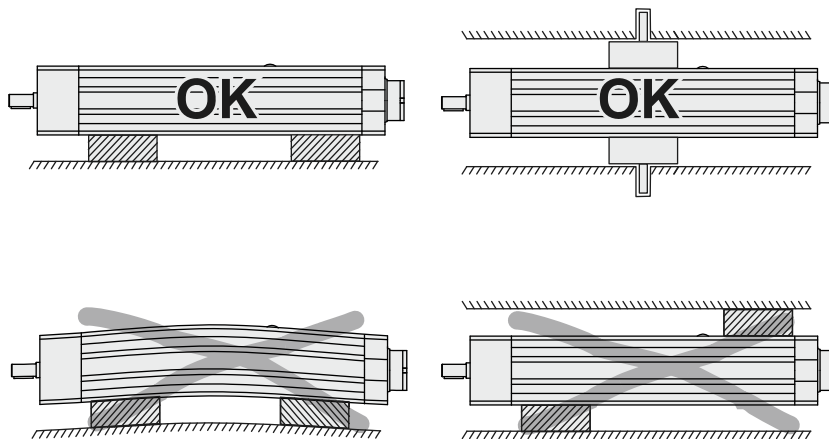
T09-B25 (T09-B32)



T30-B40 (T13-B50)



2



mounting_may2010.wmf

Figure 2: mounting instructions

1. The actuators have threaded holes in the front and rear housings and T-slots along the profile that can be used for mounting. Be sure to mount the actuator so that the lubrication hole is accessible.
2. Only mount the actuator to one side if not trunnion mounting is used. Do not mount the actuator so that the profile is deformed.

