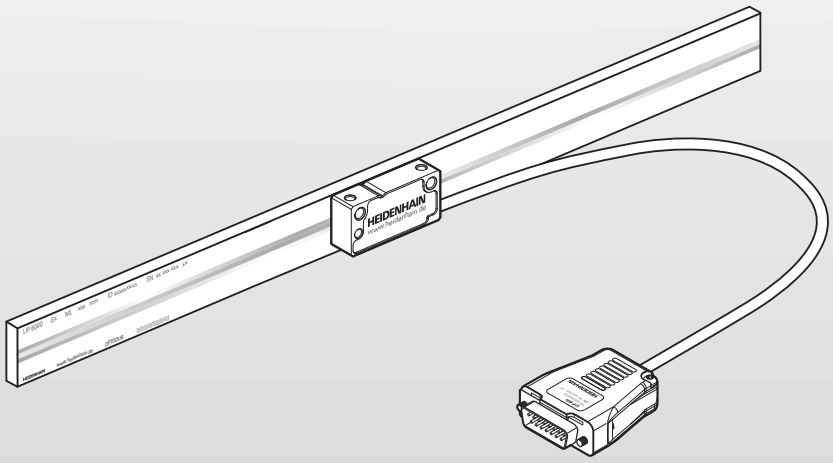
HEIDENHAIN



LIP 6071
LIP 6081

Mounting Instructions

English (en)
10/2024

Table of contents

1 Basic information

This chapter contains information about the product and the Mounting Instructions.

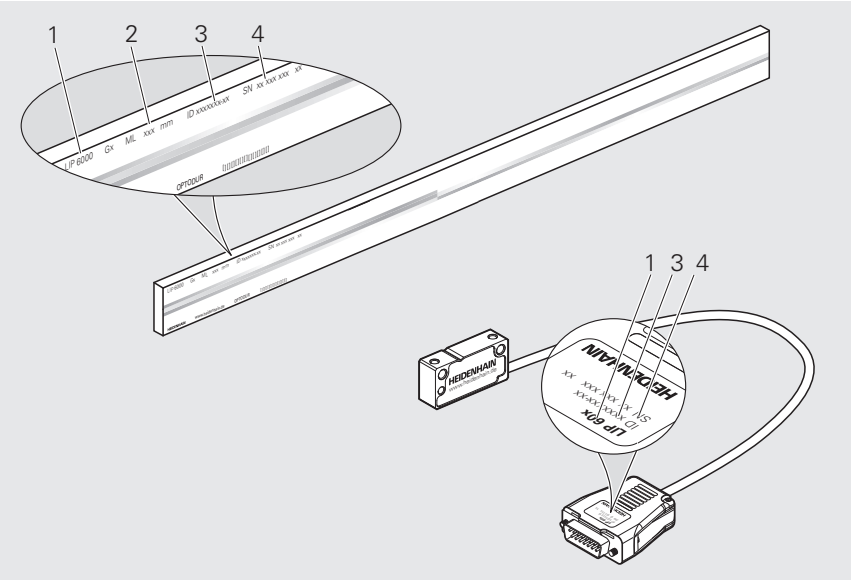
1.1 Validity of the documentation

These Mounting Instructions apply to encoders of the LIP 6071, LIP 6081 series.

- Prior to using the documentation, check whether the documentation and encoder model match

The encoder designation is printed on the ID label.

ID label



ID label with legend

1 Product name
2 Measuring length (ML)
3 Part number (ID)
4 Serial number (SN)

1.2 Target groups of the Mounting Instructions

The Mounting Instructions must be read and observed by every person who performs any of the following tasks:

- Design
- Mounting
- Removal

1.3 Notes on reading the documentation

⚠ WARNING

Fatal accidents, personal injury or property damage caused by non-compliance with the documentation!

Failure to comply with the documentation may result in fatal accidents, personal injury or property damage.

- Read the documentation carefully from beginning to end
- Keep the documentation for future reference

The following table lists the various parts of the documentation in their order of reading priority.

Document type	Description
Addendum	An Addendum supplements or supersedes the corresponding contents of the Operating Instructions and, if applicable, of the Mounting Instructions. If an Addendum is included in the shipment, it has the highest priority for reading. All other documentation content retains its validity.
Operating Instructions	The Operating Instructions contain all of the information and safety instructions for the proper and intended operation of the device. The Operating Instructions (English language version) are included in delivery and can also be downloaded in other languages from **www.heidenhain.com/documentation**. The Operating Instructions must be read prior to commissioning the product. The Operating Instructions have the second highest priority for reading.
Mounting Instructions	The Mounting Instructions contain all the information and safety precautions needed for the proper mounting and installation of a product. The Mounting Instructions are not included in delivery and must be downloaded from **www.heidenhain.com/documentation**. The Mounting Instructions have the third highest priority for reading.

Have you found any errors or would you like to suggest changes?

We are continuously striving to improve our documentation for you. Please help us by sending your suggestions to the following e-mail address:

userdoc@heidenhain.de

1.4 Symbols and fonts used for marking text

In these instructions the following symbols and fonts are used for marking text:

Format	Meaning
▶ ...	Identifies an action and the result of this action
> ...	Example: ▶ Tilt the shipping brace to remove it **(c)** > The shipping brace has been removed now
■ ...	Identifies an item of a list
■ ...	Example: ■ Solid contaminants: class 3 ■ Max. pressure dew point: class 4
Bold	Identifies elements in figures and illustrations, such as positions, dimensions and worksteps Example: **S** marks the beginning of the measuring length **(ML)**.

1.5 Notes in this documentation

Safety precautions

Precautionary statements warn of hazards in handling the product and provide information on their prevention. Precautionary statements are classified by hazard severity and divided into the following groups:

⚠ DANGER

Danger indicates hazards for persons. If you do not follow the avoidance instructions, the hazard **will result in death or severe injury.**

⚠ WARNING

Warning indicates hazards for persons. If you do not follow the avoidance instructions, the hazard **could result in death or serious injury**.

⚠ CAUTION

Caution indicates hazards for persons. If you do not follow the avoidance instructions, the hazard **could result in minor or moderate injury.**

NOTICE

Notice indicates danger to material or data. If you do not follow the avoidance instructions, the hazard **could result in property damage**.

Informational notes

Informational notes ensure reliable and efficient operation of the product. Informational notes are divided into the following groups:

The information symbol indicates a **tip**.
A tip provides important additional or supplementary information.

The book symbol indicates a **cross reference**.
A cross reference leads to external documentation, for example: further documentation from HEIDENHAIN or another supplier.

1.6 Units and tolerances

Unless otherwise specified, the dimensions stated in these Mounting Instructions are given in millimeters.

Unless otherwise specified, the tolerances stated in these Mounting Instructions conform to ISO 8015 and ISO 2768 standards.

mm
Tolerancing ISO 8015
ISO 2768:1989-mH
≤ 6 mm: ±0.2 mm

2 Safety

This chapter provides important safety information needed for the proper mounting and installation of the product.

2.1 Personnel qualification

Mounting, initial configuration and removal must be conducted by a qualified specialist under compliance with local safety regulations.

2.2 General safety precautions

⚠WARNING

Danger of electric shock due to connection to unsuitable downstream electronics!

If you connect unsuitable downstream electronics to the product, fatal accidents or severe personal injuries can occur.

- Connect the product only to downstream electronics whose supply voltage comes from PELV systems

⚠WARNING

Live plug connections!

If you disengage plug connections while the equipment is under power, this may result in fatal accidents or severe personal injury.

- Do not engage or disengage any connecting elements while the product is under power

⚠WARNING

Risk of injury from damaged or worn components!

Safety functions can fail if damaged or worn components are installed. Failed safety functions can result in death or serious injury.

- Inspect the component for damage.
- Do not use any damaged or worn components
- In case of replacement, repair the thread
- Use new screws, spring pins and nuts
- Secure screws and nuts with suitable material-bonding anti-rotation lock

NOTICE

Property damage due to mechanical stress!

- Do not drop the product or subject it to major vibration
- Do not expose the product to mechanical stress
- Do not change the physical structure of the product

NOTICE

Property damage due to electrical stress!

- Do not engage or disengage any connecting elements while the product is under power
- Do not touch the contacts of the plug connections

NOTICE

Electrostatic discharge (ESD)!

This product contains electrostatic sensitive components that can be destroyed by electrostatic discharge (ESD).

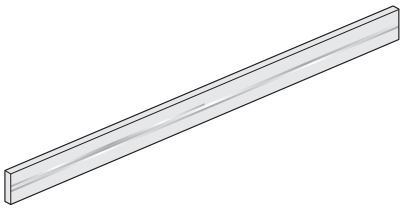
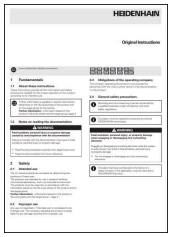
- It is essential to observe the safety precautions for handling ESD-sensitive components
- Never touch connector pins without ensuring proper grounding
- Wear a grounded ESD wristband when handling the connections of the product

3 Items supplied and accessories

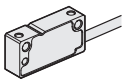
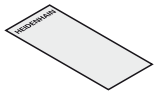
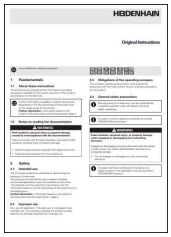
This chapter contains information on the items supplied and the available accessories of the product.

3.1 Items supplied

3.1.1 Items supplied with the linear scale

Component	Figure
Linear scale	
Operating Instructions	
Quality Inspection Document	

3.1.2 Items supplied with the scanning head

Component	Figure
Scanning head	
Spacer shim	
Limit plates for the linear scale	
Operating Instructions	
Manufacturer's Inspection Document	

3.2 Mounting accessories

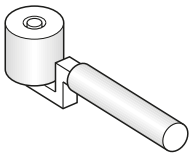
The following accessories can be obtained separately from HEIDENHAIN.

For more information on the listed products, please refer to the applicable Mounting Instructions and the **Exposed Linear Encoders** brochure.

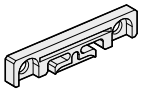
- **www.heidenhain.com/documentation**
- Enter the document ID **208960**

3.2.1 Accessories for mounting the linear scale

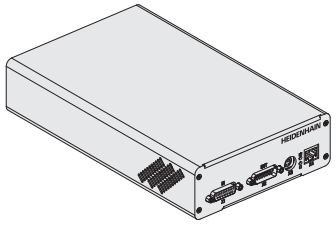
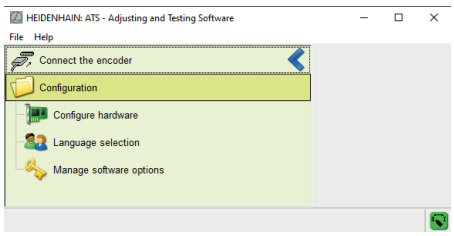
Accessories for mounting with adhesive film

Designation	ID	Figure
Roller	276885-01	

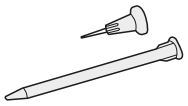
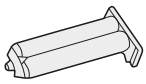
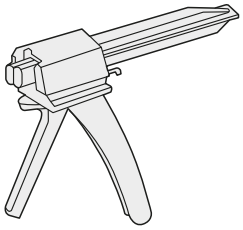
Accessories for mounting with fixing clamps

Designation	ID	Figure
Spacer shim	1176441-xx	
Fixing clamps	1176458-xx	
Fixed-point elements	1176475-xx	

3.2.2 Accessories for mounting the scanning head

Designation	ID	Figure
PWM 21 inspection device	1200635-51	
Adjusting and Testing Software (ATS) The ATS software is available for download free of charge from **www.heidenhain.com/service/downloads/software/**.		

3.2.3 Accessories for fixed-point bonding and for mounting the limit plates

Designation	ID	Figure
Dispensing nozzles and mixing tubes	1176444-01	
Adhesive 3M DP 460 EG	1180444-01	
Double-cartridge gun	1180450-01	

4 Mounting

This chapter describes the mounting prerequisites, different mounting variants, and all other tasks necessary when mounting.

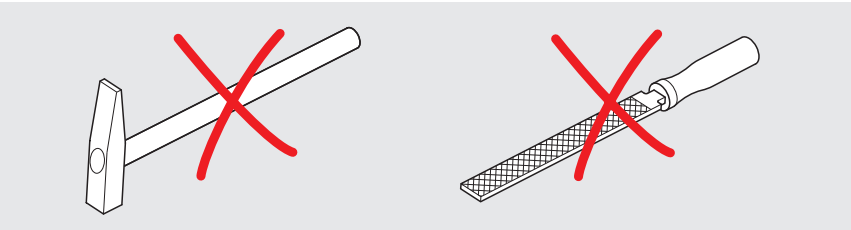
4.1 Prerequisites and notes

NOTICE

Property damage due to inappropriate tools!

Using inappropriate tools for mounting or removal of the encoder may cause damage to the encoder.

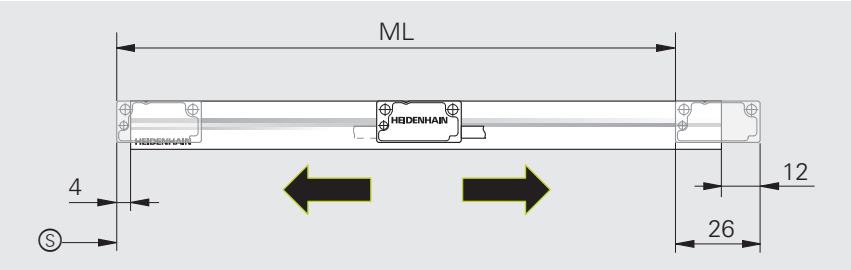
- Do not use hammers
- Do not use pointed or sharp-edged tools



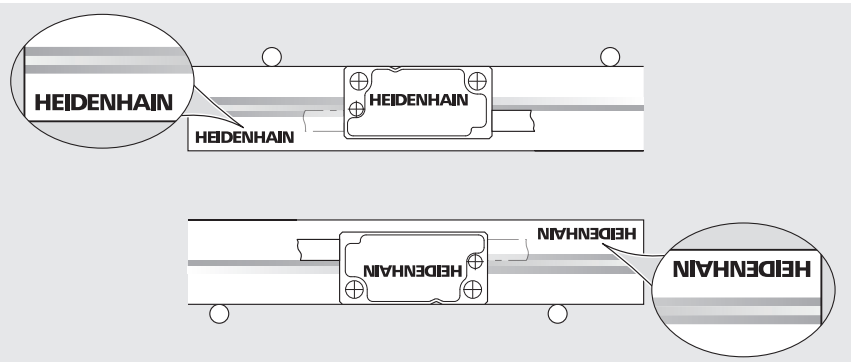
Choose a mounting attitude such that the traverse range is within the measuring length **(ML)** of the encoder.

Protect the graduation from direct contamination.

(S) = Beginning of measuring length **(ML)**



In order for the encoder to operate correctly, ensure that the linear scale, the scanning head, and the stop are correctly aligned relative to each other.



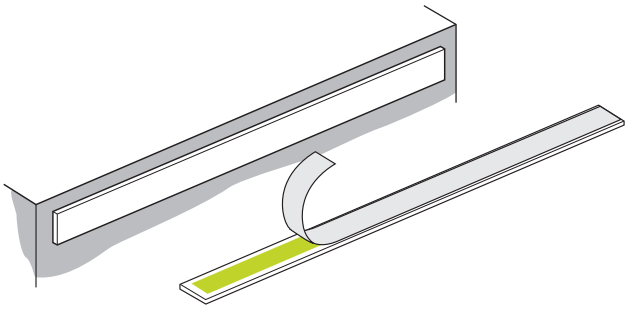
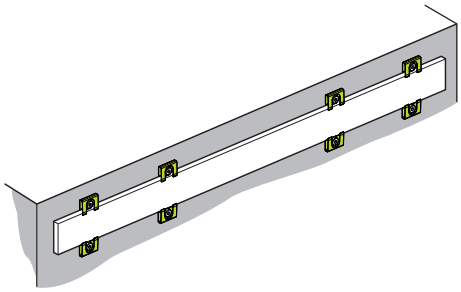
In order to avoid signal interferences, observe the minimum clearance from sources of interference.

For more information on sources of interference, refer to the **Interfaces of HEIDENHAIN Encoders** brochure.

- **www.heidenhain.com/documentation**
- Enter the document ID **1078628**

4.2 Mounting the linear scale

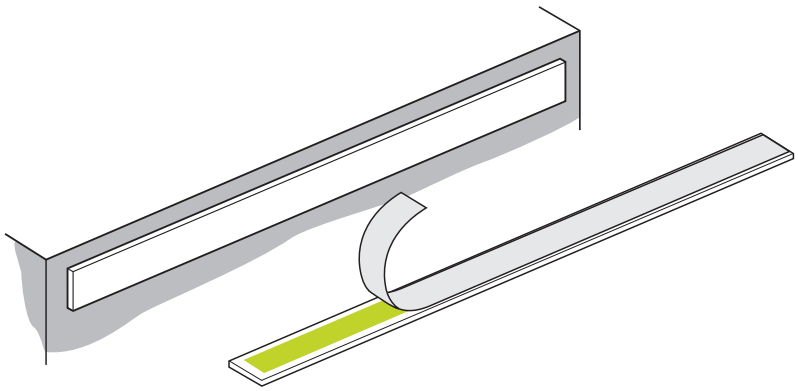
4.2.1 Selecting the mounting variant

Mounting variants for the linear scale	
Mounting **with adhesive film**	Mounting **with fixing clamps**
	
Page 16	**Page 20**

4.2.2 Variant: Mounting with adhesive film

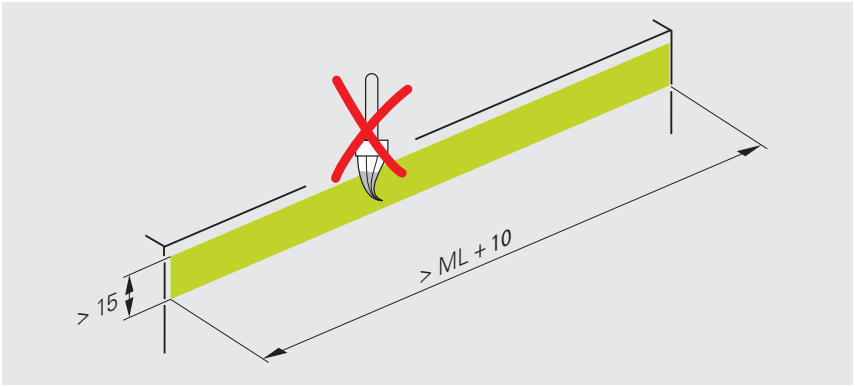
The mounting variant described in this chapter refers to mounting of the linear scale with an adhesive film.

An overview of the mounting variants is provided on Page 15.



Notes on mounting with adhesive film

Note that the mounting surface, as well as the surface of the scale, must be clean and free of paint, dust or grease.



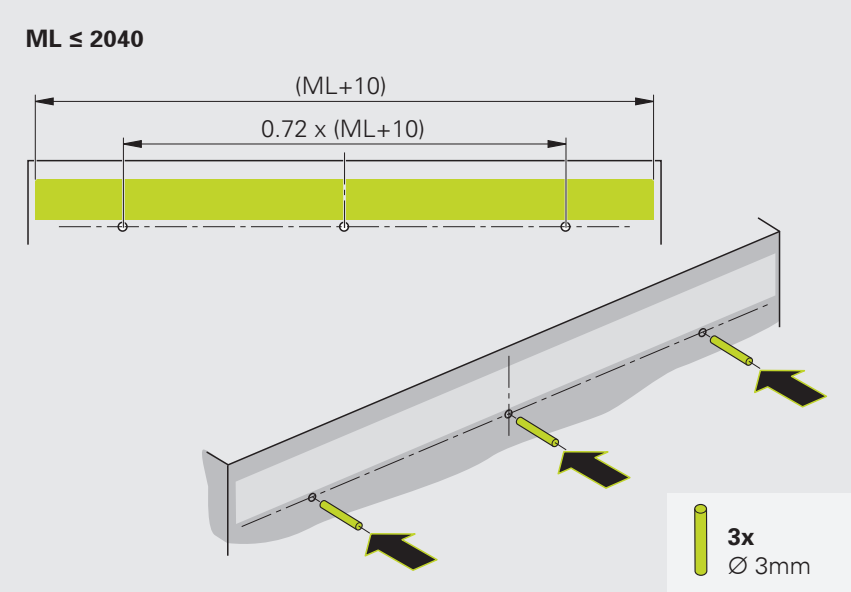
> You can mount the linear scale by means of stop pins or an aligning rail.

