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Scanner Installation Manual

BK Mikro9

Tool and Object Monitoring System
Protection against Follow-up Problems
in the Process of Production

Version 1.00

Jul. 25, 2018

General Notice

Safety guidelines

This document contains notices which you should observe to ensure your own personal safety, as well as to protect the product and connected equipment. These notices are highlighted in the manual by a warning triangle and are marked as follows according to the level of danger.



DANGER

Symbol with signal word: **Danger**

Immediate danger to life and limb of personnel and others.

Non-compliance will cause death or serious (crippling) injury.



WARNING

Symbol with signal word: **Warning**

Hazardous situation to life and limb of personnel and others.

Non-compliance may cause death or serious injury.



CAUTION

Symbol with signal word: **Caution**

Potentially hazardous situation

Non-compliance may cause slight injury;
possible damage to property.

Notes on correct handling



Non-compliance may cause damage to the product and/or to parts/items in the vicinity.

Important information about the product, the handling of the product, or the part of the documentation onto which is supposed to be made especially attentive.



Environmental protection

Non-compliance may have an impact on the environment.

Intended use

Warning:



WARNING

The products of Schubert System Elektronik GmbH may only be used for the applications described in the technical documents, and only in connection with devices or components from other manufacturers which have been approved or recommended by us.

Start-up must not take place until it is established that the machine which is to accommodate this component conforms to the guideline 2006/42/EC.

This product can only function correctly and safely if it is transported, stored, set up, and installed correctly, and operated and maintained as recommended.

Qualification of personnel

Only qualified personnel may carry out the following activities on the products: installation, commissioning, operation, maintenance.

Qualified persons in accordance with the safety guidelines are defined as persons who are authorized to commission, to ground, and to tag circuits, equipment, and systems in accordance with established safety practices and standards.

Disclaimer of liability

We have checked the contents of this document for agreement with the hardware and software described. Since deviations cannot be precluded entirely, we cannot guarantee full agreement. However, the data in this manual are reviewed regularly and any necessary corrections included in subsequent editions. Suggestions for improvement are welcomed.

Areas of use

Products of Schubert System Elektronik GmbH meet the applicable, harmonized, European standards for the respective area of applications.

Warranty

For the devices of Schubert System Elektronik GmbH, the agreements determined in the General Terms and Conditions (AGB) are valid.

Fitting conditions

The fitting conditions and safety notes in the submitted document must be adhered to when commissioning and operating the products.

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All hardware and software names are trade names and/or trademarks of the respective manufacturer.

Copyright

Every user documentation is intended for the operator and the operator's personnel only. The transmission and reproduction of this document and the exploitation and communication of its contents are not allowed without express authority.

Offenders will be liable for damages.

ESD (Electrostatic discharge)



All modules and components are electrostatically sensitive.

The ESD notes are absolutely to be observed.

The adjacent symbol indicates the use of electrostatically sensitive modules.

Avoid touching electrostatically sensitive components (e.g. connector pins).

Discharge your body electrostatically before touching the device (e.g. by contacting a grounded metallic object).

EU Declaration of Conformity



The product of Schubert System Elektronik GmbH complies with EMC directive 2104/30/EU and RoHS directive 2011/65/EU.

The assessment of the requirements is based on the standards listed therein.

The EU declaration of conformity and the related documentation will be maintained in accordance with the directives at:

Schubert System Elektronik GmbH
take-off Gewerbepark 36
78579 Neuhausen ob Eck
Germany

Restriction of Hazardous Substances (RoHS) Compliance

RoHS-compliant

All products of the BK Mikro9 series are Pb-free / RoHS compliant referred to EU directive 2011/65/EU.

Standard(s) for Safety



The BK Mikro9 series is UL listed.

UL 508 - Standard for Industrial Control Equipment C22.2. No. 142-M1987
- Standard for Process Control

Note

This BK Mikro9 Scanner Installation Manual describes the scanner installation of the following system:

■ BK Mikro9

Please read the Scanner Installation Manual before the first use, and keep it carefully for the later use.

It is written for customers with prior knowledge in PC technology and automation.

Purpose



This Scanner Installation Manual is part of the Technical Documentation of the Tool and Object Monitoring System BK Mikro9. It provides service personnel and system advisors with the information required to install, commission, operate and maintain the system.

