

Assembly instructions

Adapters HX

HX-Adapter-01-3-EN-2406-MA

Imprint

HIWIN GmbH

Brücklesbünd 1

77654 Offenburg

Germany

Fon +49 781 93278-0

info@hiwin.de

hiwin.de

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1 General

1.1 About these assembly instructions

These assembly instructions are intended for planners, developers and operators of systems who plan and install the named products as machine elements. It is also addressed to the persons who carry out the following work in connection with the named axes:

- Transport
- Assembly
- Retrofitting or upgrading
- Setup
- Commissioning
- Operation
- Cleaning
- Maintenance
- Troubleshooting
- Decommissioning, disassembly and disposal

1.1.1 Requirements

We assume that

- ▶ The operating personnel have been instructed in the safe operation of the named products and have read and understood these assembly instructions in full

1.1.2 Availability

The assembly instructions must always be available to all persons working with or on the named products. The assembly instructions are also available at hiwin.de.

1.2 Presentation and layout conventions used in these assembly instructions

1.2.1 Instructions for actions

Instructions for actions are provided in sequential order and identified with a triangle symbol. The results of the actions are accompanied by a tick symbol.

Example:

- ▶ Instruction 1
- ▶ Instruction 2
- ✓ Result

1.2.2 Lists

Lists are identified through the use of bullet points.

Example:

The products must not be operated:

- Outdoors
- In areas where there is a risk of explosion
- ...

1.2.3 Information

Note:

Notes describe general advice and recommendations.

1.3 Warranty and liability

The manufacturer's "General Terms and Conditions of Sale and Delivery" apply.

1.4 Manufacturer information

Address	HIWIN GmbH Brücklesbünd 1 77654 Offenburg, Germany
Telephone	+49 (0) 781 / 9 32 78 - 0
Technical customer service team	+49 (0) 781 / 9 32 78 - 77
Fax	+49 (0) 781 / 9 32 78 - 90
Technical customer service team fax	+49 (0) 781 / 9 32 78 - 97
E-mail	support@hiwin.de
Internet	hiwin.de

1.5 Product monitoring

Please inform HIWIN GmbH, as manufacturer of the named products, about:

- Accidents
- Possible sources of danger on the products
- Any unclear information in these assembly instructions

1.6 General functional principle

HIWIN adapters for cross tables and multi-axis systems allow two and more axes to be flexibly combined. This allows individual multi-axis systems to be designed quickly and easily. Forces and torques are safely transmitted through force and form closure. Centring sleeves allow for precise and reproducible connection. Depending on the desired alignment of the axes to be connected, three basic adapter types are available:

- CPN
- CPR
- CCN
- CCR

1.7 Scope of delivery

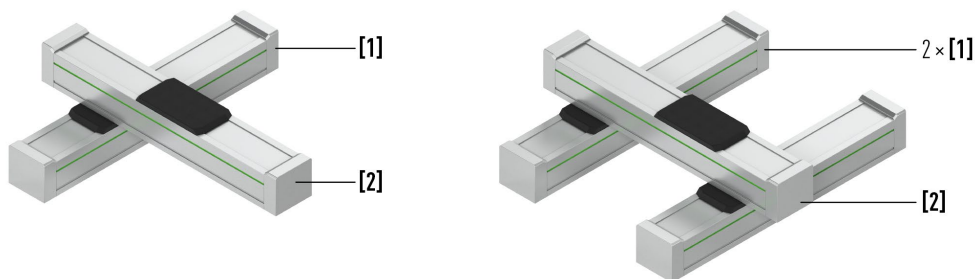
All adapters are supplied ready for installation including fixing material.

2 CPN adapter

Adapter for connecting the axis profile of the upper axle to the carriage of the lower axis. Both carriages point in the same direction. It is possible to combine two single axes or a double axis with a single axis.

The following series can be connected together:

- HT – HT
- HT – HM
- HT – KK
- HM – KK
- 2 × HM – HM / HD – HM
- 2 × HM – HT / HD – HT



1 Axis 1

2 Axis 2

2.1 General assembly instructions

Note

The quantity and type of fixing material vary according to the size of the axes used.

Note

When tightening the screws, always use the tightening torques specified in the individual chapters of these assembly instructions.

Note

The female thread must be free of dust, oil and grease.

Note

All the screws used have an adhesive coating, which hardens shortly after the screw has been screwed into the thread.

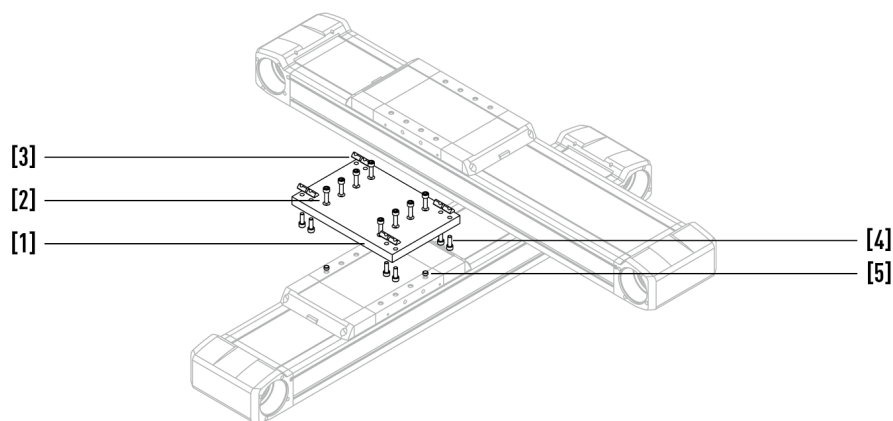
Please note the following conditions:

- 5 minutes flexible for adjustment and tightening procedures
- Functional after approx. 6 hours
- Final strength after 24 hours

Note

Note that the thread locker only works for one use. If the screw is reused, a new adhesive coating must be applied to the screw.

2.2 General assembly HT – HT



1	Adapter plate	4	Mounting bolts B
2	Mounting bolts A	5	Centring sleeve
3	T nuts		

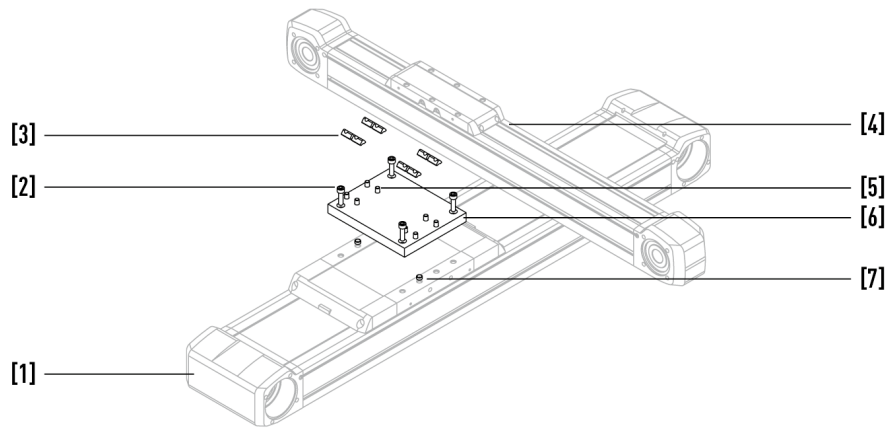
- ▶ Place the two centring sleeves [5] diagonally opposite each other on the carriage of the lower axis.
- ▶ Place the adapter plate [1] onto the carriage of the lower axis.
- ▶ Working in a criss-cross fashion and in three steps, tighten mounting bolts A [2] to the tightening torque specified in [Table 2.1](#).
- ▶ Insert the T nuts [3] into the grooves on the bottom of the upper axis.
- ▶ Lightly tighten mounting bolts B [4] to mount the upper axis.
- ▶ Align the upper axis so that it is perpendicular to the lower axis. Use an angle gauge to do so.
- ▶ Working in a criss-cross fashion and in three steps, tighten mounting bolts B [4] to the tightening torque specified in [Table 2.1](#).
- ✓ The adapter is fully assembled.