The mounting tolerances refer to the machine guideway **(F)**.

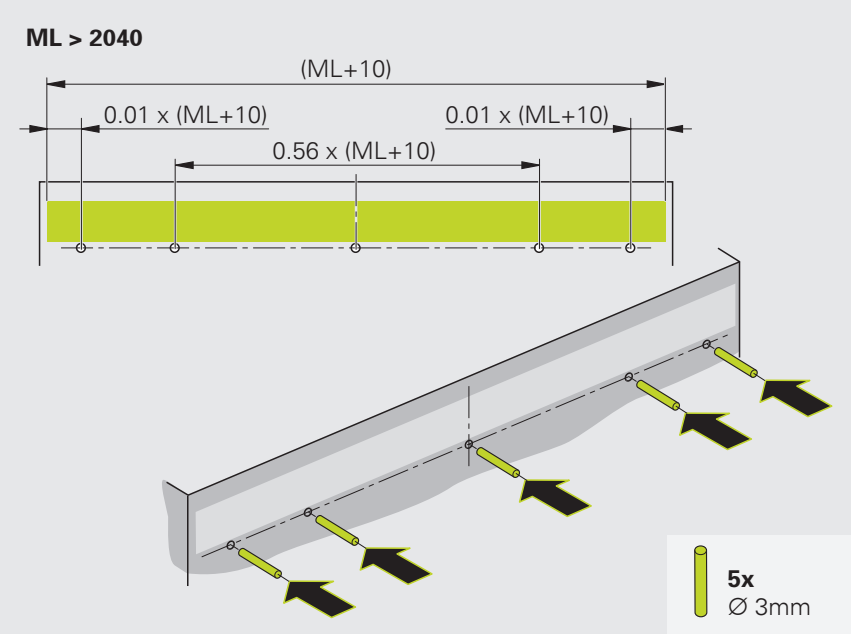
Number of stop pins to be used

Recommended diameter of the stop pins: 3 mm.

For a measuring length of **ML ≤ 2040**, use three stop pins to stabilize the scale sufficiently.



For a measuring length of **ML > 2040,** use five stop pins to stabilize the scale sufficiently.



Materials and tools

For this task, the following materials and tools are needed:

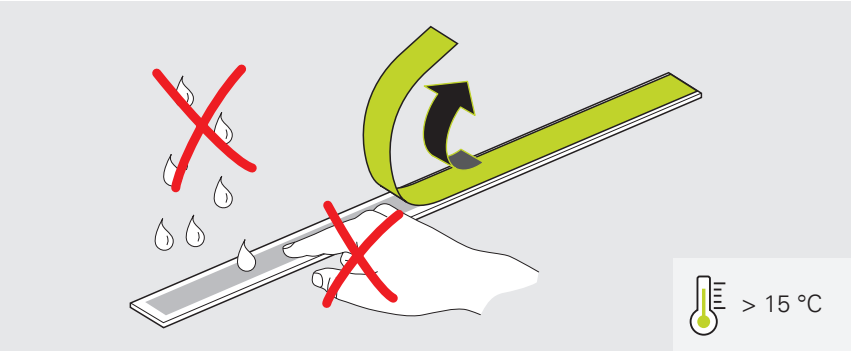
Included in delivery	To be provided separately
	■ Stop pins ■ Roller ■ Dispensing nozzle and mixing tubes ■ Adhesive 3M DP 460 EG ■ Double-cartridge gun

Gluing the linear scale

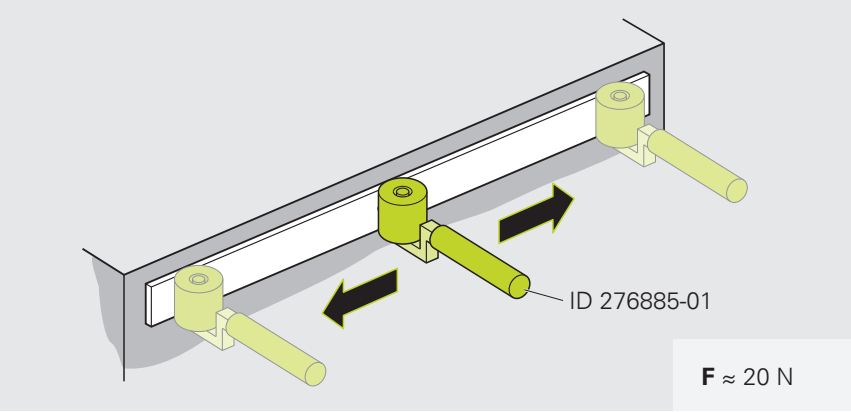
Attach the scale with adhesive mounting film only at a temperature of > 15 °C.

Pay attention to the expiration date on the package.

- Insert the stop pins
- Remove the protective foil from the adhesive film

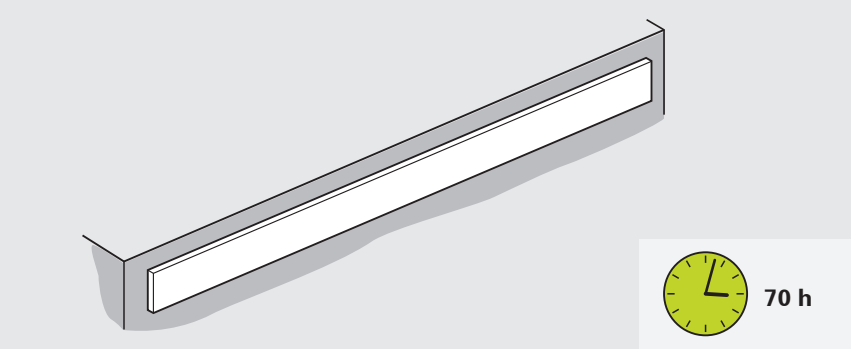


- Carefully place the scale onto the stop pins
- Starting from the center, evenly press the scale onto the mounting surface using the roller
- Remove the stop pins



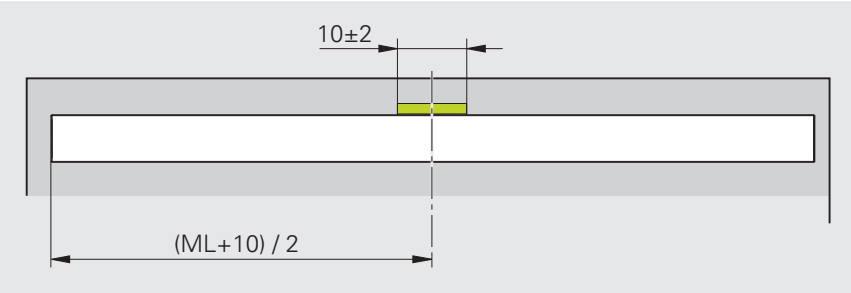
- Do not perform further work on the linear scale until the maximum adhesive force has been reached

The maximum adhesive force of the mounting film is reached at room temperature after approx. 70 hours.



Bonding the fixed point

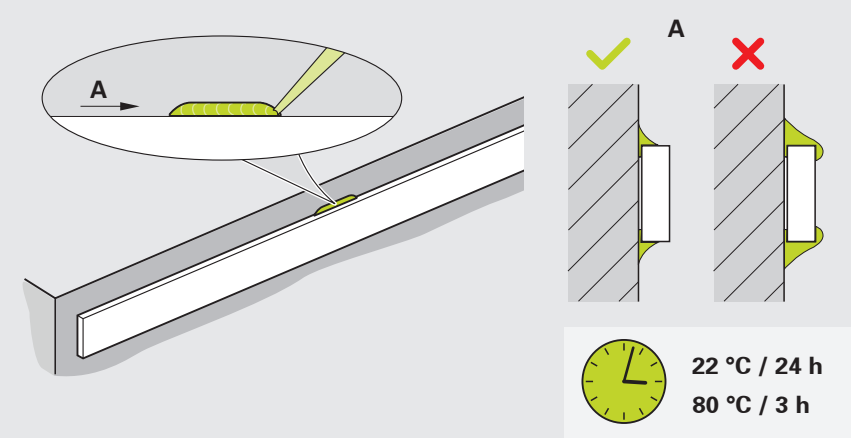
Due to potential thermal effects, HEIDENHAIN recommends fixed-point bonding at the center.



Pay attention to the work instructions in the applicable documentation.

Do not add more adhesive afterwards.

- Apply a bead of adhesive with a double cartridge gun and a dispensing nozzle.
- Allow the adhesive to harden as appropriate for the intended operating temperature



To ensure high fixed-point rigidity, pay attention to the specifications for curing temperature and curing time.

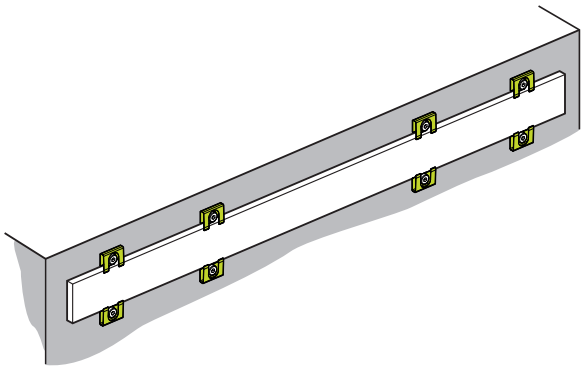
Operating temperature	Curing temperature	Curing time
–10 °C to +30 °C	22 °C	24 hours
–10 °C to +70 °C	80 °C	3 hours

Next step: "Mounting the scanning head", Page 26

4.2.3 Variant: Mounting with fixing clamps

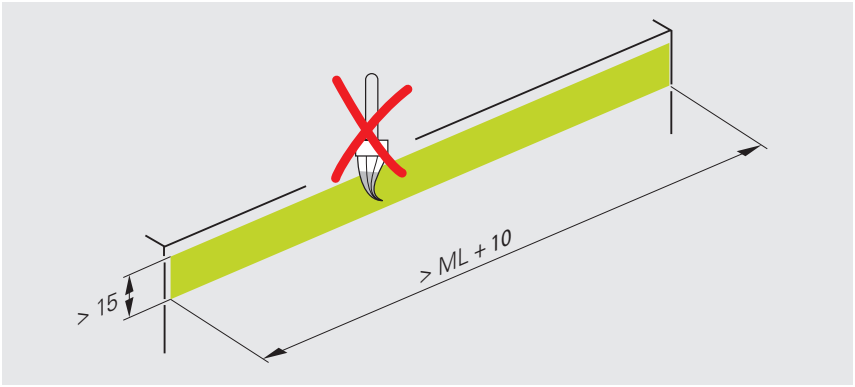
The mounting variant described in this chapter refers to mounting of the linear scale with fixing clamps.

An overview of the mounting variants is provided on Page 15.

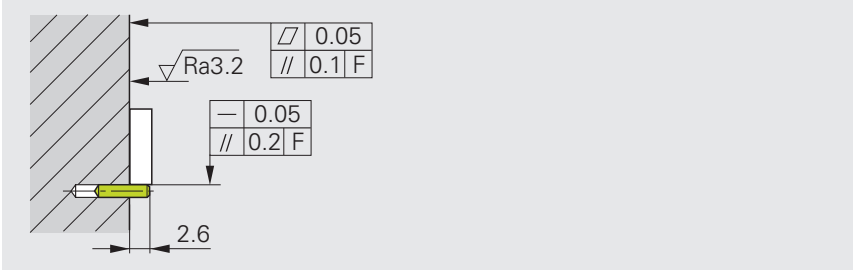


Notes on mounting with fixing clamps

Note that the mounting surface, as well as the surface of the scale, must be clean and free of paint, dust or grease.



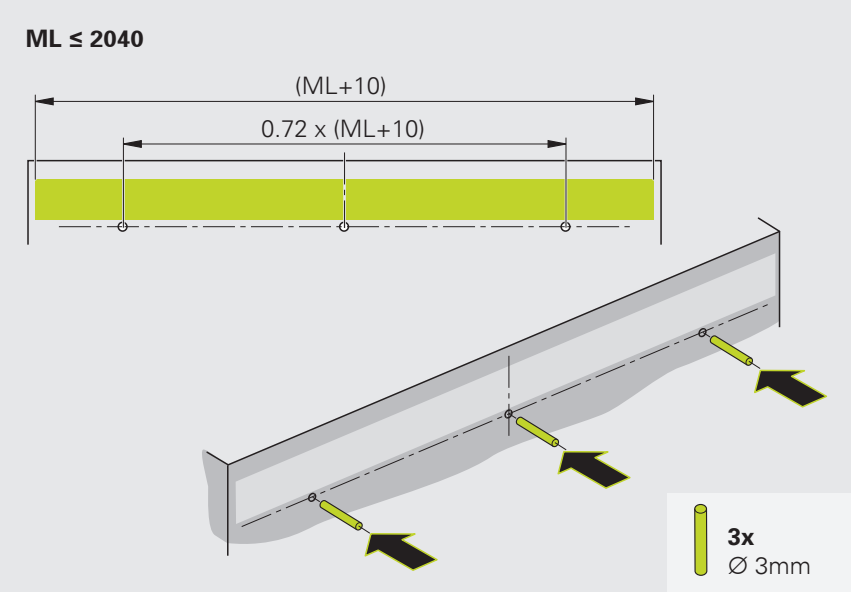
The mounting tolerances refer to the machine guideway **(F)**.



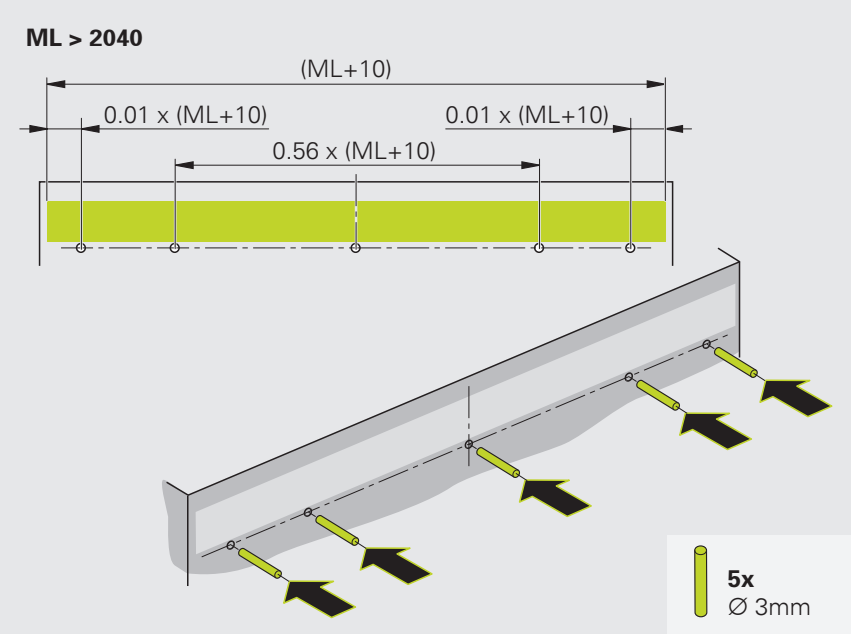
Number of stop pins to be used

Recommended diameter of the stop pins: 3 mm.

For a measuring length of **ML ≤ 2040**, use three stop pins to stabilize the scale sufficiently.



For a measuring length of **ML > 2040,** use five stop pins to stabilize the scale sufficiently.



Materials and tools

For this task, the following materials and tools are needed:

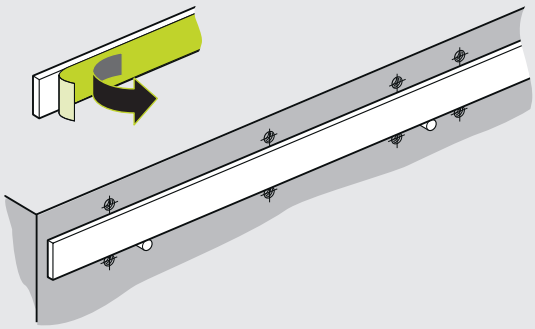
Included in delivery

To be provided separately

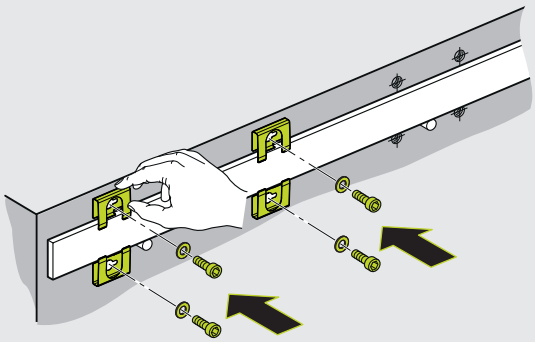
- Fixing clamps
- Spacer shims
- Stop pins
- Fixed-point elements
- Screws (DIN 7984 – M3×6)
- Washers (ISO 7092–3)
- Torque wrench (hexagon socket for 2.5 mm)
- Dispensing nozzle and mixing tubes
- Adhesive 3M DP 460 EG
- Double-cartridge gun

Mounting the fixing clamps

- Insert the stop pins
- Remove the protective film of the scale
- Carefully place the scale onto the stop pins



- Press all fixing clamps lightly in the direction of the scale and fasten them with screws and washers. Tighten the screws only lightly



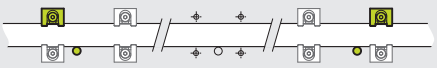
DIN 7984 – M3x6
ISO 7092–3

Perform the following steps only with those fixing clamps that are nearest to, but across from, a stop pin:

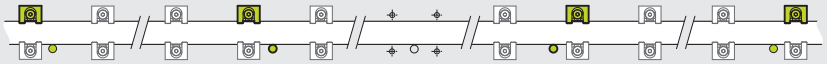
For a measuring length of
ML ≤ 2040
= 2 fixing clamps

For a measuring length of
ML > 2040
= 4 fixing clamps

ML ≤ 2040
= 2×

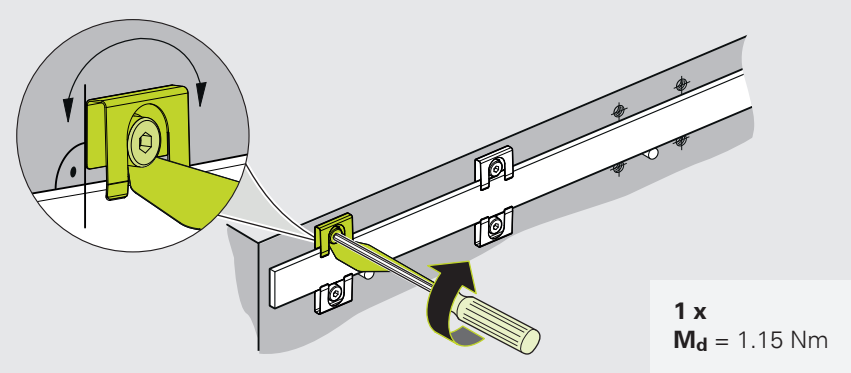


ML > 2040
= 4×



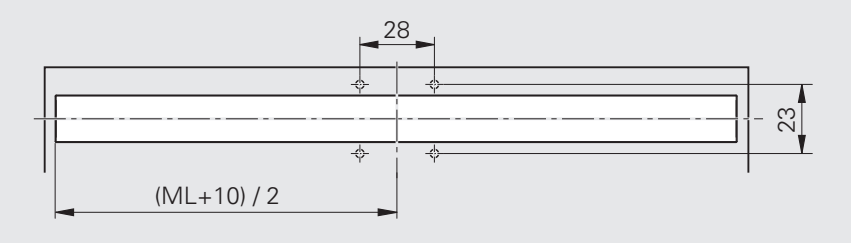
- Place the spacer shim between the fixing clamp and scale
- Align the fixing clamp at a right angle to the scale
- Tighten the screw using the prescribed torque

> Do not remove the spacer shims.