BK Mikro9

Scanner Installation Manual

Material no. 68 36 336

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Contents

1	General.....	3
2	Scanner Description.....	4
3	Orientation of the scanner	5
4	Assembly instruction for scanning wand and wand holder.....	6
4.1	Air gap between scanner and wand holder	6
4.2	Tightening torque.....	7
4.2.1	TK96A / TK96RL	7
4.2.2	TK94A / TK94RL / TK7A / TK7RL	7
4.2.3	TK91A / TK91UNI.....	8
4.3	Checking balance weight (if present).....	9
5	Assembly instruction for control cable	10
6	External and internal back stop	11
6.1	Usage of the internal stop.....	11
6.2	Usage of an external stop.....	12
7	Mounting bracket.....	13
7.1	Mounting bracket Ø 32 mm	13
7.2	Mounting bracket Ø 20 mm	13
7.3	Mounting bracket Ø 12 mm & rod system.....	14
7.4	Mounting bracket with mounting aid (optionally available)	15
8	Additional assembly information	16
8.1	Scanner axis.....	16
8.2	Compressed air & coolant	17
9	For direct contact.....	18

Table of Figures

Fig. 2-1:	Scanner with scanning wand for radial tool detection	4
Fig. 2-2:	Scanner with scanning wand for axial tool detection.....	4
Fig. 3-1:	Alignment scanning wand for radial tool detection	5
Fig. 3-2:	Alignment scanning wand for axial tool detection.....	5
Fig. 4-1:	Air gab wand holder and scanner.....	6
Fig. 4-2:	Tightening torques for TK96A & TK96RL	7
Fig. 4-3:	Tightening torques for TK94A, TK94RL, TK7A & TK7RL.....	7
Fig. 4-4:	Tightening torques for TK91A & TK91UNI.....	8
Fig. 4-5:	Balance weight & scanning wand.....	9
Fig. 5-1:	Tightening torque for the control cable	10
Fig. 6-1:	External stop position / Correct alignment	12
Fig. 6-2:	External stop position / Wrong stop position	12
Fig. 7-1:	Tightening torque / Mounting bracket Ø 32 mm	13
Fig. 7-2:	Tightening torque / Mounting bracket Ø 20 mm	13
Fig. 7-3:	Tightening torque / Mounting bracket Ø 12 mm	14
Fig. 7-4:	Tightening torque / Rod system	14
Fig. 7-5:	Mounting bracket with mounting aid.....	15
Fig. 7-6:	Mounting bracket with mounting aid and scanner	15
Fig. 8-1:	Assembly information (force to the scanner axis)	16
Fig. 8-2:	Assembly information (compressed air and coolant jet)	17

1 General

This manual contains all required information for the installation of a BK Mikro9 scanner.

Only under considering of the following points, a correct function of the BK Mikro system can be guaranteed.



Notes on correct handling

Non-observance of these points can cause measurement errors or damage the system.

2 Scanner Description

There are basically two types of scanners:

- for radial tool detection (scanning wand including protective cap)
- for axial tool detection (scanning wand including plate)

A scanner consists of the following components:

