



Assembly instructions
CNC portal milling machine kit
Basic-Line

Technical specifications

Basic-Line	0605	0607	1005	1007
Travel	X: 650 mm Y: 530 mm Z: 140 mm	X: 650 mm Y: 730 mm Z: 140 mm	X: 1050 mm Y: 530 mm Z: 140 mm	X: 1050 mm Y: 730 mm Z: 140 mm
Clearance under portal	180 mm	180 mm	180 mm	180 mm
Clamping area	X: 840 mm Y: 530 mm	X: 840 mm Y: 730 mm	X: 1240 mm Y: 530 mm	X: 1240 mm Y: 730 mm
Outer dimensions	L: 950 mm B: 790 mm H: 820 mm	L: 950 mm B: 990 mm H: 820 mm	L: 1350 mm B: 790 mm H: 820 mm	L: 1350 mm B: 990 mm H: 820 mm
Ball screw spindles Tolerance class T07	X: 16 x 10 mm Y: 16 x 10 mm Z: 16 x 5 mm	X: 16 x 10 mm Y: 16 x 10 mm Z: 16 x 5 mm	X: 16 x 10 mm Y: 16 x 10 mm Z: 16 x 5 mm	X: 16 x 10 mm Y: 16 x 10 mm Z: 16 x 5 mm
Weight without accessories	approx. 46 kg	approx. 52 kg	approx. 50 kg	approx. 57 kg

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Introduction

Congratulations on the purchase of our kit for a Basic-Line CNC portal milling machine. We recommend reading through these instructions completely before assembly and then assembling the kit step by step as described.

Required tools

The following tools and aids must or should be available during assembly:

- Common hand tools, such as Allen keys, screwdrivers, plastic hammers, etc.
- Work surface as flat as possible in the size of the base frame
- Flat or stop angle, at least 300 mm long in tolerance class 1 or better
- Dial indicator with stand / holder
- Torque wrench from 6 Nm up to at least 25 Nm¹⁾



Caution!

Only carry out the work if you are familiar with the necessary actions and suitable tools are available.

Für Sach- oder Personenschäden, die bei der Montage oder dem Betrieb der CNC-Portalfräsmaschine entstehen, übernimmt die Sorotec GmbH keine Haftung!

Optional accessories

The fully assembled machine can be supplemented and adapted to your requirements with optional accessories. In the Sorotec shop you will find:

- Performance Kit ²⁾
- Milling spindles
- Electrical installation kit
- Control electronics
- Control software
- T-slot plate
- Vacuum table
- Minimum quantity lubrication

General information

Please assemble the kit as carefully and precisely as possible - the accuracy of the finished machine does not only depend on the quality of the delivered components, but also to a high degree on the correct assembly and exact alignment. Before assembly, all components must be checked for burrs and reworked if necessary.

²⁾ recommended for processing non-ferrous metals

Scope of delivery

Illustration	Description	Number
1	End plate Y on the left BL.FT.007.01	1
2	End plate Y on the right BL.FT.008.01	1
3	Stop plate Z BL.FT.013.01	1
4	Drive X: fixed bearing 4F CL.ZAN.FL16.H Ball screw 4S see page 6 Recirc. ball nut 4K readily mounted on ball screw floating bearing 4L CL.ZAN.LL16.H	1 1 1 1 1
5	Drive Y: fixed bearing 5F CL.ZAN.FL16.H Ball screw 5S see page 6 Recirc. ball nut 5K readily mounted on ball screw floating bearing 5L CL.ZAN.LL16.H	1 1 1 1 1
6	Drive Z: fixed bearing 6F CL.ZAN.FL16.H Ball screw 6S CL.ZAN.KGS1605.0270KH Recirc. ball nut 6K readily mounted on ball screw	1 1 1 1
7	Stiffeners Z: left 7L / right 7R BL.FT.022.01	2
8	Base plate Z BL.FT.012.01	1

Illustration	Description	Number
9	Flange bracket X BL.FT.018.01	1
10	Flange bracket Y BL.FT.019.01	1
11	Flange bracket Z BL.FT.020.01	1
12	Flange plate BL.FT.016.01	1
13	Device base (self-adhesive) AL.EZB.0109	7
14	Claw clutch MZK.080.100.V25	3
15	Carriage MZK.080.100.V25	5 (7)
16	Linear rail X see page 6	2
17	Linear rail Y see page 6	2

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Illustration	Description	Number
18	Linear rail Z (300 mm lg.) BL.ZFS.HGR20R.0300	1
19	Motor flange Z BL.FT.011.01	1
20	Plate Z BL.FT.010.01	1
21	Portal beam (preassembled) see page 6	1
22	Portal beam see page 6	1
23	Portal cheek: left 23L BL.FT.005.01 right 23R BL.FT.004.01	1 1
24	Profile 10 45 x 90 light see page 6	3 (4)
25	Profile 10 45 x 90 heavy (819 mm lg.) see page 6	2
26	Profile 5 20 x 20 BL.PR.0520201N.0372	2

Illustration	Description	Number
27	Reference switch with shim EZB.T1 / AL.IS.001	3
28	Switch carrier X CL.FT.013.01	1
29	Switch carrier Y BL.FT.021.01	1
31	Sled Y BL.FT.009.01	1
32	Face plate in the back see page 6	1
33	Front plate see page 6	1
34	Angle 20 x 20 BL.PR.W.052020	5
35	Angle 40 x 40 AL.PR.WS.084040	6
36	Angle 45 x 45 AL.PR.WS.104545	8 (12)

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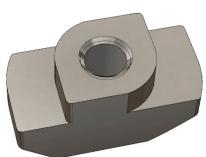
Illustration	Description	Number
	Drag chain holder CL.FT.032.01	1
	Tapered grease nipple M6 x 0.75 ZB.HI.SN002	2
	Cylinder head screw DIN 912 M3 x 14 A1 MED.SMZ8.8V.03.014 M3 x 16 A2 MED.SMZ8.8V.03.016 M4 x 16 B1 MED.SMZ8.8V.04.016 M4 x 20 B2 MED.SMZ8.8V.04.020 M4 x 25 B3 MED.SMZ8.8V.04.025 M5 x 12 C1 MED.SMZ8.8V.05.012 M5 x 14 C2 MED.SMZ8.8V.05.014 M5 x 16 C3 MED.SMZ8.8V.05.016 M5 x 18 C4 MED.SMZ8.8V.05.018 M5 x 20 C5 MED.SMZ8.8V.05.020 M5 x 22 C6 MED.SMZ8.8V.05.022 M5 x 25 C7 MED.SMZ8.8V.05.025 M6 x 14 D1 MED.SMZ8.8V.06.014 M6 x 35 D2 MED.SMZ8.8V.06.035 M6 x 50 D3 MED.SMZ8.8V.06.050	
	Sliding block 5 M5 3D.PR.NS.05M5S	
	Hammer nut Slot 8 M5 G1 AL.PR.HM.08M5.017 Slot 8 M6 G2 AL.PR.HM.08M6.017 Slot 10 M5 H1 AL.PR.HM.10M5.030 Slot 10 M6 H2 AL.PR.HM.10M6.030 Slot 10 M8 H3 AL.PR.HM.10M8.030	
	Hammer screw Slot 10 M8 x 20 J enclosed with angle	

Illustration	Description	Number
	Flat headed screw ISO 7380 M5 x 8 K1 MED.SMF10.9.05.008 M5 x 20 K2 MED.SMF10.9.05.020 M6 x 16 K3 MED.SMF10.9.06.016 M6 x 25 K4 MED.SMF10.9.06.025 M8 x 16 K5 MED.SMF10.9.08.016 M12 x 30 K6 MED.SMF10.9.12.030	
	Mounting bracket drag chain CL.PR.BW.604020	1
	Cylinder head screw DIN 6912 M5 x 10 L1 MED.SMZNK8.8V.05.010 M5 x 16 L2 MED.SMZNK8.8V.05.016 M6 x 40 M1 MED.SMZNK8.8V.06.040 M8 x 20 N1 MED.SMZNK8.8V.08.020	
	Nut DIN 934 M3 O MED.SMU0.8V.03 M4 P MED.SMU0.8V.04	
	Flange nut DIN 6923 M8 Q enclosed with angle	
	Washer DIN 125 3,2 U MED.SUS.V.03 8,4 X MED.SUS.V.08	
	Dowel pin hard DIN 6325 5 x 18 mm Z AL.ZS.05.18	

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Order numbers of size-dependent parts

		Maschine			
	Bezeichnung	BL 0605	BL 0607	BL 1005	BL 1007
4S	Ball screw X	CL.ZAN.KGS1610.0800KH	CL.ZAN.KGS1610.0800KH	CL.ZAN.KGS1610.1200KH	CL.ZAN.KGS1610.1200KH
5S	Ball screw Y	CL.ZAN.KGS1610.0650KH	BL.ZAN.KGS1610.0850KH	CL.ZAN.KGS1610.0650KH	BL.ZAN.KGS1610.0850KH
16	Linear rail X	BL.ZFS.HGR20R.0817	BL.ZFS.HGR20R.0817	BL.ZFS.HGR20R.1217	BL.ZFS.HGR20R.1217
17	Linear rail Y	BL.ZFS.HGR20R.0622	BL.ZFS.HGR20R.0822	BL.ZFS.HGR20R.0622	BL.ZFS.HGR20R.0822
21	Portal beam	BL.FT.023.01	BL.FT.028.01	BL.FT.023.01	BL.FT.028.01
22	Portal beam	BL.FT.003.01	BL.FT.024.01	BL.FT.003.01	BL.FT.024.01
24	Profile 10 45 x 90 light	BL.PR.104590L.0395	BL.PR.104590L.0595	BL.PR.104590L.0395	BL.PR.104590L.0595
25	Profile 10 45 x 90 heavy	BL.PR.104590S.0819	BL.PR.104590S.0819	BL.PR.104590S.1219	BL.PR.104590S.1219
32	Face plate back	BL.FT.001.01	BL.FT.025.01	BL.FT.001.01	BL.FT.025.01
33	Face plate front	BL.FT.002.01	BL.FT.026.01	BL.FT.002.01	BL.FT.026.01

Preparatory work

Preparing angles for surface mounting

When installing an angle 36 on a component without fastening grooves, the centering tabs on the angle must be removed before installation (see Figure 1). This can be done by breaking off with a screwdriver or filing / sanding.