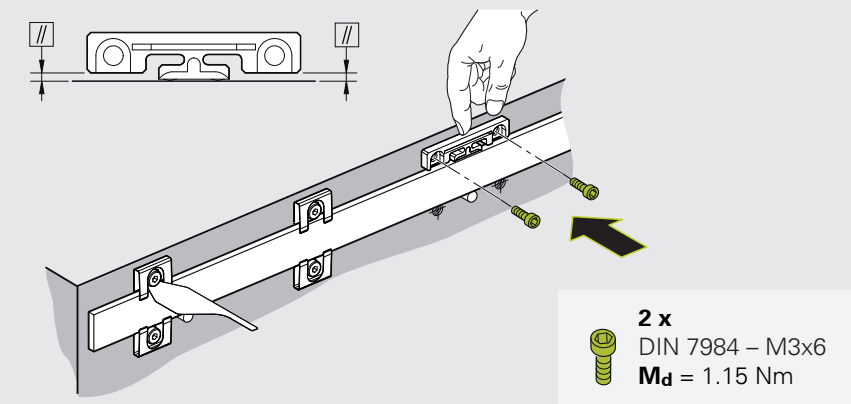


Mounting the fixed-point element

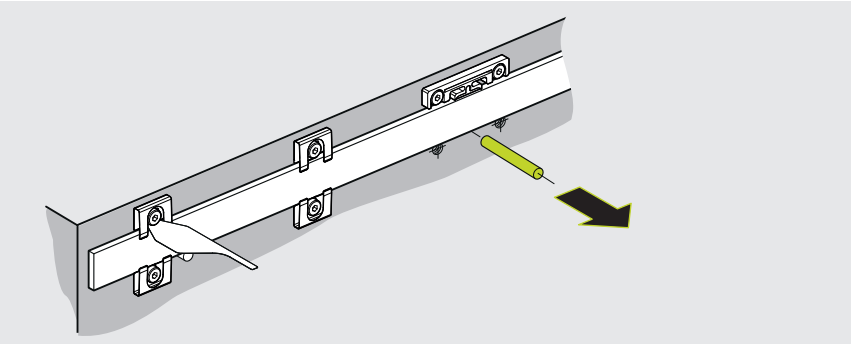
Pay attention to the mounting dimensions. Deviations from the mounting dimensions lead to imprecise measurement results during operation.



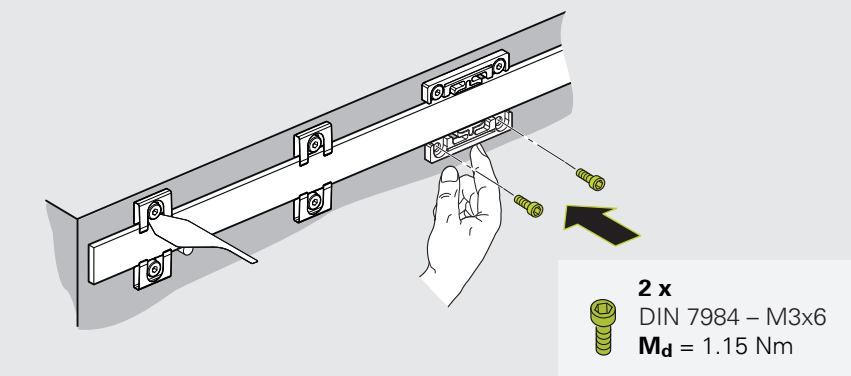
- Align the fixed-point element in parallel
- Lightly press the upper fixed-point element against the scale and fasten it with screws using the prescribed torque



- Remove the stop pin



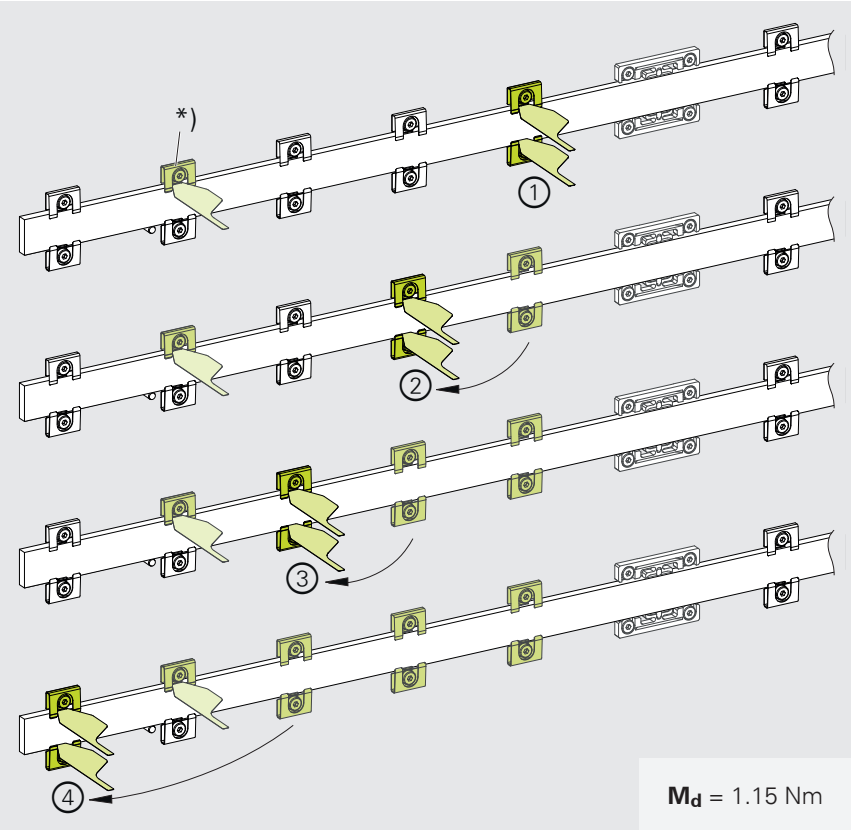
- Align the fixed-point element in parallel
- Lightly press the lower fixed-point element against the scale and fasten it with screws using the prescribed torque



Tightening the fixing clamps

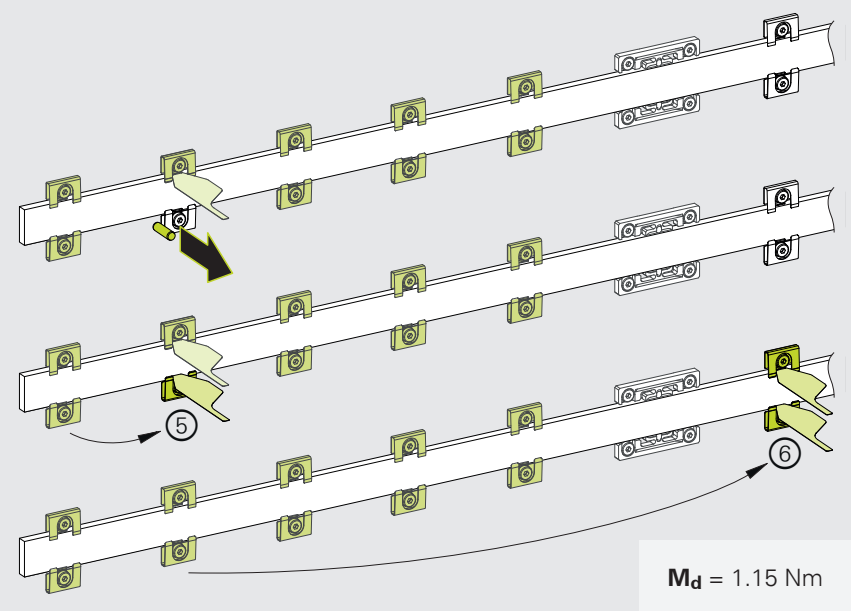
- The figure shows an example. The number and position of the fixing clamps and stop pins depends on the length of the linear scale.
- Always tighten the fixing clamps in pairs.

- Place the spacer shims between each pair of fixing clamps and the scale
- Tighten the screws using the prescribed torque
- Remove the spacer shims and use them for the next pair of fixing clamps
- Tighten the screws in the sequence shown



*) Do not remove the spacer shims from the first tightened fixing clamps until all fixing clamps have been tightened.

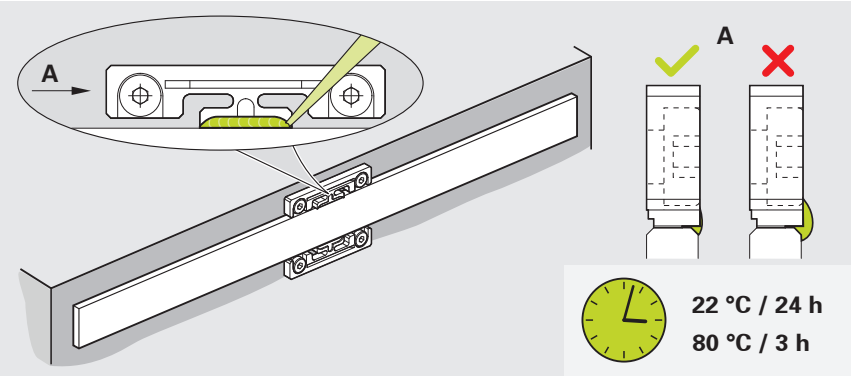
- Remove the stop pin
- Finally, tighten the fixing clamp opposite the first fixing clamp that was tightened
- Tighten the screws on the other side of the fixed-point element according to the same pattern



Gluing the fixed-point element

Pay attention to the work instructions in the applicable documentation.

Do not add more adhesive afterwards.



- Apply a bead of adhesive with a double cartridge gun and a dispensing nozzle.
- Allow the adhesive to harden as appropriate for the intended operating temperature

To ensure high fixed-point rigidity, pay attention to the specifications for curing temperature and curing time.

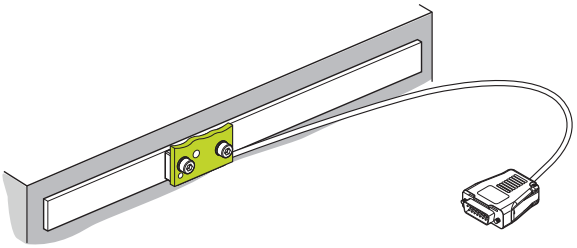
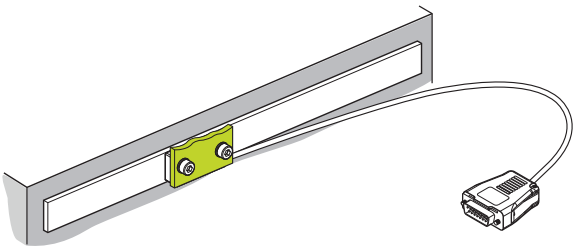
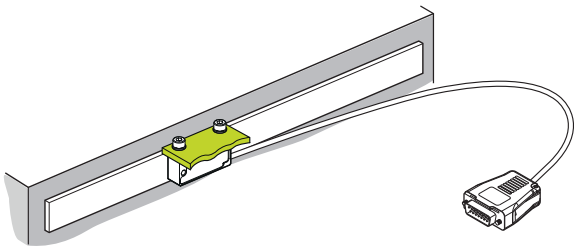
Operating temperature	Curing temperature	Curing time
–10 °C to +30 °C	22 °C	24 hours
–10 °C to +70 °C	80 °C	3 hours

Next step: "Mounting the scanning head", Page 26

4.3 Mounting the scanning head

4.3.1 Selecting the mounting variant

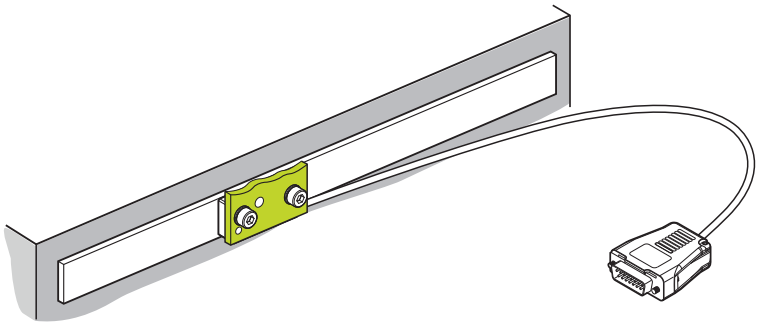
Mounting variants for the scanning head

	Holder **on the side**	Holder **at the top**
With stop pin	 **Page 27**	
Without stop pin	 **Page 29**	 **Page 31**

4.3.2 Variant: Mounting the scanning head with the holder on the side by means of a stop pin

The mounting variant described in this chapter refers to mounting of the scanning head with the holder on the side by means of a stop pin.

An overview of the mounting variants is provided on Page 26.



Notes on mounting the scanning head

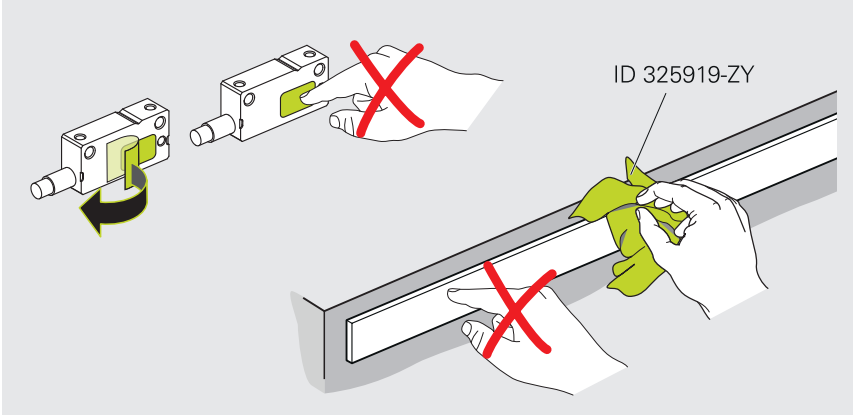
The tightening torques of the mounting screws are only valid for mounting on steel.

If necessary, clean the graduation and the scanning head with a lint-free cloth and isopropyl alcohol.

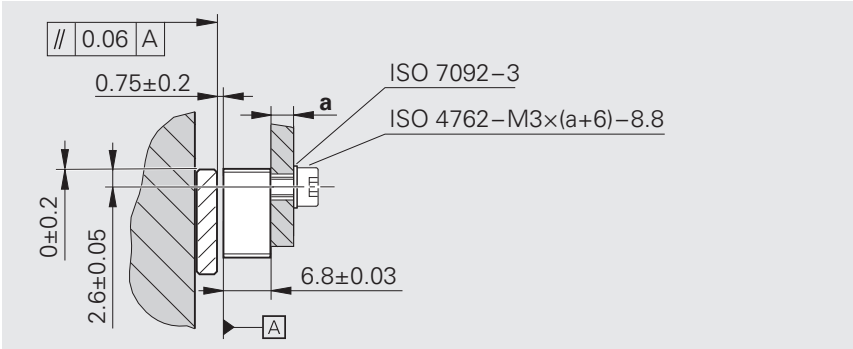
NOTICE

Property damage due to unsuitable cleaning agents!

- Use only isopropyl alcohol to clean the encoder
- Clean the encoder with a lint-free cloth



Pay attention to the mounting dimensions. Deviations from the mounting dimensions lead to imprecise measurement results during operation.



Materials and tools

For this task, the following materials and tools are needed:

Included in delivery

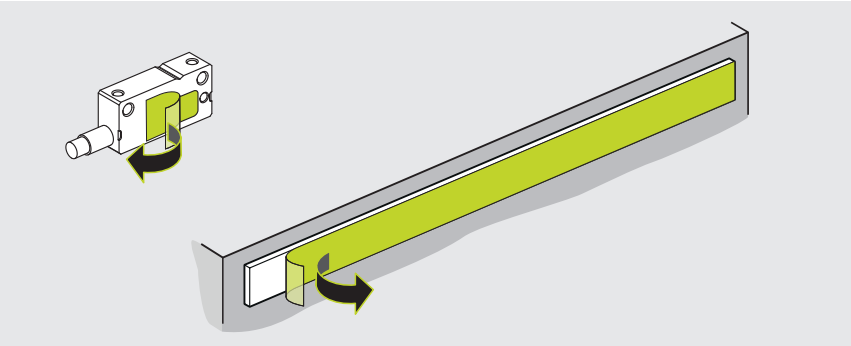
- Spacer shim

To be provided separately

- Stop pin
- Two screws (ISO 4762–M3×(**a**+6)– 8.8)
- Two washers (ISO 7092–3)
- Torque wrench (hexagon socket for 2.5 mm)

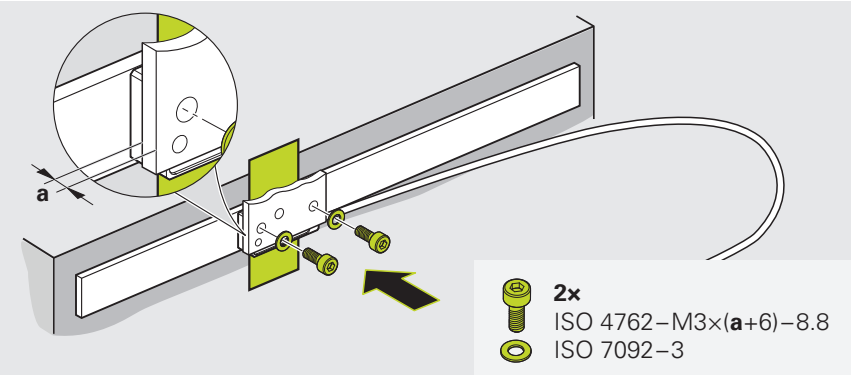
Mounting the scanning head

- Remove the protective film of the scanning head
- Remove the protective film of the scale (depending on the mounting variant)



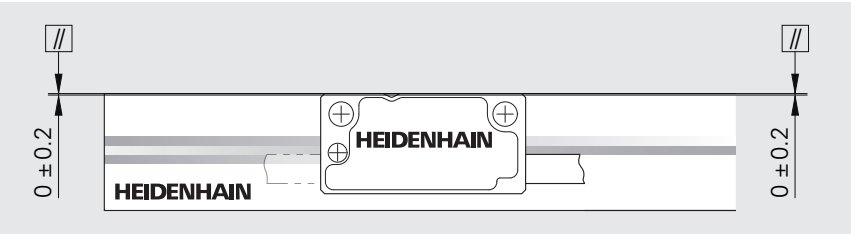
When mounting the linear scale with fixing clamps:

Do not insert the spacer shim near the fixing clamps.



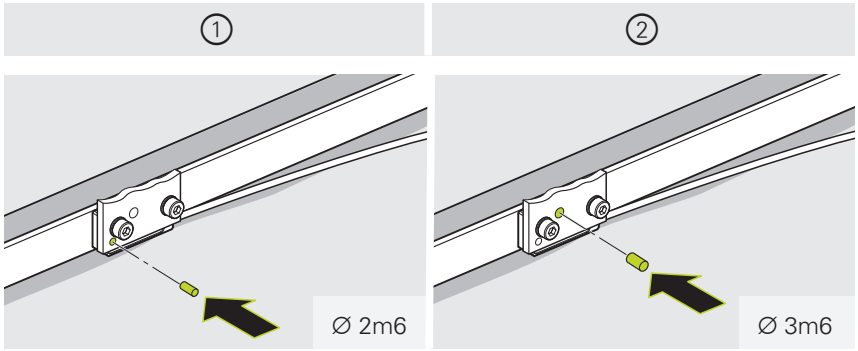
- Use the spacer shim to set the mounting clearance
- Lightly screw on the scanning head
- Remove the spacer shim

- Align the top edge of the scanning head relative to the scale as follows:
  - In parallel
  - At the same height: 0 ±0.2 mm



- Insert a stop pin (diameter: 2 mm) at position (1) or a stop pin (diameter: 3 mm) at position (2) to provide a center of rotation for the moiré adjustment.

To prevent damage to the linear scale, do not push the stop pin completely through the hole.