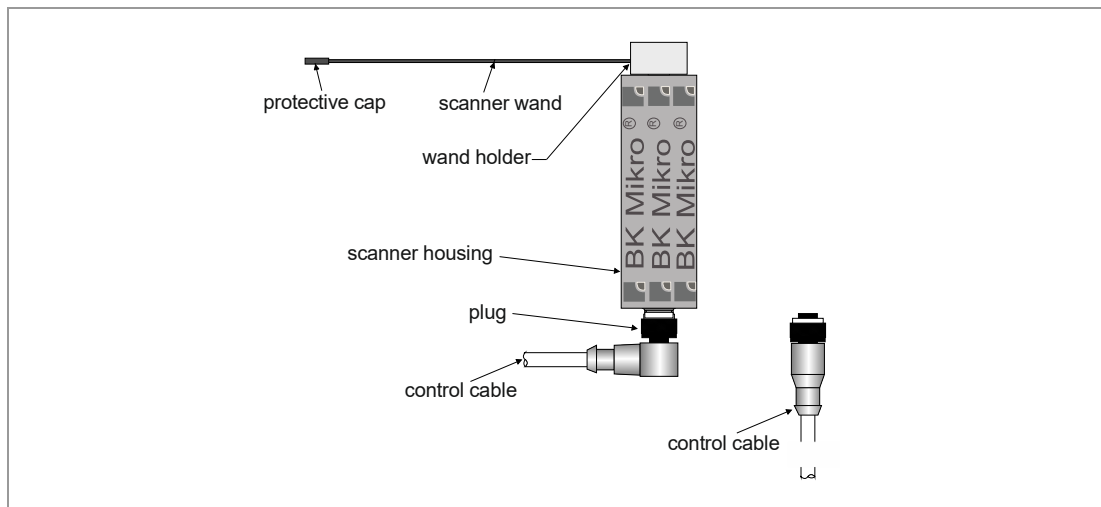


Fig. 2-1: Scanner with scanning wand for radial tool detection

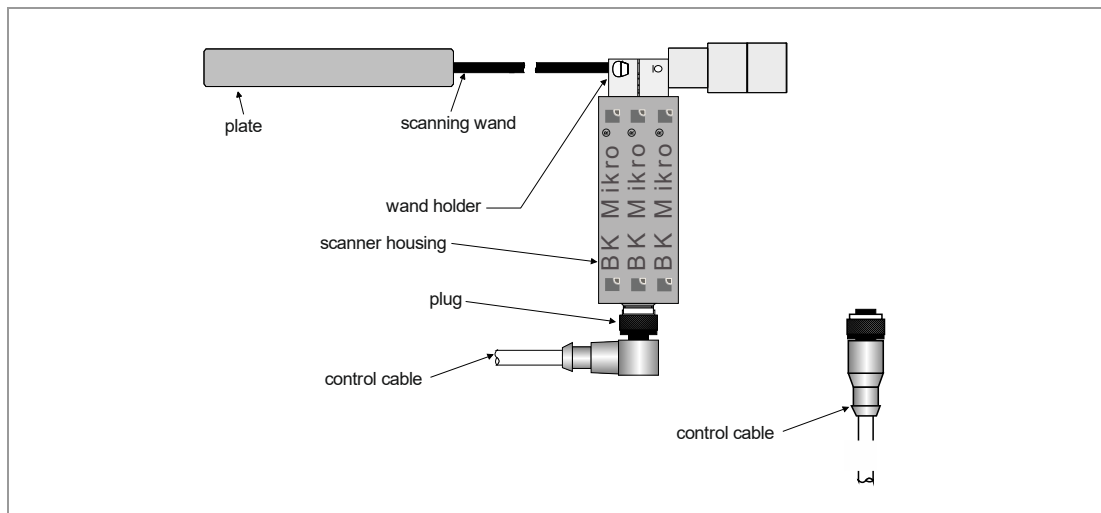


Fig. 2-2: Scanner with scanning wand for axial tool detection

The scanner has to be fixed mechanically with the machine. Perfectly suitable are the BK Mikro mounting brackets.

Before the scanner is fixed in the mounting bracket, the scanning wand has to be mounted to the scanner and placed to hit the tool.



Note:

A not correct fixed scanner can cause measurement errors.

3 Orientation of the scanner

To avoid incorrect measurements it is important to adjust the scanner, so that the scanning wand hits the tool in the correct position.

A radial scanning wand should hit the tool very close to the top but otherwise not slip over the tool tip.

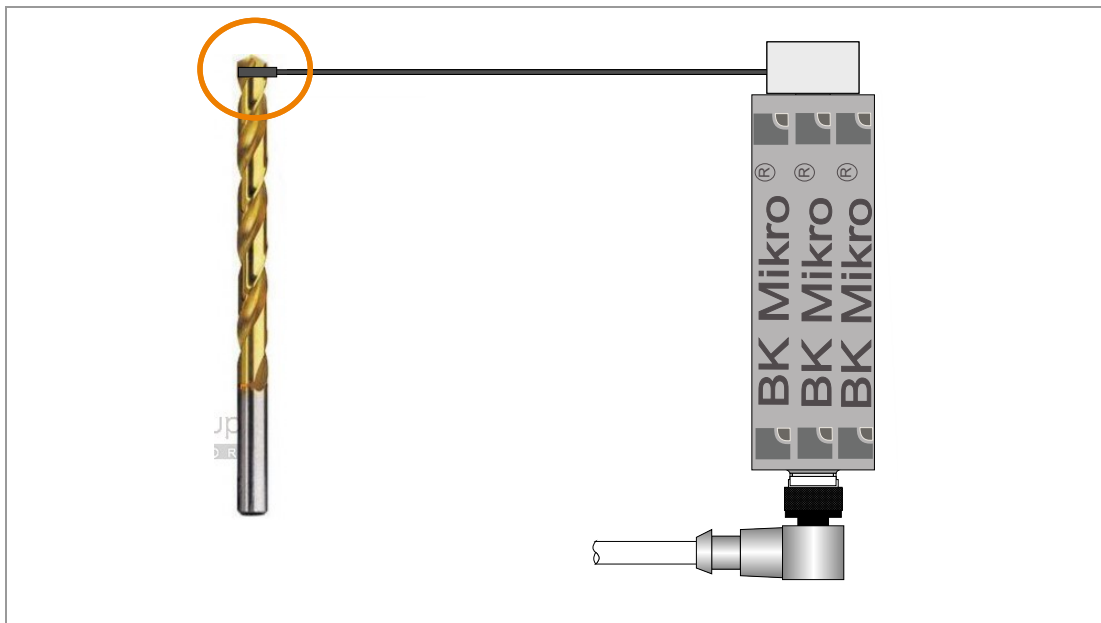


Fig. 3-1: Alignment scanning wand for radial tool detection

An axial scanning wand should hit the tool in the middle of the plate.