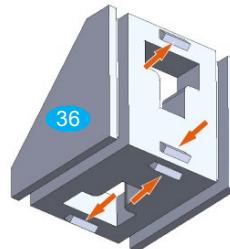


Fig. 1: Centering tabs on mounting bracket

Pre-assembly of the ball screws, spindle nuts and bearing units



Caution!

The pre-assembled recirculating ball nuts must not be turned off the ball screws!

The ball nuts and ball screws are sensitive and must be handled with care!

Install the grease nipple (all drives):

Equip all ball nuts with 90° angled grease nipples (see picture 2). Do not fully tighten the grease nipples to be able to align them later.

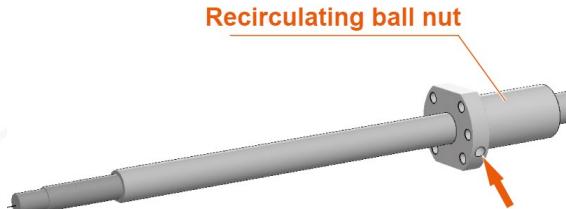


Fig 2: Bore and thread for grease nipples

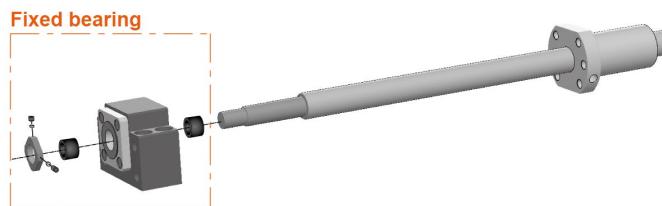
Assembly instructions

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Mount the fixed bearings

- Push the first bushing onto the ball screw. Place the fixed bearing unit on the ball screw.
- Push the second bushing onto the ball screw.
- Screw the shaft nut onto the ball screw. Attention: The collar of the shaft nut in the direction of the fixed bearing block.
- To adjust the axial play, tighten the shaft nut until the ball screw can only be turned with difficulty in the fixed bearing unit. Then carefully loosen the shaft nut a little (approx. 5 °) until the ball screw can easily be turned again.
- Screw the stud bolts into the threaded holes in the shaft nut and tighten.
- X drive only: screw the fixed bearing **4F** to the flange plate **12**. Tighten the screws **D2** slightly.
- Align the rear edges of the fixed bearing and flange plate in parallel and tighten the screws.



Outer ring. Use a suitable drive sleeve (tube) and oil the outer bearing ring before assembly!

- Place the floating bearing on the ball screw.

Install floating bearing Y drive

- Place the floating bearing unit on the ball screw and attach the circlip to the end of the ball screw.

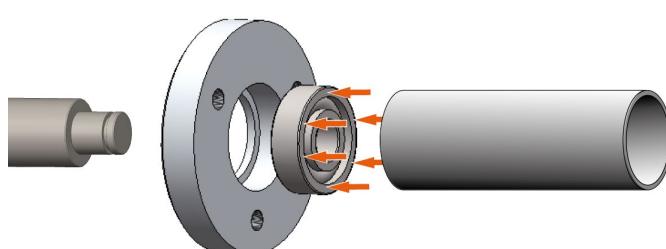


Fig. 3: Mounting fixed bearings

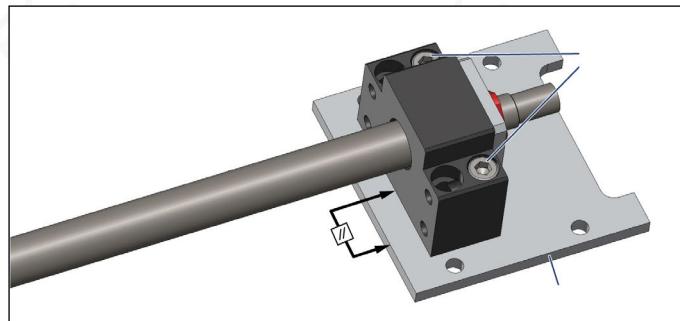


Fig. 4: Fixed bearing on X-drive

Install floating bearing X drive

- Press the roller bearing into the housing.

i Note:

In order not to damage the rolling bearing when installing it in the housing, only push / hit on the be-

Fig. 5: Rolling bearing assembly with drive sleeve

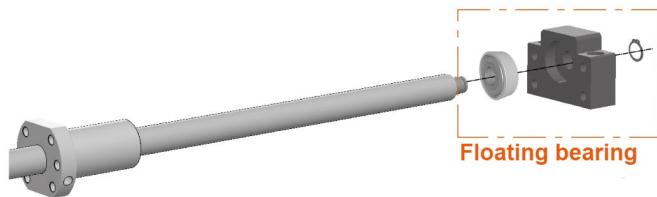


Fig 6: Floating bearing assembly

Assembly X axis and base frame

i Note:

The following illustrations show the Basic-Line 0605 kit. The Basic-Line 1005 is installed analogously.

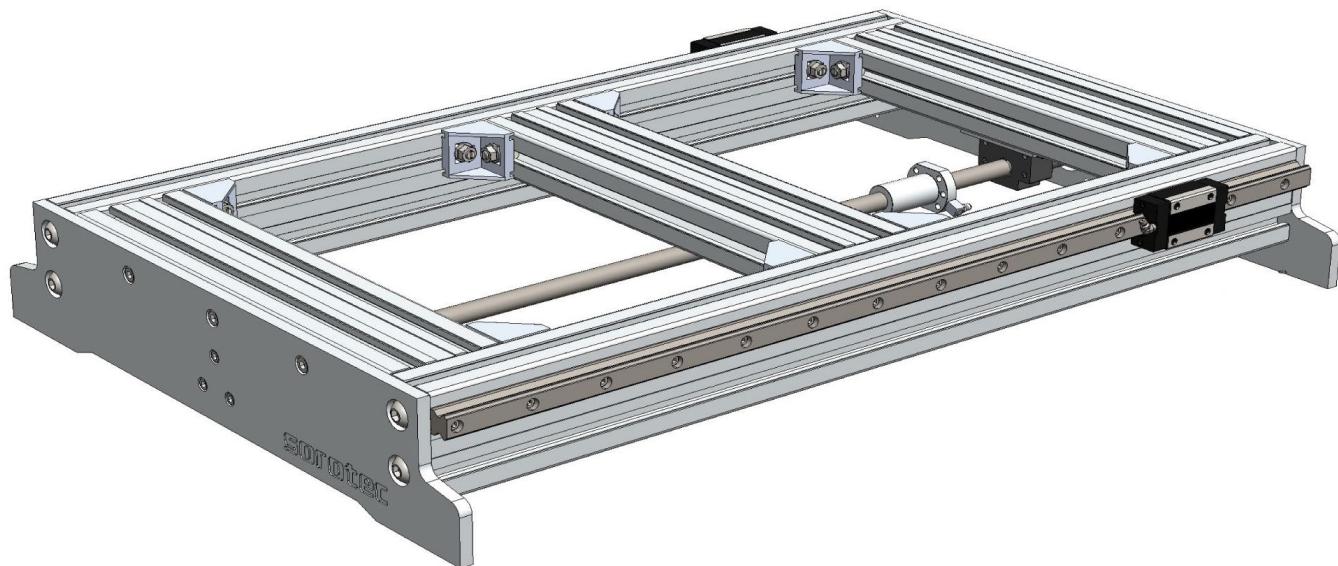
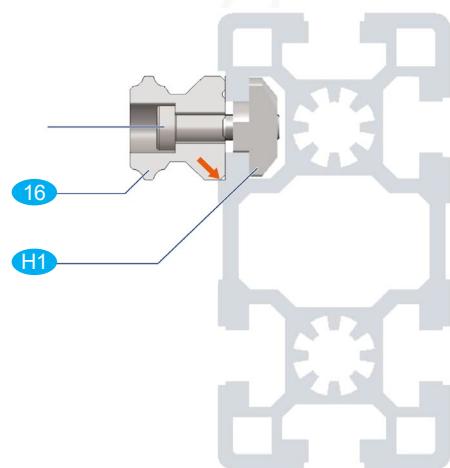


Fig. 7: Completely assembled base frame

- Screw the linear guide 16 to the profile 25; The reference edge of the linear guide marked with arrows must lie along the milled stop edge of the profile over its entire length (see Figure 8).
- Tighten the screws evenly outwards in the middle. Screw tightening torque: 6 Nm
- Repeat steps with a second profile and a second linear guide.