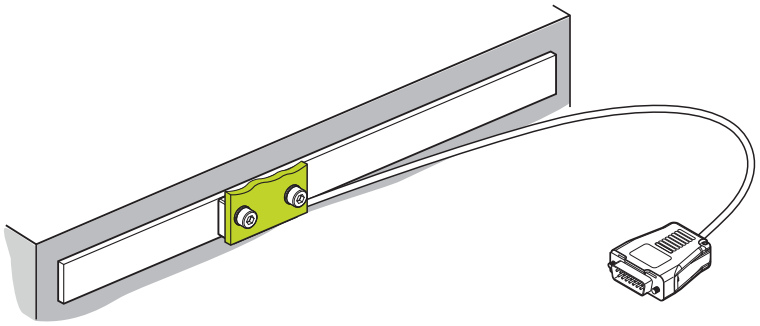


Next step: "Adjustment and diagnosis", Page 35

4.3.3 Variant: Mounting the scanning head with the holder on the side without a stop pin

The mounting variant described in this chapter refers to mounting of the scanning head with the holder on the side without using a stop pin.

An overview of the mounting variants is provided on Page 26.



Notes on mounting the scanning head

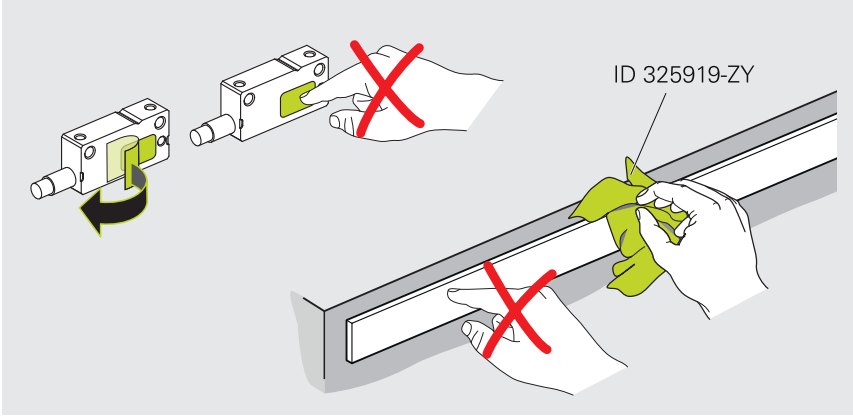
The tightening torques of the mounting screws are only valid for mounting on steel.

If necessary, clean the graduation and the scanning head with a lint-free cloth and isopropyl alcohol.

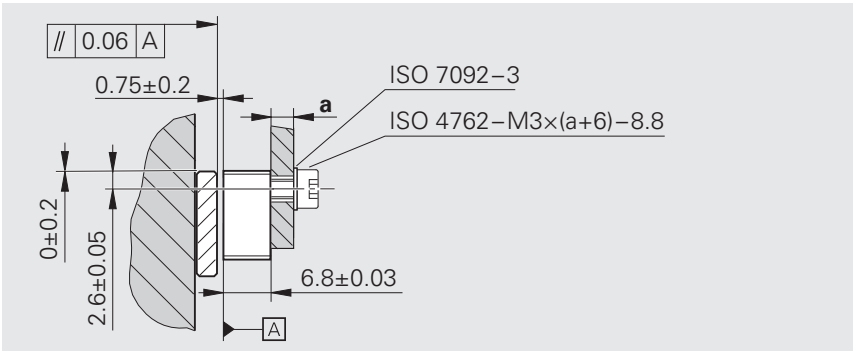
NOTICE

Property damage due to unsuitable cleaning agents!

- Use only isopropyl alcohol to clean the encoder
- Clean the encoder with a lint-free cloth



Pay attention to the mounting dimensions. Deviations from the mounting dimensions lead to imprecise measurement results during operation.



Materials and tools

For this task, the following materials and tools are needed:

Included in delivery

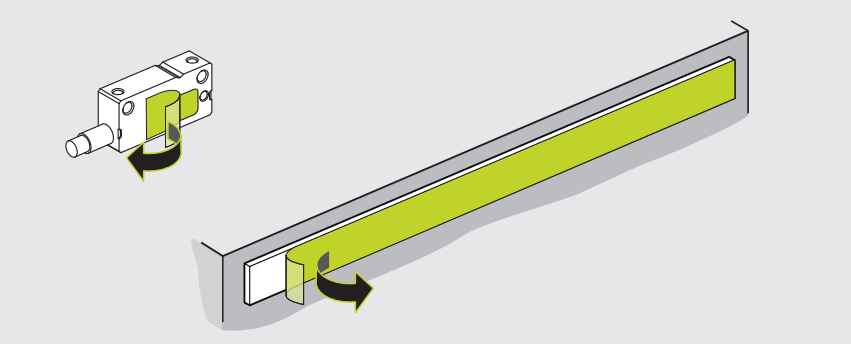
- Spacer shim

To be provided separately

- Two screws (ISO 4762–M3×(**a**+6)–8.8)
- Two washers (ISO 7092–3)
- Torque wrench (hexagon socket for 2.5 mm)

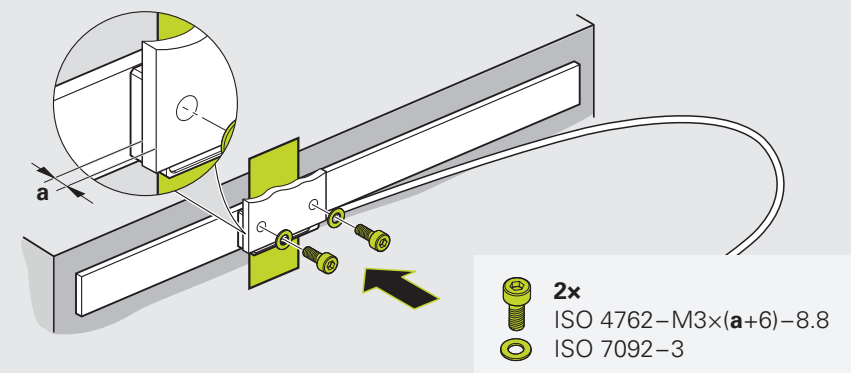
Mounting the scanning head

- Remove the protective film of the scanning head
- Remove the protective film of the scale (depending on the mounting variant)

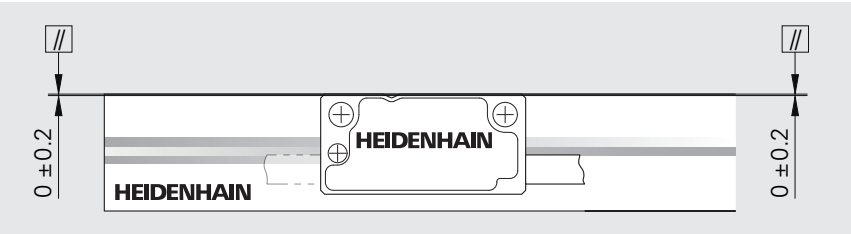


> When mounting the linear scale with fixing clamps:
>
> Do not insert the spacer shim near the fixing clamps.

- Use the spacer shim to set the mounting clearance
- Lightly screw on the scanning head
- Remove the spacer shim



- Align the top edge of the scanning head relative to the scale as follows:
  - In parallel
  - At the same height: 0 ±0.2 mm
  - Distance: 3.8 ±0.2 mm

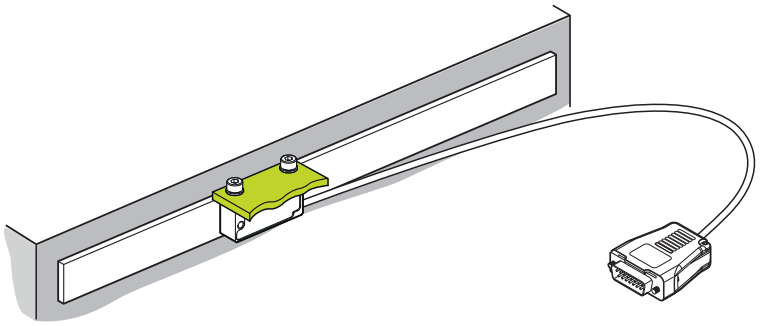


Next step: "Adjustment and diagnosis", Page 35

4.3.4 Variant: Mounting the scanning head with the holder at the top without a stop pin

The mounting variant described in this chapter refers to mounting of the scanning head with the holder at the top without using a stop pin.

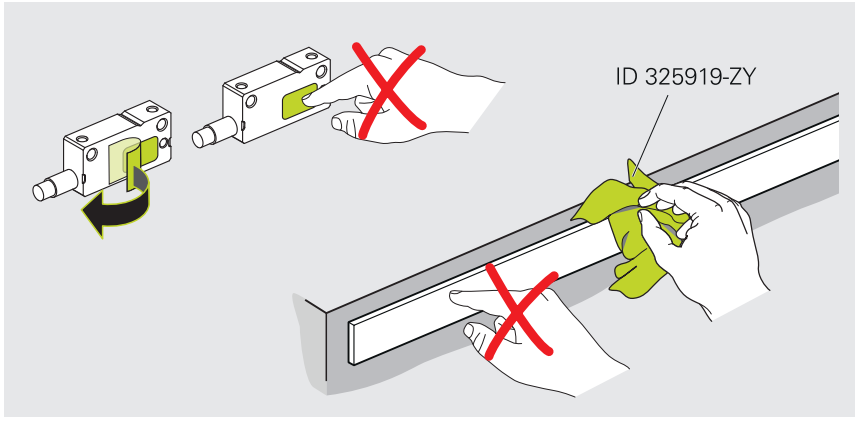
An overview of the mounting variants is provided on Page 26.



Notes on mounting the scanning head

The tightening torques of the mounting screws are only valid for mounting on steel.

If necessary, clean the graduation and the scanning head with a lint-free cloth and isopropyl alcohol.

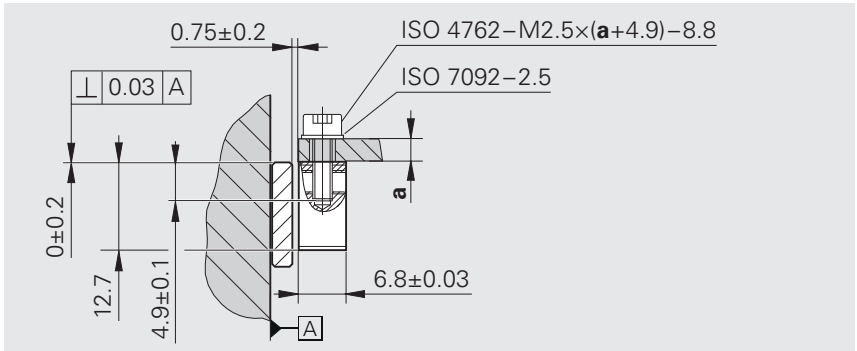


NOTICE

Property damage due to unsuitable cleaning agents!

- Use only isopropyl alcohol to clean the encoder
- Clean the encoder with a lint-free cloth

Pay attention to the mounting dimensions. Deviations from the mounting dimensions lead to imprecise measurement results during operation.



Materials and tools

For this task, the following materials and tools are needed:

Included in delivery

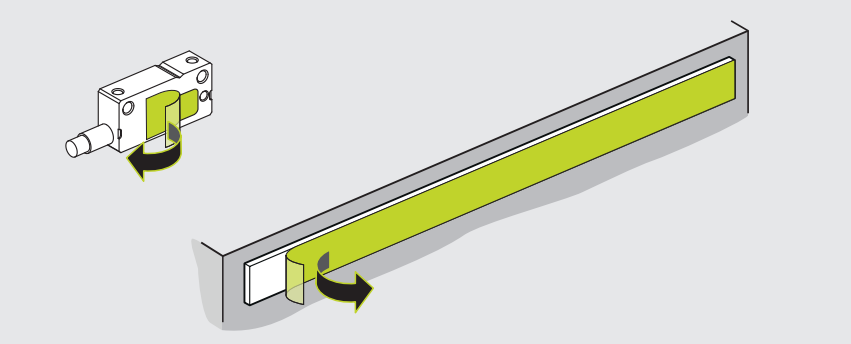
- Spacer shim

To be provided separately

- Two screws (ISO 4762–M2.5×(**a**+4.9)–8.8)
- Two washers (ISO 7092–2.5)
- Torque wrench (hexagon socket for 2 mm)

Mounting the scanning head

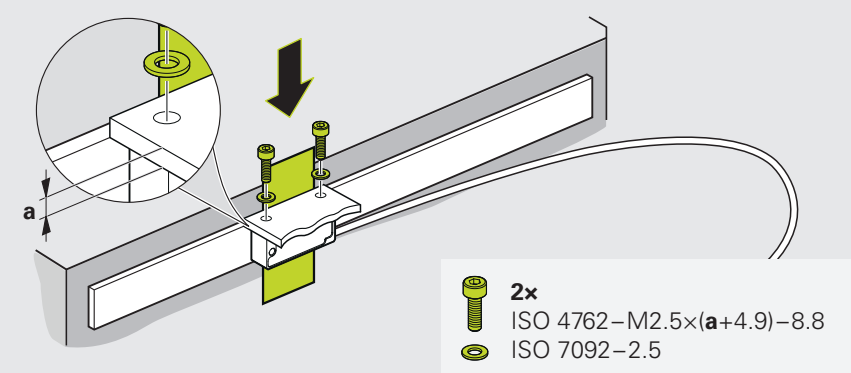
- Remove the protective film of the scanning head
- Remove the protective film of the scale (depending on the mounting variant)



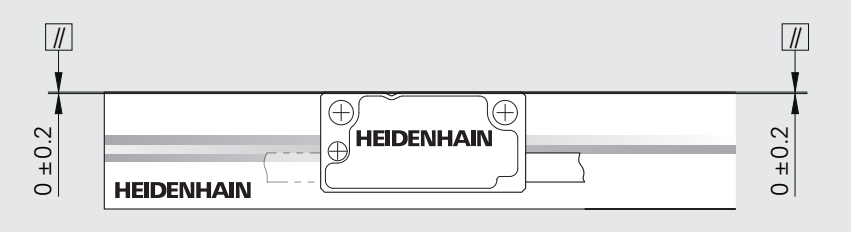
When mounting the linear scale with fixing clamps:

Do not insert the spacer shim near the fixing clamps.

- Use the spacer shim to set the mounting clearance
- Lightly screw on the scanning head
- Remove the spacer shim



- Align the top edge of the scanning head relative to the scale as follows:
  - In parallel
  - At the same height: 0 ±0.2 mm
  - Distance: 3.8 ±0.2 mm



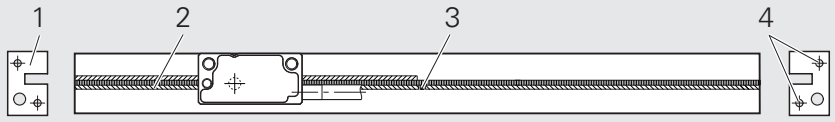
Next step: "Adjustment and diagnosis", Page 35

4.4 Optional: Mounting the limit plates

4.4.1 Notes on mounting the limit plates

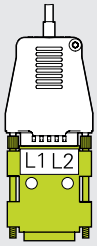
The mounting of the limit plates is optional.
Limit plates make it possible to detect the limit positions and to distinguish whether the right or left limit position is crossed.

1 = Limit plate
2 = Homing track
3 = Reference mark
4 = Holes for adhesive



The trigger point can be displayed using the Adjusting and Testing Software or by using an adapter.

L1 (homing)	L2 (limit)	
●	○	Limit, homing left
●	●	Homing left
○	●	Homing right
○	○	Limit, homing right



ID 353995-01

4.4.2 Mounting the limit plates

Materials and tools

For this task, the following materials and tools are needed:

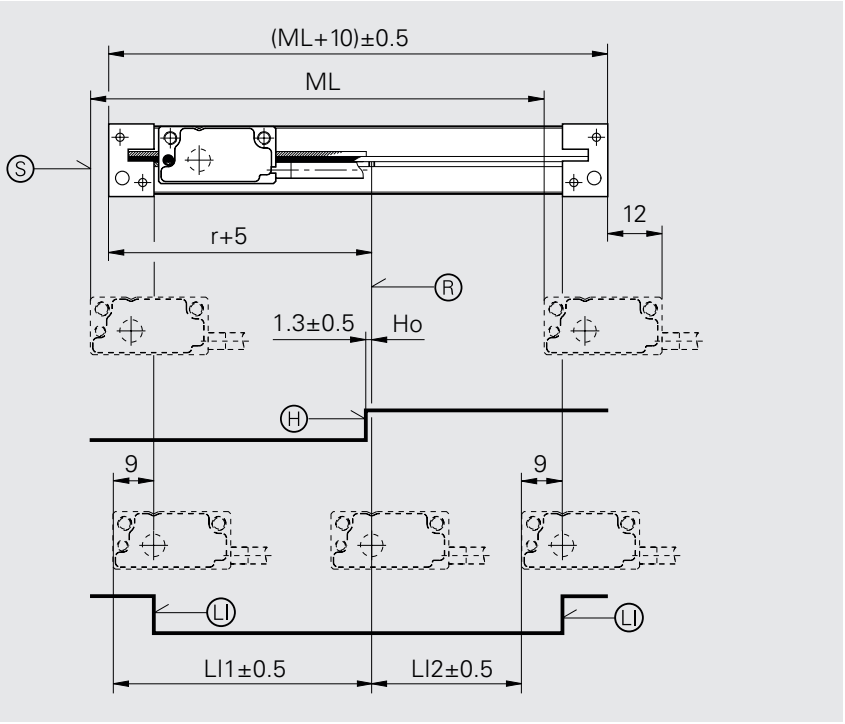
Included in delivery

- Limit plates for the linear scale

To be provided separately

- Dispensing nozzle and mixing tubes
- Adhesive 3M DP 460 EG
- Double-cartridge gun

- ▶ Attach the limit plates to the scale
- ▶ Adjust the desired trigger points see "Adjustment and diagnosis", Page 35
- ▶ Press the limit plate against the scale
- ▶ Insert a small amount of adhesive into the holes for the adhesive
- > The limit plates are now firmly secured.



R = Reference mark position
S = Beginning of measuring length
LI = Limit mark (adjustable)
H = Switch for homing track
Ho = Trigger point for homing

5 Adjustment and diagnosis

This chapter describes the continuity test, as well as the adjustment and diagnosis with the PWM 21 and the Adjusting and Testing Software (ATS).

5.1 Prerequisites and notes

The PWM 21 testing device together with the Adjusting and Testing Software (ATS) serves for the diagnosis and adjustment of HEIDENHAIN encoders.

The following components are needed:

- PWM 21
- ATS with version 3.2.xx and later: With integrated local encoder database for automatic encoder detection

The ATS software is available for download free of charge from **www.heidenhain.com/service/downloads/software/**.

For more information, see the **Exposed Linear Encoders** brochure.
- **www.heidenhain.com/documentation**
- Enter the document ID **208960**

For more information, see the associated Adjusting and Testing Software documentation.
- **www.heidenhain.com/documentation**
- Enter the document ID **543734**

5.2 Continuity check

Materials and tools

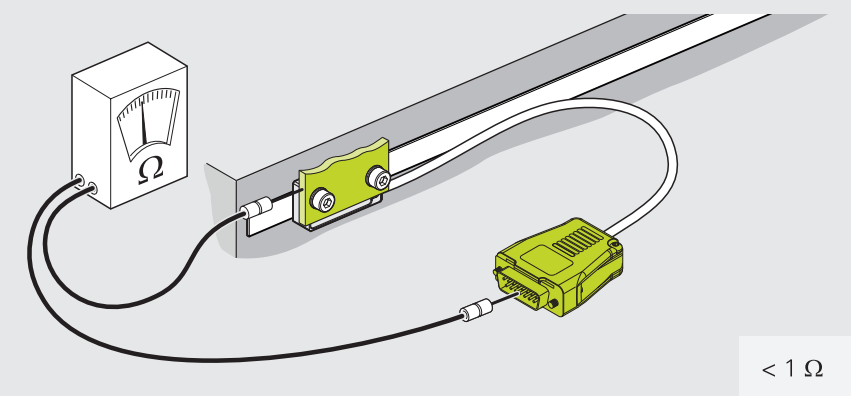
For this mounting step, the following materials and tools are needed:

Included in delivery	To be provided separately
	■ Resistance measuring device

5.2.1 Measuring the electrical resistance

- Check the resistance between the connector housing and the machine

The electrical resistance between the connector housing and the machine must be < 1 Ω.