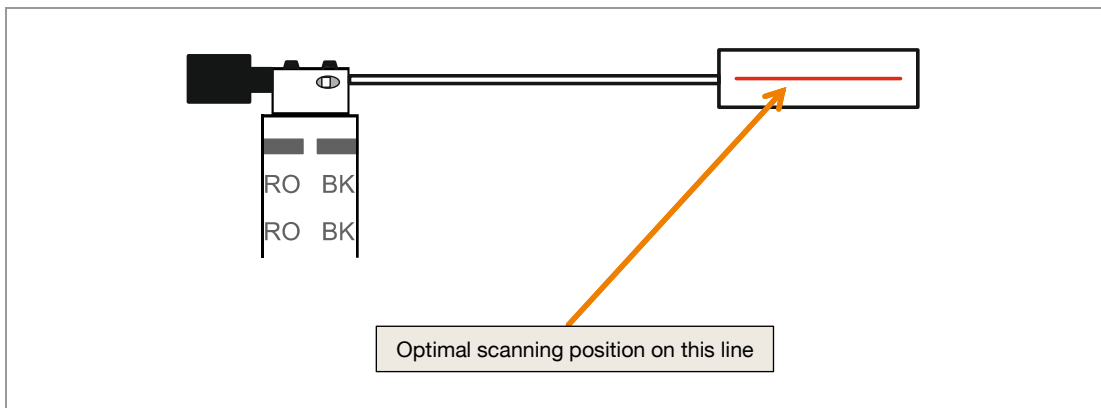


Fig. 3-2: Alignment scanning wand for axial tool detection

4 Assembly instruction for scanning wand and wand holder

4.1 Air gab between scanner and wand holder

The air gab between the scanner and the wand holder has to be checked and adjusted if necessary.

The air gab has to be adjusted to **0.25 – 0.5 mm**.

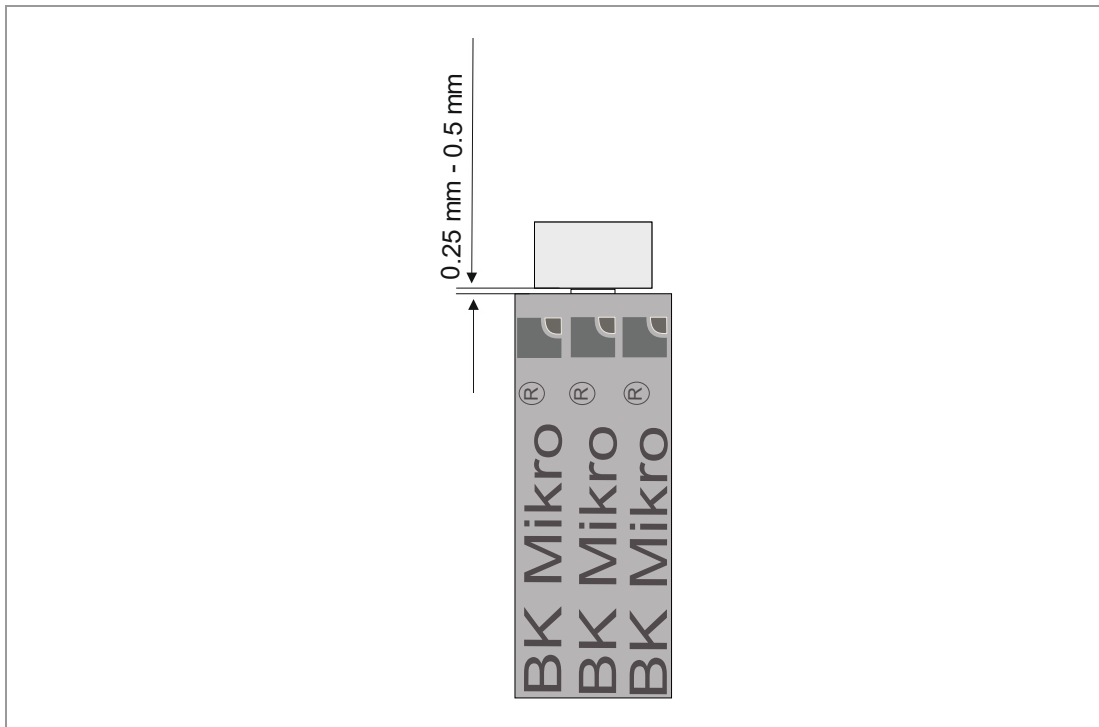


Fig. 4-1: Air gab wand holder and scanner



Note:

An incorrect air gab can lead to measurements errors or clamp the rotation of the scanning wand completely.

4.2 Tightening torque

All screws of the wand holder and wand should be tightened with the recommended torques, see drawings of the different scanners.

