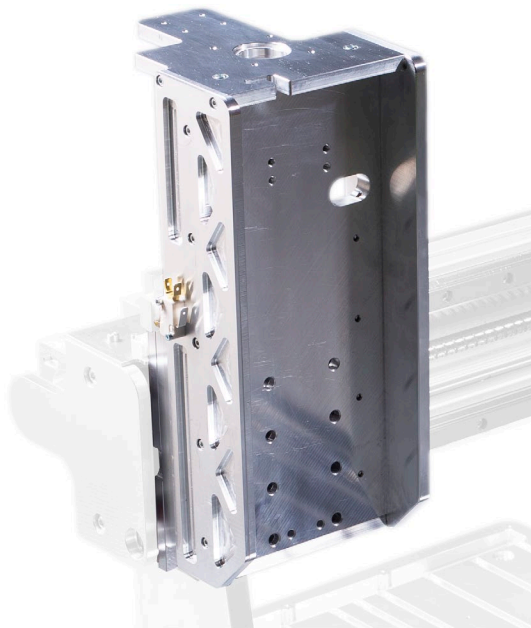


SOROTEC

Assembly Instructions

Z-axis Kit Compact Line



CLZA0001.BL

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Description

This kit contains all the parts for the mechanical construction of a Z-axis, as is also the case with all Sorotec Compact-Line machines. **The second section of this description provides guidelines for constructive integration in environments other than those originally intended.**

The Z-axis of the Compact-Line portal milling machine is a self-contained assembly that can also be easily integrated into other projects. Be it as the core of your own new construction, be it as a suitable completion of a new building that has long been underway. But replacing an older machine is also an option, whether as a repair, to improve rigidity, or to use a milling motor for which no suitable mount is available so far.



Attention!

You set up and use the Compact-Line Z-axis at your own discretion and risk. Sorotec assumes no liability for the technical suitability of the entire system or the consequences of its use.

Technical features:

- Travel 140 mm
- Linear guides size 20
- HIWIN ball screw tolerance class T07

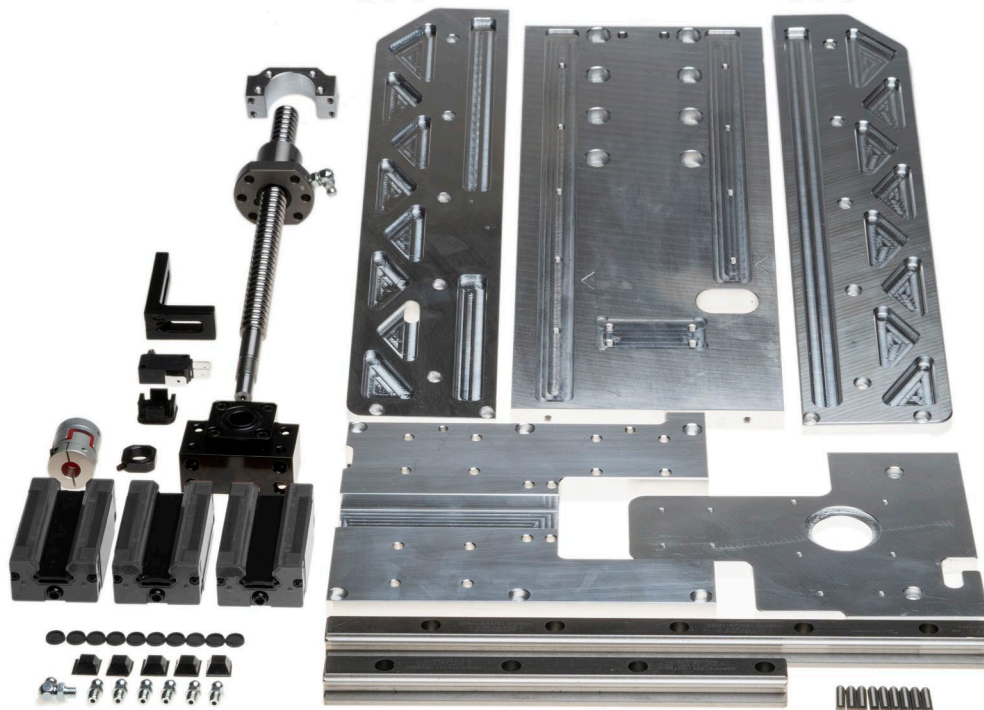



Fig. 1: The Z-axis Compact-Line kit

Scope of delivery

Illustration	Designation	Num	Illustration	Designation	Num
	guide plate	1		linear guide rail 320 mm	1
	stop plate	1		slide block	3
	plate	1		mounting bracket	1
	bracing on the left	1		claw clutch	1
	bracing on the right	1		straight pin	9
	motor flange	1		device foot	5
	flange bracket	1		Reference switch with insert film	1
	Ball screw with nut	1		cover cap for linear rail	10
	Festlager	1		grease access cover	1
	linear guide rail 220 mm	1		washer DIN 125 Ø M3	2