Table 2.1: Quantity and tightening torques of the mounting bolts depending on the axis combination (HT – HT)

Axes		Article number	Mounting bolt A			Mounting bolt B		
Axis 1	Axis 2		Screw size 1)	Torque [Nm]	Quantity [pcs.]	Screw size 1)	Torque [Nm]	Quantity [pcs.]
HT100	HT100	25-001615	M5 × 16	5.5	8	M5 × 12	5.5	8
HT150	HT100	25-001616	M6 × 20	9.0	6	M5 × 14	5.5	8
HT150	HT150	25-001617	M6 × 22	9.0	8	M6 × 18	9.0	8
HT200	HT150	25-001618	M8 × 20	22.0	8	M6 × 16	9.0	8
HT200	HT200	25-001619	M8 × 20	22.0	8	M8 × 16	22.0	8
HT250	HT200	25-001620	M10 × 25	40.0	8	M8 × 20	22.0	8
HT250	HT250	25-001621	M10 × 25	40.0	8	M8 × 20	22.0	8

1) Strength class 8.8

2.3 General assembly HT – HM



1	HT axis	5	Mounting bolts B
2	Mounting bolts A	6	Adapter plate
3	T nuts	7	Centring sleeve
4	HM axis		

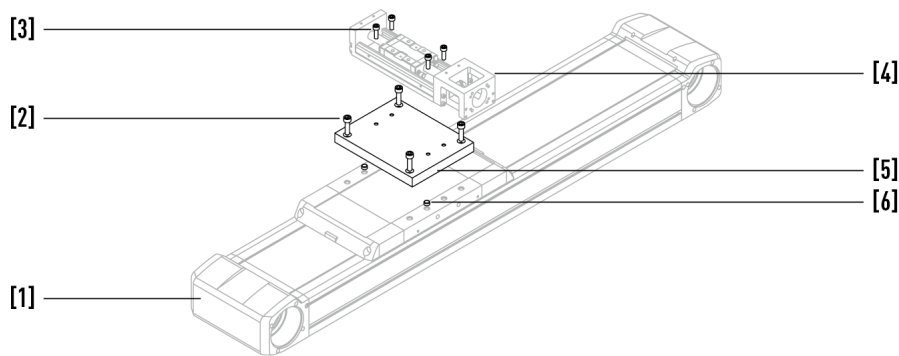
- ▶ Place the two centring sleeves [7] opposite each other on the carriage of the HT axis [1].
- ▶ Insert the T nuts [3] into the grooves on the bottom of the HM axis [4].
- ▶ Use mounting bolts B [6] to screw the adapter plate [5] onto the T nuts [3] of the HM axis [4].
- ▶ Working in a criss-cross fashion and in three steps, tighten mounting bolts B [5] to the tightening torque specified in [Table 2.2](#).
- ▶ Place the adapter plate [6] with the mounted HM axis [4] onto the carriage of the HT axis [1].
- ▶ Lightly tighten mounting bolts A [2] to mount the upper axis.
- ▶ Align the upper axis so that it is perpendicular to the lower axis. Use an angle gauge to do so.
- ▶ Working in a criss-cross fashion and in three steps, tighten mounting bolts A [2] to the tightening torque specified in [Table 2.2](#).
- ✓ The adapter is fully assembled.

Table 2.2: Quantity and tightening torques of the mounting bolts depending on the axis combination (HT – HM)

Axes		Article number	Mounting bolt A			Mounting bolt B		
Axis 1	Axis 2		Screw size ¹⁾	Torque [Nm]	Quantity [pcs.]	Screw size ¹⁾	Torque [Nm]	Quantity [pcs.]
HT100	HM040	25-001608	M5 × 16	5.5	4	M5 × 12	5.5	8
HT150	HM040	25-001609	M6 × 18	9.0	4	M5 × 12	5.5	8
HT150	HM060	25-001610	M6 × 22	9.0	4	M6 × 16	9.0	8
HT200	HM060	25-001611	M8 × 20	22.0	4	M6 × 16	9.0	8
HT200	HM080	25-001612	M8 × 20	22.0	4	M8 × 16	22.0	8
HT250	HM080	25-001613	M10 × 25	40.0	4	M8 × 20	22.0	8
HT250	HM120	25-001614	M10 × 25	40.0	4	M8 × 20	22.0	8

¹⁾ Strength class 8.8

2.4 General assembly HT – KK



1	HT axis	4	KK axis
2	Mounting bolts A	5	Adapter plate
3	Mounting bolts B	6	Centring sleeve

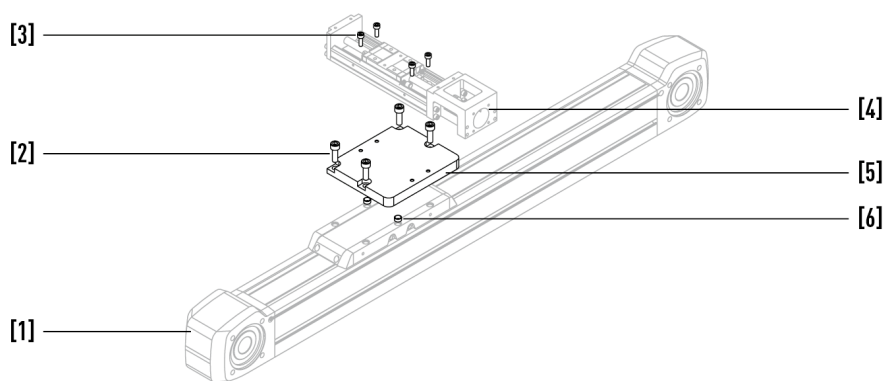
- ▶ Place the two centring sleeves **[6]** opposite each other on the carriage of the lower axis.
- ▶ Place the adapter plate **[5]** onto the carriage of the lower axis.
- ▶ Working in a criss-cross fashion and in three steps, tighten mounting bolts A **[2]** to the tightening torque specified in [Table 2.3](#).
- ▶ Lightly tighten mounting bolts B **[3]** to mount the upper axis.
- ▶ Align the upper axis so that it is perpendicular to the lower axis. Use an angle gauge to do so.
- ▶ Working in a criss-cross fashion and in three steps, tighten mounting bolts B **[3]** to the tightening torque specified in [Table 2.3](#).
- ✓ The adapter is fully assembled.

Table 2.3: Quantity and tightening torques of the mounting bolts depending on the axis combination (HT – KK)

Axes		Article number	Mounting bolt A			Mounting bolt B		
Axis 1	Axis 2		Screw size ¹⁾	Torque [Nm]	Quantity [pcs.]	Screw size ¹⁾	Torque [Nm]	Quantity [pcs.]
HT100	KK50	25-001624	M5 × 16	5.5	4	M4 × 12	3.0	4
HT100	KK60	25-001625	M5 × 16	5.5	4	M5 × 14	5.5	4
HT150	KK60	25-001628	M6 × 22	9.0	4	M5 × 16	5.5	4
HT150	KK86	25-001629	M6 × 22	9.0	4	M6 × 16	9.0	4
HT200	KK86	25-001632	M8 × 20	22.0	4	M6 × 18	9.0	4
HT200	KK100	25-001633	M8 × 20	22.0	4	M8 × 16	22.0	4
HT100	KK50	25-001624	M5 × 16	5.5	4	M4 × 12	3.0	4

¹⁾ Strength class 8.8

2.5 General assembly HM – KK



1	HM axis	4	KK axis
2	Mounting bolts A	5	Adapter plate
3	Mounting bolts B	6	Centring sleeve

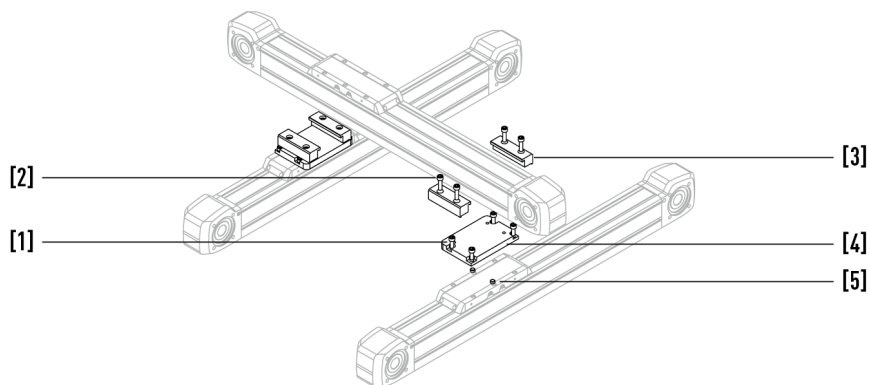
- ▶ Place the two centring sleeves [6] opposite each other on the carriage of the lower axis.
- ▶ Place the adapter plate [5] onto the carriage of the lower axis.
- ▶ Working in a criss-cross fashion and in three steps, tighten mounting bolts A [2] to the tightening torque specified in [Table 2.4](#).
- ▶ Lightly tighten mounting bolts B [3] to mount the upper axis.
- ▶ Align the upper axis so that it is perpendicular to the lower axis. Use an angle gauge to do so.
- ▶ Working in a criss-cross fashion and in three steps, tighten mounting bolts B [3] to the tightening torque specified in [Table 2.4](#).
- ✓ The adapter is fully assembled.