Detail: marking of linear guide



Fig. 8: Linear guides on the stop edge (arrow)

Note:

The further assembly of the base frame is carried out lying on its back, as shown in Figure 9.



Fig. 9: Base frame in supine position

Assembly instructions

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The base frame must be mounted in such a way that there is an air gap of approx. 0.5 mm between the end faces of the profiles 24 and the long profile 25 for aligning the base frame (see red arrows in Figure 10). On the opposite side, the end faces of the profiles 24 must be in contact with the long profile 25. The base frame should be installed as stress-free as possible.

- Lay out profiles 24 / 25 as shown on a flat work surface and loosely screw them together with angles 36. Use the hammer screws J and flange nuts Q for this.
- Move the inner profile 24 or inner profiles (1005) so that equally long fields (x) are created.
- Tighten the screws one after the other from an outside corner (screw tightening torque: 25 Nm). Always check the perpendicularity and parallelism of the base frame and correct if necessary.

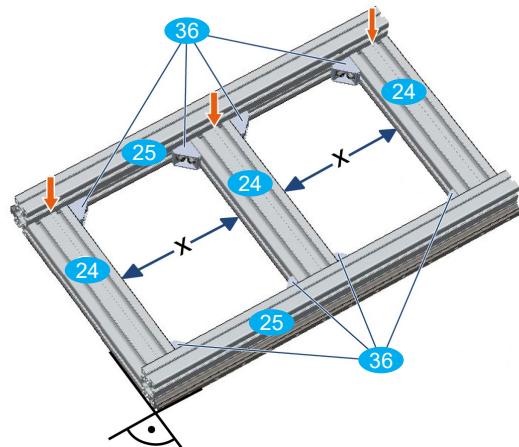


Fig. 10: Assembly of the base frame

- Fit three front screws K5 on the front plate 33 and loosely screw on three hammer nuts H3 on the inside.
- Position the front plate 33 at the front, threading the hammer nuts into the T-groove of the profile. Tighten the screws slightly to turn the hammer nuts 90° in the T-slot
- Screw front end plate 33 with profiles 25; Tighten screws K6 slightly.
- Tighten all front panel mounting screws.
- Push one or two carriages 15 on each side onto the linear guides 16. **Please note:** smoothed, bare surfaces on the long sides of the carriage point down towards the work surface.
- Load the carriage with straight grease nipples SN so that they point outwards.

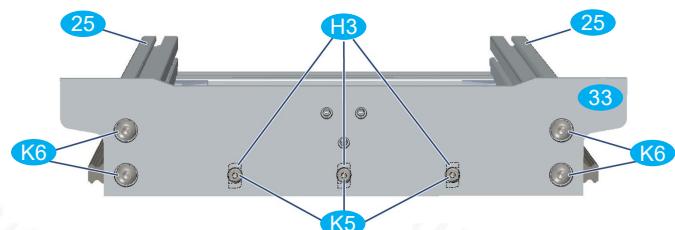


Fig. 11: Mounting end plate on frame profiles

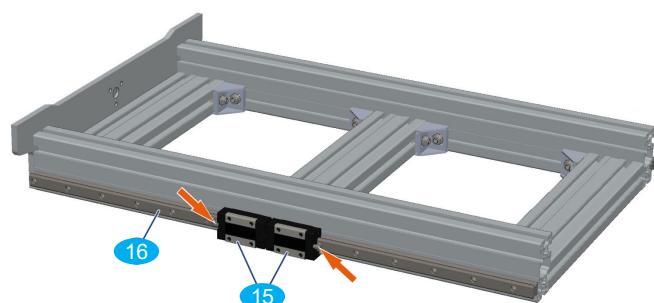


Fig. 12: Lubricating nipples on the carriage point outwards

Note:

The illustration shows the assembly with the Performance Kit, i.e. with two carriages per side on the guide of the X axis.

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- Equip the rear faceplate 32 with three screws N2 and loose screw on three hammer nuts H3 on the inside.
- Position the rear end plate, threading hammer nuts into the T-slot of the profile. Tighten the screws slightly to turn the hammer nuts in the T-slot by 90°.
- Screw the rear face plate to the profiles with flat-head screws K6; Tighten screws slightly.
- Tighten all rear face plate mounting screws.

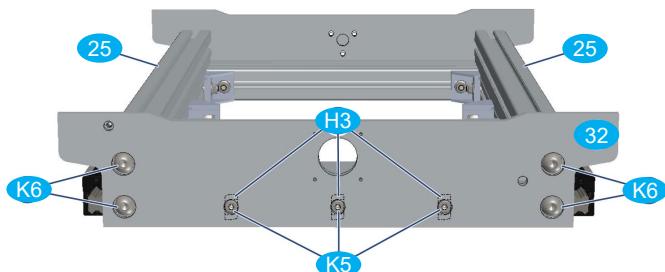


Fig. 13: Assembly of the rear face plate

- Place the pre-assembled X drive 4 in the base frame as shown in Figure 14.
- Screw the floating bearing to the front face plate with socket head screws D1; Tighten screws slightly.
- Insert two hammer nuts H2 in the groove of the profile, turn them 90 ° and slide them under the mounting holes of the fixed bearing.
- Screw the fixed bearing to the profile using socket head screws D3; Tighten screws slightly.
- Insert four hammer nuts H1 in the grooves of the profile, turn them 90° and slide them under the mounting holes of the flange plate 12.
- Screw the flange plate to the profile using socket head screws C3; Tighten screws slightly.

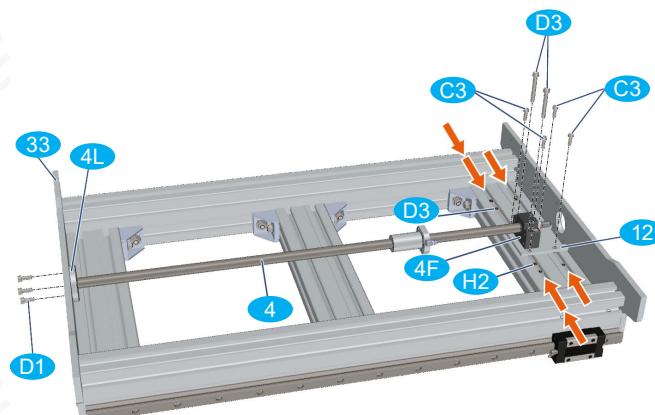


Fig. 14: Assembly of the X drive

Note:

The fastening screws C3, D1 and D3 of the bearing units 4L / 4F are not tightened until aligning.

For the following reference switch assembly, if necessary, observe the additional instructions for assembly „Electrical installation kit“.

Assembly instructions Basic-Line kit

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- Equip switch carrier X 28 with screws K5 and washers X and loosely screw on two hammer nuts H3 on the inside.
- Position switch carrier X as shown on the fixed bearing side of the base frame, threading hammer nuts into the T-slot of the profile.
- Tighten the screws, turning the hammer nut through 90° in the T-slot.
- Place the shim between the reference switch and switch carrier X and screw on the reference switch.

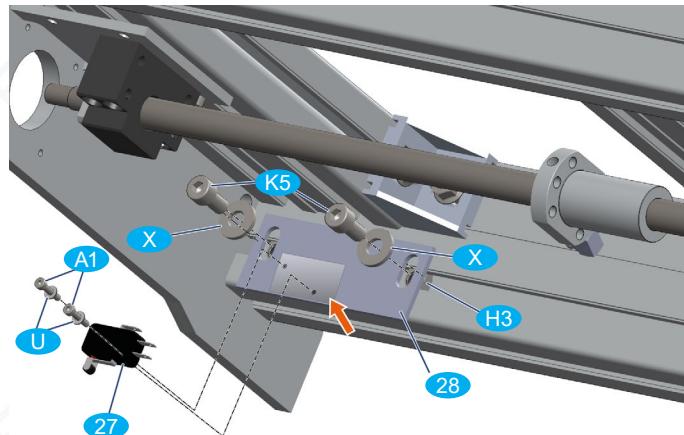


Fig. 15: Assembly of the X reference switch

Assembly of Y-axis / portal

Note:

The following illustration shows the assembly without a performance kit, i.e. with one carriage per side on the X axis.