Illustration	Designation	Num
	cylinder head screw DIN 912	
	M3 x 16 21	2
	M4 x 12 22	14
	M4 x 16 23	4
	M5 x 16 24	20
	M5 x 18 25	6
	M5 x 20 26	13
	M6 x 40 27	4

Assembly

- Drive the cylindrical pins 15 into the guide plate 1 until they protrude by about 3-4 mm.
- Screw the slide block 12 to the guide plate with cylinder screws 24. The following must be observed:
 - Ground, blank surfaces on the long sides of the carriage point to the outer edges of the plate.
 - The lubricating nipples on the carriages point outwards. If necessary, turn the lubricating nipples or screw them to the opposite end.
- Tighten screws slightly.
- Push the linear rail 11 into the two carriages as shown. Keep the ball protection strips pressed out. Press the carriage with the linear rail against the cylindrical pins and screw the two carriages tight in this position. Tightening torque: 6 Nm
- Carefully remove the linear rail again and reinsert the ball protection strips.
- Remove cylindrical pins (were only required for alignment during assembly).
- Degrease the adhesive surface and stick the device base 16 to the guide plate.

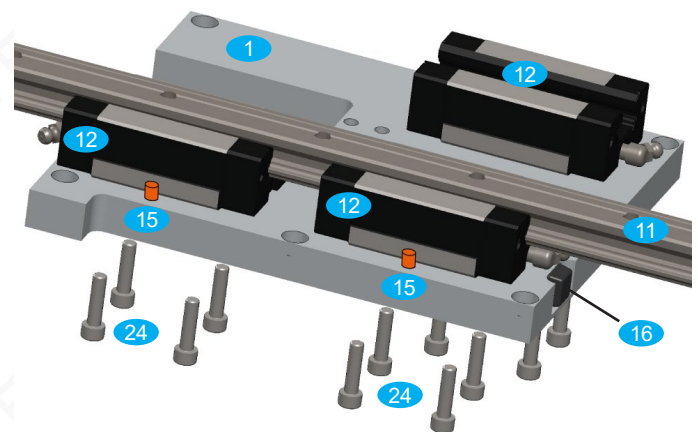


Fig. 2: Assembly of the slide blocks

Note
The fastening screws of the individual slide blocks are only finally tightened when they are aligned.

- Place linear rails **10** and **11** on the milled stop edges of plate Z **3** (red arrows in Fig. 3).
- Screw linear rails with cylinder head screws; tighten screws slightly.
- Starting in the middle, tighten the screws evenly outwards; the reference edges of the linear rails must lie against the milled stop edges of the plate **3** over their entire length. Tightening torque: 6 Nm
- Seal the holes in the rails with cover caps **18**.

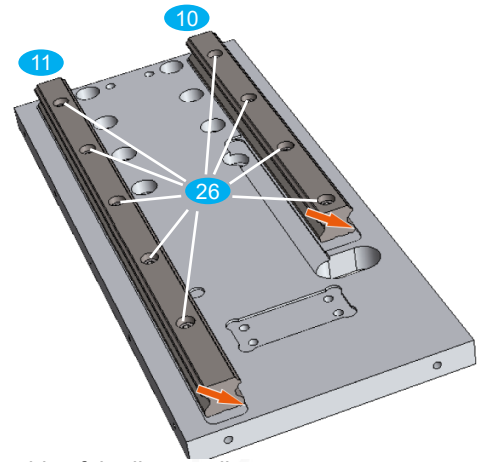


Fig. 3: Assembly of the linear rails

- Slide the slide blocks with the guide plate **1** onto the linear rails of the plate **3**.
- Slide the guide plate **1** back and forth several times over the entire travel on the linear rails; gradually tighten the fastening screws of the individual carriages. Tightening torque: 6 Nm
- Screw the flange bracket **7** to the guide plate **1** with cylinder screws **24**; tighten screws slightly.