Table 2.4: Quantity and tightening torques of the mounting bolts depending on the axis combination (HM – KK)

Axes		Article number	Mounting bolt A			Mounting bolt B		
Axis 1	Axis 2		Screw size ¹⁾	Torque [Nm]	Quantity [pcs.]	Screw size ¹⁾	Torque [Nm]	Quantity [pcs.]
HM040	KK30	25-001622	M5 × 16	5.5	4	M3 × 10	1.3	4
HM040	KK40	25-001623	M5 × 16	5.5	4	M3 × 12	1.3	4
HM060	KK40	25-001626	M6 × 18	9.0	4	M3 × 12	1.3	4
HM060	KK50	25-001627	M6 × 18	9.0	4	M4 × 12	3.0	4
HM080	KK50	25-001630	M8 × 20	22.0	4	M4 × 12	3.0	4
HM080	KK60	25-001631	M8 × 20	22.0	4	M5 × 14	5.5	4

¹⁾ Strength class 8.8

2.6 General assembly 2 × HM – HM / HD – HM



1 Mounting bolts A	4 Adapter plate
2 Mounting bolts B	5 Centring sleeve
3 Clamping profile	

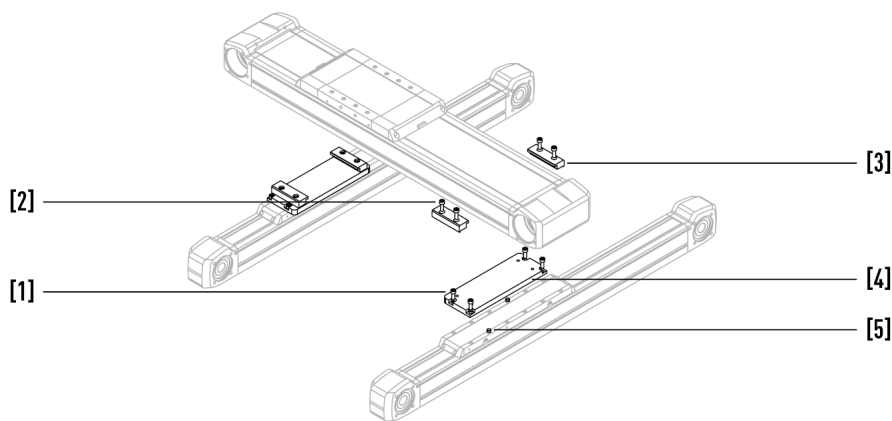
- ▶ Place the centring sleeves **[5]** opposite each other on the carriages of the two lower axes.
- ▶ Place the two adapter plates **[4]** onto the carriages of the lower axes.
- ▶ Working in a criss-cross fashion and in three steps, tighten mounting bolts A **[1]** to the tightening torque specified in [Table 2.5](#).
- ▶ Place the cross axis onto the mounted adapter plates **[4]**.
- ▶ Insert the clamping profiles **[3]** on both sides.
- ▶ Lightly tighten mounting bolts B **[2]** to mount the upper axis.
- ▶ Align the upper axis so that it is perpendicular to the two lower axes. Use an angle gauge to do so.
- ▶ Working in a criss-cross fashion and in three steps, tighten mounting bolts B **[2]** to the tightening torque specified in [Table 2.5](#).
- ✓ The adapter is fully assembled.

Table 2.5: Quantity and tightening torques of the mounting bolts depending on the axis combination (2 × HM – HM)

Axes		Article number	Mounting bolt A			Mounting bolt B		
Axis 1	Axis 2		Screw size ¹⁾	Torque [Nm]	Quantity [pcs.]	Screw size ¹⁾	Torque [Nm]	Quantity [pcs.]
2 × HM060 / HD2	HM040	25-001595	M6 × 16	9.0	8	M5 × 14	5.5	8
2 × HM060 / HD2	HM060	25-001596	M6 × 16	9.0	8	M6 × 22	9.0	8
2 × HM080 / HD3	HM060	25-001597	M8 × 20	22.0	8	M6 × 25	9.0	8
2 × HM080 / HD3	HM080	25-001598	M8 × 20	22.0	8	M8 × 25	22.0	8
2 × HM120 / HD4	HM080	25-001599	M10 × 30	40.0	8	M8 × 30	22.0	12
2 × HM120 / HD4	HM120	25-001600	M10 × 30	40.0	8	M8 × 30	22.0	12

¹⁾ Strength class 8.8

2.7 General assembly 2 × HM – HT / HD – HT



1	Mounting bolts A	4	Adapter plate
2	Mounting bolts B	5	Centring sleeve
3	Clamping profile		

- ▶ Place the centring sleeves [5] diagonally opposite each other on the carriages of the two lower axes.
- ▶ Place the two adapter plates [4] onto the carriages of the lower axes.
- ▶ Working in a criss-cross fashion and in three steps, tighten mounting bolts A [1] to the tightening torque specified in [Table 2.6](#).
- ▶ Place the cross axis onto the mounted adapter plates [4].
- ▶ Insert the clamping profiles [3] on both sides.
- ▶ Lightly tighten mounting bolts B [2] to mount the upper axis.
- ▶ Align the upper axis so that it is perpendicular to the two lower axes. Use an angle gauge to do so.
- ▶ Working in a criss-cross fashion and in three steps, tighten mounting bolts B [2] to the tightening torque specified in [Table 2.6](#).
- ✓ The adapter is fully assembled.

Table 2.6: Quantity and tightening torques of the mounting bolts depending on the axis combination (2 × HM – HM)

Axes		Article number	Mounting bolt A			Mounting bolt B		
Axis 1	Axis 2		Screw size ¹⁾	Torque [Nm]	Quantity [pcs.]	Screw size ¹⁾	Torque [Nm]	Quantity [pcs.]
2 × HM040 / HD1	HT100	25-001601	M5 × 16	5.5	8	M5 × 16	5.5	8
2 × HM060 / HD2	HT100	25-001602	M6 × 16	9.0	8	M5 × 14	5.5	8
2 × HM060 / HD2	HT150	25-001603	M6 × 16	9.0	8	M6 × 18	9.0	8
2 × HM080 / HD3	HT150	25-001604	M8 × 20	22.0	8	M6 × 18	9.0	8
2 × HM080 / HD3	HT200	25-001605	M8 × 20	22.0	8	M8 × 25	22.0	12
2 × HM120 / HD4	HT200	25-001606	M10 × 30	40.0	8	M8 × 30	22.0	12
2 × HM120 / HD4	HT250	25-001607	M10 × 30	40.0	8	M8 × 30	22.0	12

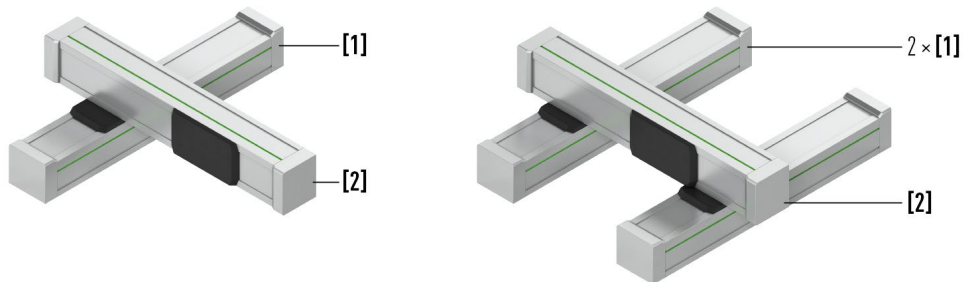
¹⁾ Strength class 8.8

3 CPR adapter

Adapter for connecting the axis profile of the upper axis to the carriage of the lower axis, with the two carriages rotated 90° to each other. It is possible to combine two single axes or a double axis with a single axis.

The following series can be connected together:

- HT – HT
- HT – HM
- 2 × HM – HM / HD – HM
- 2 × HM – HT / HD – HT



1	Axis 1
2	Axis 2

3.1 General assembly instructions

Note

The quantity and type of fixing material vary according to the size of the axes used.

Note

When tightening the screws, always use the tightening torques specified in the individual chapters of these assembly instructions.

Note

The female thread must be free of dust, oil and grease.

Note

All the screws used have an adhesive coating, Hardening begins shortly after fastening the screw into the thread.

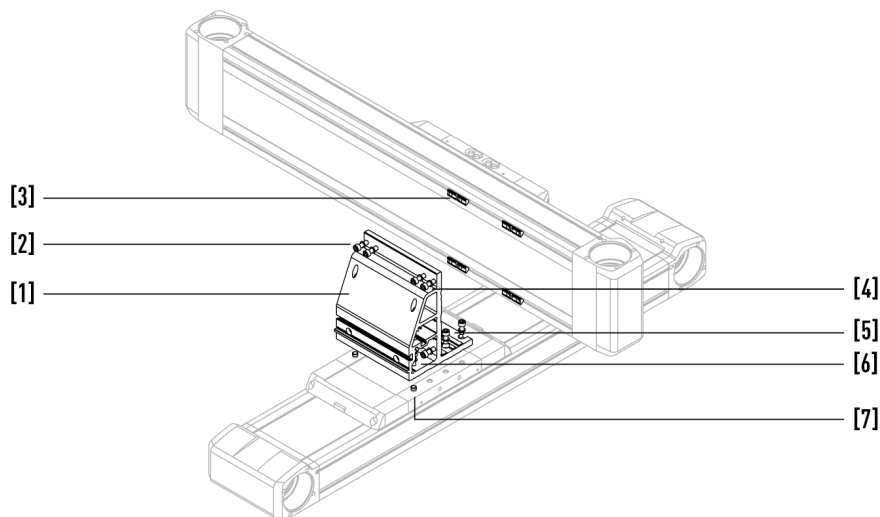
Please note the following conditions:

- 5 minutes flexible for adjustment and tightening procedures
- Functional after approx. 6 hours
- Final strength after 24 hours

Note

Note that the thread locker only works for one use. If the screw is reused, a new adhesive coating must be applied to the screw.