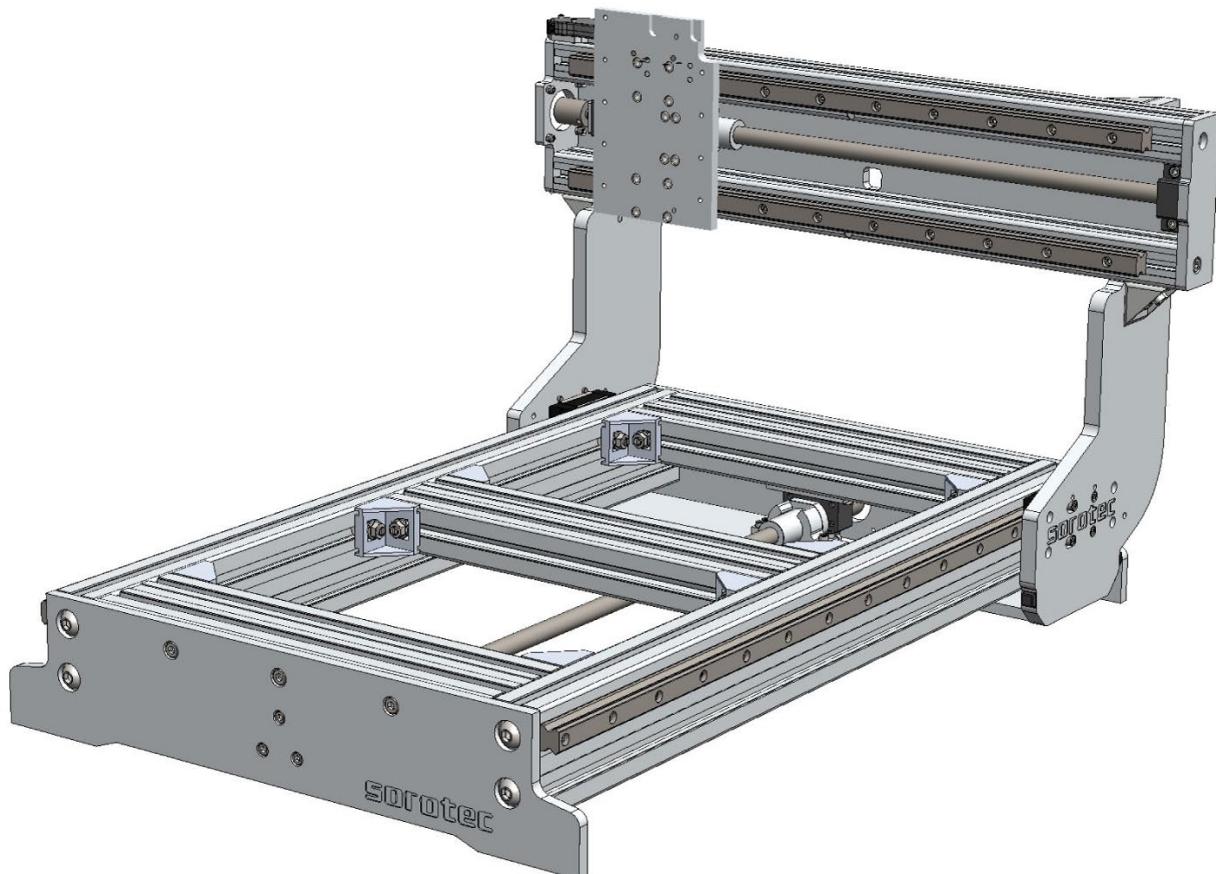


Fig. 16: Fully assembled portal with Y axis

Assembly instructions

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- Drive in dowel pins **Z** into the portal cheeks **23L / 23R** until they protrude approximately 3 ... 4 mm on the inside.
- Place the portal cheeks with the cylinder pins on the carriages **15** and screw them in with cylinder screws **Z**. Screw tightening torque: 6 Nm

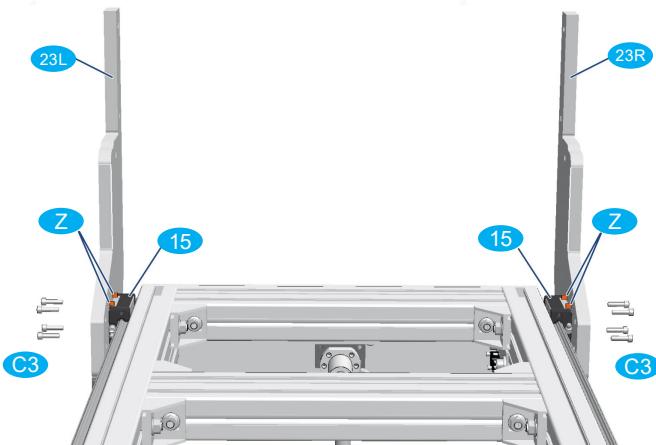


Fig. 17: Assembly of the portal cheeks

- Load the linear rails **17** from above with cylinder screws **C4** and screw on the hammer nuts **G1** from below.
- Place the linear rails on the profiles of the portal beam in such a way that the reference edges of the linear guides marked with arrows in Figure 18 (detail) point to the milled stop edges.
- Align the linear rails in the center of the profiles and turn the screws slightly in order to turn the hammer nuts by 90° in the T-slot.
- Screw the linear rails to the profiles; The reference edges of the linear guides must lie on the milled stop edges of the profiles over their entire length. Screw tightening torque: 6 Nm

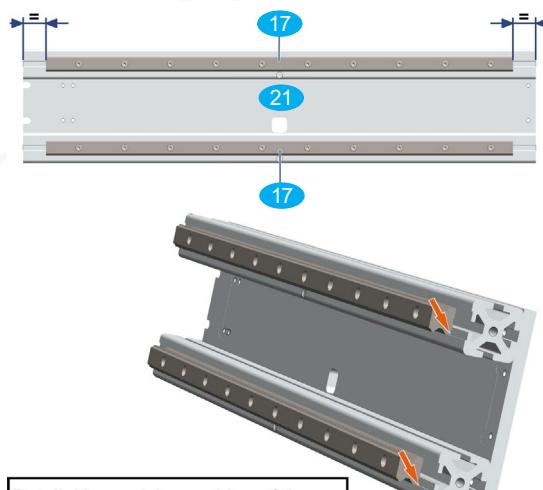


Fig. 18: Assembly of the Y linear guides

- Load four angles **35** with one screw **K4** each and loosely screw on a hammer nut **G2** at the back.
- Insert the hammer nuts through the elongated holes on the back of the gantry beam into the profile and screw the brackets (Fig. 19, magnifying glass above); Tighten the screws slightly so that the angles can just be shifted.
- Screw two angles **35** with flat-head screws **K3** and hammer nuts **G2** to the lower profile of the gantry beam **21** (Fig. 19, magnifying glass below); Tighten the screws slightly so that the angles can just be moved on the profile.
- Place the portal beam on the two portal cheeks as shown and screw all angles to the portal cheeks with flat-head screws **K3** and hammer nuts **G2**; Tighten screws slightly.

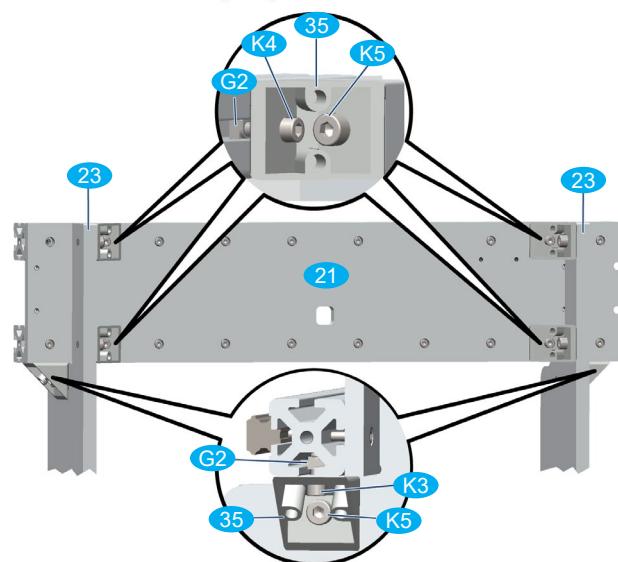


Fig. 19: Connection of portal beams and cheeks

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- Insert the portal beam 22 as shown in Figure 20 in the recesses in the portal cheeks and mount with cylinder screws D1; Tighten screws slightly
- Degrease the adhesive surfaces and stick a device foot 13 on the portal cheeks at the front and rear.

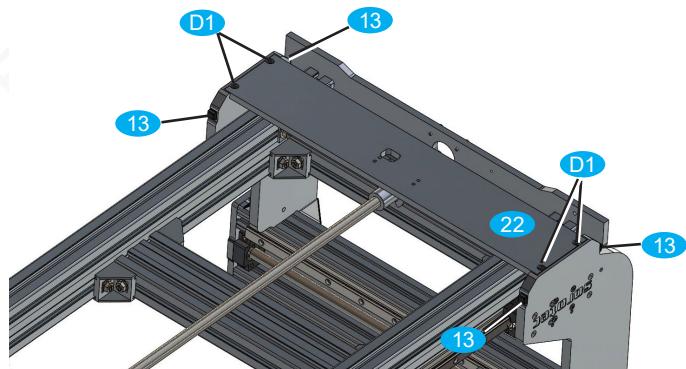


Fig. 20: Installation of girder portal beam

- Before aligning the X axis (Figure 21), check that the following screw connections are not yet tight, but are only slightly tightened:

- D1 Connections portal girder / portal cheeks
- K5 Connections angle / portal cheeks
- K4 Connections angle / portal beam
- K3 Connections angle / profile

- If necessary, loosen screw connections and fasten slightly.
- Move the portal several times from one end of the base frame to the other end, gradually tightening the screws in the following order:

- D1 Connections portal girder / portal cheeks
- K5 Connections angle / portal cheeks
- K4 Connections angle / portal beam
- K3 Connections angle / profile

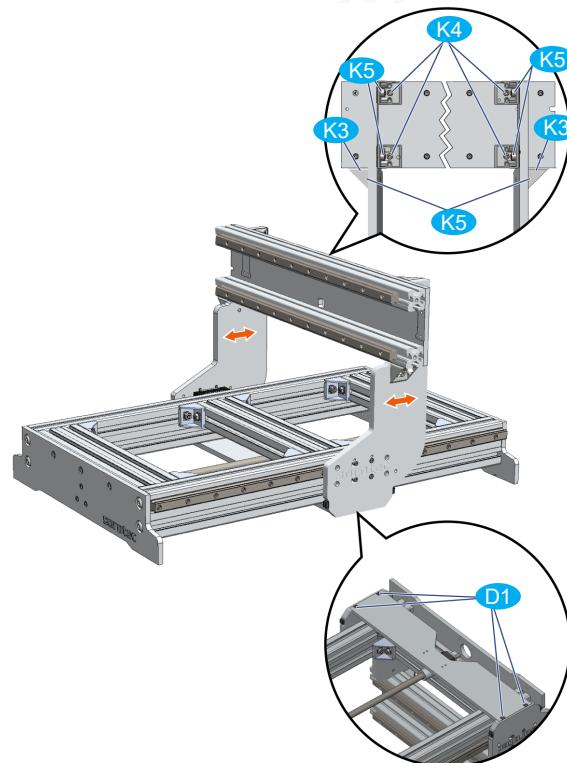


Fig. 21: Align the X axis

To adjust the parallelism of the base frame, some screw connections are loosened on the side with the air gap (see Fig. 10 and Fig. 22) so that the width of the base frame can be shifted slightly.