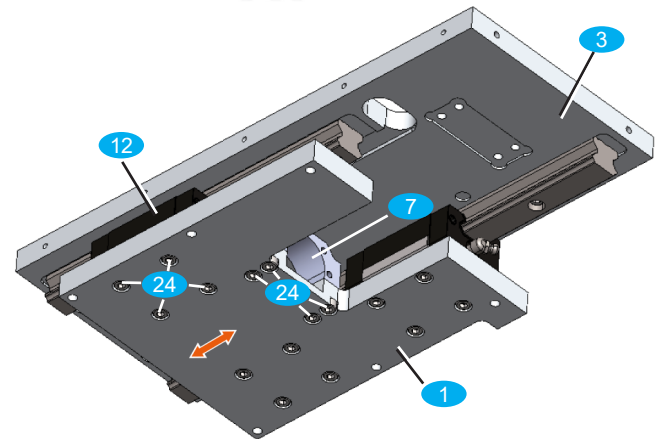


Fig. 4: Assembly of the guidance group

- Insert the spindle **8** with the recirculating ball nut into the flange block **7** as shown. Attach the fixed bearing **9** and screw to the plate **3** with four screws **27**; tighten screws slightly.
- Tighten the ball nut grease fitting so that it faces the hole in the plate **3**. Screw the recirculating ball nut to the flange bracket **7** with screws **26**. Tightening torque: 6 Nm
- Carefully tighten the fastening screws on the flange bracket **7**.
- Move the guide plate **1** as far as possible towards the fixed bearing by turning the ball screw.
- Tighten the fixed bearing **9** mounting screws. Tightening torque: 10 Nm

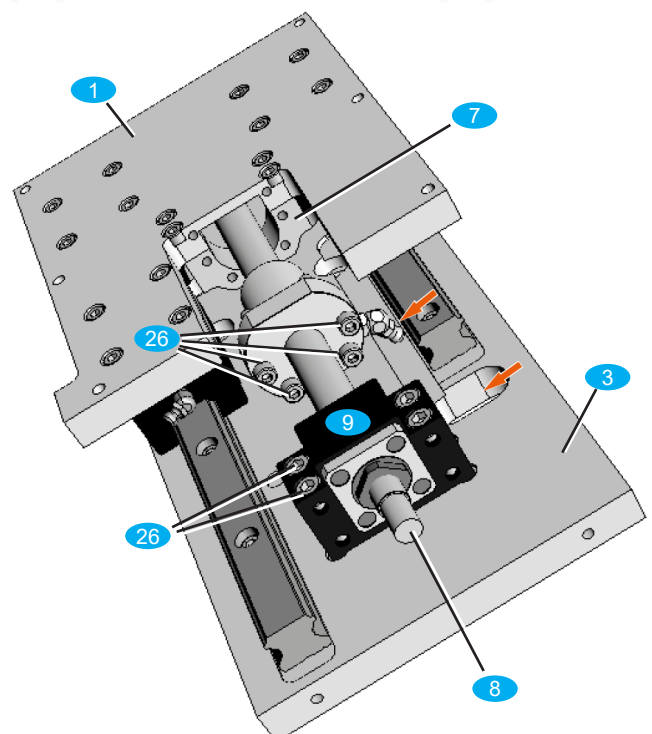


Fig. 5: Grease nipple towards the opening (red arrows)

- Screw the pre-assembled Z-axis to the Y-slide of the milling machine with screws 25; tighten screws slightly.

To align the Z-axis, a dial indicator must be attached to the plate 3 and a try square must be attached to the table. Rotating the ball screw of the Z-axis moves it up and down.

- Align the Z-axis so that the dial gauge does not deflect when moving up and down the Z-axis. In this position, tighten the fastening screws. Tightening torque: 6 Nm