4.2.1 TK96A / TK96RL

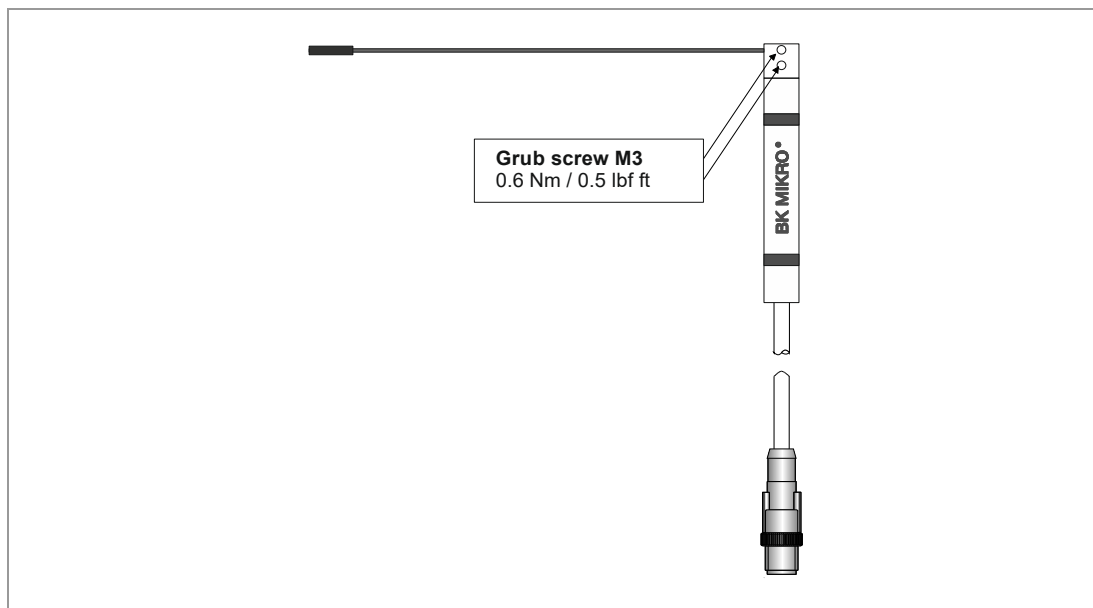


Fig. 4-2: Tightening torques for TK96A & TK96RL

4.2.2 TK94A / TK94RL / TK7A / TK7RL

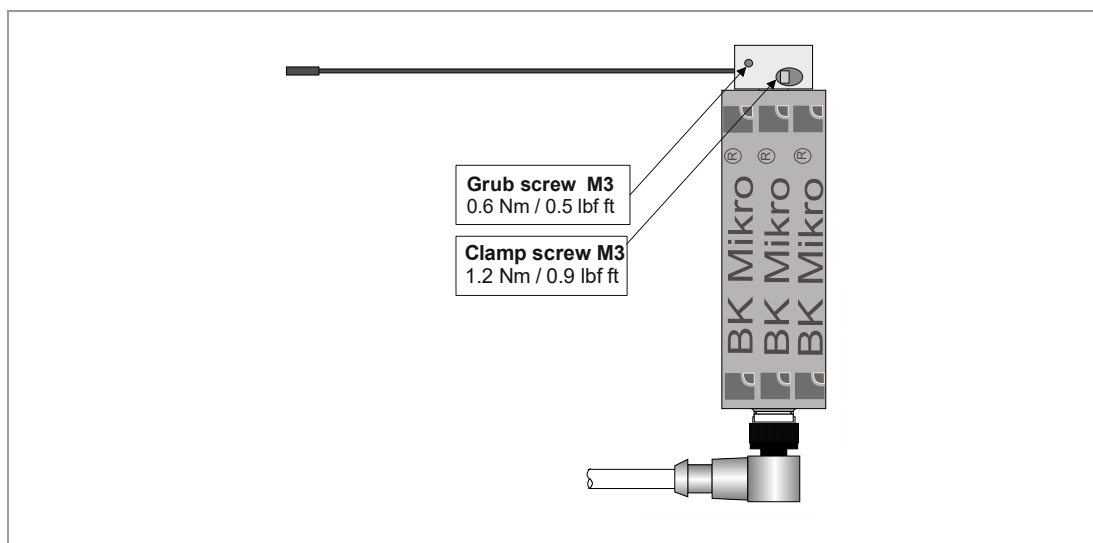


Fig. 4-3: Tightening torques for TK94A, TK94RL, TK7A & TK7RL

4.2.3 TK91A / TK91UNI

The scanners TK91A and TK91UNI can be used with two different wand holders (with or without anti-twist protection). Both methods are shown in the drawings simultaneously.