- Loosen screw connections somewhat.
- Move the portal several times from one end of the base frame to the other end and gradually tighten the loosened screws again.
- Check whether the portal can be easily moved over the entire travel path over the base frame after all screws have been tightened.

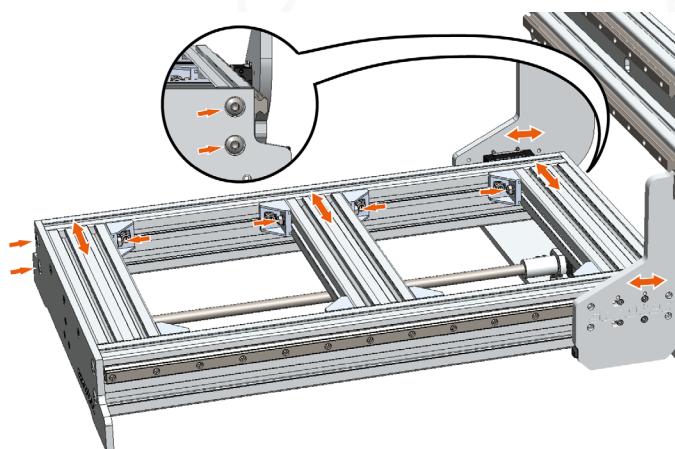


Fig. 22: Setting the parallelism of the basic frame

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- Tighten the lubricating nipple of the recirculating ball nut **4K** so that it faces the rear face plate.
- Mount the ball nut on the flange bracket X **9** using socket head screws **C5**; Tighten screws slightly.
- Move the portal until the flange bracket X is above the portal beam.
- Screw flange bracket X to the gantry beam using socket head screws **C7**; Tighten screws slightly.
- Move the portal as far forward as possible by turning the ball screw **4S**.
- Tighten the fixing screws **D2** of the floating bearing. Screw tightening torque: 10 Nm
- Tighten the fixing screws **C5** of the ball nut on the flange bracket X (see Figure 23). Screw tightening torque: 6 Nm

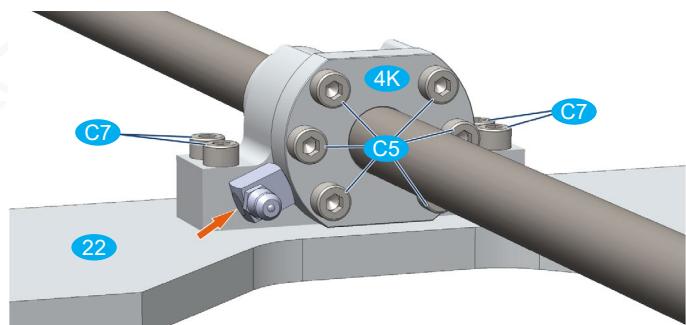


Fig. 23: Mounting flange bracket

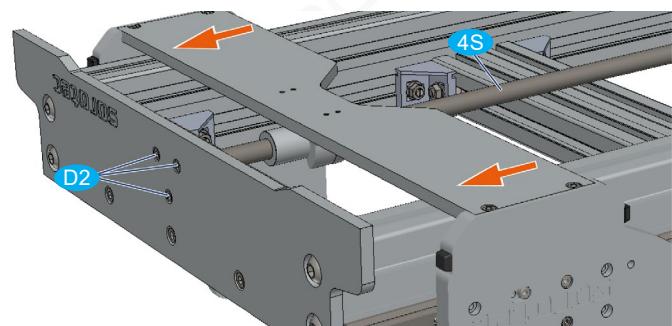


Fig. 24: Tighten floating bearing X-axis

- Carefully tighten the fastening screws **C7** of the flange bracket X on the gantry beam (see Fig. 23).
- Move the portal backwards by turning the ball screw so that the fixing screws **4F** of the fixed bearing are just accessible.
- Tighten the fixing screws **D3** of the fixed bearing. Screw tightening torque: 10 Nm
- Befestigungsschrauben der Flanschplatte 12 festziehen. Schraubenanzugsdrehmoment: 6 Nm Tighten the fastening screws **C3** of the flange plate **C5**. Screw tightening torque: 6 Nm
- Drive the dowel pins **Z** into the Y slide **31** from the back until they protrude about 3 ... 4 mm.

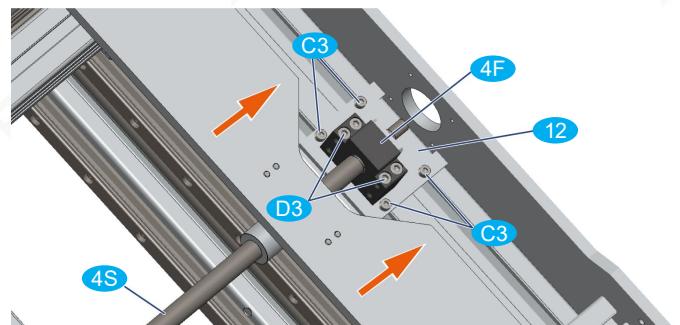


Fig. 25: Festziehen Festlager und Flanschplatte X-Achse

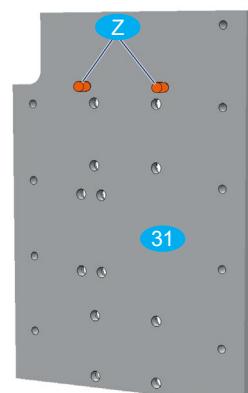


Fig. 26: Dowel pins in sledge

Assembly instructions

Basic-Line kit

SOROTEC

- Push one carriage 15 each onto the linear rails 17; Please note the following:
 - smoothed, bare surface on the long sides of the carriage point upwards
 - Grease nipples point to the left (see picture 27)
- Place the slide Y 31 with the cylinder pins Z on the upper carriage and screw them in with cylinder screws C1. Screw tightening torque: 6 Nm
- Screw carriage Y to the lower carriage; Tighten screws slightly.
- Slide carriage Y back and forth on the linear rails several times as far as possible; gradually tighten the fastening screws of the lower carriage. Screw tightening torque: 6 Nm

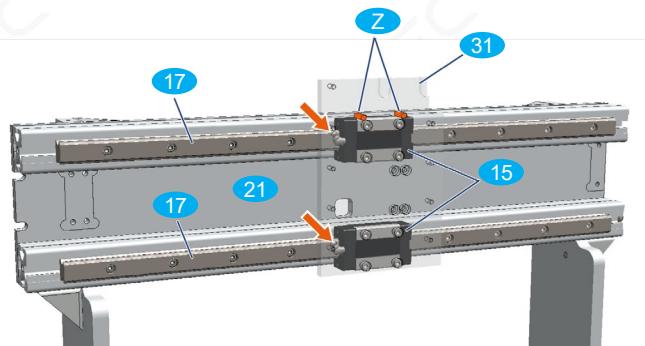


Fig. 27: Location of the grease nipples on the Y carriage

- Guide the pre-assembled Y drive 5 behind the Y carriage as shown in Figure 28. Screw the floating bearing 5L with 2 and the fixed bearing 5F with 4 cylinder screws M1 to the portal beam; Tighten screws slightly.
- Tighten the lubrication nipple on the recirculating ball nut 5K as shown.
- Mount the ball nut on the flange bracket Y 10 using pan head screws K2; Tighten screws slightly.
- Slide the slide Y to the screw connection with the flange bracket Y.
- Screw slide Y and flange bracket Y with socket head screws C1; Tighten screws slightly
- Move the slide Y to the fixed bearing by turning the ball screw 5S until the fixing screws of the fixed bearing are just accessible.