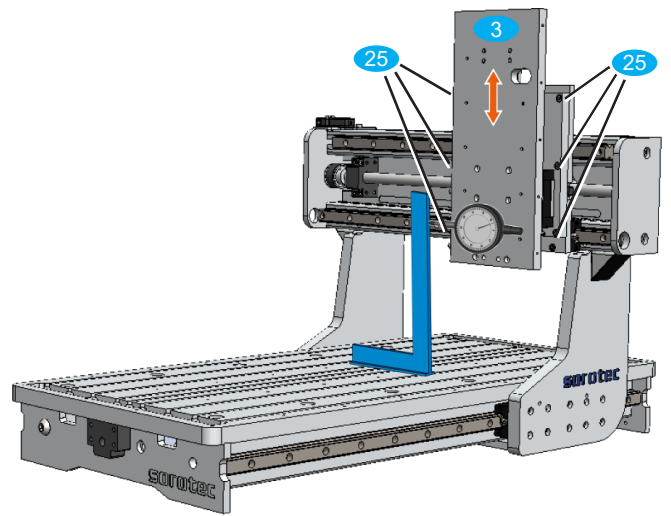


Fig. 6: Align the Z axis on the machine

- Mount the stop plate 2 with screws 24 on the underside of the plate 3; tighten screws slightly.

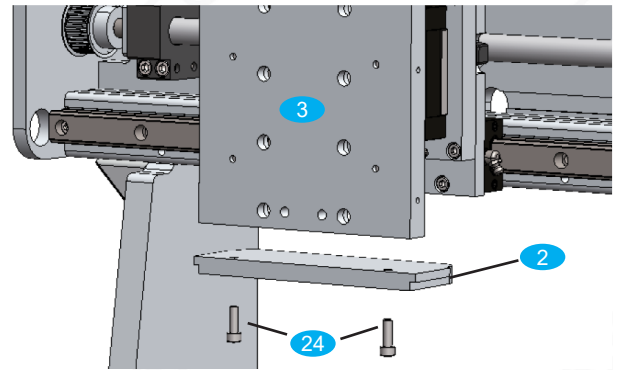


Fig. 7: Assembly of the stop plate

- Attach motor flange 6 to plate 3 with screws 24; tighten screws slightly.
- Mount the bracings 4 and 5 to the plate 3 and to the motor flange 6 with screws 22.
- Tighten the fastening screws (motor flange 6 to plate 3).
- Tighten the fastening screws (braces 4 and 5 to the plate 3).
- Mount the reference switch 17 together with the insert film with washers 20 and screws 21 on the left reinforcement 4.

Note

In the following figure, only the Z-axis is shown for a better overview.

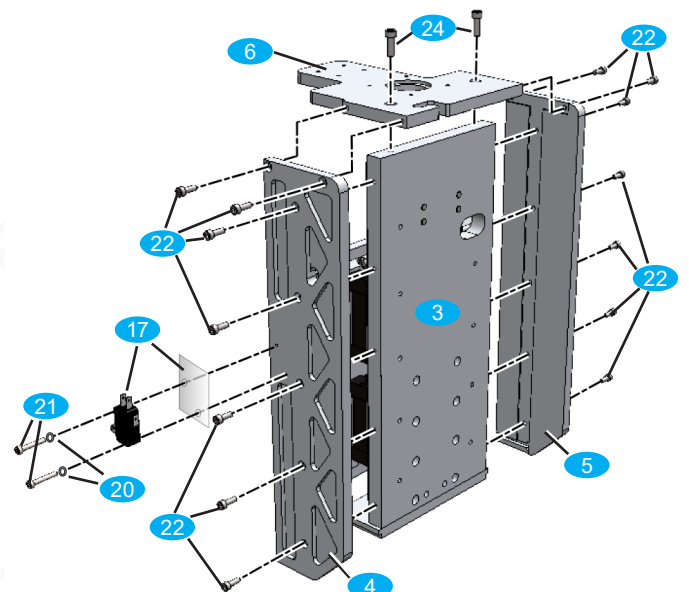


Fig. 8: Assembly of motor flange and bracings

i Note

The stepper motor shown below is not part of the scope of delivery. The illustration is intended to clarify the structure of the axle drive.

- Push the claw coupling **14** as far as possible onto the shoulder of the ball screw **8** and fix it with the locking screw.
- Insert the stepper motor into the claw coupling and screw to the motor flange **6** with screws **23**.
- Fix the stepper motor shaft with the safety screw of the claw coupling.