2.2 Connection of load

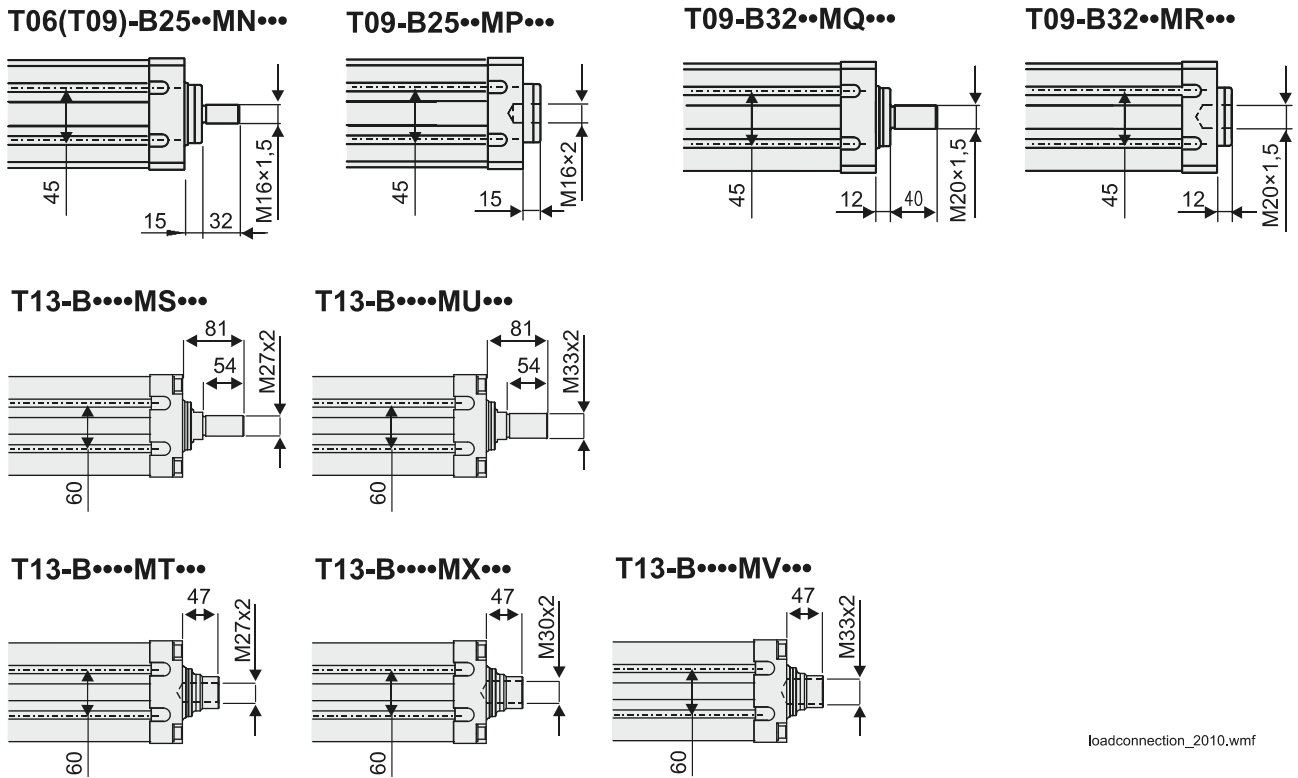


Figure 3: connection of load

2.3 Motor flange

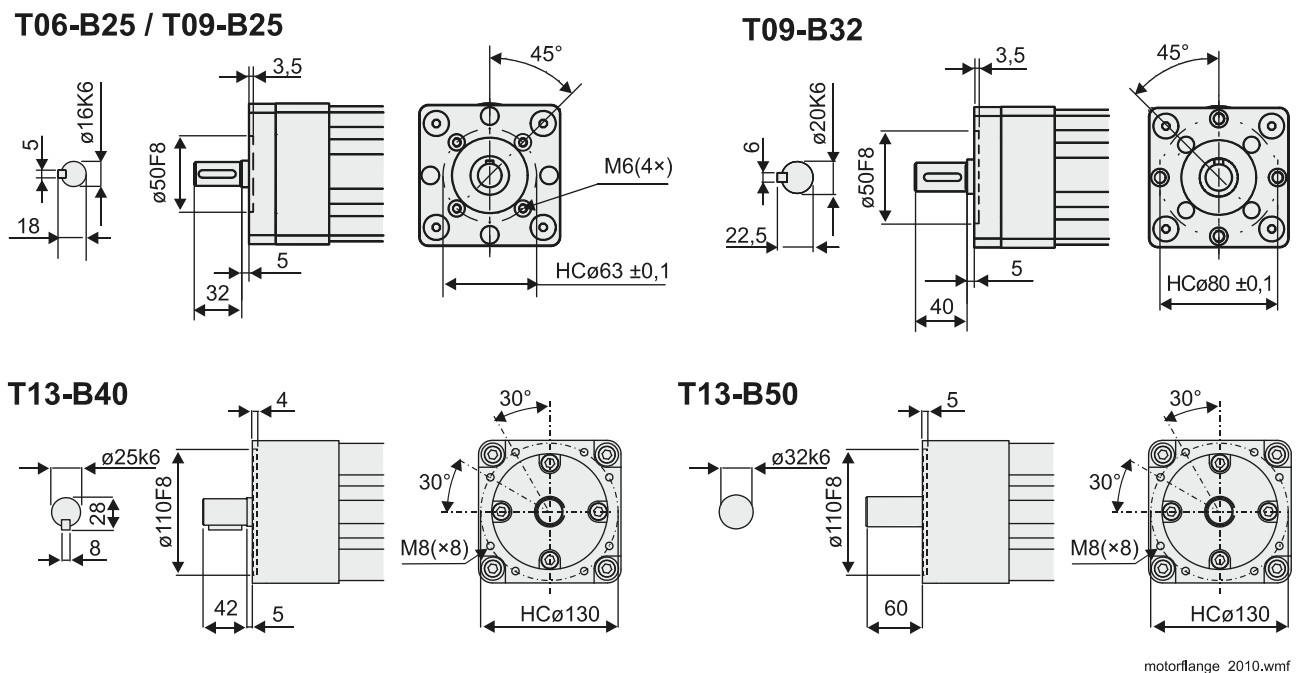


Figure 4: motor flanges

2.4 Feet mounting kit

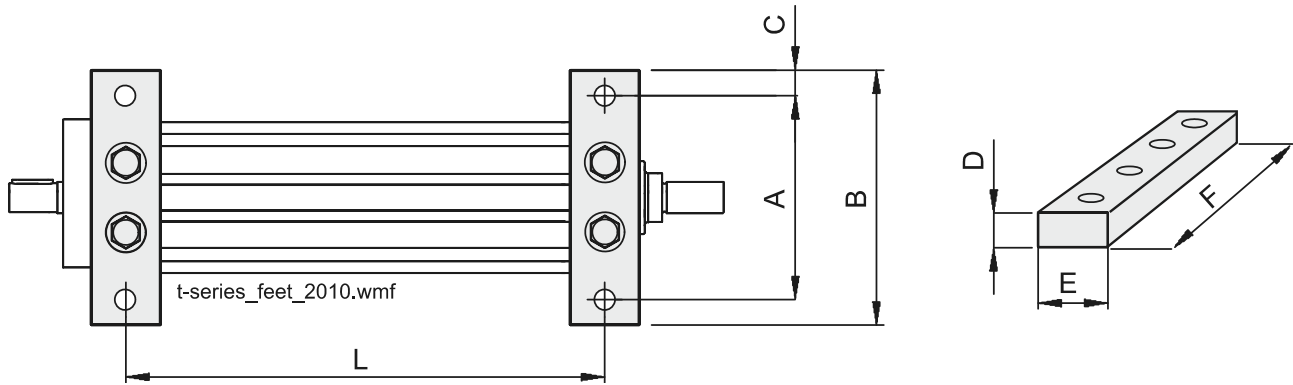


Figure 5: mounting feet

| | A | B | C | D | E | F | L | Tightening torque [Nm] |
|----------------|----------------|-----|----|----|----|-----|------------|------------------------|
| T06-B25 | - on request - | | | | | | | |
| T09-B25 | 125 | 155 | 15 | 20 | 40 | 155 | Smax + 141 | 78 |
| T09-B32 | 125 | 155 | 15 | 20 | 40 | 155 | Smax + 162 | 78 |
| T13-B40 | 176 | 220 | 22 | 30 | 60 | 220 | Smax + 216 | 220 |