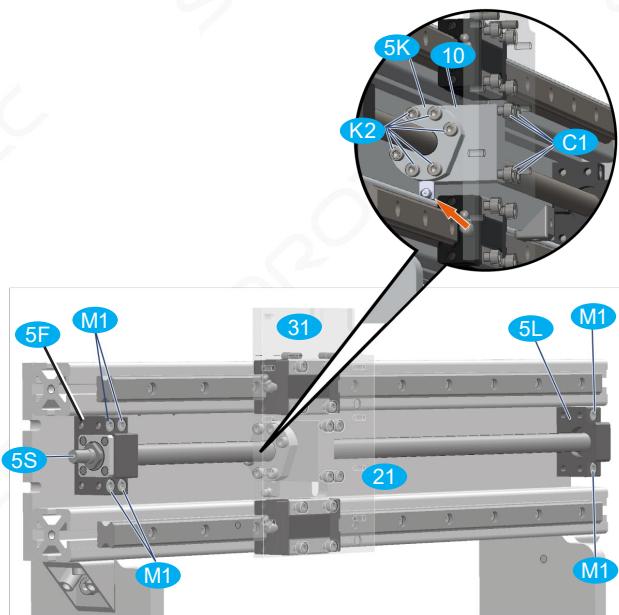


Fig. 28: Assembly of flange bracket and Y-slide

Assembly instructions

Basic-Line kit

SOROTEC

- Tighten the fixing screws of the fixed bearing. Screw tightening torque: 10 Nm
- Tighten the fixing screws of the ball nut on the flange bracket Y. Tightening torque: 6 Nm
- Carefully tighten the fastening screws of the flange bracket Y.
- Move the slide Y to the floating bearing by turning the ball screw until the fastening screws of the floating bearing are just accessible.
- Tighten the fixing screws of the floating bearing. Screw tightening torque: 10 Nm
- Degrease the adhesive surfaces on the fixed bearing and floating bearing and stick on the device feet 13.

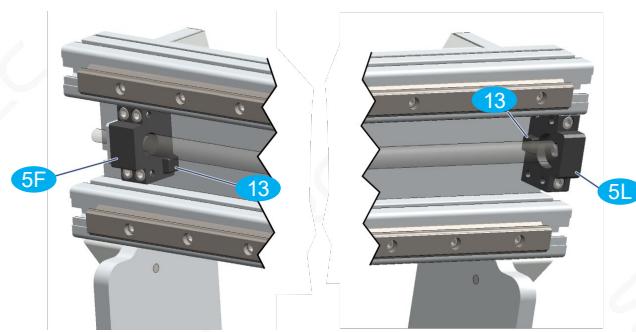


Fig. 29: Stick on the device feet as a buffer



Fig. 30: Assembly of the right end plate

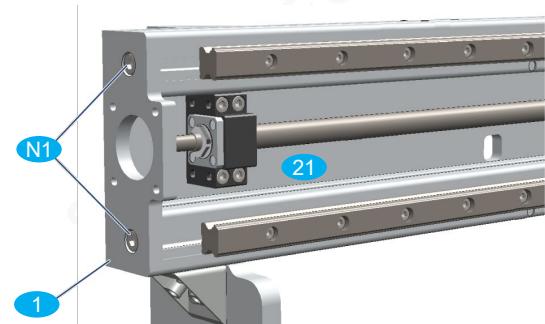


Fig. 31: Assembly of the left end plate

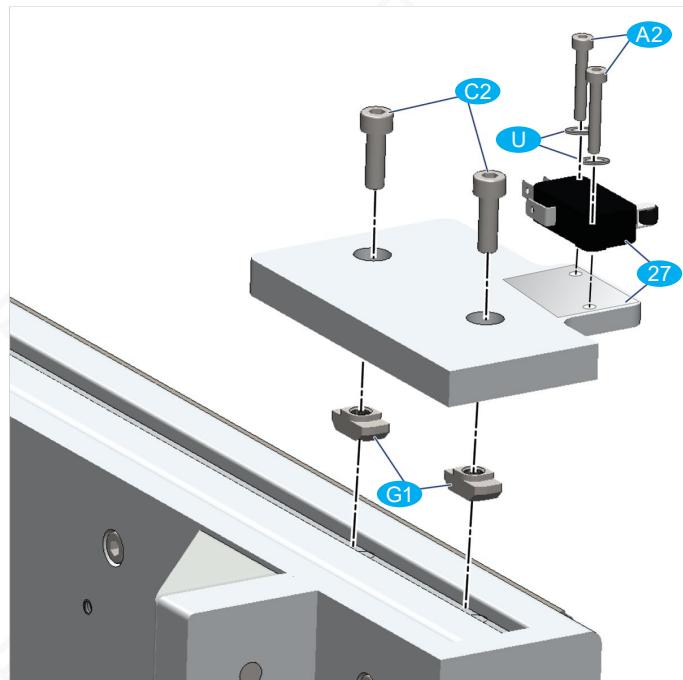


Fig. 32: Installation of Y reference switch

Assembly Z axis / spindle holder

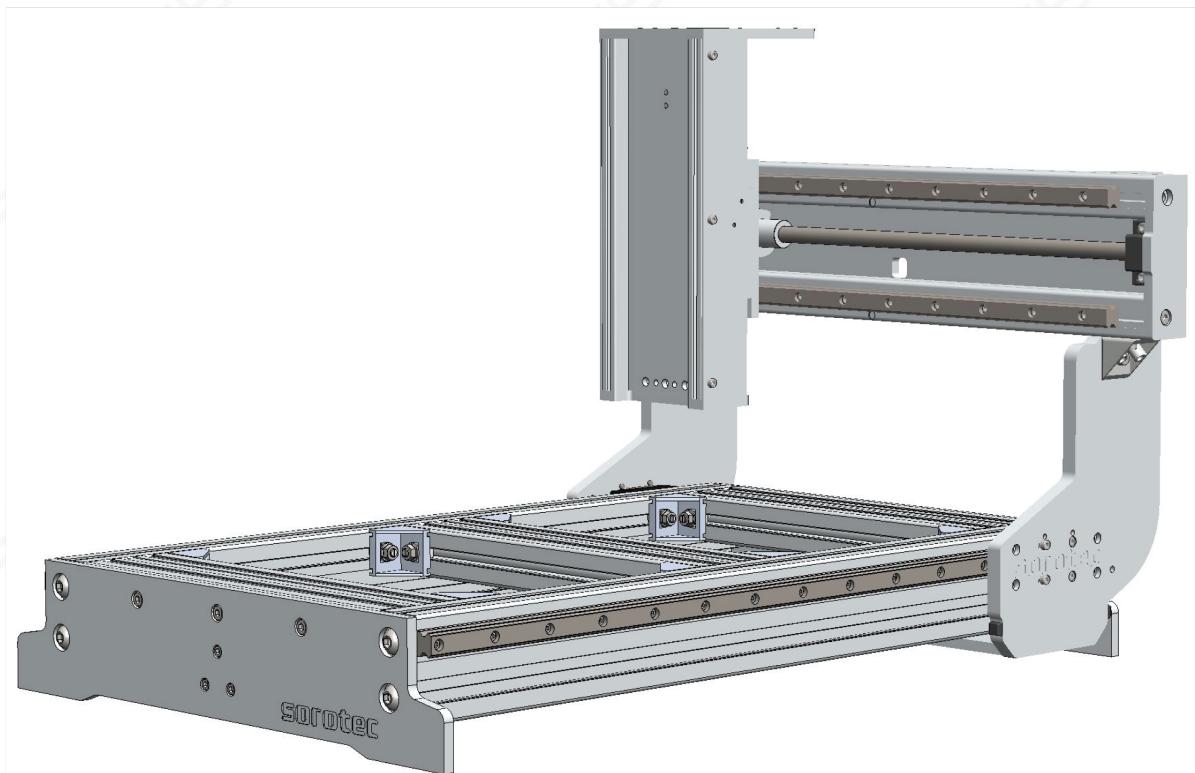


Fig. 33: Basic-Line with mounted Z-axis

Note:

The Z-axis is assembled as a single assembly. The complete Z axis is then screwed to the guide plate Y using screws C3.

After aligning the Z axis, the side braces Z are finally installed.

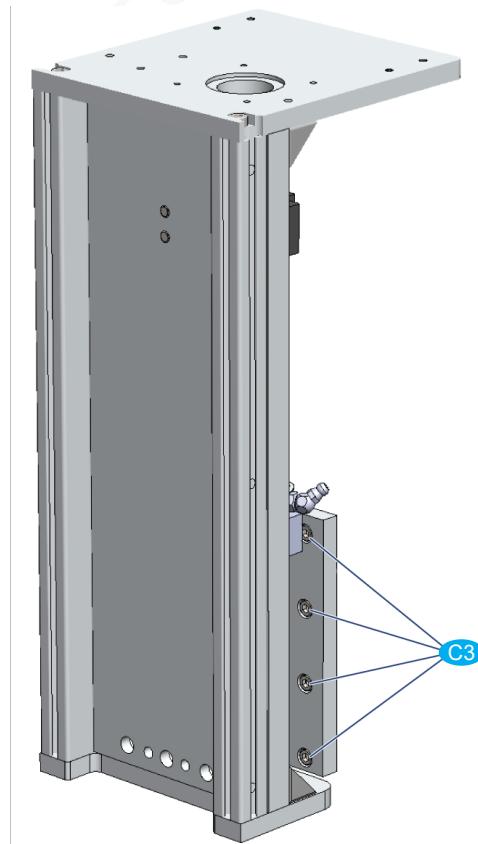


Fig. 34: Screwing the Z-axis onto the guide plate

Note:

The illustration shows the assembly with the Performance Kit, i.e. with two carriages 15 on the Z axis.