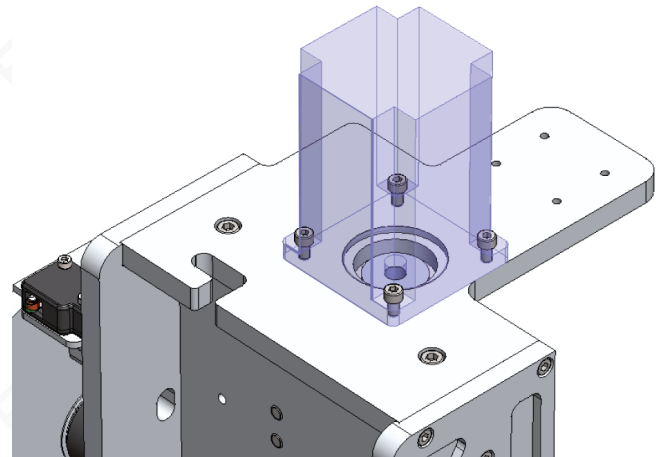


Fig. 9: Installation of the stepper motor

i Note

Claw couplings can cause loud noises during operation. In this case, lubricate the plastic buffer with a little Vaseline. Never use normal grease or lubricating oil! Ordinary lubricants attack the plastic and can destroy it.

Constructive interfaces

The constructive integration into a machine takes place via two mounting surfaces, the exact dimensions and other properties of which are described in Figs. 11 to 14.

Mounting on the portal slide

Fig. 13 shows the mounting points for screwing the Z-axis to the portal slide. The Y-axis carriages are not connected directly to the Z-axis.

An adapter plate is to be constructed, which is screwed to the guide carriage on the one hand and which creates the connection to the Z-axis screwed on from the front on the other hand (see also front view, Fig. 11).

Mounting the milling spindle

Figure 14 shows the spindle mounting points on the Z-axis. An adapter plate is to be constructed to accommodate the respective spindle. Ready-made holders are available in the Sorotec shop for the popular round spindles (but also for others):