Table 2: mounting feet dimensions

2.5 Trunnion mounting kits

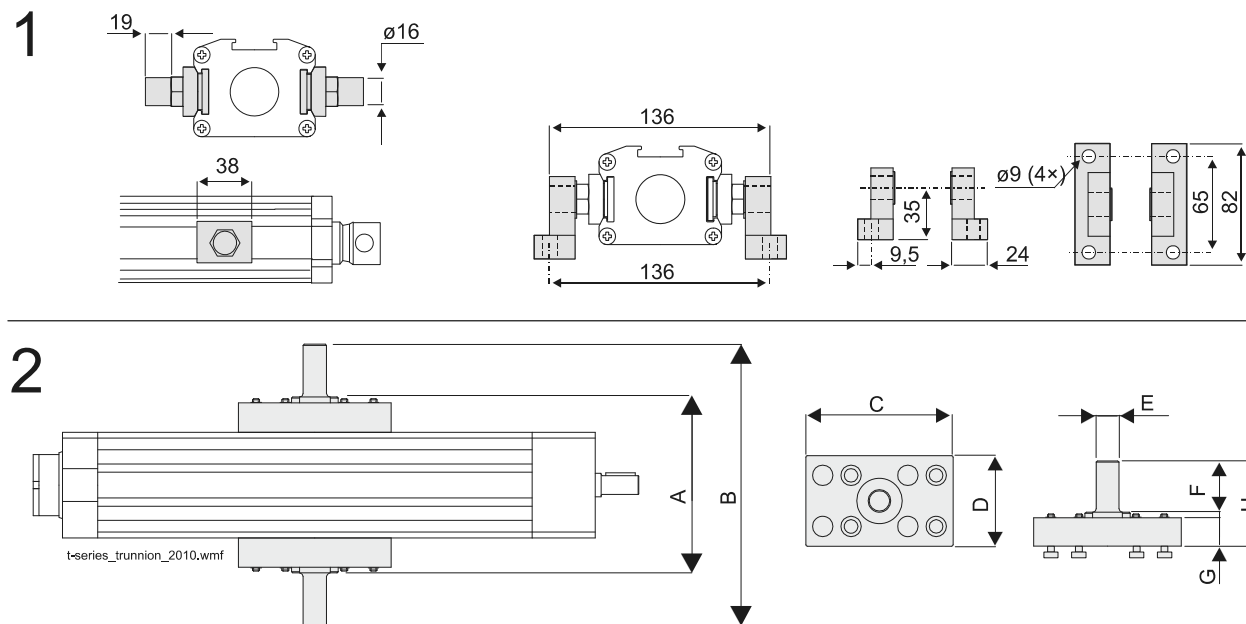


Figure 6: trunnion

| | A | B | C | D | E | F | G | H | Tightening torque [Nm] |
|--------------|-----|-----|-----|-----|--------|----|----|----|------------------------|
| T09-B | 150 | 240 | 130 | 80 | ∅20 f8 | 45 | 25 | 75 | 11 |
| T13-B | 316 | 210 | 180 | 110 | ∅35 f8 | 63 | 30 | 93 | 45 |

Table 3: trunnion dimensions

1. Trunnion shafts and trunnion brackets for T60.
2. Trunnion kit for T90 and T130.

Make sure to mount the bearings on the trunnion shafts as close to the unit as possible!

2.6 Mounting of worm gear type BS40 / BS50

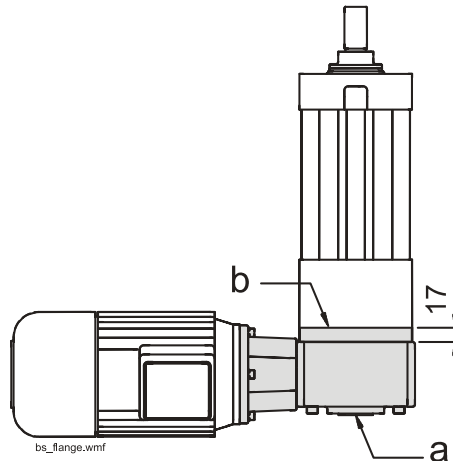


Figure 7: flange for worm gear type BS40 / BS50

To be able to mount a worm gear (a) of type BS40 (for T90 only) or BS50 (for T130 only) an intermediate flange (b) must be used. There is no flange available for T60.