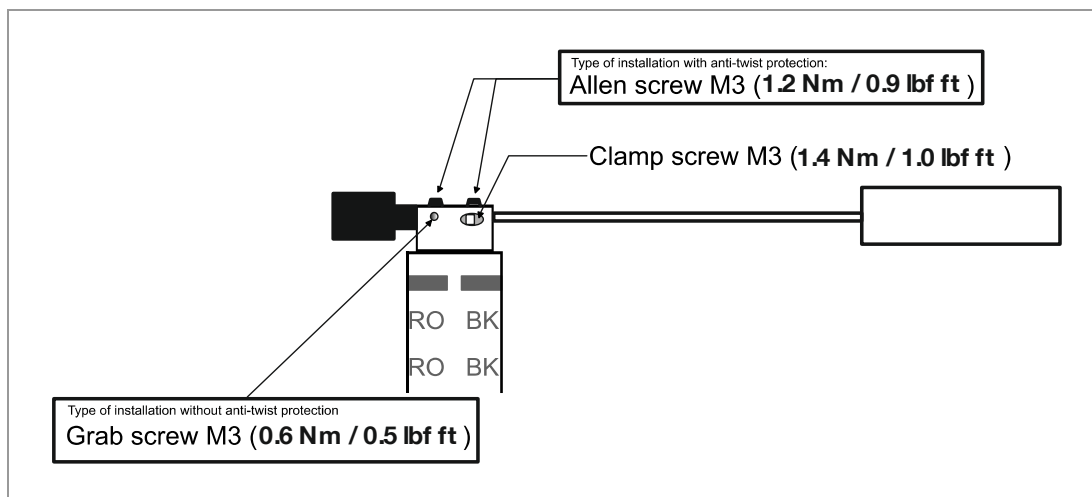


Fig. 4-4: Tightening torques for TK91A & TK91UNI



Note:

The usage of other tightening values may cause measurement errors or damage the system.

4.3 Checking balance weight (if present)

Balance weights are used with scanning wands for the scanners TK91A & TK91UNI. Balance weights are unusual for all other scanners.

The scanning wand is not allowed to move in one direction by itself (the control cable should be disconnected for this).

The scanning wand and the balance weight should be in balance. *

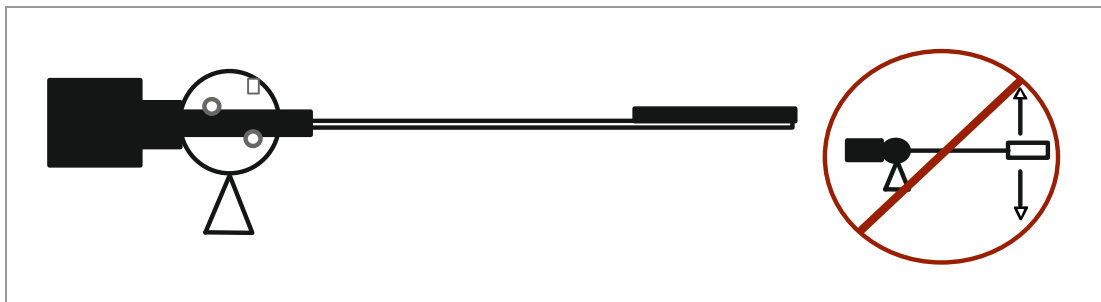


Fig. 4-5: Balance weight & scanning wand

* Balance weight sets are available for older wands. The correct balance of the wand can be achieved by individual arrangement of the balance weight parts.



Note:

Incorrect balanced scanning wands can cause measurement errors or block the rotation of the scanner.

5 Assembly instruction for control cable

The control cable has to be fixed with the knurled nut to the plug on the scanner and on the control unit. Sporadic measurement errors can be caused by a loose cable connection.