3.2 General assembly HT – HT



1 Adapter	5 Mounting bolts B
2 Mounting bolts A	6 Mounting bolts C
3 T nuts	7 Centring sleeve
4 Lock washer	

- ▶ Place the two centring sleeves **[7]** opposite each other on the carriage of the lower axis.
- ▶ Place the adapter **[1]** onto the carriage of the lower axis.
- ▶ Working in a criss-cross fashion and in three steps, tighten mounting bolts B **[5]** and C **[6]** with the corresponding lock washers to the tightening torque specified in [Table 3.2](#) and [Table 3.3](#).
- ▶ Insert the T nuts **[3]** into the grooves on the bottom of the upper axis.
- ▶ Lightly tighten mounting bolts A **[2]** to mount the upper axis.
- ▶ Align the upper axis so that it is perpendicular to the lower axis. Use an angle gauge to do so.
- ▶ Working in a criss-cross fashion and in three steps, tighten mounting bolts A **[2]** with the corresponding lock washers to the tightening torque specified in [Table 3.1](#).
- ✓ The adapter is fully assembled.

Table 3.1: Quantity and tightening torques of mounting bolts A depending on the axis combination (HT – HT)

Axes		Article number	Mounting bolt A		
Axis 1	Axis 2		Screw size ¹⁾	Torque [Nm]	Quantity [pcs.]
HT100	HT100	25-001575	M5 × 16	5.5	8
HT150	HT100	25-001576	M5 × 16	5.5	8
HT150	HT150	25-001577	M6 × 18	9.0	8
HT200	HT150	25-001578	M6 × 25	9.0	8
HT200	HT200	25-001579	M8 × 30	22.0	8
HT250	HT200	25-001580	M8 × 30	22.0	8
HT250	HT250	25-001581	M8 × 30	22.0	8

¹⁾ Strength class 8.8

Table 3.2: Quantity and tightening torques of mounting bolts B depending on the axis combination (HT – HT)

Axes		Article number	Mounting bolt B		
Axis 1	Axis 2		Screw size ¹⁾	Torque [Nm]	Quantity [pcs.]
HT100	HT100	25-001575	M5 × 20	5.5	2
HT150	HT100	25-001576	M6 × 22	9.0	2
HT150	HT150	25-001577	M6 × 22	9.0	2
HT200	HT150	25-001578	M8 × 30	22.0	4
HT200	HT200	25-001579	M8 × 30	22.0	4
HT250	HT200	25-001580	M10 × 35	40.0	4
HT250	HT250	25-001581	M10 × 35	40.0	4

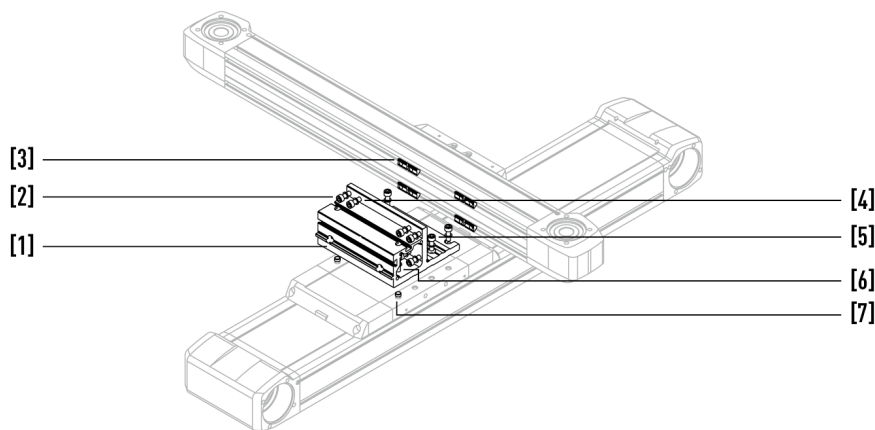
¹⁾ Strength class 8.8

Table 3.3: Quantity and tightening torques of mounting bolts C depending on the axis combination (HT – HT)

Axes		Article number	Mounting bolt C		
Axis 1	Axis 2		Screw size ¹⁾	Torque [Nm]	Quantity [pcs.]
HT100	HT100	25-001575	M5 × 14	5.5	4
HT150	HT100	25-001576	M6 × 16	9.0	2
HT150	HT150	25-001577	M6 × 16	9.0	4
HT200	HT150	25-001578	M8 × 20	22.0	2
HT200	HT200	25-001579	M8 × 20	22.0	2
HT250	HT200	25-001580	M10 × 25	40.0	4
HT250	HT250	25-001581	M10 × 25	40.0	4

¹⁾ Strength class 8.8

3.3 General assembly HT – HM



1	Adapter	5	Mounting bolts B
2	Mounting bolts A	6	Mounting bolts C
3	T nuts	7	Centring sleeve
4	Lock washer		

- ▶ Place the two centring sleeves **[7]** opposite each other on the carriage of the lower axis.
- ▶ Place the adapter **[1]** onto the carriage of the lower axis.
- ▶ Working in a criss-cross fashion and in three steps, tighten mounting bolts **B [5]** and **C [6]** with the corresponding lock washers to the tightening torque specified in [Table 3.5](#) and [Table 3.6](#).
- ▶ Insert the T nuts **[3]** into the grooves on the bottom of the upper axis.
- ▶ Lightly tighten mounting bolts **A [2]** to mount the upper axis.
- ▶ Align the upper axis so that it is perpendicular to the lower axis. Use an angle gauge to do so.
- ▶ Working in a criss-cross fashion and in three steps, tighten mounting bolts **A [2]** with the corresponding lock washers to the tightening torque specified in [Table 3.4](#).
- ✓ The adapter is fully assembled.

Table 3.4: Quantity and tightening torques of mounting bolts A depending on the axis combination (HT – HM)

Axes		Article number	Mounting bolt A		
Axis 1	Axis 2		Screw size ¹⁾	Torque [Nm]	Quantity [pcs.]
HT100	HM040	25-001568	M5 × 16	5.5	8
HT150	HM040	25-001569	M5 × 16	5.5	8
HT150	HM060	25-001570	M6 × 18	9.0	8
HT200	HM060	25-001571	M6 × 18	9.0	8
HT200	HM080	25-001572	M8 × 30	22.0	8
HT250	HM080	25-001573	M8 × 30	22.0	8
HT250	HM120	25-001574	M8 × 30	22.0	8

¹⁾ Strength class 8.8

Table 3.5: Quantity and tightening torques of mounting bolts B depending on the axis combination (HT – HM)

Axes		Article number	Mounting bolt B		
Axis 1	Axis 2		Screw size ¹⁾	Torque [Nm]	Quantity [pcs.]
HT100	HM040	25-001568	M5 × 14	5.5	4
HT150	HM040	25-001569	M6 × 18	9.0	2
HT150	HM060	25-001570	M6 × 18	9.0	4
HT200	HM060	25-001571	M8 × 25	22.0	2
HT200	HM080	25-001572	M8 × 30	22.0	4
HT250	HM080	25-001573	M10 × 35	40.0	4
HT250	HM120	25-001574	M10 × 35	40.0	4

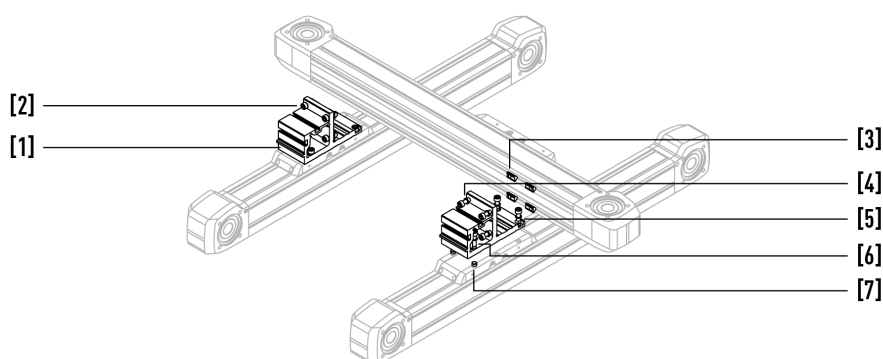
¹⁾ Strength class 8.8

Table 3.6: Quantity and tightening torques of mounting bolts C depending on the axis combination (HT – HM)