Carriage assembly without Performance kit:

- Drive in dowel pins ZA and ZB into base plate Z 8 until they protrude about 3 ... 4 mm on the underside.
- Screw the carriage 15A to the base plate Z using socket head screws C1; Please note the following:
 - smoothed, bare surface on the long side of the carriage lies against the dowel pins
 - The grease nipple on the carriage points down and to the right as shown for 15A in Figure 35

Screw tightening torque: 6 Nm

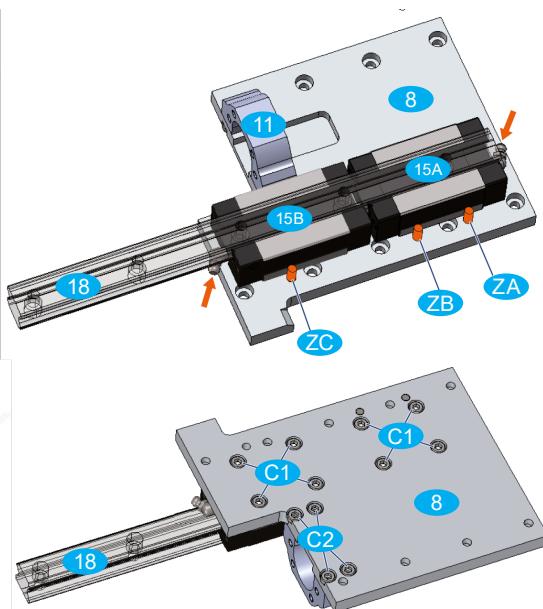


Fig. 35: Assembly of the Z-axis carriage. Red arrows show the location of the grease nipples.

Carriage assembly with Performance kit:

- Drive in dowel pins ZA and ZB into base plate Z 8 until they protrude about 3 ... 4 mm on the underside.
- Screw the carriages 15A and 15B to the base plate Z using socket head screws C1; Please note the following:
 - smoothed, bare surface on the long side of the carriage lies against the dowel pins
 - The grease nipple on the carriage 15A points down and to the right as shown in Figure 35
 - Grease nipple on the carriage 15B points up and left
- Push the linear rail Z into the carriage, press the carriage against the dowel pins and tighten the fastening screws C1 of the carriage.

Screw tightening torque: 6 Nm

Assembly instructions Basic-Line kit

SOROTEC

Continued for all kits:

- Screw the flange bracket Z 11 to the base plate Z 8 using socket head screws C4; Tighten screws slightly.
- Align the linear rail Z 18 on the plate Z 20 and screw it in with socket head screws; the reference edge (Fig. 36, see magnifying glass) of the linear rail must lie on the milled stop edge of plate Z over its entire length.
Screw tightening torque: 6 Nm

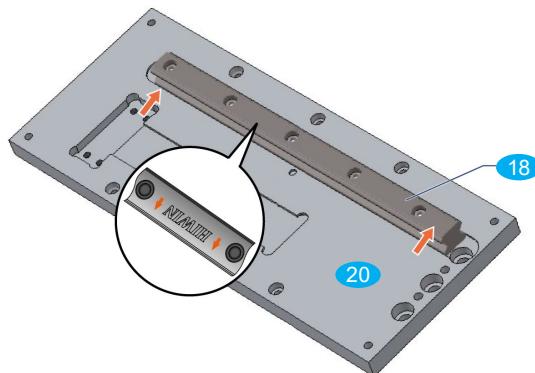


Fig. 36: Assembly of Z-axis linear rail

- Place the pre-assembled drive Z 6 on plate Z 20 as shown in Figure 37; Please note the following:

- Lubricating nipple of the recirculating ball nut 6K points upwards as shown
- Screw the fixed bearing 6F to plate Z using four socket head screws M1; Tighten screws slightly.
- Push plate Z 20 and base plate Z 8 together as shown.

- Screw the ball nut onto the flange bracket Z 11 using socket head screws C5.
Screw tightening torque: 6 Nm

- Move the base plate Z to the fixed bearing 6F as far as possible by turning the ball screw 6S.
- Carefully tighten the screws of the flange bracket Z C4.
- Tighten the screws M1 of the fixed bearing 6F
Screw tightening torque: 10 Nm

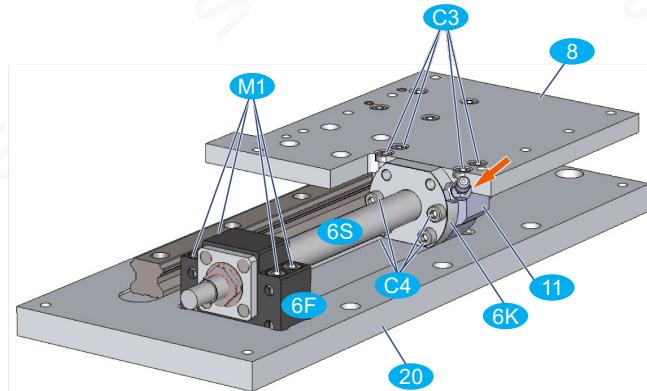


Fig. 37: Installation of drive Z

Assembly instructions

Basic-Line kit

SOROTEC

Note:

For reasons of clarity, the components previously mounted on the plate Z 20 are not shown in the figure.

All components shown in the illustration are first loosely screwed together, then aligned with each other and finally tightened the screws!

- Degrease the adhesive surface on the stop plate Z 3 (see magnifying glass in Fig. 38) and stick on the device foot 13 as a stop buffer.
- Place an angle 34 on each corner of plate Z 20.
- Insert the socket head screws C6 from above through the angles 34 and the holes in the plate Z and screw on a sliding block F1 from below.
- Insert the socket head screws L2 through the holes in plate Z and screw on one sliding block F1 each.
- Slide profiles 26 onto the hammer nuts; It should be noted that the closed sides of the profiles face each other on the inside (red double arrow in Figure 38).
- Slightly tighten the screws C6 / L2 so that the profiles can still be moved.
- Mount the stop plate Z 3 and the motor flange Z 19 with cylinder screws C3 on the front of the profiles; Tighten screws slightly.
- Mount the angles 34 to the stop plate Z and the motor flange Z using socket head screws L1. Tighten screws slightly.
- Align profiles flush with the outer edges of plate Z 20 and tighten screws C6 / L2.
- Align stop plate Z and motor flange Z flush and tighten screws L1 / C3.
- Mount the pre-assembled Z-axis on the slide Y using socket head screws C3; Tighten screws slightly.

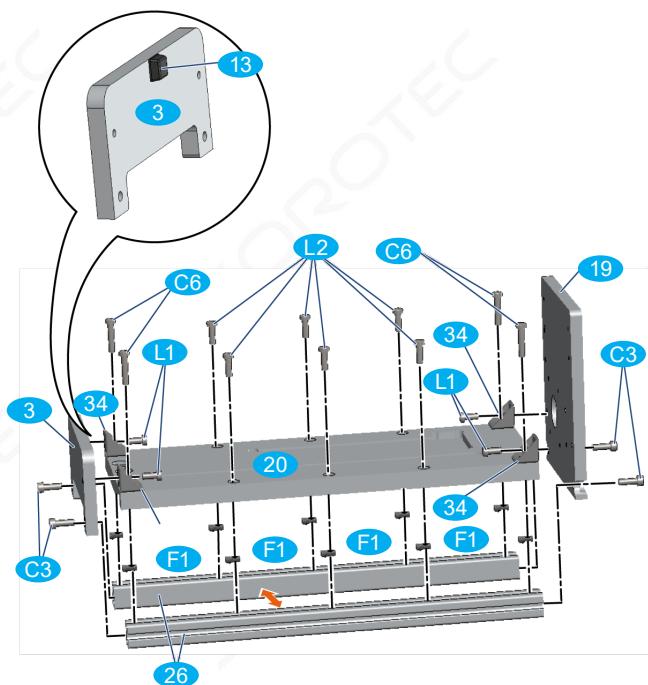


Fig. 38: Assembly of the Z-axis assembly

Assembly instructions

Basic-Line kit

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- To align the Z axis 20, a dial gauge must be attached to the Z plate and a stop bracket attached to the table. By turning the ball screw of the Z axis, it is moved up and down.
- Align the Z axis so that the dial gauge has no deflection when the Z axis is moved up and down. Tighten the fastening screws in this position.

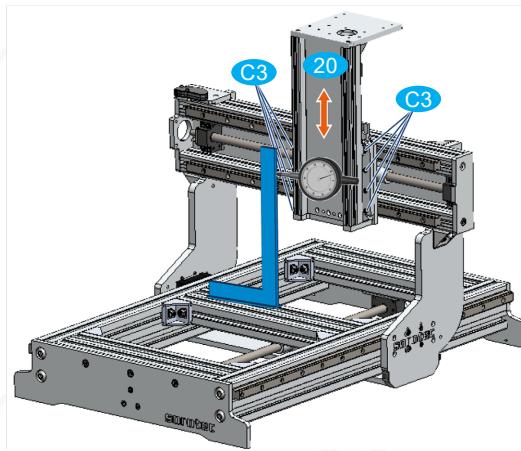


Fig. 39: Aligning the Z axis

Note:

When installing the reference switch, observe the additional instructions for the „Electrical installation kit“.

- Place the shim between the reference switch 27 and the left bracing Z 7L and screw the reference switch to the bracing Z using socket head screws A2, washers U and nuts O.
- Insert pan head screws K1 from the outside through the holes in the bracing Z 7 and screw on a sliding block F1 on the inside.
- Push the hammer nuts of the bracings Z into the profiles from above.
- Align bracings Z flush and tighten screws.