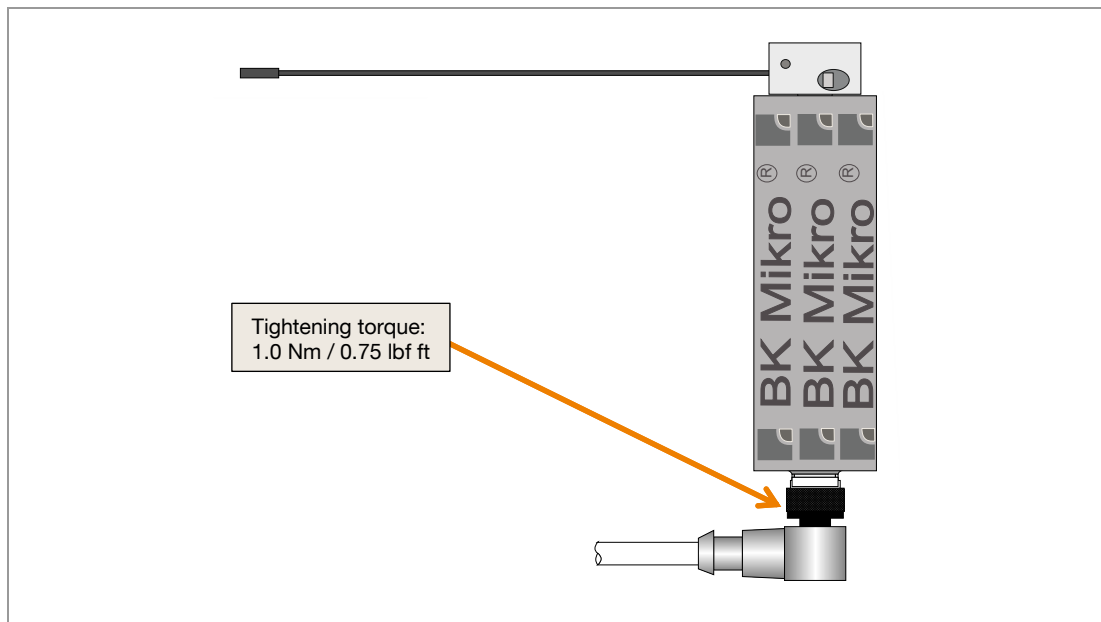


Fig. 5-1: Tightening torque for the control cable



Note:

The usage of other tightening torques can cause measurement errors or damage the system.



Note:

The control cable includes a seal which prevents coolant from getting into the plug contacts.

Insufficient tightening torque of the knurled nut may cause short circuit due to coolant in the connector.

6 External and internal back stop

When referencing the scanner, the wand moves in the opposite direction to the set rotation direction until the system encounters a resistance (back stop).

The zero position (Home Position) will be set there.

This object may be an external stop such as e.g. a machine wall, or an internal stop of the system.

6.1 Usage of the internal stop

The internal stop consists of two screws running against each other. One screw is located in the back of the wand holder and the other is attached to the scanner.

The internal stop is located at the position where both screws hit each other.

During installation the scanner has to be placed in the desired stop position.

6.2 Usage of an external stop

When using the external stop it is important that soiling (for example chippings) is not able to accumulate at the stop position.

The stop position is preferably to be positioned in the area of the plate or the protective cap.