Axes		Article number	Mounting bolt C		
Axis 1	Axis 2		Screw size ¹⁾	Torque [Nm]	Quantity [pcs.]
HT100	HM040	25-001568	M5 × 20	5.5	2
HT150	HM040	25-001569	M6 × 25	9.0	2
HT150	HM060	25-001570	M6 × 25	9.0	2
HT200	HM060	25-001571	M8 × 20	22.0	2
HT200	HM080	25-001572	M8 × 20	22.0	2
HT250	HM080	25-001573	M10 × 25	40.0	4
HT250	HM120	25-001574	M10 × 25	40.0	4

¹⁾ Strength class 8.8

3.4 General assembly 2 × HM – HM / HD – HM



1 Adapter	5 Mounting bolts B
2 Mounting bolts A	6 Mounting bolts C
3 T nuts	7 Centring sleeve
4 Lock washer	

- ▶ Place the two centring sleeves [7] opposite each other on the carriage of the lower axis.
- ▶ Place the adapter [1] onto the carriages of the lower axis.
- ▶ Working in a criss-cross fashion and in three steps, tighten mounting bolts B [5] and C [6] with the corresponding lock washers to the tightening torque specified in [Table 3.8](#) and [Table 3.9](#).
- ▶ Insert the T nuts [3] into the grooves on the bottom of the upper axis.
- ▶ Lightly tighten mounting bolts A [2] to mount the upper axis.
- ▶ Align the upper axis so that it is perpendicular to the lower axes. Use an angle gauge to do so.
- ▶ Working in a criss-cross fashion and in three steps, tighten mounting bolts A [2] with the corresponding lock washers to the tightening torque specified in [Table 3.7](#).
- ✓ The adapter is fully assembled.

Table 3.7: Quantity and tightening torques of mounting bolts A depending on the axis combination (2 × HM – HM)

Axes		Article number	Mounting bolt A		
Axis 1	Axis 2		Screw size ¹⁾	Torque [Nm]	Quantity [pcs.]
2 × HM040 / HD1	HM040	25-001594	M5 × 16	5.5	8
2 × HM040 / HD1	HM040	25-001561	M5 × 16	5.5	8
2 × HM060 / HD2	HM060	25-001562	M6 × 18	9.0	8
2 × HM080 / HD3	HM080	25-001563	M8 × 30	22.0	8

¹⁾ Strength class 8.8

Table 3.8: Quantity and tightening torques of mounting bolts B depending on the axis combination (2 × HM – HM)

Axes		Article number	Mounting bolt B		
Axis 1	Axis 2		Screw size ¹⁾	Torque [Nm]	Quantity [pcs.]
2 × HM040 / HD1	HM040	25-001594	M5 × 16	5.5	8
2 × HM040 / HD1	HM040	25-001561	M5 × 14	5.5	4
2 × HM060 / HD2	HM060	25-001562	M6 × 16	9.0	4
2 × HM080 / HD3	HM080	25-001563	M8 × 20	22.0	4

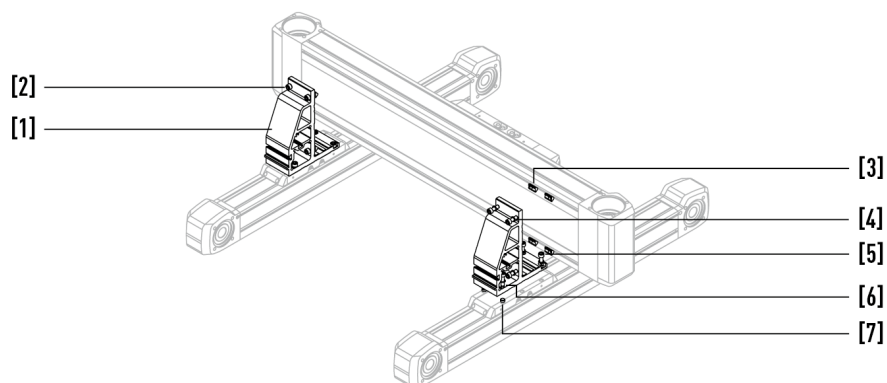
¹⁾ Strength class 8.8

Table 3.9: Quantity and tightening torques of mounting bolts C depending on the axis combination (2 × HM – HM)

Axes		Article number	Mounting bolt C		
Axis 1	Axis 2		Screw size ¹⁾	Torque [Nm]	Quantity [pcs.]
2 × HM040 / HD1	HM040	25-001594	-	-	-
2 × HM040 / HD1	HM040	25-001561	M5 × 20	5.5	4
2 × HM060 / HD2	HM060	25-001562	M6 × 22	9.0	4
2 × HM080 / HD3	HM080	25-001563	M8 × 30	22.0	8

¹⁾ Strength class 8.8

3.5 General assembly 2 × HM – HT / HD – HT



1	Adapter	5	Mounting bolts B
2	Mounting bolts A	6	Mounting bolts C
3	T nuts	7	Centring sleeve
4	Lock washer		

- ▶ Place the two centring sleeves [7] opposite each other on the carriage of the lower axis.
- ▶ Place the adapter [1] onto the carriages of the lower axis.
- ▶ Working in a criss-cross fashion and in three steps, tighten mounting bolts B [5] and C [6] with the corresponding lock washers to the tightening torque specified in [Table 3.11](#) and [Table 3.12](#).
- ▶ Insert the T nuts [3] into the grooves on the bottom of the upper axis.
- ▶ Lightly tighten mounting bolts A [2] to mount the upper axis.
- ▶ Align the upper axis so that it is perpendicular to the lower axes. Use an angle gauge to do so.
- ▶ With the corresponding lock washers and
- ▶ Working in a criss-cross fashion and in three steps, tighten mounting bolts A [2] to the tightening torque specified in [Table 3.10](#).
- ✓ The adapter is fully assembled.

Table 3.10: Quantity and tightening torques of mounting bolts A depending on the axis combination (2 × HM – HT)

Axes		Article number	Mounting bolt A		
Axis 1	Axis 2		Screw size ¹⁾	Torque [Nm]	Quantity [pcs.]
2 × HM040 / HD1	HT100	25-001564	M5 × 16	5.5	8
2 × HM060 / HD2	HT150	25-001565	M6 × 18	9.0	8
2 × HM080 / HD3	HT200	25-001566	M8 × 30	22.0	8
2 × HM120 / HD4	HT250	25-001567	M8 × 30	22.0	8

¹⁾ Strength class 8.8

Table 3.11: Quantity and tightening torques of mounting bolts B depending on the axis combination (2 × HM – HT)

Axes		Article number	Mounting bolt B		
Axis 1	Axis 2		Screw size ¹⁾	Torque [Nm]	Quantity [pcs.]
2 × HM040 / HD1	HT100	25-001564	M5 × 16	5.5	4
2 × HM060 / HD2	HT150	25-001565	M6 × 22	9.0	4
2 × HM080 / HD3	HT200	25-001566	M8 × 20	22.0	4
2 × HM120 / HD4	HT250	25-001567	M10 × 35	40.0	8

¹⁾ Strength class 8.8

Table 3.12: Quantity and tightening torques of mounting bolts C depending on the axis combination (2 × HM – HT)

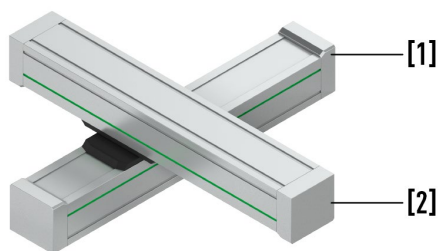
Axes		Article number	Mounting bolt C		
Axis 1	Axis 2		Screw size ¹⁾	Torque [Nm]	Quantity [pcs.]
2 × HM040 / HD1	HT100	25-001564	M5 × 14	5.5	4
2 × HM060 / HD2	HT150	25-001565	M6 × 16	9.0	4
2 × HM080 / HD3	HT200	25-001566	M8 × 30	22.0	8
2 × HM120 / HD4	HT250	25-001567	M10 × 25	40.0	8

¹⁾ Strength class 8.8

4 CCN adapter

Adapter for connecting the carriage of the upper axis to the carriage of the lower axis.
The following series can be connected together:

- HT – HT
- HT – HM
- HT – HC
- HT – KK
- HM – KK



1 Axis 1

2 Axis 2

4.1 General assembly instructions

Note

The quantity and type of fixing material vary according to the size of the axes used.

Note

When tightening the screws, always use the tightening torques specified in the individual chapters of these assembly instructions.

Note

The female thread must be free of dust, oil and grease.

Note

All the screws used have an adhesive coating, Hardening begins shortly after fastening the screw into the thread.