2.7 Installation of magnetic sensors

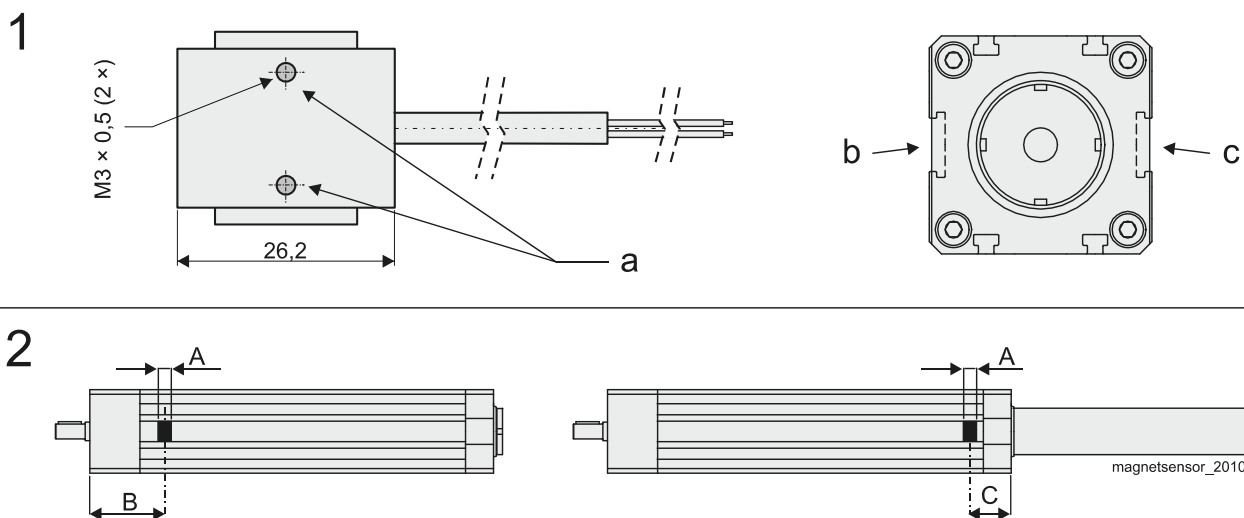


Figure 8: magnetic sensor

1. The sensors are locked in the desired position with the aid of the lock screws (a) in the T-slot. On T60 there is only one T-slot for sensors (b) while T90 and T130 has twp (b and c).
2. Magnet positions at fully retracted and fully extended rod. Keep in mind that the duration of the sensor signal is dependent upon the speed and the width of the magnet (the signal is somewhat longer than the magnet due to the spread of the magnetic field). This means that the relay or input device, which shall detect the signal, must be capable of detecting the duration of the signal in question.

| | A | B | C |
|--|----|-----|-----------|
| T06-B2505, T06-B2525 (T06-B2510, T06-B2550) | 5 | 55 | 118 (140) |
| T09-B25 | 8 | 68 | 141 |
| T09-B32 | 8 | 82 | 162 |
| T13-B40 | 24 | 194 | 84 |
| T13-B50 | 24 | 324 | 100 |

Table 4: magnet positions

3. Service and maintenance

3.1 General maintenance instructions

- The customer can perform the service and maintenance described in this manual. Other service ought to be performed by authorised personnel / service workshop.
 - Follow the recommended service intervals. Replace defective parts immediately. Only use parts of the same make and type as original. Ordering data can be found in the spare part lists supplied with the unit. Also state the manufacturing number of the unit (embossed in the drive end).
 - T90 and T130 is not self-braking. This means that the load and the extension tube can move if the driving force is disconnected, or if the motor, gears or brakes are detached during service. This is even more important for vertical applications. Ensure therefore that the load is secured before service is begun.
 - Check the unit in connection to lubrication. Be attentive towards the wear and function of the rod seal, the magnetic sensors, limit switches and the mounting of them. Check all connections to the support and the rod. Also be attentive towards a changed level of noise. Replace, repair or adjust.
 - Keep the actuator clean. Wipe it off as required, particularly the rod. If cleaning fluid is required, use small amounts and see to it that none gets into the actuator. Do not use strong cleaning agents. Dry it fully.
 - **Never** mix different types of oils / lubricants!
-