5.3 Connecting the encoder to the ATS

5.3.1 Connecting the encoder

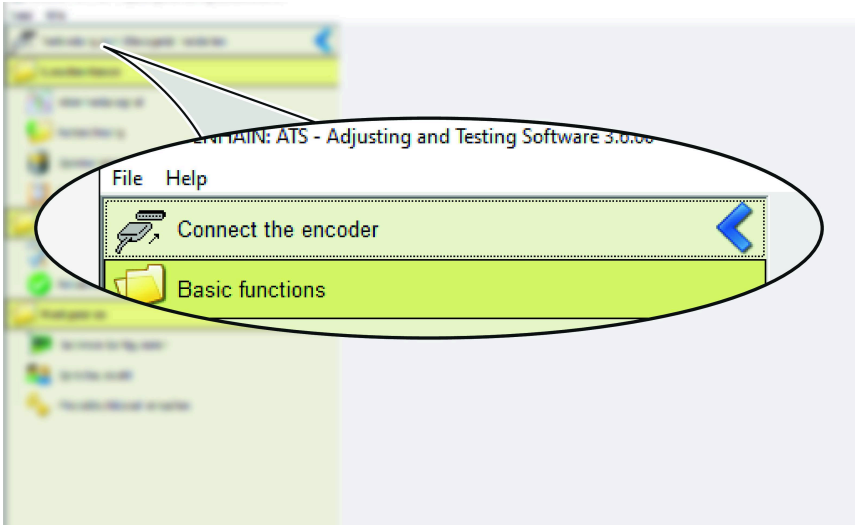
- Connect the encoder to the PWM 21
- Switch on the PWM 21

5.3.2 Selecting the connection

Connection options	
Connecting the encoder using its ID	**Connecting the encoder manually**
Recommended option with automatic determination of the measuring parameters. **Page 37**	Alternative option if the encoder cannot be connected using its ID. **Page 38**

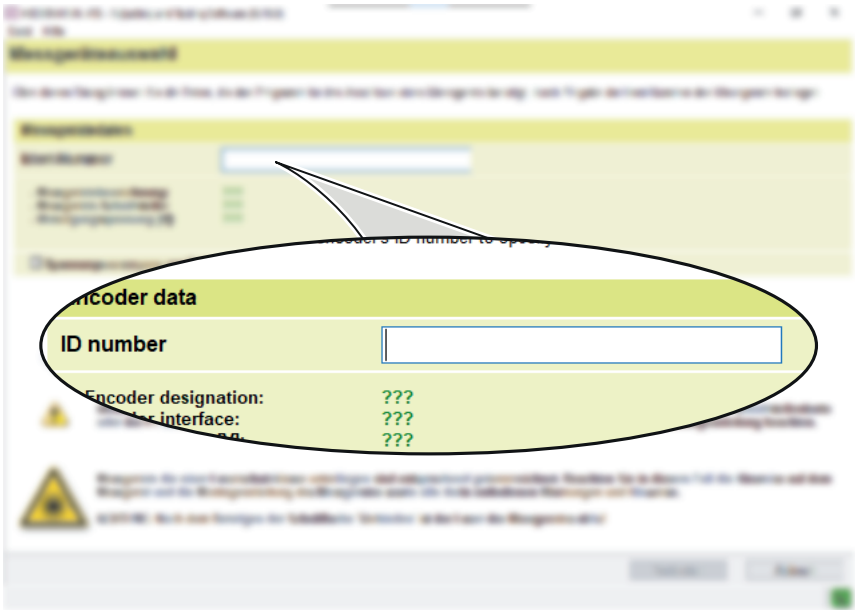
5.3.3 Connecting the encoder using its ID

- ▶ Double-click **Connect the encoder** in the function menu
- > The **Encoder selection** dialog opens



Function menu

- ▶ Enter the encoder ID in the **ID number** field
- > The determined encoder parameters are shown in the **Encoder data** field.
- ▶ Click **Connect**
- > The connection to the encoder is established.
- > The **Function menu** opens.



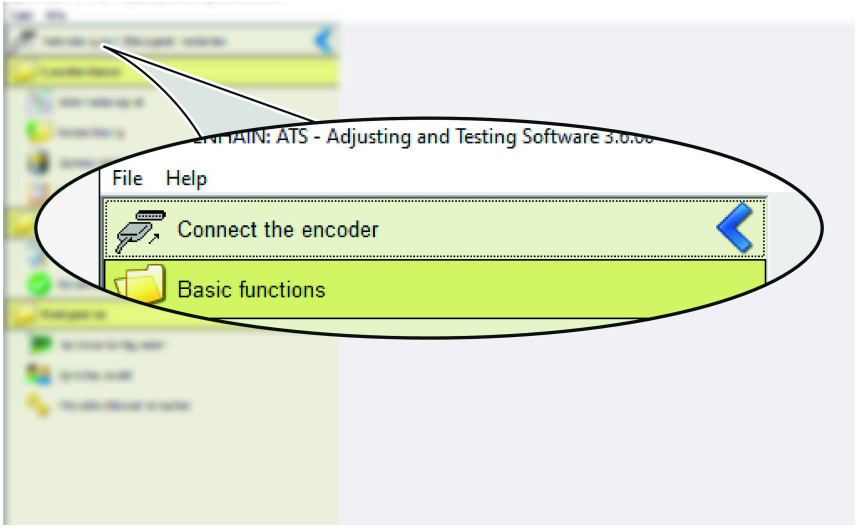
Encoder selection dialog

If you cannot connect the encoder using its ID, proceed as described in the **"Connecting the encoder manually"** chapter.

Next step: "Selecting the scanning head", Page 41

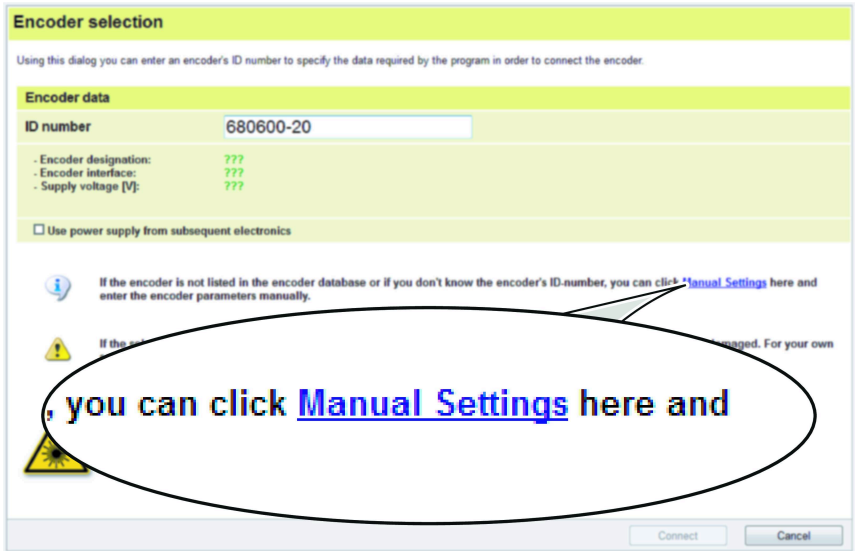
5.3.4 Connecting the encoder manually

- ▶ Double-click **Connect the encoder** in the function menu
- > The **Encoder selection** dialog opens.



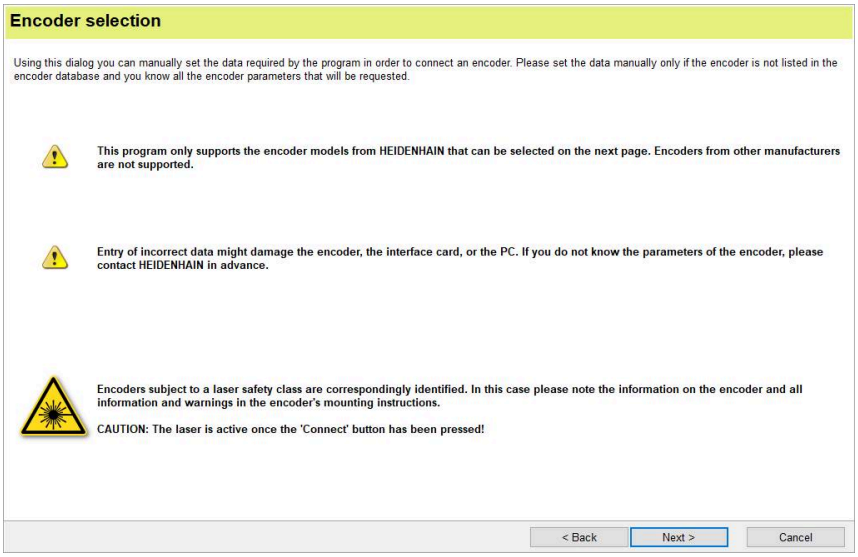
Function menu

- ▶ Click **Manual Settings**
- > The **Encoder selection** dialog opens.



The **Encoder selection** dialog

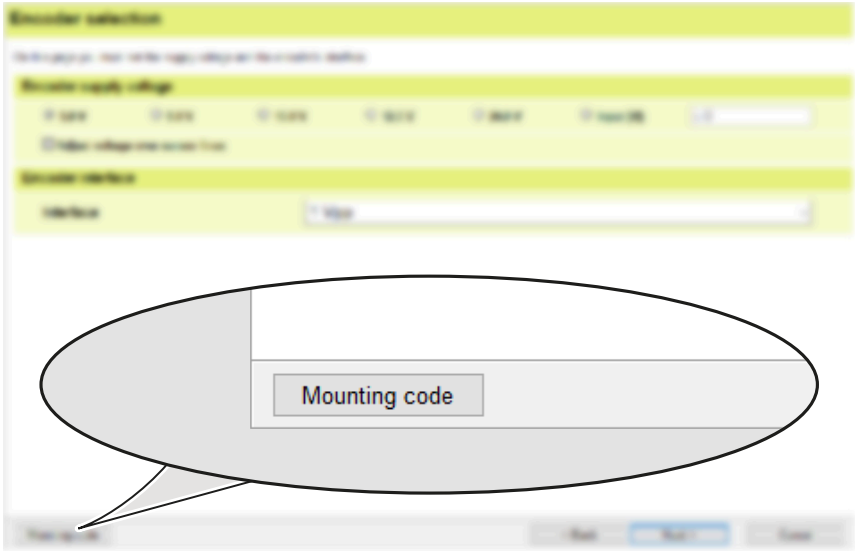
- ▶ Follow the safety instructions
- ▶ Click **Next**
- > The **Encoder selection** dialog opens.



The **Encoder selection** dialog

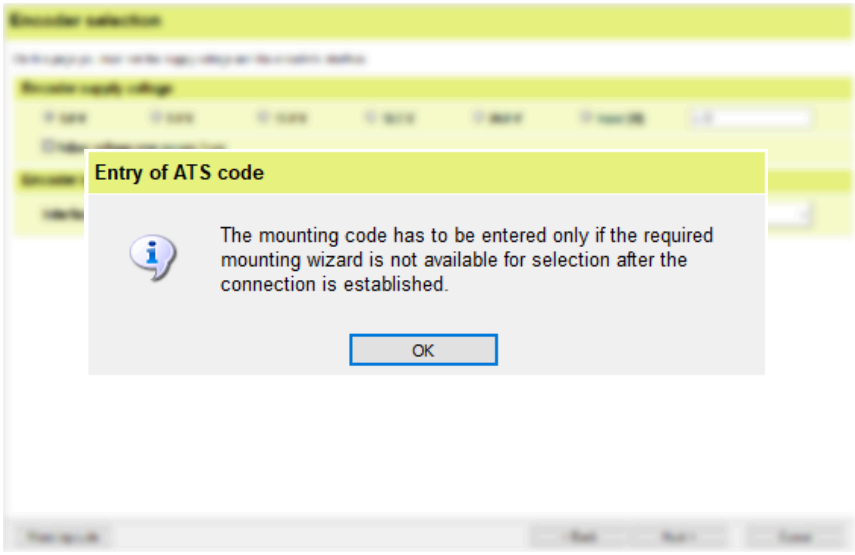
For more information on the supply voltage and interfaces, refer to the **Exposed Linear Encoders** brochure.
- **www.heidenhain.com/documentation**
- Enter the document ID **208960**

- Select the permissible encoder supply voltage in the **Encoder supply voltage** section
- To activate voltage readjustment by the PWM, select the **Adjust voltage over sensor lines**
- Select the interface type in the **Encoder interface** section
- Click **Mounting code**
- > The **Entry of ATS code** message appears.



The **Encoder selection** dialog

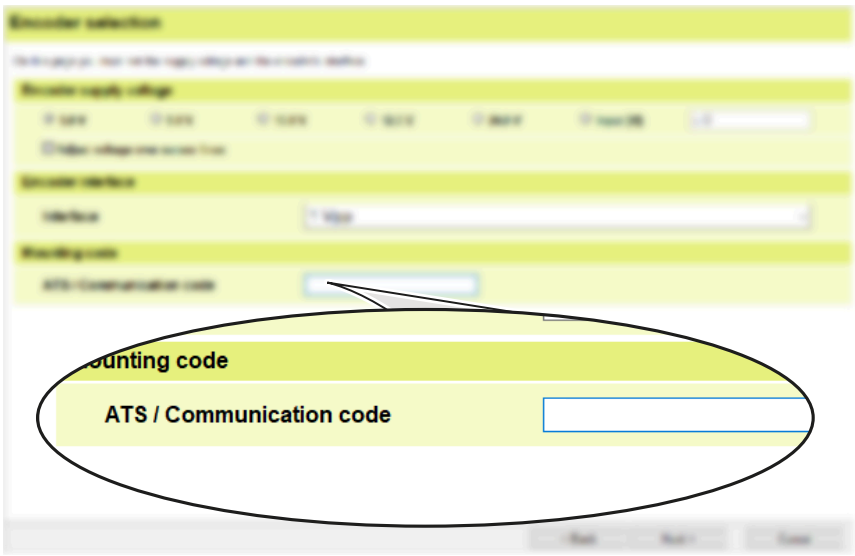
- Click **OK**
- > The **Encoder selection** dialog with the mounting code opens.



The **Entry of ATS code** message

- For the **Mounting code**, enter the value:
  I002-A003
- Click **Next**

> The **Encoder selection** dialog with the encoder data opens.



The **Encoder selection** dialog with the mounting code

NOTICE

Property damage due to incorrect data settings!

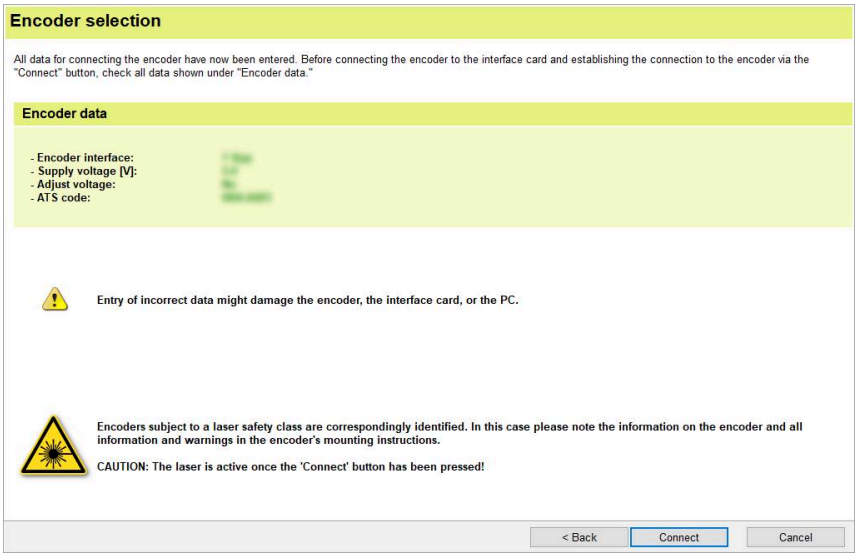
Incorrect data settings can cause damage to the interface card or the PC.

- Before connecting the encoder, check the encoder data
  Supply voltage [V]: 5.0

- Click **Connect**

> The connection to the encoder is established.

> The **Function menu** opens.



The **Encoder selection** dialog with the encoder data

Next step: "Selecting the scanning head", Page 41

5.4 Mounting the scanning head

5.4.1 Selecting the scanning head

Scanning head variants	
LIP 608	**LIP 607**
Scanning head with 1 V_{PP} interface **Page 42**	Scanning head with TTL interface **Page 49**

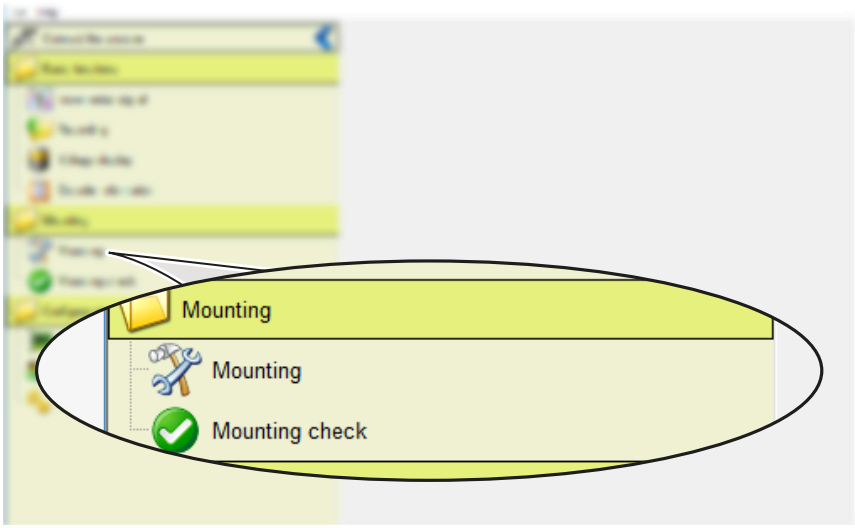
5.4.2 Mounting the LIP 608 scanning head

Using the mounting wizard

- ▶ Double-click **Mounting**
- > The **Mounting wizard** opens.

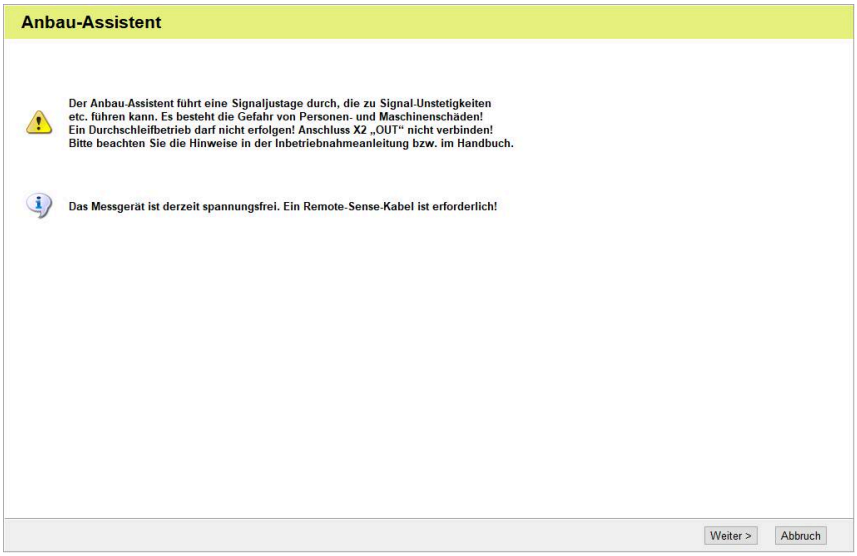
If the connection was set up by connecting the encoder manually:

- ▶ Double-click **Mounting**
- > The **Select encoder model** window opens.
- ▶ Select the encoder
- ▶ Click **OK**
- > The **Mounting wizard** opens.