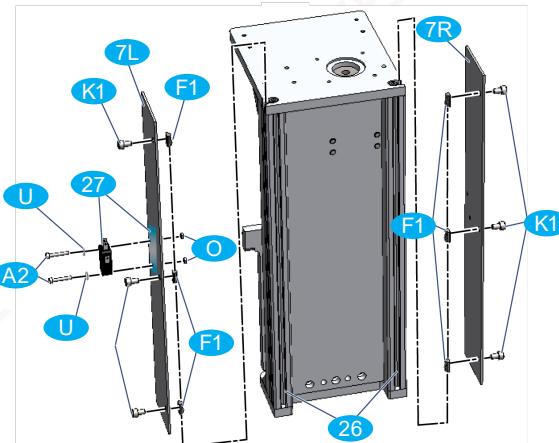


Fig. 40: Installation of stiffeners and Z reference switch

Assembly of the axis drives

Note:

The stepper motors shown below are not part of the scope of delivery. They are shown to clarify the structure of the axis drives.

X axis

- Slide the claw coupling 13 as far as possible onto the shoulder of the ball screw and fix it with the locking screw.
- Insert the stepper motor into the claw coupling and screw it into the rear face plate 32 with socket head screws B2.
- Secure the stepper motor with the locking screw of the claw coupling.

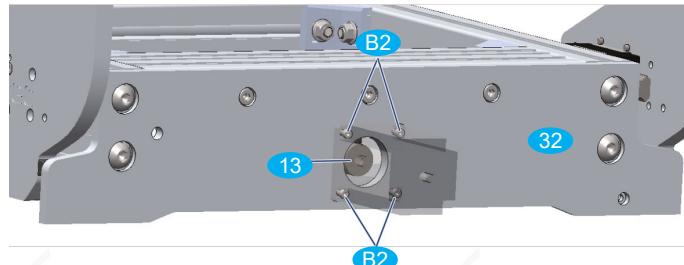


Fig. 41: Assembly of stepper motor X-axis

Y axis

- Slide the claw coupling 13 as far as possible onto the shoulder of the ball screw and fix it with the locking screw.
- Insert the stepper motor into the claw coupling and screw it to the right end plate Y 1 using socket head screws B3 and nuts P.
- Fix the stepper motor with the claw coupling locking screw.

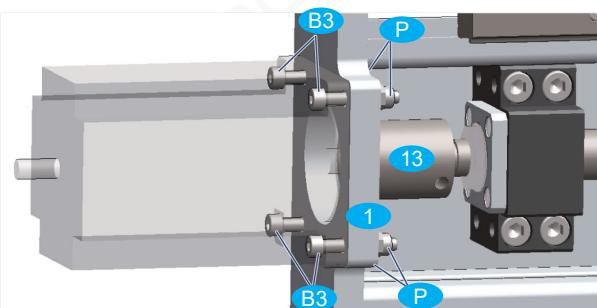


Fig. 42: Assembly of stepper motor Y-axis

Z axis

- Slide the claw coupling 13 as far as possible onto the shoulder of the ball screw and fix it with the locking screw.
- Insert the stepper motor into the claw coupling and screw it onto the motor flange Z 19 using socket head screws B1.
- Fix the stepper motor with the claw coupling locking screw.

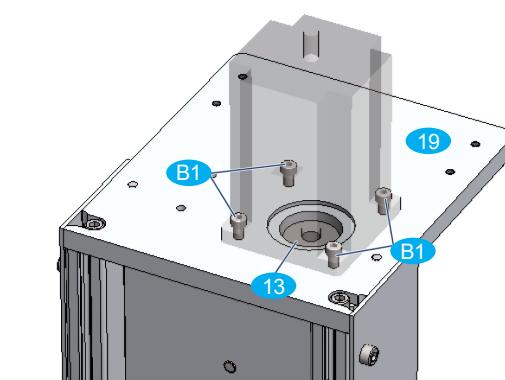


Fig. 43: Assembly of Z-axis stepper motor

Note:

Claw couplings can make loud noises during operation. In this case, lubricate the plastic buffer with a little Vaseline. Under no circumstances use normal grease or lubricating oil! Ordinary lubricants attack the plastic and can destroy it.

Maintenance

In normal use, the portal milling machine should be lubricated every six months, but at the latest after twelve months. To do this, proceed as follows:

All lubrication points

After greasing, remove excess grease with a rag.

X-axis carriage

- Drive the portal to the front stop of the X axis. The lubrication nipples of the carriages are now easily accessible from the front.
- Lubricate left and right as shown in Figure 44.
- On a machine with a performance kit, repeat the process for the rear carriages from the rear.

Note:

As a grease gun, we recommend the „HIWIN grease gun“ set from the Sorotec online shop (item no. SM.00014).

Common multi-purpose grease is sufficient to lubricate the spindle nuts and guide carriages.

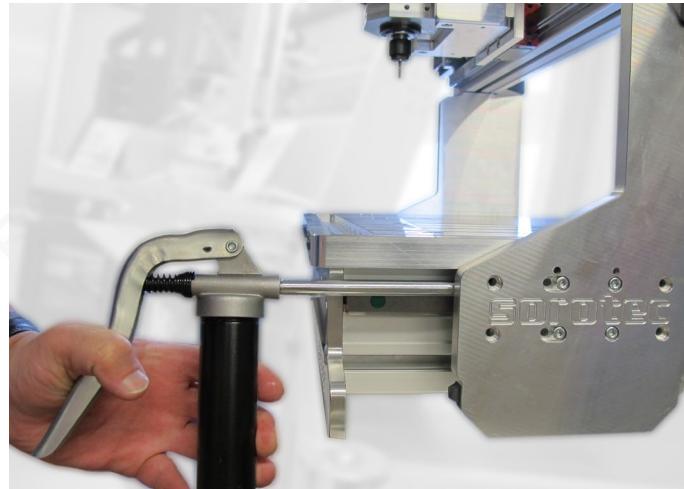


Fig. 44: Lubricating the front carriage X-axis

Spindle nut X axis

- Apply lubrication as shown in Figure 45.

Note:

The lubrication nipple of the X spindle nut can only be reached from below. With a maintenance opening in the machine base, you can simplify the lubrication process.

Otherwise, the portal milling machine must be put to one side or raised at the back to lubricate the X spindle nut.



Fig. 45: Lubricating the X spindle nut with the machine tilted forward

Y-axis carriage

- Drive the Y axis to the right stop. The grease nipples of the upper and lower carriage are now easily accessible from the left side.
- Lubricate the Y-axis carriage as shown in Figure 46.



Fig. 46: Lubricating Y-axis carriage

Spindle nut Y axis

- Bring the Y axis in the center position. The lubrication nipple of the Y-spindle nut is now easily accessible through the opening in the middle of the portal beam.
- Lubricate the Y-spindle nut as shown in Figure 47.

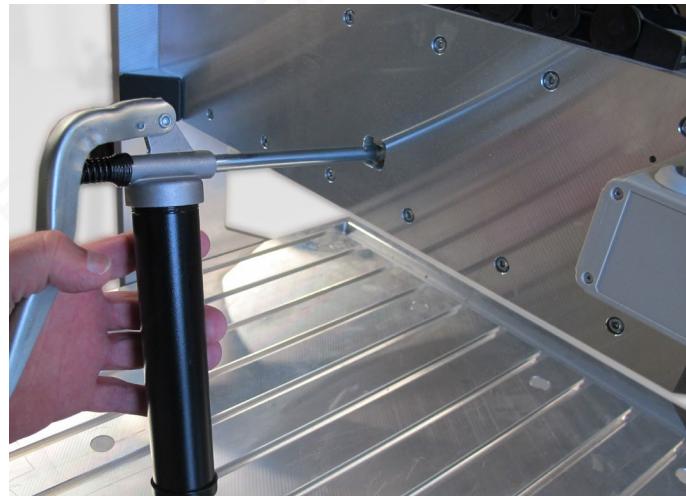


Fig. 47: Lubricating Y-axis spindle nut

Z-axis carriage

- Drive the Y axis to the right stop.
- Remove the Z-axis left stiffener. It is not necessary to remove the reference switch beforehand. The lubrication nipples of the runner blocks are now easily accessible from the left side.
- Lubricate the lower carriage as shown in Figure 48.
- For machines with a performance kit, repeat the process for the upper carriage.



Fig. 48: Lubricating carriage Z-axis

Spindle nut Z axis

The grease nipple on the spindle nut of the Z axis is easily accessible from behind and above.

- Lubricate the Z-spindle nut as shown in Figure 49.

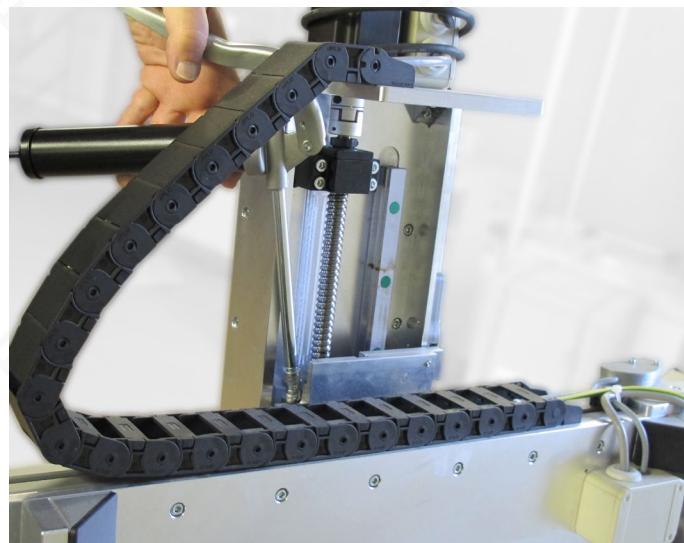


Fig. 49: Lubricating Z-axis spindle nut