ZSP.HFSH65IS.AL for \varnothing 65 mm

ZSP.HFSH80.1IS.AL for \varnothing 80 mm



Fig. 10: The Z-axis of the Compact-Line as a 3D drawing

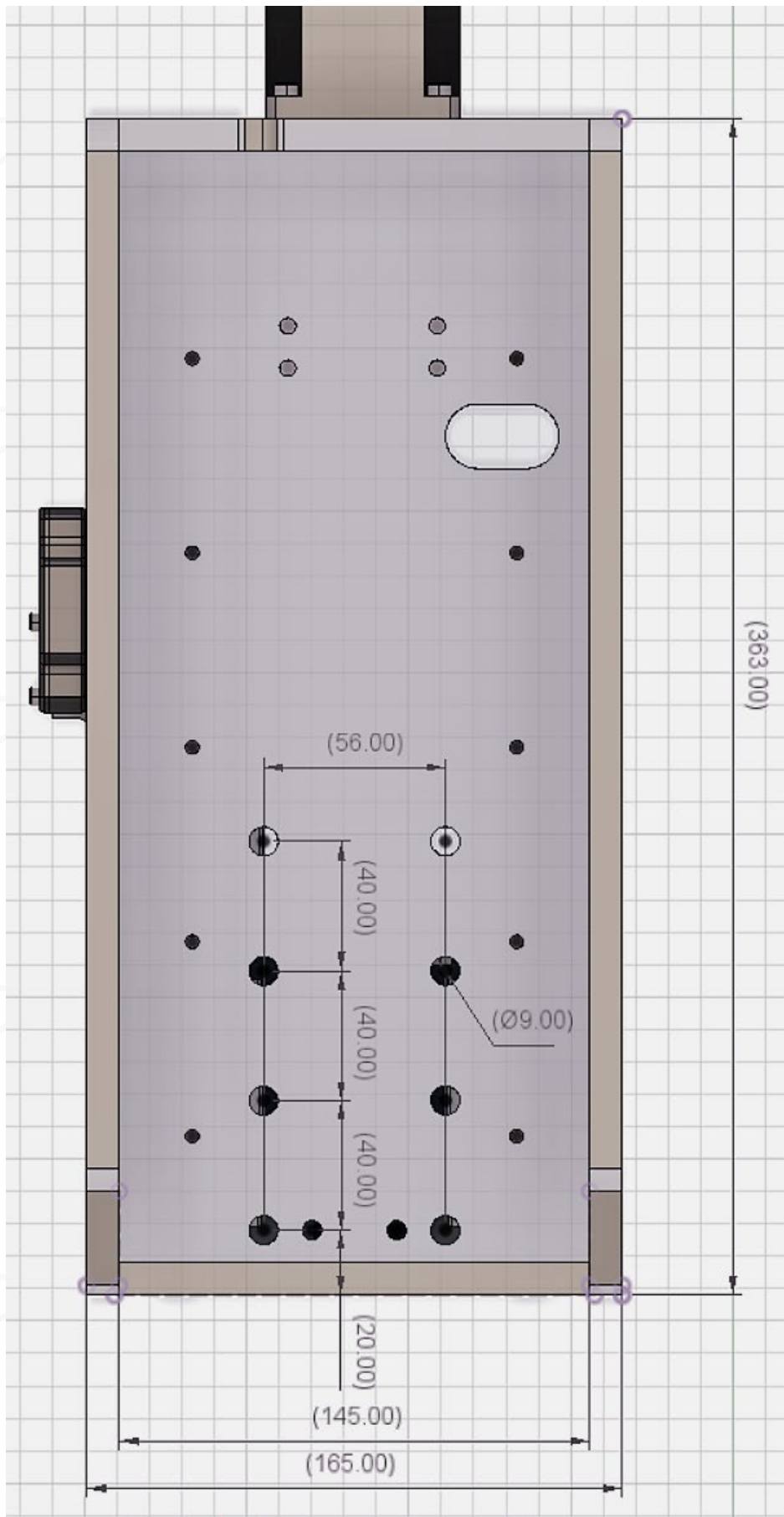


Fig. 11: front view

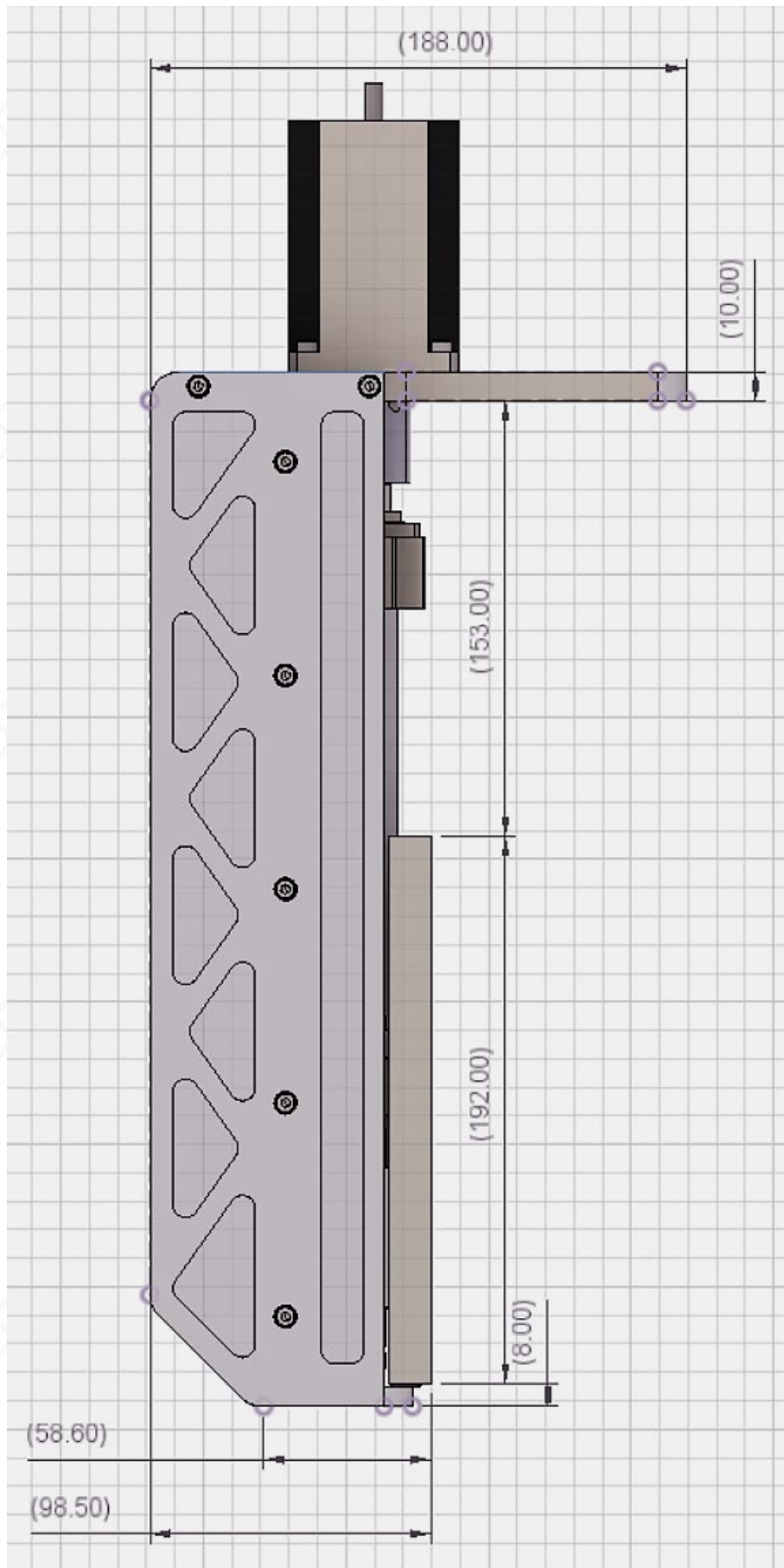


Fig. 12: side view

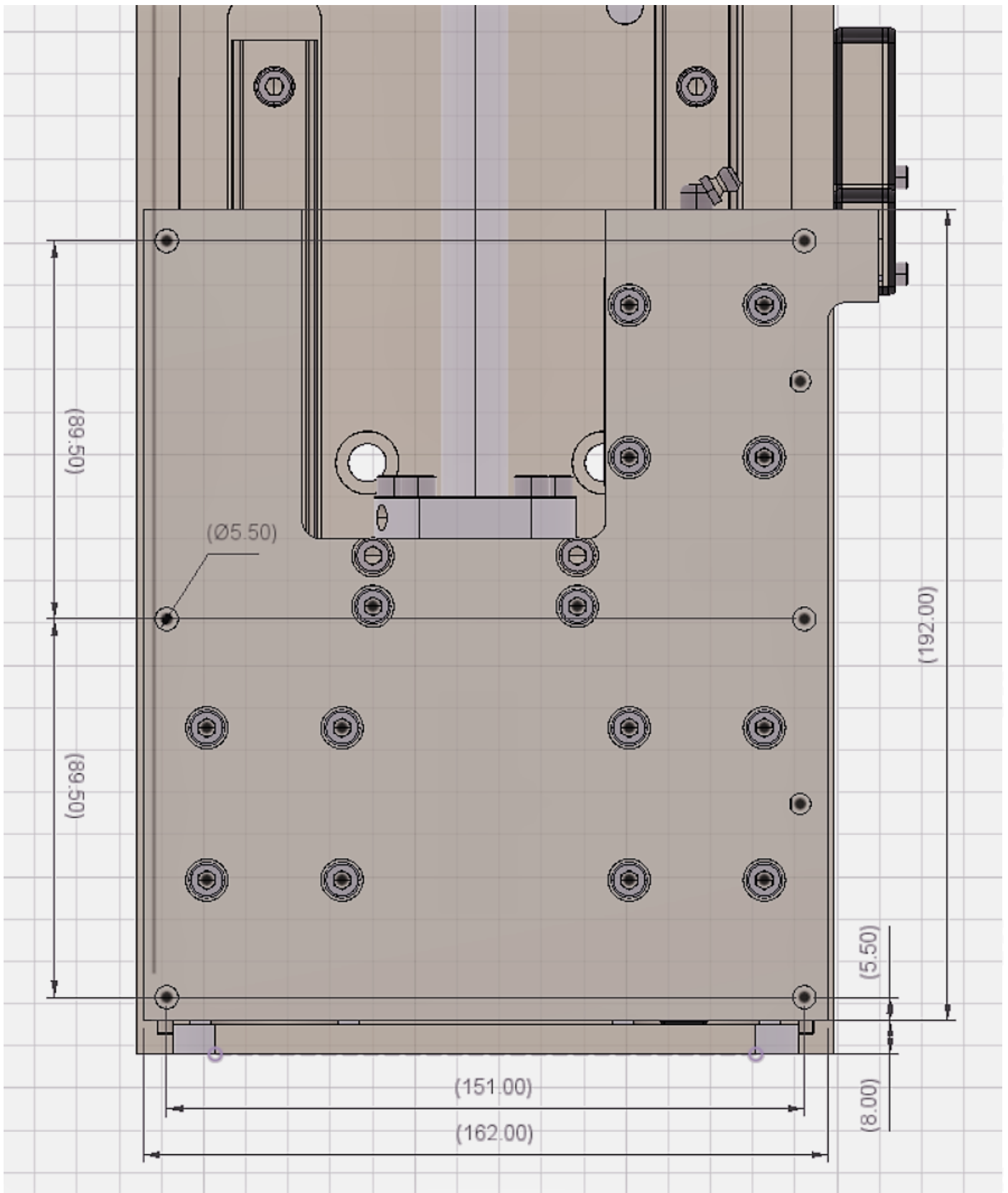