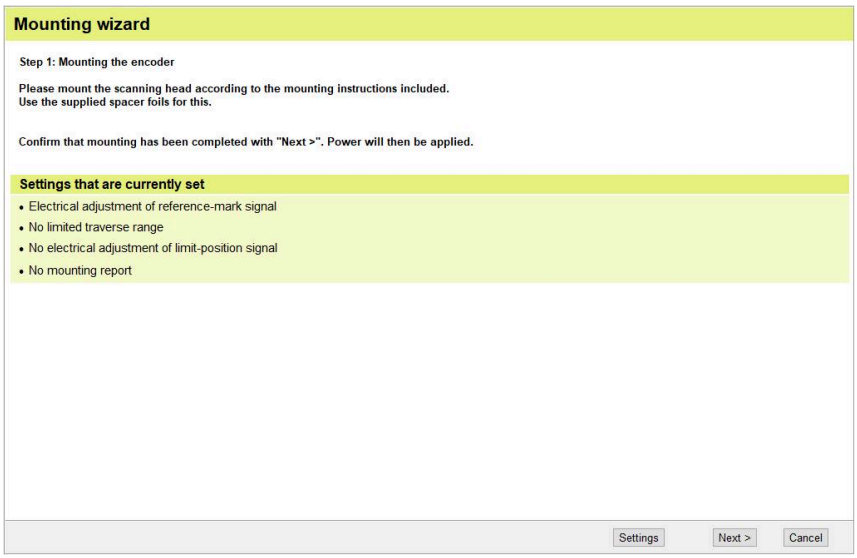
Function menu

- ▶ Observe the messages
- ▶ Click **Next**
- > The **Step 1: Mounting the encoder** dialog opens.



The **Mounting wizard** dialog

- ▶ Click **Settings**
- > The **Settings** dialog opens.



The **Step 1: Mounting the encoder** dialog

If **Electrical adjustment of reference-mark signal** is activated, the reference-mark signal is adjusted. If there is no reference mark on the encoder, deactivate this function.

- Deselect **Electrical adjustment of reference-mark signal** as needed
- Deselect **Electrical adjustment of limit-position signal** if the limit function of the encoder is not used
- If you want to use the limit function of the encoder, contact the responsible sales employee

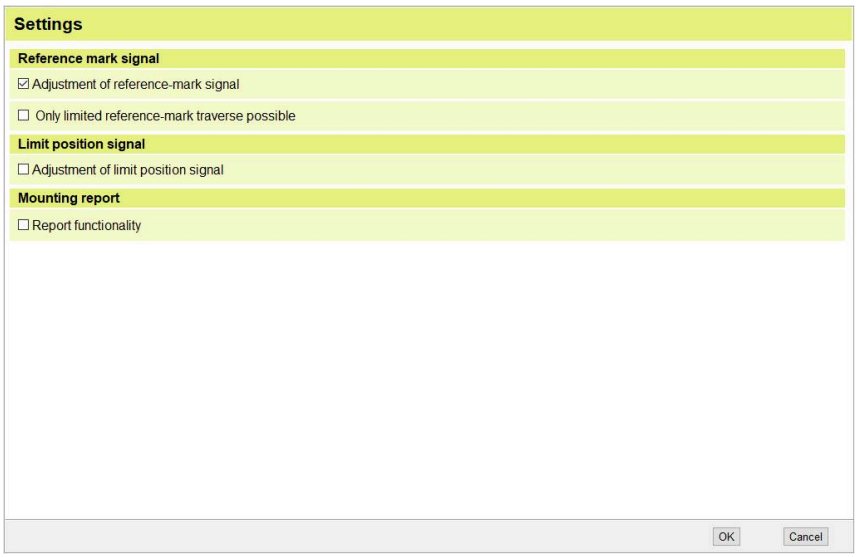
The **Report functionality** generates a report in .json format. This report is stored in the root directory of the project.

- Select the **Report functionality**, if required
- Click **OK**

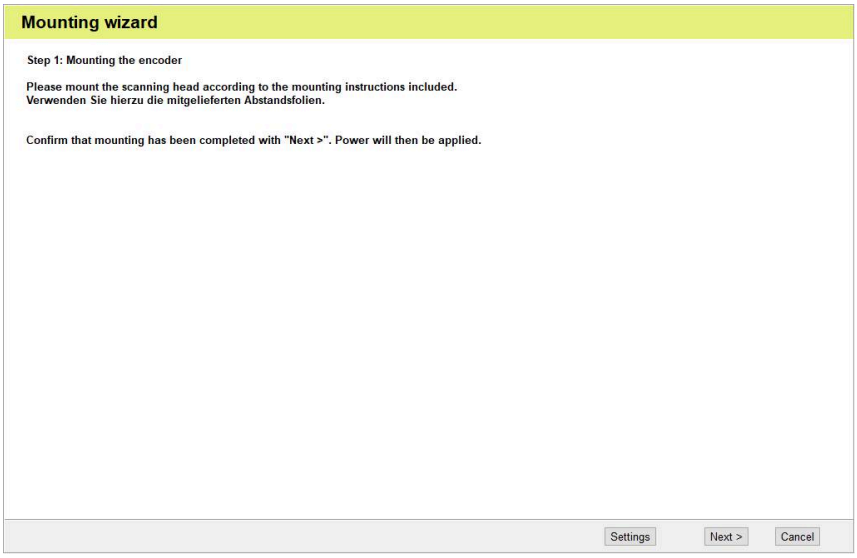
> The **Step 1: Mounting the encoder** dialog opens.

- Click **Next**

> The **Mounting wizard** message appears.

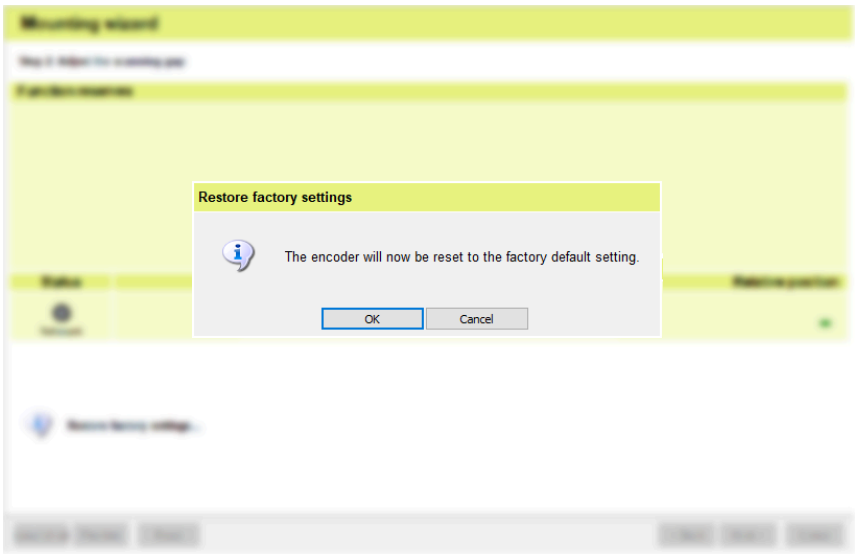


The **Settings** dialog



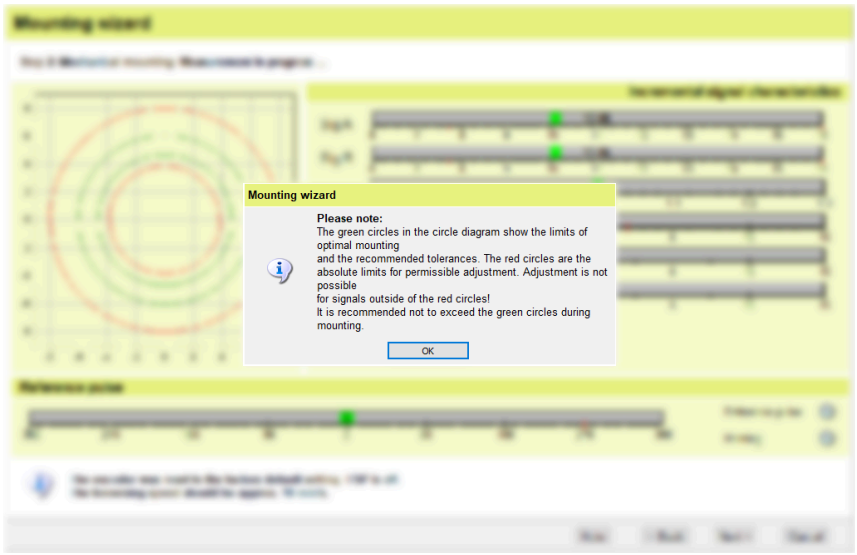
The **Step 1: Mounting the encoder** message

- ▶ Click **OK**
- > The **Step 2: Mechanical mounting** dialog opens.
- > The encoder was reset to the factory default setting.



The **Mounting wizard** message

- ▶ Click **Note** and observe the displayed message
- ▶ Click **OK**
- > The **Step 2: Mechanical mounting** dialog opens.



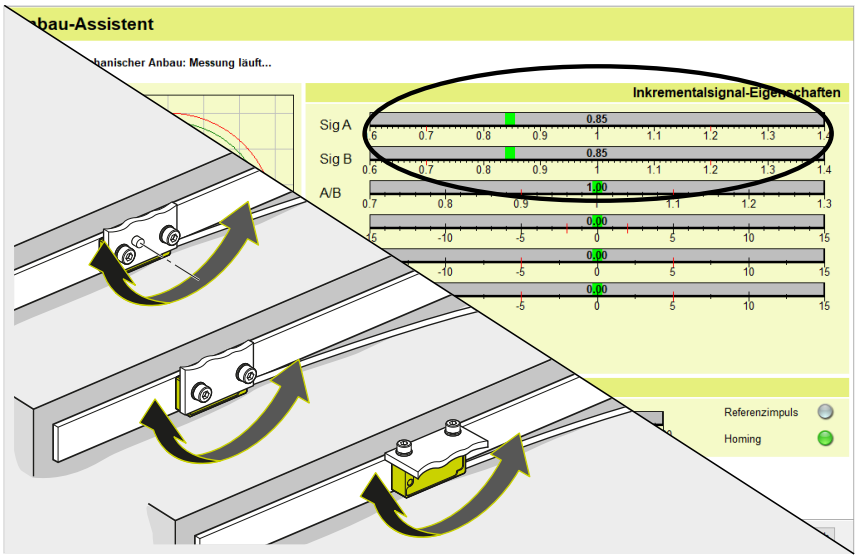
The **Mounting wizard** message

> The green circles show the limits of optimal mounting and of the recommended tolerances.
>
> The red circles are the absolute limits for permissible adjustment.
>
> Adjustment is not possible when the signals are outside of the red circles. If necessary, check the mounting tolerances and clean the scanning head.

Perform Moiré alignment.

- Rotate the scanning head to set the maximum possible signal (Sig A, Sig B)

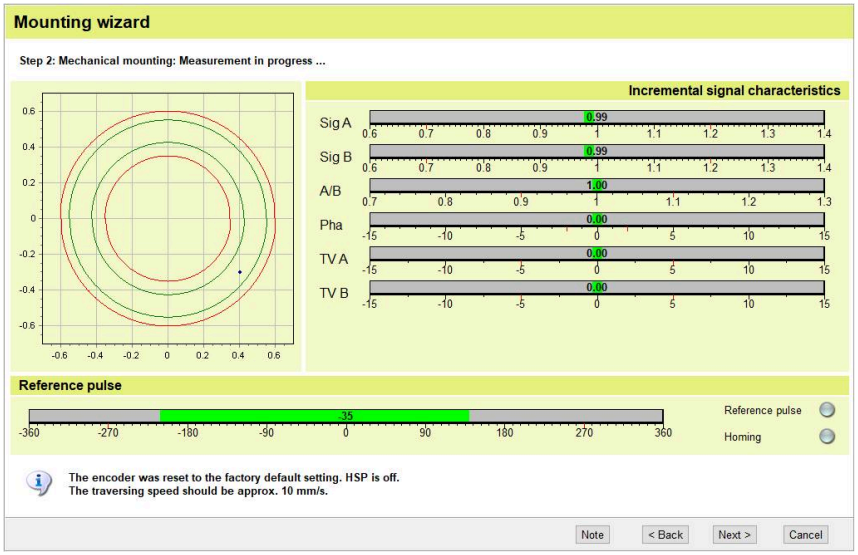
> - Perform the alignment at standstill
> - Do not perform the alignment at the reference mark



Moiré alignment

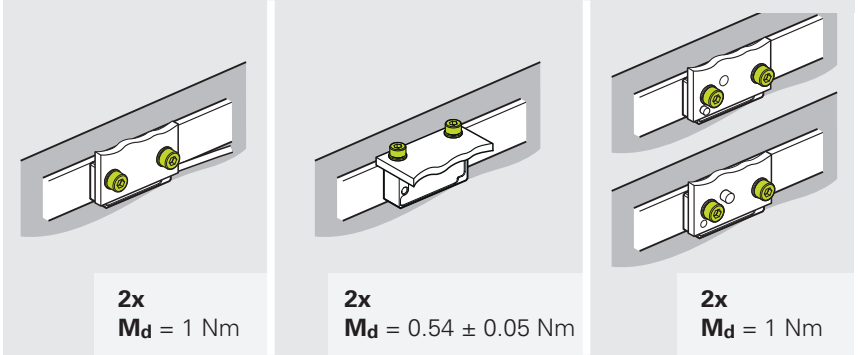
- Traverse the scanning head at 10 mm/s

> The blue dot must be within the green circles.



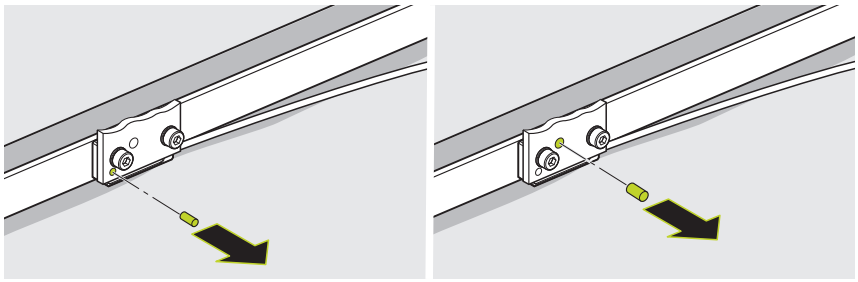
The **Step 2: Mechanical mounting: Measurement in progress ...** dialog

- Tighten the screws with the specified torque



- If a stop pin was used, remove it
- Click **Next**

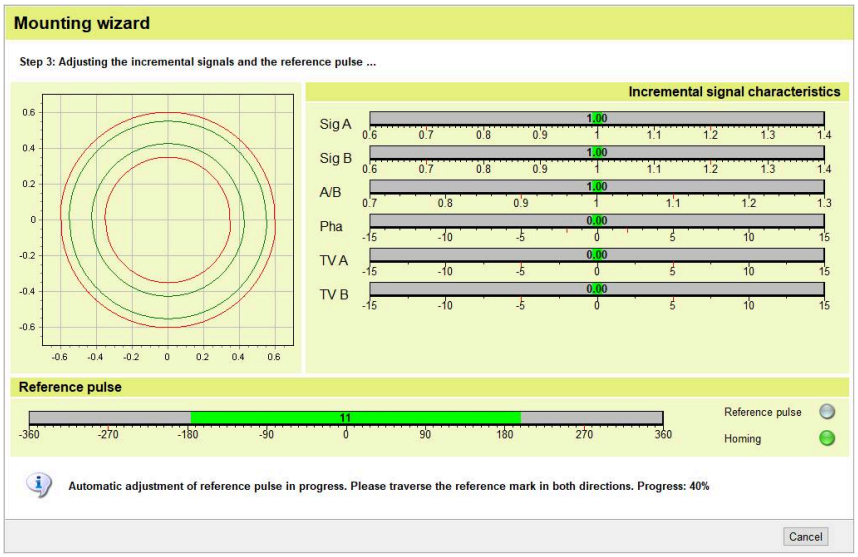
> The **Step 3: Adjusting ...** dialog opens.



- Traverse the reference mark in both directions until "Progress: 100%" has been reached

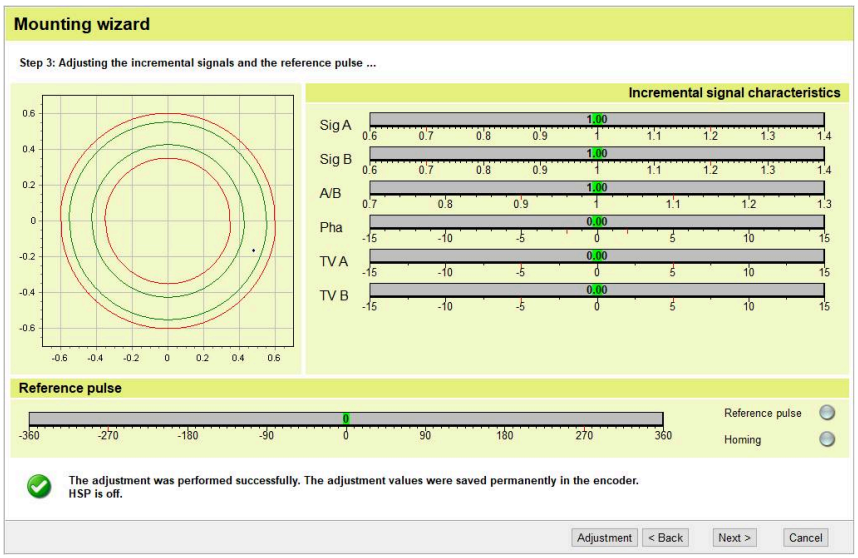
> The reference mark and the incremental track have now been adjusted.

> The adjustment values are saved permanently in the encoder.



- Click **Next**

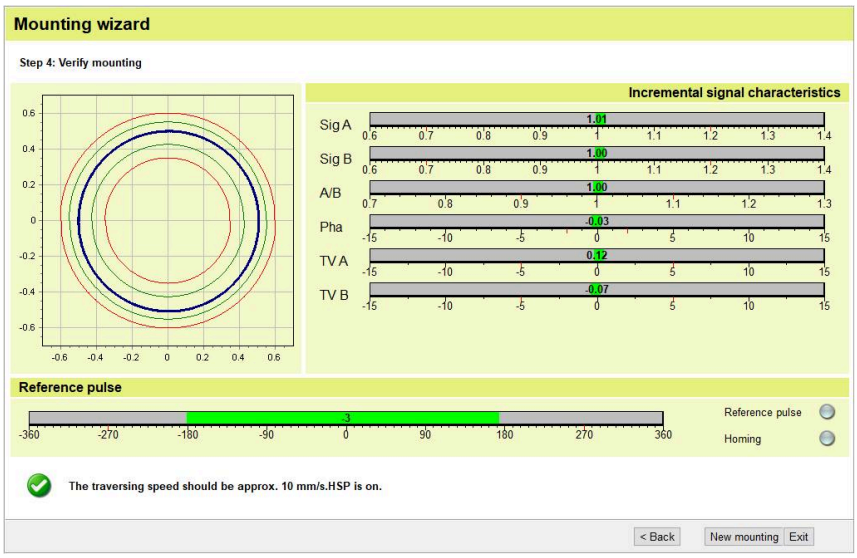
> The **Step 4: Verify mounting** dialog opens.



The **Step 3: Adjusting the incremental signals and the reference pulse ...** dialog

> The mounting is verified.

▶ Click **Exit**



The **Step 4: Verify mounting** dialog

Verifying the mounting

▶ Double-click **Mounting check**

> The **Mounting inspection** function opens and displays a message.