3.2 Lubrication of the ball screw

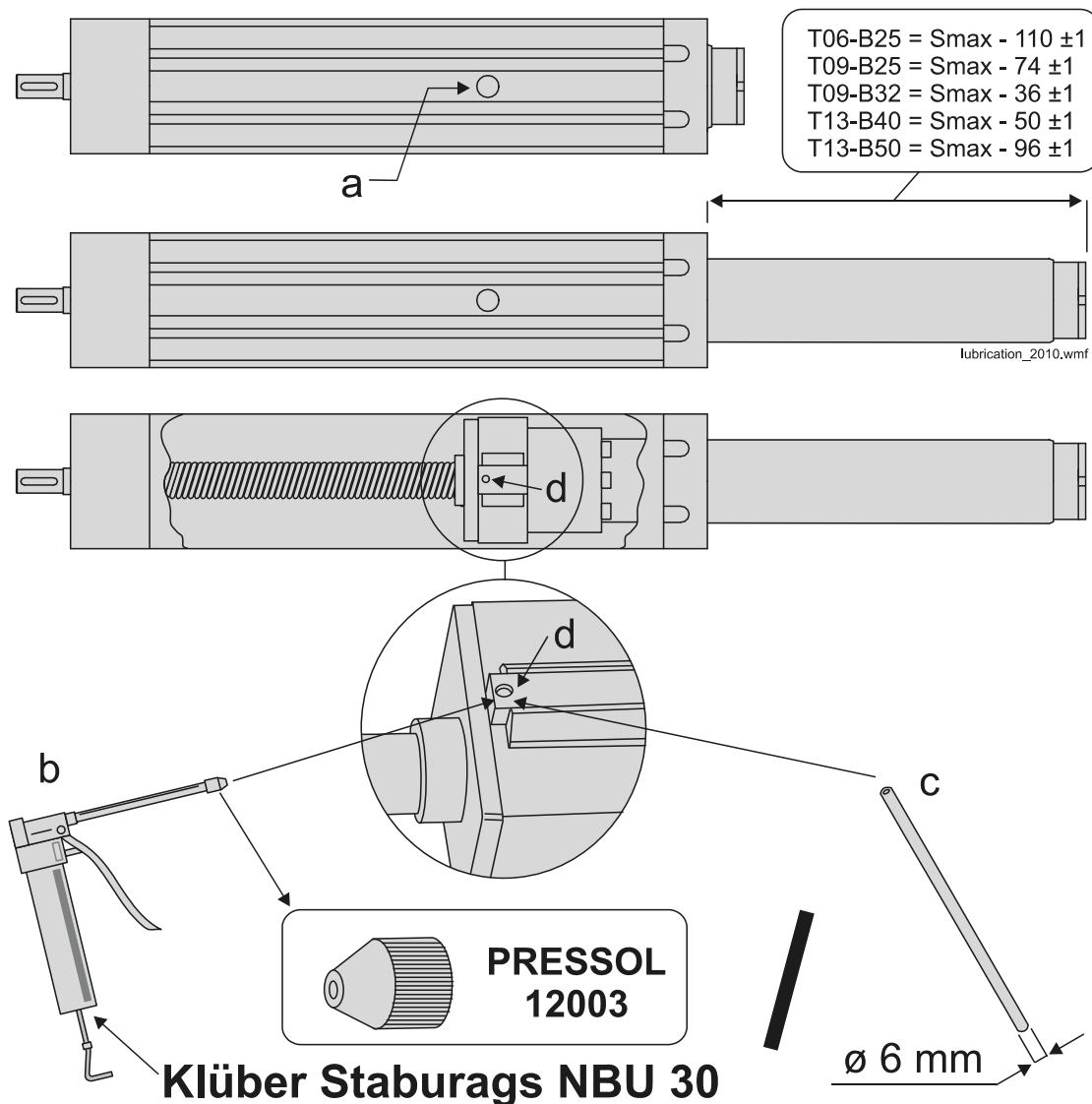


Figure 9: lubrication of the ball screw

1. The ball screw is lubricated every 600 hours of operation or every 6:th month depending on whichever comes first.
2. Recommended lubricant is Klüber Staburags NBU 30.
3. Remove the plastic plug covering the lubrication hole (a).
4. Run the extension tube to the indicated position for the actuator model in question. For T06-B25 the lubrication position is at the maximum stroke length (S_{max}) of the unit – 110 mm, for T09-B25 it is at S_{max} – 74 mm, for T09-B32 at S_{max} – 36, for T13-B40 at S_{max} – 50 mm and for T13-B50 at S_{max} – 96 mm.
5. Apply 20 ml of lubricant to the ball nut by sticking a grease gun nipple (b) or a tube (c), through which the lubricant can be applied, straight in to the lubrication hole in the profile so that it enter the lubrication hole (d) of the ball nut assembly. Recommended type of grease gun nipple is Pressol pointed coupler M10 x 1 female article no: 12003 or equivalent. If a tube is used the recommended tube diameter is 6 mm.
6. Pull out the grease gun nipple / tube and put back the plastic plug.