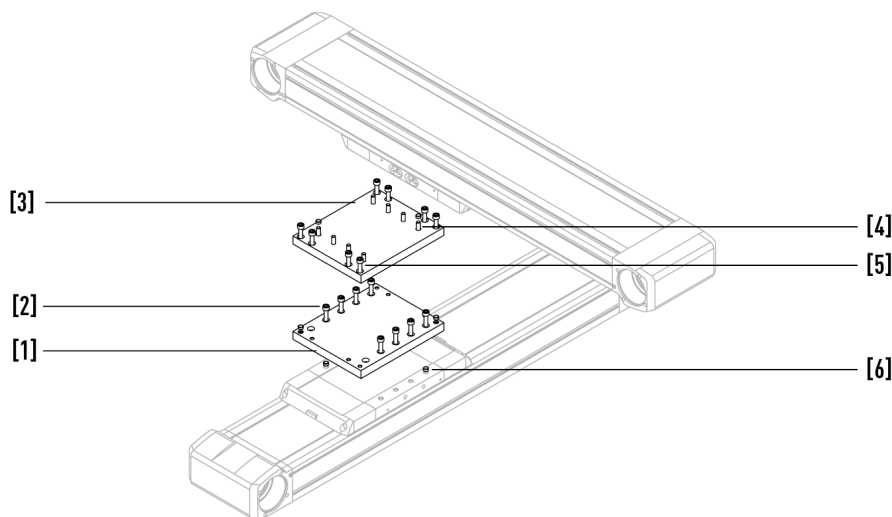
Please note the following conditions:

- 5 minutes flexible for adjustment and tightening procedures
- Functional after approx. 6 hours
- Final strength after 24 hours

Note

Note that the thread locker only works for one use. If the screw is reused, a new adhesive coating must be applied to the screw.

4.2 General assembly HT – HT



1	Adapter plate A	4	Mounting bolts B
2	Mounting bolts A	5	Mounting bolts C
3	Adapter plate B	6	Centring sleeve

- ▶ Place the centring sleeves **[6]** diagonally opposite each other on the carriage of the lower and upper axes.
- ▶ Place adapter plate A **[1]** onto the carriage of the lower axis.
- ▶ Working in a criss-cross fashion and in three steps, tighten mounting bolts A **[2]** to the tightening torque specified in [Table 4.1](#).
- ▶ Place the centring sleeves onto adapter plate A **[1]**.
- ▶ Place adapter plate B **[3]** onto the carriage of the upper axis.
- ▶ Working in a criss-cross fashion and in three steps, tighten mounting bolts B **[4]** to the tightening torque specified in [Table 4.2](#).
- ▶ Lightly tighten mounting bolts C **[5]** to mount the two adapter plates.
- ▶ Align the upper axis so that it is perpendicular to the lower axis. Use an angle gauge to do so.
- ▶ Working in a criss-cross fashion and in three steps, tighten mounting bolts C **[5]** to the tightening torque specified in [Table 4.3](#).
- ✓ The adapter is fully assembled.

Table 4.1: Quantity and tightening torques of mounting bolts A depending on the axis combination (HT – HT)

Axes		Article number	Mounting bolt A		
Axis 1	Axis 2		Screw size ¹⁾	Torque [Nm]	Quantity [pcs.]
HT100	HT100	25-001588	M5 × 16	5.5	8
HT150	HT100	25-001589	M6 × 22	9.0	8
HT150	HT150	25-001590	M6 × 22	9.0	8
HT200	HT150	25-001591	M8 × 20	22.0	8
HT200	HT200	25-001592	M8 × 20	22.0	8
HT250	HT200	25-001593	M10 × 25	40.0	8
HT250	HT250	25-001647	M10 × 25	40.0	8

¹⁾ Strength class 8.8

Table 4.2: Quantity and tightening torques of mounting bolts B depending on the axis combination (HT – HT)

Axes		Article number	Mounting bolt B		
Axis 1	Axis 2		Screw size ¹⁾	Torque [Nm]	Quantity [pcs.]
HT100	HT100	25-001588	M5 × 16	5.5	8
HT150	HT100	25-001589	M5 × 18	5.5	8
HT150	HT150	25-001590	M6 × 22	9.0	8
HT200	HT150	25-001591	M6 × 20	9.0	8
HT200	HT200	25-001592	M8 × 20	22.0	8
HT250	HT200	25-001593	M8 × 25	22.0	8
HT250	HT250	25-001647	M10 × 25	40.0	8

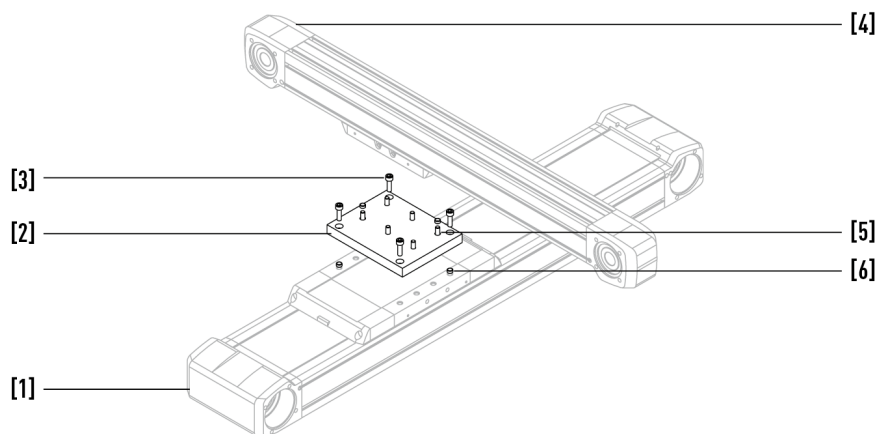
¹⁾ Strength class 8.8

Table 4.3: Quantity and tightening torques of mounting bolts C depending on the axis combination (HT – HT)

Axes		Article number	Mounting bolt C		
Axis 1	Axis 2		Screw size ¹⁾	Torque [Nm]	Quantity [pcs.]
HT100	HT100	25-001588	M5 × 16	5.5	8
HT150	HT100	25-001589	M6 × 22	9.0	8
HT150	HT150	25-001590	M6 × 22	9.0	8
HT200	HT150	25-001591	M8 × 20	22.0	8
HT200	HT200	25-001592	M8 × 20	22.0	8
HT250	HT200	25-001593	M10 × 25	40.0	8
HT250	HT250	25-001647	M10 × 25	40.0	8

¹⁾ Strength class 8.8

4.3 General assembly HT – HM



1	HT axis	4	HM axis
2	Adapter plate	5	Mounting bolts B
3	Mounting bolts A	6	Centring sleeve

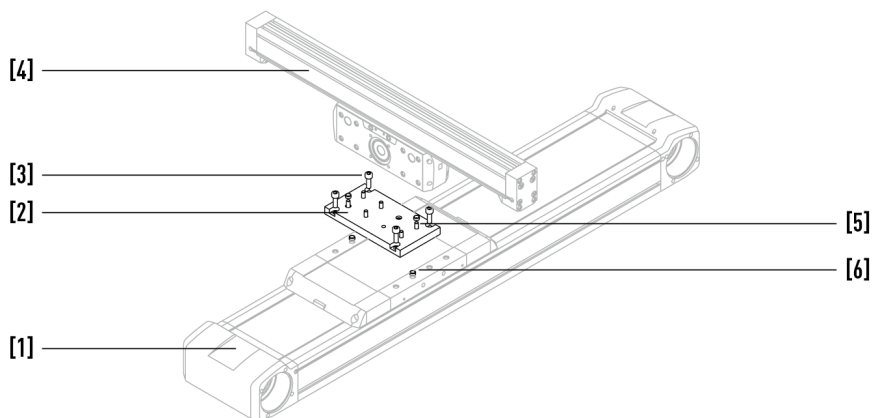
- ▶ Place the two centring sleeves [6] diagonally opposite each other on the carriages of both axes.
- ▶ Place the adapter plate [2] onto the carriage of the upper axis.
- ▶ Working in a criss-cross fashion and in three steps, tighten mounting bolts B [5] to the tightening torque specified in [Table 4.4](#).
- ▶ Lightly tighten mounting bolts A [3] to mount the lower axis.
- ▶ Align the upper axis so that it is perpendicular to the lower axis. Use an angle gauge to do so.
- ▶ Working in a criss-cross fashion and in three steps, tighten mounting bolts A [3] to the tightening torque specified in [Table 4.4](#).
- ✓ The adapter is fully assembled.