If the connection was set up by connecting the encoder manually:

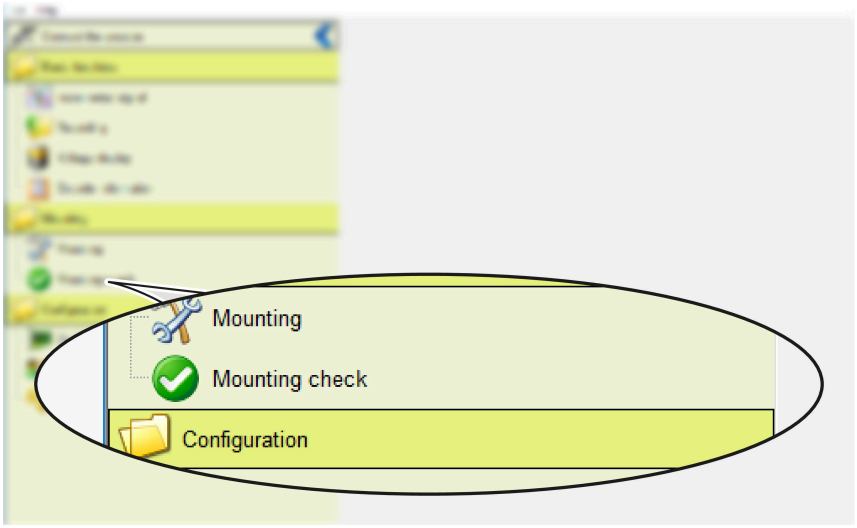
▶ Double-click **Mounting check**

> The **Select encoder model** window opens.

▶ Select the encoder

▶ Click **OK**

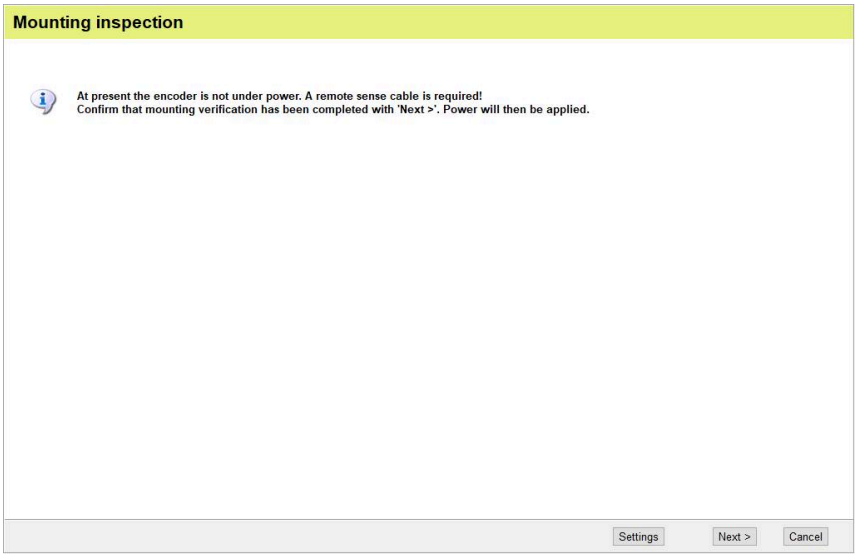
> The **Mounting inspection** function opens and displays a message.



Function menu

▶ Click **Next**

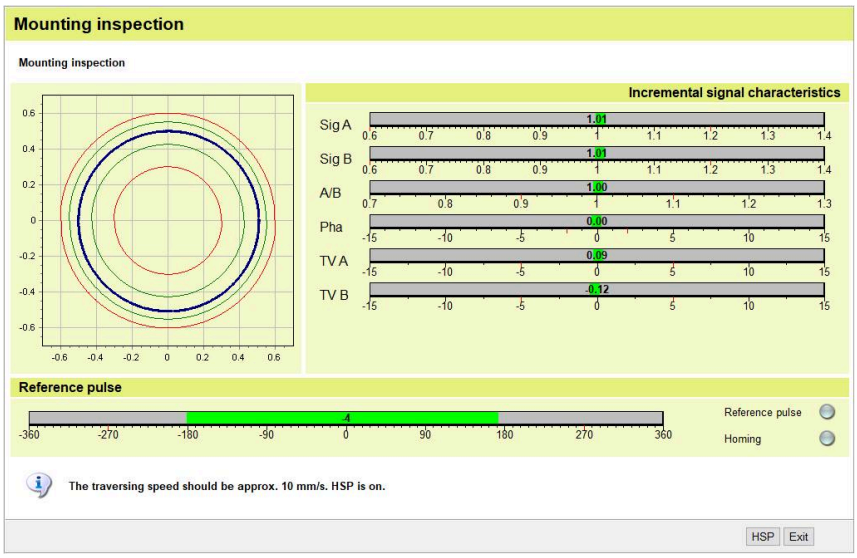
> The **Mounting inspection** function opens and displays a message about the **traversing speed**.



The **Mounting inspection** dialog with a message

- Traverse the scanning head at 10 mm/s
- Check the values
- Click **Exit**

> The **Mounting inspection** function closes.



The **Mounting inspection** dialog with the message about the **traversing speed**

Next step "Final steps", Page 57

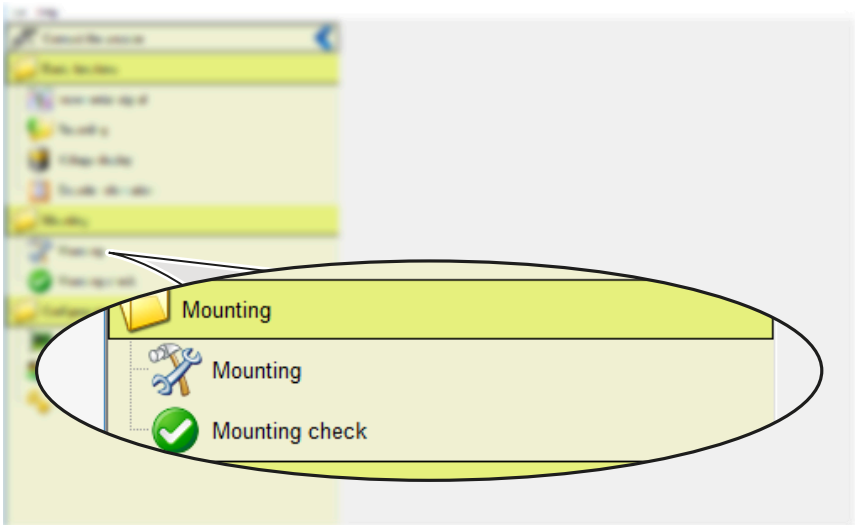
5.4.3 Mounting the LIP 607 scanning head

Using the mounting wizard

- ▶ Double-click **Mounting**
- > The **Mounting wizard** opens.

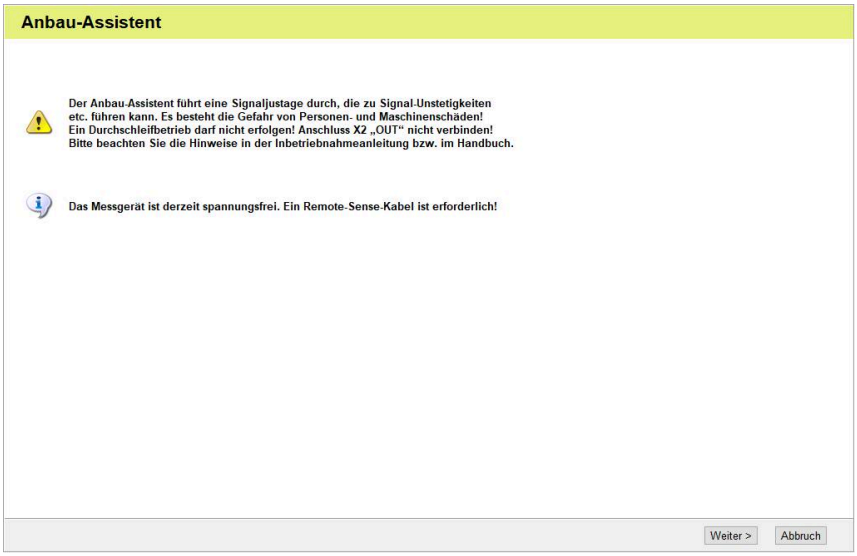
If the connection was set up by connecting the encoder manually:

- ▶ Double-click **Mounting**
- > The **Select encoder model** window opens.
- ▶ Select the encoder
- ▶ Click **OK**
- > The **Mounting wizard** opens.



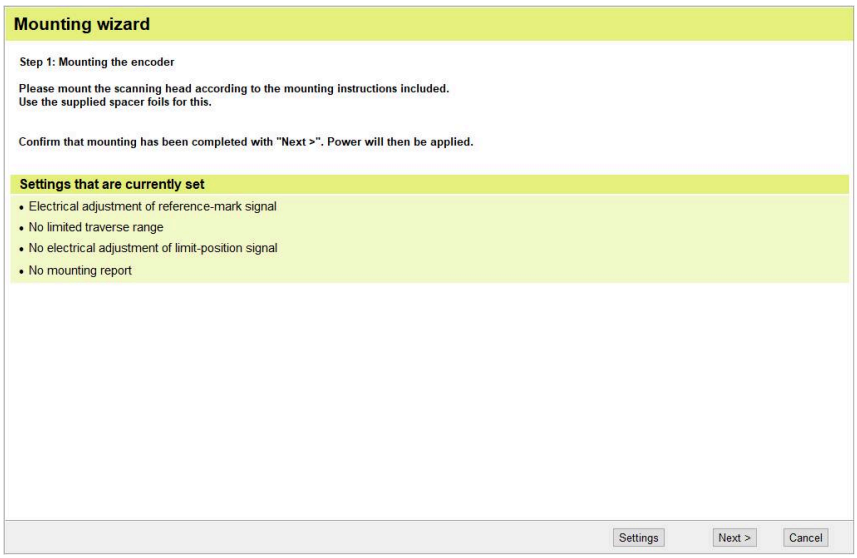
Function menu

- ▶ Observe the messages
- ▶ Click **Next**
- > The **Step 1: Mounting the encoder** dialog opens.



The **Mounting wizard** dialog

- ▶ Click **Settings**
- > The **Settings** dialog opens.



The **Step 1: Mounting the encoder** dialog

If **Electrical adjustment of reference-mark signal** is activated, the reference-mark signal is adjusted. If there is no reference mark on the encoder, deactivate this function.

- Deselect **Electrical adjustment of reference-mark signal** as needed
- Deselect **Electrical adjustment of limit-position signal** if the limit function of the encoder is not used
- If you want to use the limit function of the encoder, contact the responsible sales employee

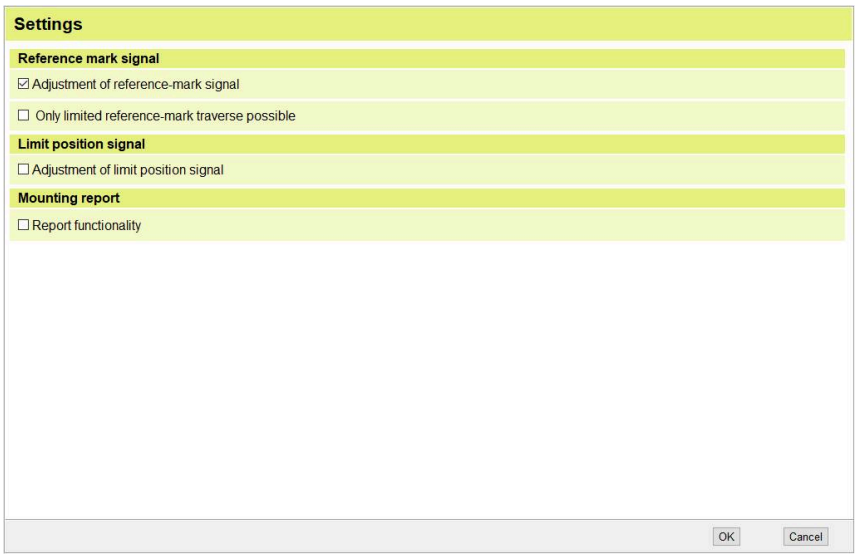
The **Report functionality** generates a report in .json format. This report is stored in the root directory of the project.

- Select the **Report functionality**, if required
- Click **OK**

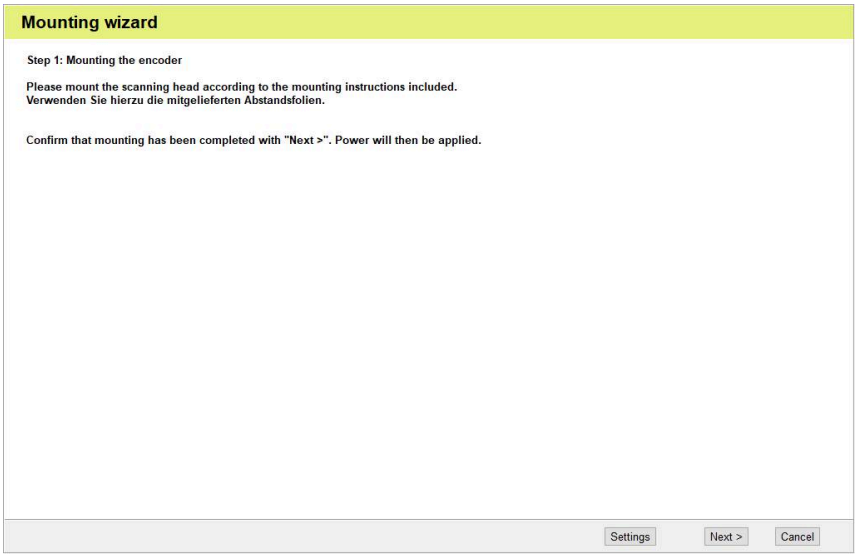
> The **Step 1: Mounting the encoder** dialog opens.

- Click **Next**

> The **Mounting wizard** message appears.

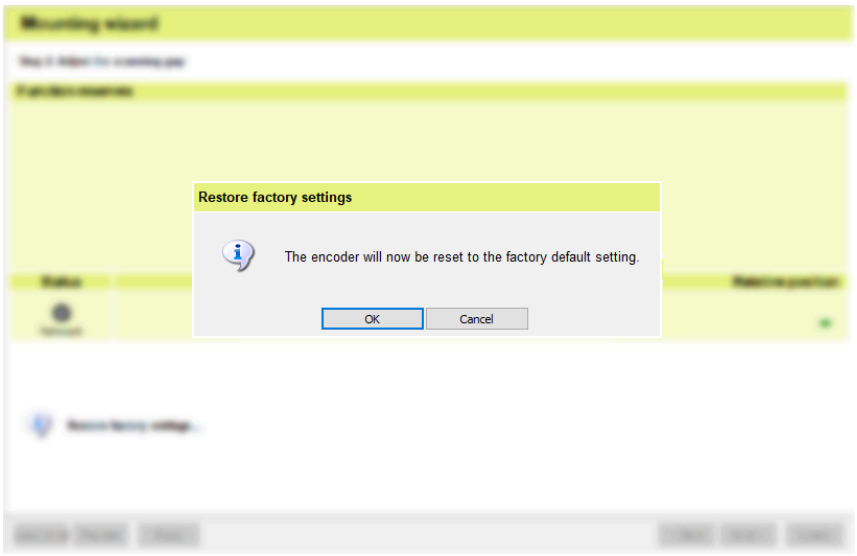


The **Settings** dialog



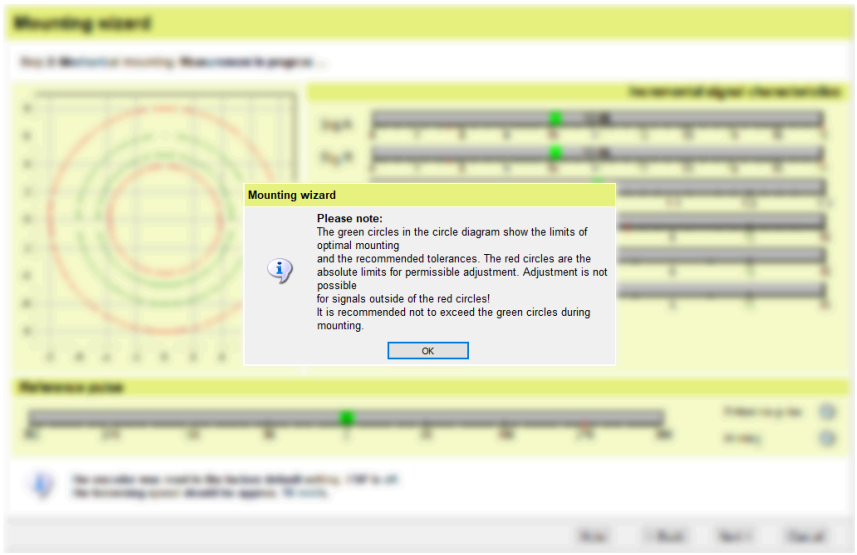
The **Step 1: Mounting the encoder** message

- ▶ Click **OK**
- > The **Step 2: Mechanical mounting** dialog opens.
- > The encoder was reset to the factory default setting.



The **Mounting wizard** message

- ▶ Click **Note** and observe the displayed message
- ▶ Click **OK**
- > The **Step 2: Mechanical mounting** dialog opens.



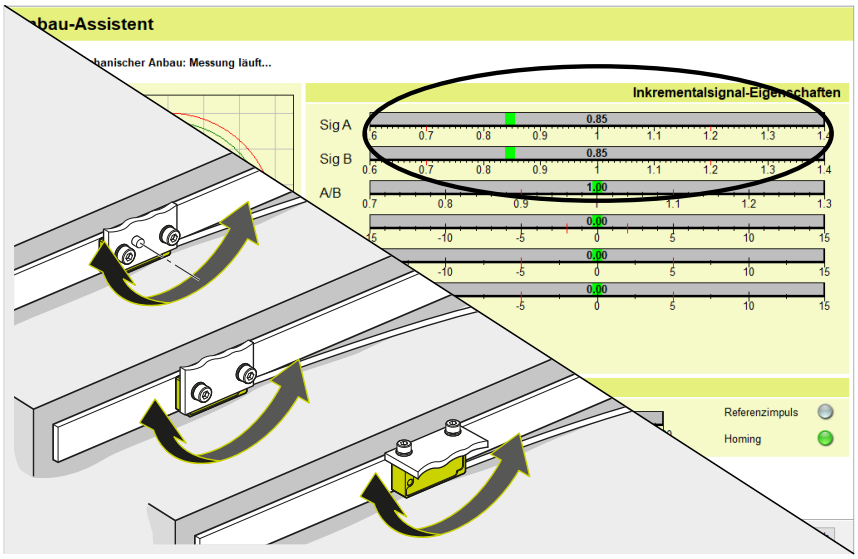
The **Mounting wizard** message

> The green circles show the limits of optimal mounting and of the recommended tolerances.
>
> The red circles are the absolute limits for permissible adjustment.
>
> Adjustment is not possible when the signals are outside of the red circles. If necessary, check the mounting tolerances and clean the scanning head.

Perform Moiré alignment.

- Rotate the scanning head to set the maximum possible signal (Sig A, Sig B)

> - Perform the alignment at standstill
> - Do not perform the alignment at the reference mark

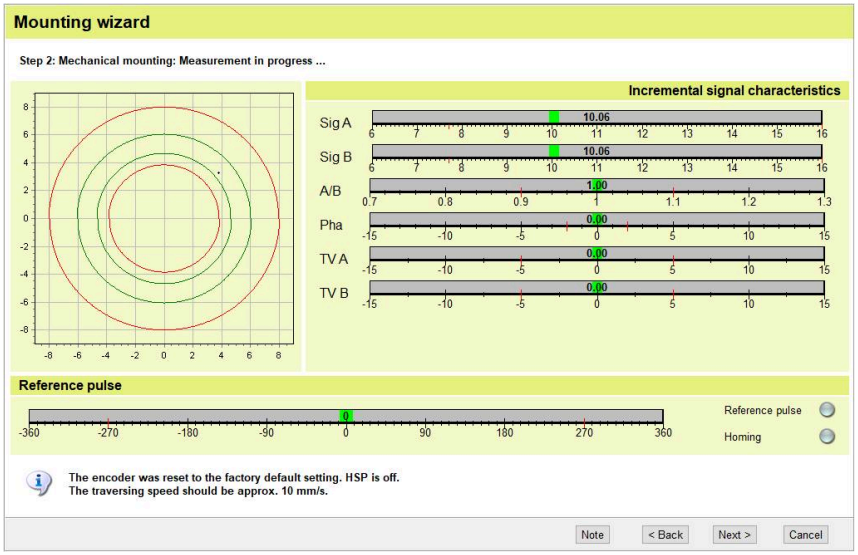


Moiré alignment

- Traverse the scanning head at 10 mm/s

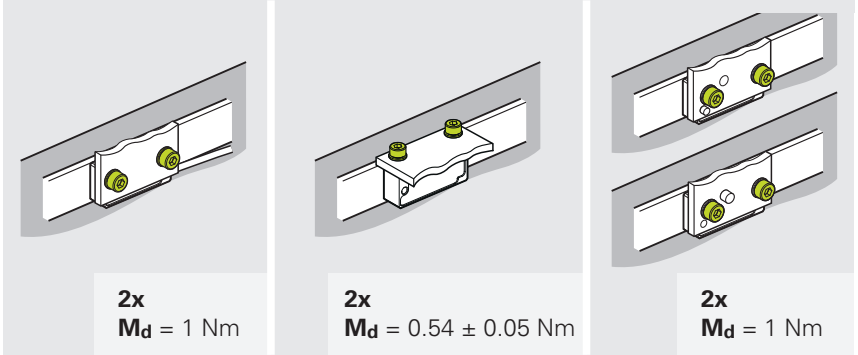
> The blue dot must be within the green circles.