4. Technical data

4.1 Technical data

| | | T06-B2505M •••• | T06-B2510M •••• | T06-B2525M •••• |
|--------------------------|--------|------------------------|------------------------|------------------------|
| Max. speed | [m/s] | 0,25 | 0,66 | 1,66 |
| Max. radial load | Fr [N] | 100 | 100 | 100 |
| Max. axial load | Fx [N] | | | |
| static | | 15 000 | 15 000 | 15 000 |
| dynamic | | 10 000 | 10 000 | 10 000 |
| Repeatability | [mm] | ± 0,05 | ± 0,05 | ± 0,05 |
| Max. input speed | [rpm] | 3000 | 4000 | 4000 |
| Weight | [kg] | $5 + (L^A \times 9,5)$ | $5 + (L^A \times 9,5)$ | $5 + (L^A \times 9,5)$ |
| Ambient temperature | [°C] | -20 – +70 | -20 – +70 | -20 – +70 |
| Linear move / shaft turn | [mm] | 5 | 10 | 25 |

| | | T06-B2550M •••• | T09-B2510M •••• | T09-B2525M •••• |
|--------------------------|--------|------------------------|-------------------------|-------------------------|
| Max. speed | [m/s] | 2,5 | 0,8 | 1,5 |
| Max. radial load | Fr [N] | 100 | 300 | 300 |
| Max. axial load | Fx [N] | | | |
| static | | 15 000 | 15 000 | 15 000 |
| dynamic | | 10 000 | 10 000 | 10 000 |
| Repeatability | [mm] | ± 0,05 | ± 0,05 | ± 0,05 |
| Max. input speed | [rpm] | 3000 | 4800 | 4800 |
| Weight | [kg] | $5 + (L^A \times 9,5)$ | $5 + (L^A \times 16,2)$ | $5 + (L^A \times 16,2)$ |
| Ambient temperature | [°C] | -20 – +70 | -20 – +70 | -20 – +70 |
| Linear move / shaft turn | [mm] | 50 | 10 | 25 |

| | | T09-B3220M •••• | T09-B3232M •••• | T13-B4010M •••• |
|--------------------------|--------|-------------------------|-------------------------|------------------------------------|
| Max. speed | [m/s] | 1,25 | 2 | 0,4 |
| Max. radial load | Fr [N] | 500 | 500 | 800 |
| Max. axial load | Fx [N] | | | |
| static | | 25 000 | 25 000 | 45 000 |
| dynamic | | 20 000 | 20 000 | 40 000 |
| Repeatability | [mm] | ± 0,05 | ± 0,05 | ± 0,05 |
| Max. input speed | [rpm] | 3750 | 3750 | 2500 |
| Weight | [kg] | $6,5 + (L^A \times 18)$ | $6,5 + (L^A \times 18)$ | $18,5 + (30 \times (L^A - 0,239))$ |
| Ambient temperature | [°C] | -20 – +70 | -20 – +70 | -20 – +70 |
| Linear move / shaft turn | [mm] | 20 | 32 | 10 |

| | | T13-B4020M •••• | T13-B4040M •••• | T13-B5010M •••• |
|--------------------------|--------|------------------------------------|------------------------------------|--------------------------|
| Max. speed | [m/s] | 1 | 2 | 0,33 |
| Max. radial load | Fr [N] | 800 | 800 | 800 |
| Max. axial load | Fx [N] | | | |
| static | | 45 000 | 45 000 | 80 000 |
| dynamic | | 35 000 | 15 000 | 60 000 |
| Repeatability | [mm] | ± 0,05 | ± 0,05 | ± 0,05 |
| Max. input speed | [rpm] | 3000 | 3000 | 2000 |
| Weight | [kg] | $18,5 + (30 \times (L^A - 0,239))$ | $18,5 + (30 \times (L^A - 0,239))$ | $31,8 + (L^A \times 35)$ |
| Ambient temperature | [°C] | -20 – +70 | -20 – +70 | -20 – +70 |
| Linear move / shaft turn | [mm] | 20 | 40 | 50 |

^A L in metres, see figure 1 for definition of L

Table 5: technical data

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