Table 4.4: Quantity and tightening torques of the mounting bolts depending on the axis combination (HT – HM)

Axes		Article number	Mounting bolt A			Mounting bolt B		
Axis 1	Axis 2		Screw size ¹⁾	Torque [Nm]	Quantity [pcs.]	Screw size ¹⁾	Torque [Nm]	Quantity [pcs.]
HT100	HM040	25-001582	M5 × 16	5.5	6	M5 × 16	5.5	6
HT150	HM040	25-001583	M6 × 18	9.0	4	M5 × 16	5.5	6
HT150	HM060	25-001584	M6 × 20	9.0	4	M6 × 20	9.0	6
HT200	HM060	25-001585	M8 × 20	22.0	4	M6 × 20	9.0	6
HT200	HM080	25-001586	M8 × 20	22.0	4	M8 × 20	22.0	10
HT250	HM080	25-001587	M10 × 25	40.0	4	M8 × 25	22.0	10
HT250	HM120	25-001646	M10 × 25	40.0	4	M10 × 25	40.0	10

1) Strength class 8.8

4.4 General assembly HT – HC



1	HT axis	4	HC axis
2	Adapter plate	5	Mounting bolts B
3	Mounting bolts A	6	Centring sleeve

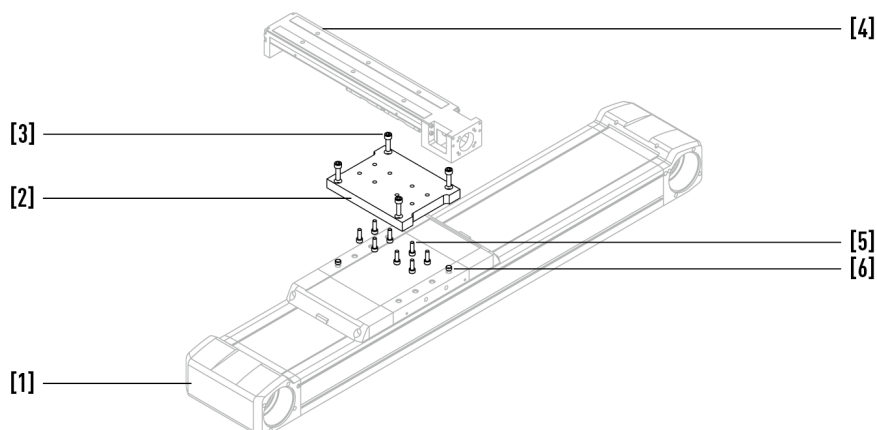
- ▶ Place two centring sleeves **[6]** diagonally opposite each other on the carriage of the HT axis.
- ▶ Place two centring sleeves **[6]** diagonally opposite each other on the drive block housing of the HC axis.
- ▶ Place the adapter plate **[2]** on the drive block housing of the HC axis.
- ▶ Working in a criss-cross fashion and in three steps, tighten mounting bolts B **[5]** to the tightening torque specified in [Table 4.5](#).
- ▶ Lightly tighten mounting bolts A **[3]** to mount the lower axis.
- ▶ Align the upper axis so that it is perpendicular to the lower axis. Use an angle gauge to do so.
- ▶ Working in a criss-cross fashion and in three steps, tighten mounting bolts A **[3]** to the tightening torque specified in [Table 4.5](#).
- ✓ The adapter is fully assembled.

Table 4.5: Quantity and tightening torques of the mounting bolts depending on the axis combination (HT – HC)

Axes		Article number	Mounting bolt A			Mounting bolt B		
Axis 1	Axis 2		Screw size ¹⁾	Torque [Nm]	Quantity [pcs.]	Screw size ¹⁾	Torque [Nm]	Quantity [pcs.]
HT100	HC040	25-001582	M5 × 16	5.5	6	M5 × 16	5.5	6
HT150	HC040	25-001583	M6 × 18	9.0	4	M5 × 16	5.5	6
HT150	HC060	25-001584	M6 × 20	9.0	4	M6 × 20	9.0	6
HT200	HC060	25-001585	M8 × 20	22.0	4	M6 × 20	9.0	6
HT200	HC080	25-001586	M8 × 20	22.0	4	M8 × 20	22.0	10
HT250	HC080	25-001587	M10 × 25	40.0	4	M8 × 25	22.0	10

¹⁾ Strength class 8.8

4.5 General assembly HT – KK



1	HT axis	4	KK axis
2	Adapter plate	5	Mounting bolts B
3	Mounting bolts A	6	Centring sleeve

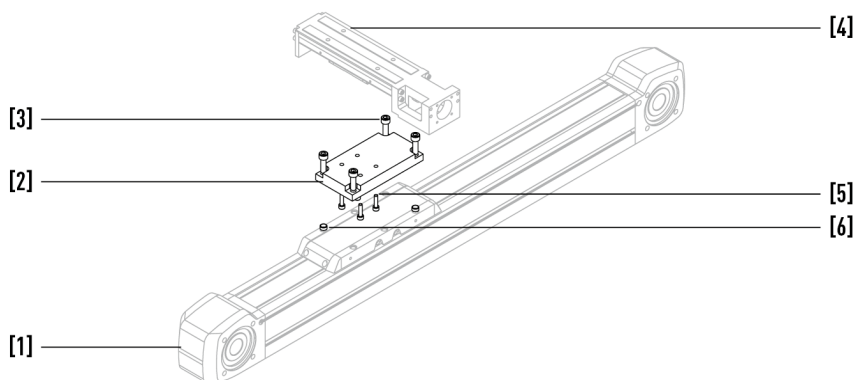
- ▶ Place the two centring sleeves [6] diagonally opposite each other on the carriage of the lower axis.
- ▶ Place the adapter plate [2] onto the carriage of the upper axis.
- ▶ Working in a criss-cross fashion and in three steps, tighten mounting bolts B [5] to the tightening torque specified in [Table 4.6](#).
- ▶ Lightly tighten mounting bolts A [3] to mount the lower axis.
- ▶ Align the upper axis so that it is perpendicular to the lower axis. Use an angle gauge to do so.
- ▶ Working in a criss-cross fashion and in three steps, tighten mounting bolts A [3] to the tightening torque specified in [Table 4.6](#).
- ✓ The adapter is fully assembled.

Table 4.6: Quantity and tightening torques of the mounting bolts depending on the axis combination (HT – KK)

Axes		Article number	Mounting bolt A			Mounting bolt B		
Axis 1	Axis 2		Screw size ¹⁾	Torque [Nm]	Quantity [pcs.]	Screw size ¹⁾	Torque [Nm]	Quantity [pcs.]
HT100	KK50	25-001636	M5 × 16	5.5	4	M4 × 14	3.0	8
HT100	KK60	25-001637	M5 × 16	5.5	4	M4 × 14	3.0	8
HT150	KK60	25-001640	M6 × 22	9.0	4	M5 × 16	5.5	8
HT150	KK86	25-001641	M6 × 22	9.0	4	M6 × 20	9.0	8
HT200	KK86	25-001644	M8 × 20	22.0	4	M6 × 18	9.0	8
HT200	KK100	25-001645	M8 × 20	22.0	4	M8 × 20	22.0	8

¹⁾ Strength class 8.8

4.6 General assembly HM – KK



1	HM axis	4	KK axis
2	Adapter plate	5	Mounting bolts B
3	Mounting bolts A	6	Centring sleeve

- ▶ Place the two centring sleeves [6] diagonally opposite each other on the carriage of the lower axis.
- ▶ Place the adapter plate [2] onto the carriage of the upper axis.
- ▶ Working in a criss-cross fashion and in three steps, tighten mounting bolts B [5] to the tightening torque specified in [Table 4.7](#).
- ▶ Lightly tighten mounting bolts A [3] to mount the lower axis.
- ▶ Align the upper axis so that it is perpendicular to the lower axis. Use an angle gauge to do so.
- ▶ Working in a criss-cross fashion and in three steps, tighten mounting bolts A [3] to the tightening torque specified in [Table 4.7](#).
- ✓ The adapter is fully assembled.

Table 4.7: Quantity and tightening torques of the mounting bolts depending on the axis combination (HM – KK)

Axes		Article number	Mounting bolt A			Mounting bolt B		
Axis 1	Axis 2		Screw size ¹⁾	Torque [Nm]	Quantity [pcs.]	Screw size ¹⁾	Torque [Nm]	Quantity [pcs.]
HM040	KK30	25-001634	M5 × 16	5.5	4	M3 × 12	1.3	4
HM040	KK40	25-001635	M5 × 16	5.5	4	M3 × 12	1.3	4
HM060	KK40	25-001638	M6 × 20	9.0	4	M3 × 14	1.3	4
HM060	KK50	25-001639	M6 × 20	9.0	4	M4 × 14	3.0	4
HM080	KK50	25-001642	M8 × 20	22.0	4	M4 × 14	3.0	4
HM080	KK60	25-001643	M8 × 20	22.0	4	M5 × 16	5.5	4

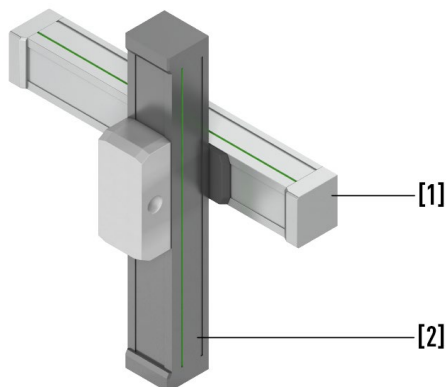
¹⁾ Strength class 8.8

5 CCR adapter

Adapter for connecting the drive block of the upper axis to the carriage of the lower axis, with the carriage and drive block rotated 90° to each other.