- Click **Next**
- The **Step 3: Adjusting ...** dialog opens.



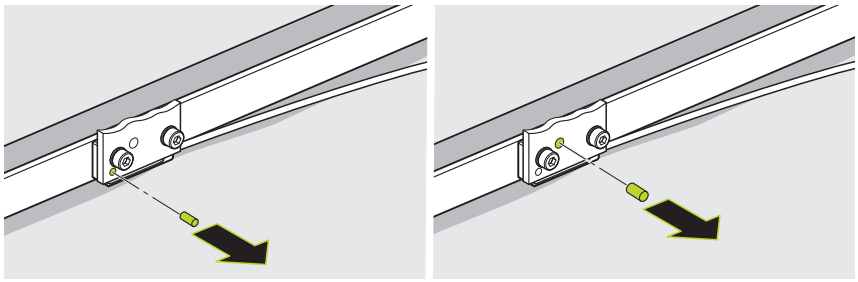
The **Step 2: Mechanical mounting: Measurement in progress ...** dialog

- Tighten the screws with the specified torque



- If a stop pin was used, remove it
- Click **Next**

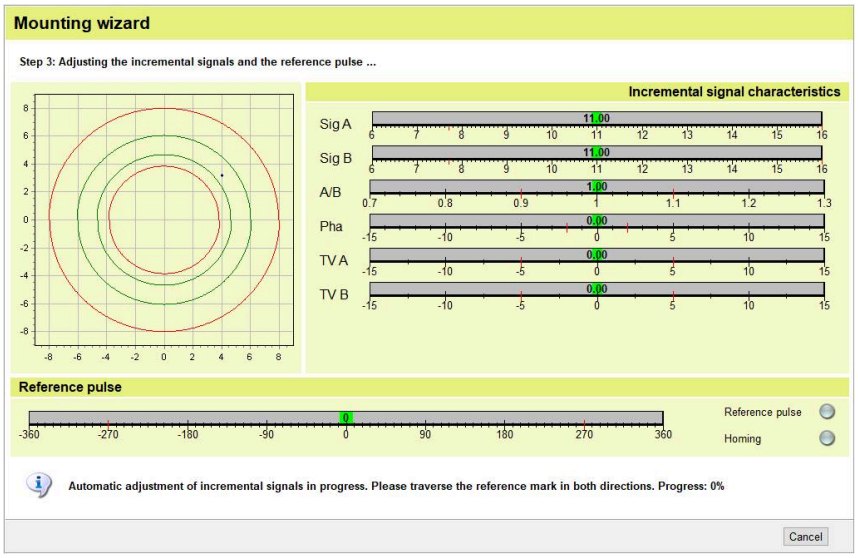
> The **Step 3: Adjusting ...** dialog opens.



- Traverse the reference mark in both directions until "Progress: 100%" has been reached

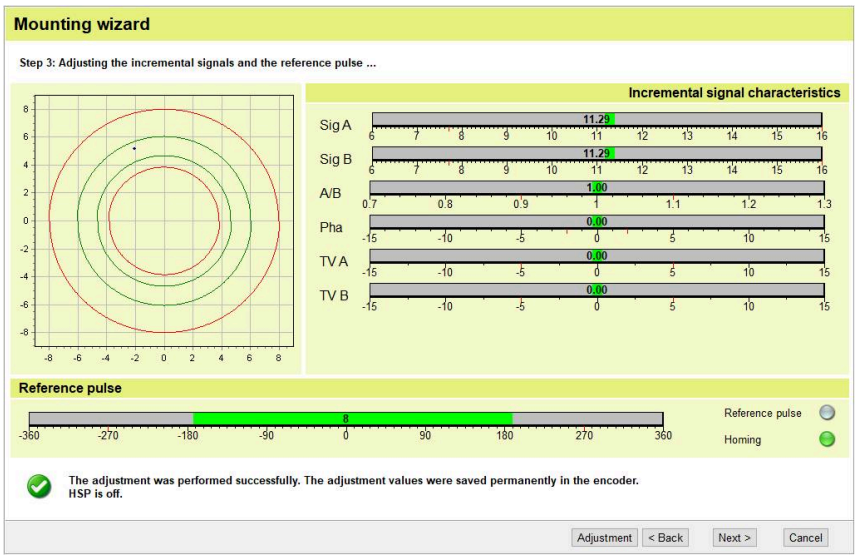
> The reference mark and the incremental track have now been adjusted.

> The adjustment values are saved permanently in the encoder.



- Click **Next**

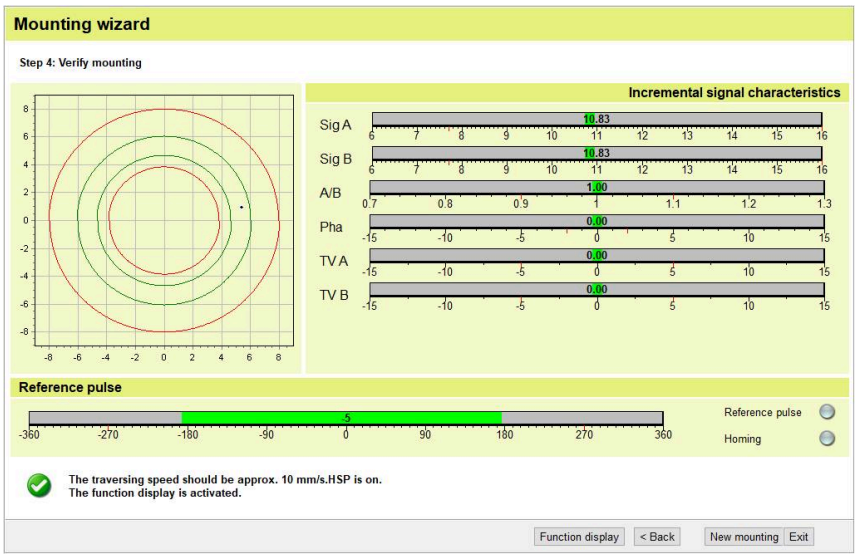
> The **Step 4: Verify mounting** dialog opens.



The **Step 3: Adjusting the incremental signals and the reference pulse ...** dialog

> The mounting is verified.

▶ Click **Exit**



The **Step 4: Verify mounting** dialog

Verifying the mounting

▶ Double-click **Mounting check**

> The **Mounting inspection** function opens and displays a message.

If the connection was set up by connecting the encoder manually:

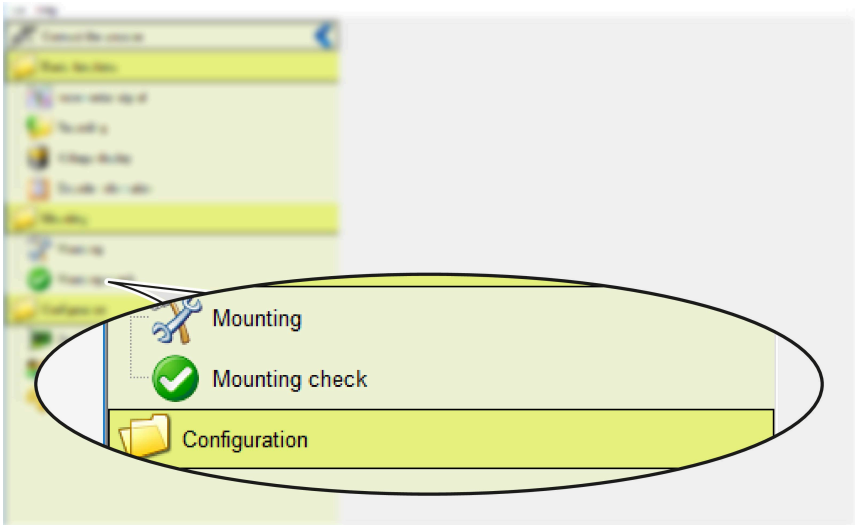
▶ Double-click **Mounting check**

> The **Select encoder model** window opens.

▶ Select the encoder

▶ Click **OK**

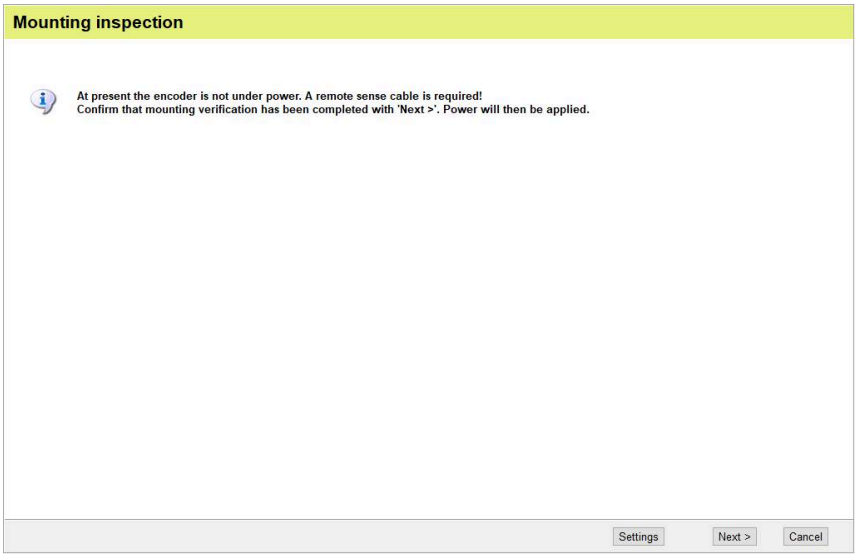
> The **Mounting inspection** function opens and displays a message.



Function menu

▶ Click **Next**

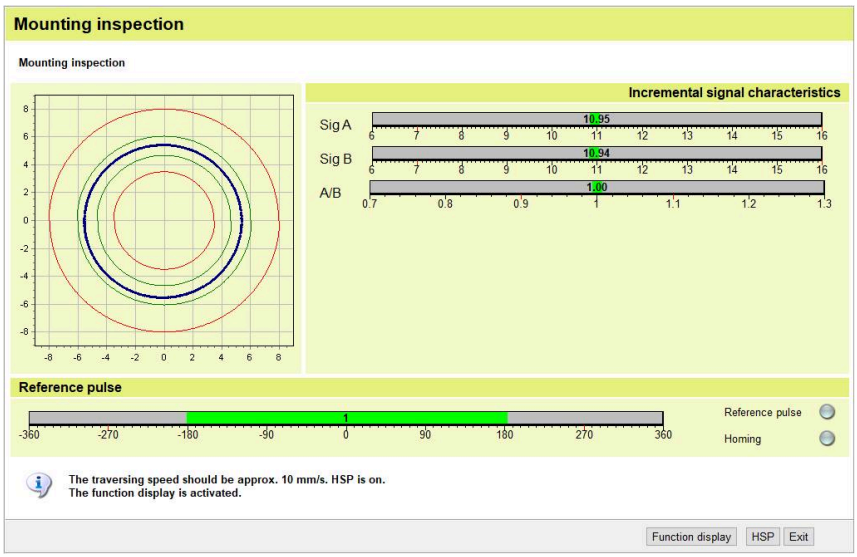
> The **Mounting inspection** function opens and displays a message about the **traversing speed**.



The **Mounting inspection** dialog with a message

- Traverse the scanning head at 10 mm/s
- Check the values
- Click **Exit**

> The **Mounting inspection** function closes.



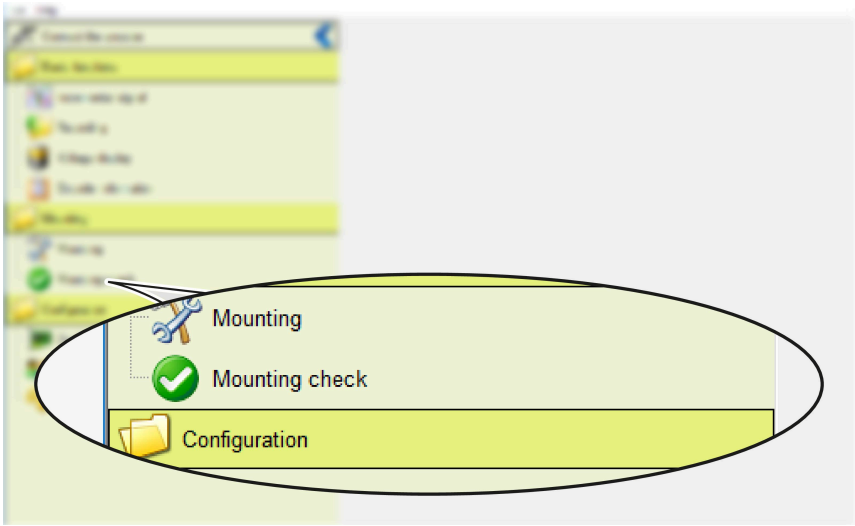
The **Mounting inspection** dialog with the message about the **traversing speed**

Next step "Final steps", Page 57

Activating/deactivating the function display

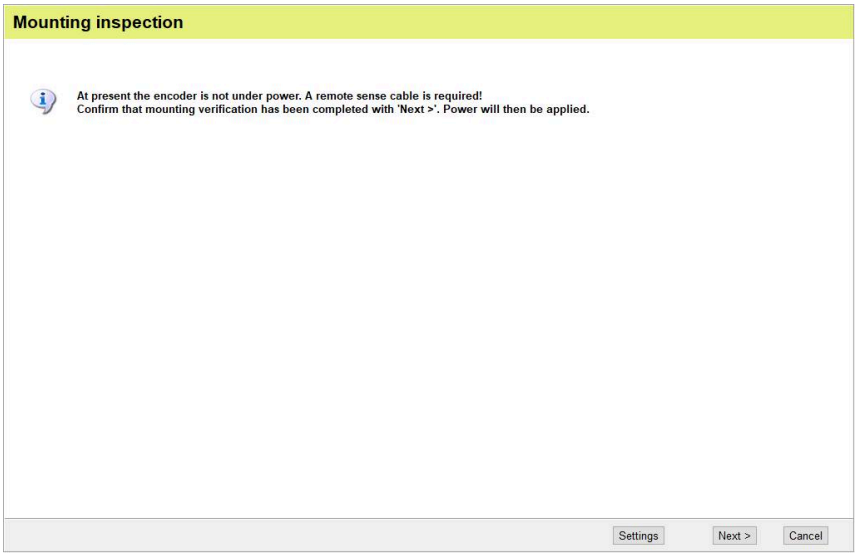
- ▶ Double-click **Mounting check**
- > The **Mounting inspection** function opens and displays a message.

  If the connection was set up by connecting the encoder manually:
- ▶ Double-click **Mounting check**
- > The **Select encoder model** window opens.
- ▶ Select the encoder
- ▶ Click **OK**
- > The **Mounting inspection** function opens and displays a message.



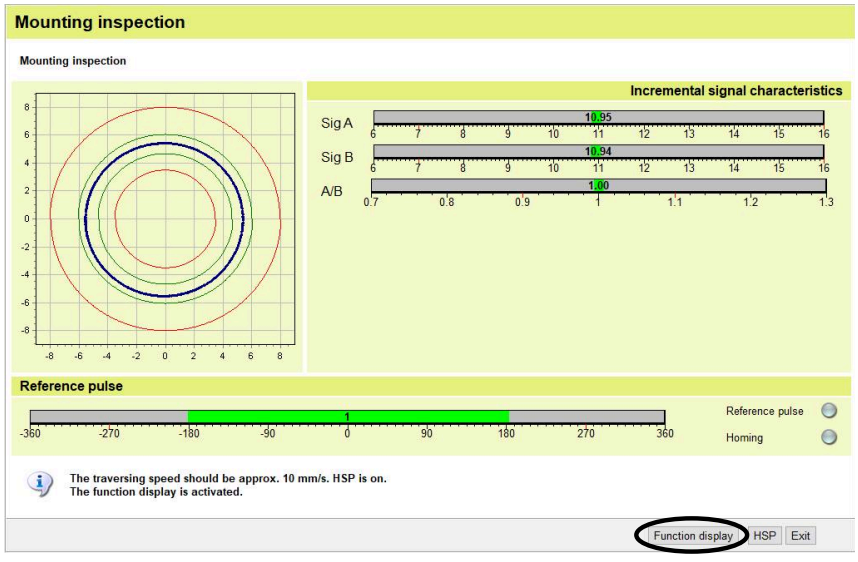
Function menu

- ▶ Click **Next**
- > The **Mounting inspection** function opens and displays a message about the **traversing speed**.



The **Mounting inspection** dialog with a message

- ▶ Click **Function display**
- > The Function display is activated or deactivated.
- ▶ Click **Exit**
- > **Mounting inspection** closes.



The **Mounting inspection** dialog with the **Function display** button

6 Final steps

6.1 Connecting the encoder with the downstream electronics

⚠ WARNING

Danger of electric shock due to plug connections under voltage!

Connecting and disconnecting live cables and plug connections in the equipment can result in death or serious injury.

- Only connect and disconnect cables and plug connections when no current is flowing through them
- Disconnect the downstream electronics from power before connecting the encoder
- For cables without connectors, pay attention to the pin layout

▶ Connect the encoder to the downstream electronics

NOTICE

Property damage resulting from incorrect routing of the connecting cable!

Connecting cables may become damaged as a result of incorrect routing.

- ▶ Observe the maximum permissible bend radii
- ▶ Do not cross connecting cables in drag chains
- ▶ Route connecting cables professionally

For more information on the cable characteristics and cable routing, refer to the **Cables and Connectors** brochure.

- ▶ **www.heidenhain.com/documentation**
- ▶ Enter the document ID **1206103**

For more information on the pin layouts, refer to the **Cables and Connectors** brochure.

- ▶ **www.heidenhain.com/documentation**
- ▶ Enter the document ID **1206103**

For more information on sources of interference, refer to the **Interfaces of HEIDENHAIN Encoders** brochure.

- ▶ **www.heidenhain.com/documentation**
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7 Removal

This chapter describes the disassembly of the product.

7.1 Safety precautions regarding removal

⚠ WARNING

Live plug connections!

If you disengage plug connections while the equipment is under power, this may result in fatal accidents or severe personal injury.

- Do not engage or disengage any connecting elements while the product is under power

⚠ WARNING

Moving machine parts!

Risk of injury due to moving machine parts depending on the installation location and the application

- Observe all of the machine manufacturer's notes on working on the machine, e.g., always disconnect the machine from the power supply

⚠ CAUTION

Fragile carrier material of the scale unit or the scale itself!

Risk of injury from splinters and sharp edges of the carrier material

- Wear protective gloves and safety goggles
- Do not bend or deform the scale unit or scale excessively

7.2 Removing the scanning head

- Remove the scanning head in the reversed sequence of mounting. **Further information:** "Mounting the scanning head", Page 26

7.3 Removing the scale

Further information can be found in the **Disassembly Instructions**.

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