Fig. 13: mounting points for screwing to the portal slide

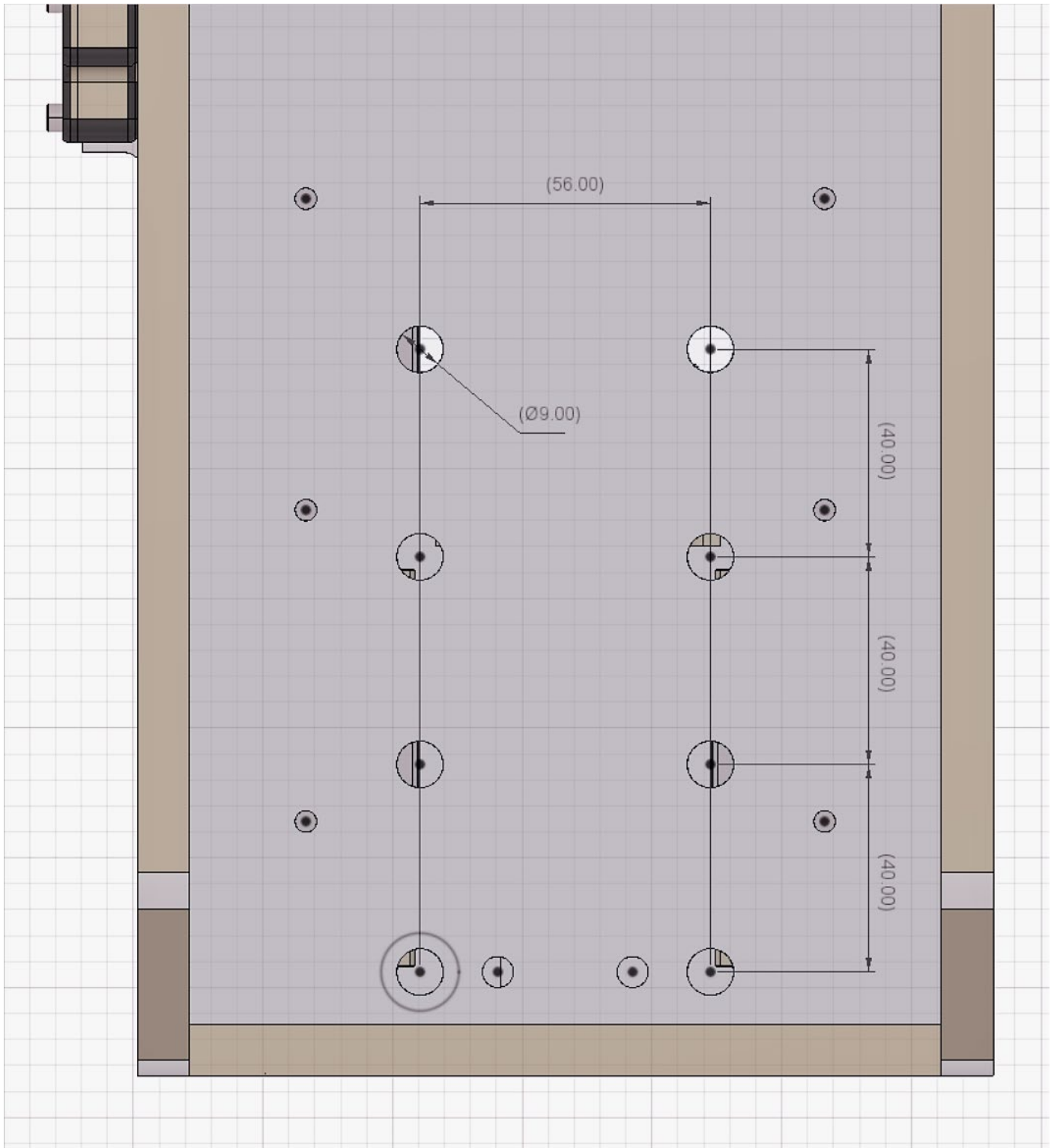


Fig. 14: spindle mount