The following series can be connected together:

- HT – HC



1 Axis 1

2 Axis 2

5.1 General assembly instructions

Note

The quantity and type of fixing material vary according to the size of the axes used.

Note

The quantity and type of fixing material vary according to the size of the axes used.

Note

The female thread must be free of dust, oil and grease.

Note

All the screws used have an adhesive coating, Hardening begins shortly after fastening the screw into the thread.

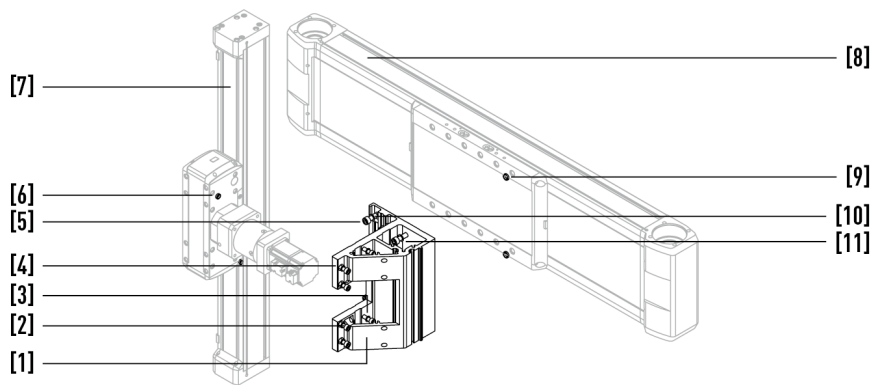
Please note the following conditions:

- 5 minutes flexible for adjustment and tightening procedures
- Functional after approx. 6 hours
- Final strength after 24 hours

Note

Note that the thread locker only works for one use. If the screw is reused, a new adhesive coating must be applied to the screw.

5.2 General assembly HT – HC



1	Adapter	7	HC axis
2	Mounting bolts A	8	HT axis
3	Mounting bolts A (HC025, HC040, HC060) Mounting bolts B (HC080)	9	Centring sleeve
4	Lock washer	10	Lock washer
5	Mounting bolts C	11	Mounting bolt D
6	Centring sleeve		

- ▶ Place two centring sleeves [9] opposite each other on the carriage of the HT axis.
- ▶ Place the adapter [1] on the HT axis
- ▶ Working in a criss-cross fashion and in three steps, tighten mounting bolts C [5] and D [11] with the corresponding lock washers [4] to the tightening torque specified in [Table 5.3](#) and [Table 5.4](#).
- ▶ Place two centring sleeves [6] diagonally opposite each other on the drive block housing of the HC axis.
- ▶ Place the HC axis on the adapter [1]
- ▶ Lightly tighten the mounting bolts A [2] [3] and B [3] (HC080 only) with the corresponding lock washers [10] to mount the HC axis.
- ▶ Align the upper axis so that it is perpendicular to the lower axis. Use an angle gauge to do so.
- ▶ Working in a criss-cross fashion and in three steps, tighten mounting bolts A [2] [3] and B [3] (HC080 only) to the tightening torque specified in [Table 5.1](#) and [Table 5.2](#).
- ✓ The adapter is fully assembled.

Table 5.1: Quantity and tightening torques of mounting screws A depending on the axis combination (HT – HC)

Axes		Article number	Mounting bolt A		
Axis 1	Axis 2		Screw size ¹⁾	Torque [Nm]	Quantity [pcs.]
HT100	HC025	25-002359	M3 × 14	1.3	6
HT150	HC040	25-002360	M5 × 18	5.5	8
HT200	HC060	25-002361	M6 × 20	9.0	8
HT250	HC080	25-002362	M8 × 25	22.0	4
HT250	HC100	80064588	M10 × 30	40,0	8

¹⁾ Strength class 8.8

Table 5.2: Quantity and tightening torques of mounting screws B depending on the axis combination (HT – HC)

Axes		Article number	Mounting bolt B		
Axis 1	Axis 2		Screw size ¹⁾	Torque [Nm]	Quantity [pcs.]
HT250	HC080	25-002362	M8 × 30	22.0	4

¹⁾ Strength class 8.8

Table 5.3: Quantity and tightening torques of mounting bolts C depending on the axis combination (HT – HC)

Axes		Article number	Mounting bolt C		
Axis 1	Axis 2		Screw size ¹⁾	Torque [Nm]	Quantity [pcs.]
HT100	HC025	25-002359	M5 × 12	5.5	2
HT150	HC040	25-002360	M6 × 18	9.0	2
HT200	HC060	25-002361	M8 × 20	22.0	2
HT250	HC080	25-002362	M10 × 25	40.0	4
HT250	HC100	80064588	M10 × 25	40,0	4

¹⁾ Strength class 8.8

Table 5.4: Quantity and tightening torques of mounting bolts D depending on the axis combination (HT – HC)

Axes		Article number	Mounting bolt D		
Axis 1	Axis 2		Screw size ¹⁾	Torque [Nm]	Quantity [pcs.]
HT100	HC025	25-002359	M5 × 18	5.5	2
HT150	HC040	25-002360	M6 × 22	9.0	2
HT200	HC060	25-002361	M8 × 25	22.0	2
HT250	HC080	25-002362	M10 × 35	40.0	2
HT250	HC100	80064588	M10 × 35	40,0	2

¹⁾ Strength class 8.8

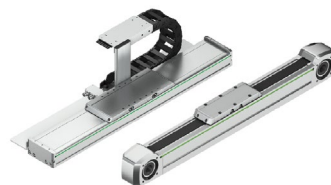
We We live motion.



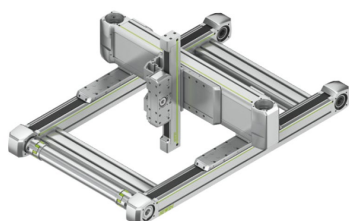
Linear guideways



Ballscrews



Linear axes



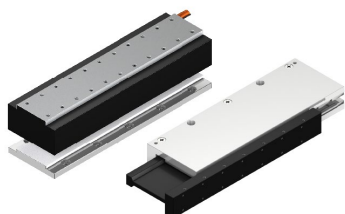
Linear axis systems



Torque motors



Robot



Linear motors



Rotary tables



Servo drives and servo motors

Germany

HIWIN GmbH
Brücklesbünd 1
77654 Offenburg
Deutschland
Fon +49 781 93278-0
info@hiwin.de
hiwin.de

Taiwan

Headquarter
HIWIN Technologies Corp.
Nr. 7, Jingke Road
Precision Machinery Park
Taichung 40852
Táiwán
Fon +886 4 2359-4510
business@hiwin.tw
hiwin.tw

Taiwan

Headquarter
HIWIN Mikrosystem Corp.
No. 6, Jingke Central Road
Precision Machinery Park
Taichung 40852
Táiwán
Fon +886 4 2355-0110
business@hiwinmikro.tw
hiwinmikro.tw

France

HIWIN GmbH
4 Impasse Joffre
67202 Wolfisheim
France
Fon +33 3 882884-80
contact@hiwin.fr
hiwin.fr

Poland

HIWIN GmbH Biuro Warszawa
ul. Puławska 405a
02-801 Warszawa
Polska
Fon +48 22 46280-00
info@hiwin.pl
hiwin.pl

Switzerland

HIWIN (Schweiz) GmbH
Eichwiesstraße 20
8645 Jona
Schweiz
Fon +41 55 22500-25
sales@hiwin.ch
hiwin.ch

Italy

HIWIN Srl
Strada Pitagora 4
20861 Brugherio (MB)
Italia
Fon +39 039 28761-68
info@hiwin.it
hiwin.it

Slovakia

HIWIN s.r.o., o.z.z.o.
Mládežnícka 2101
01701 Považská Bystrica
Slovensko
Fon +421 424 4347-77
info@hiwin.sk
hiwin.sk

Czech Republic

HIWIN s.r.o.
Medkova 888/11
62700 Brno
Česká republika
Fon +42 05 48528-238
info@hiwin.cz
hiwin.cz

Denmark

HIWIN GmbH
info@hiwin.dk
hiwin.dk

Netherlands

HIWIN GmbH
info@hiwin.nl
hiwin.nl

Austria

HIWIN GmbH
info@hiwin.at
hiwin.at

Hungary

HIWIN GmbH
info@hiwin.hu
hiwin.hu

Romania

HIWIN GmbH
info@hiwin.ro
hiwin.ro

Slovenia

HIWIN GmbH
info@hiwin.si
hiwin.si

China

HIWIN Corp.
hiwin.cn

Japan

HIWIN Corp.
info@hiwin.co.jp
hiwin.co.jp

USA

HIWIN Corp.
info@hiwin.com
hiwin.us

Korea

HIWIN Corp.
hiwin.kr

Singapore

HIWIN Corp.
hiwin.sg