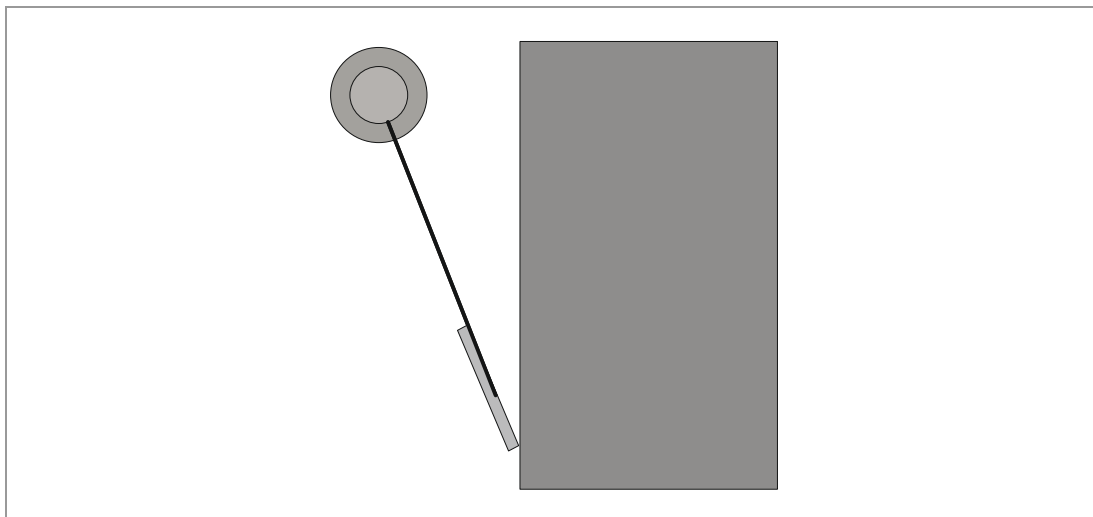


Fig. 6-1: External stop position / Correct alignment

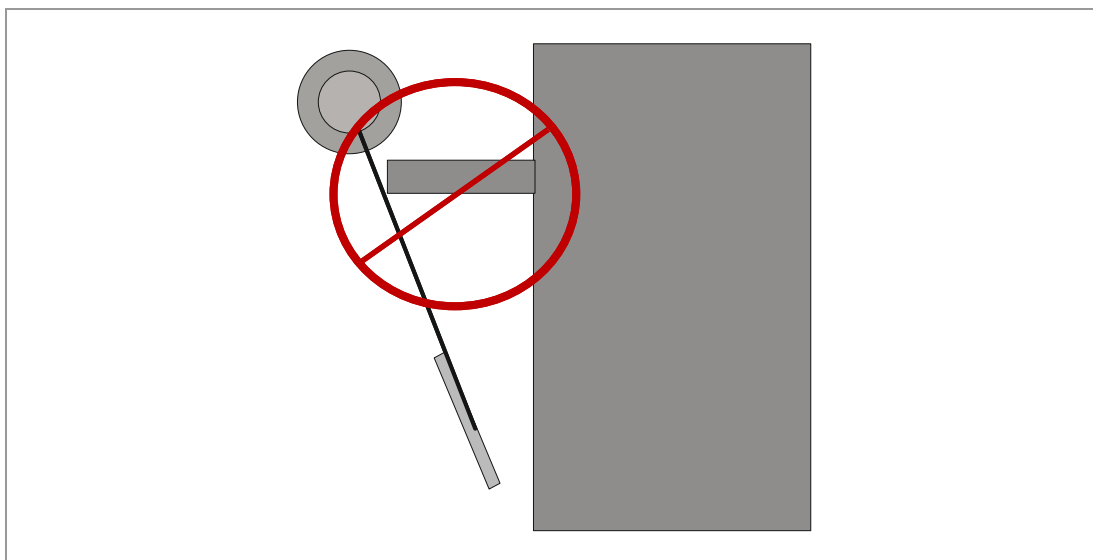


Fig. 6-2: External stop position / Wrong stop position



Note:

A wrong stop position can cause measurement errors and has influence to the accuracy.

7 Mounting bracket

BK Mikro mounting brackets are perfectly suitable for fixing a scanner in a machine.
The screws have to be tightened with the following torque values.

7.1 Mounting bracket Ø 32 mm

The screws of the mounting brackets for scanners with a diameter of Ø 32 mm has to be tightened with a torque of 2.5 Nm.

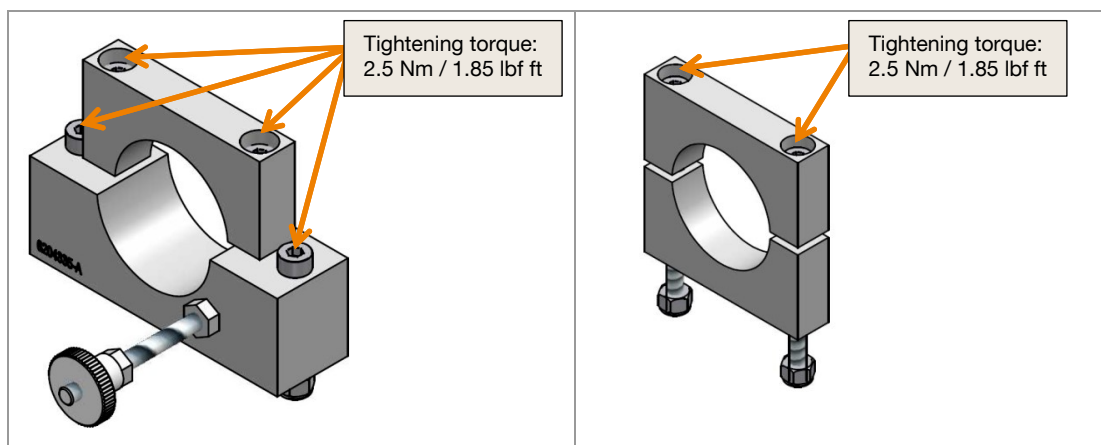


Fig. 7-1: Tightening torque / Mounting bracket Ø 32 mm

7.2 Mounting bracket Ø 20 mm

The screws of the mounting brackets for scanners with a diameter of Ø 20 mm has to be tightened with a torque of 1.5 Nm.

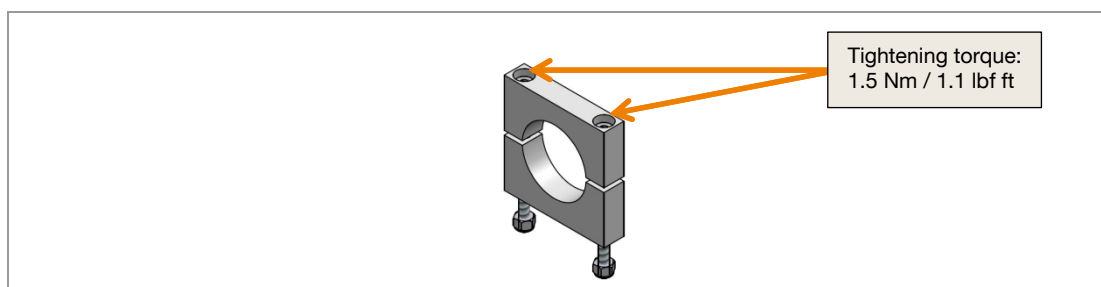


Fig. 7-2: Tightening torque / Mounting bracket Ø 20 mm

7.3 Mounting bracket Ø 12 mm & rod system

The screws of the mounting brackets for scanners with a diameter of Ø 12 mm have to be tightened with a torque of 2 Nm.

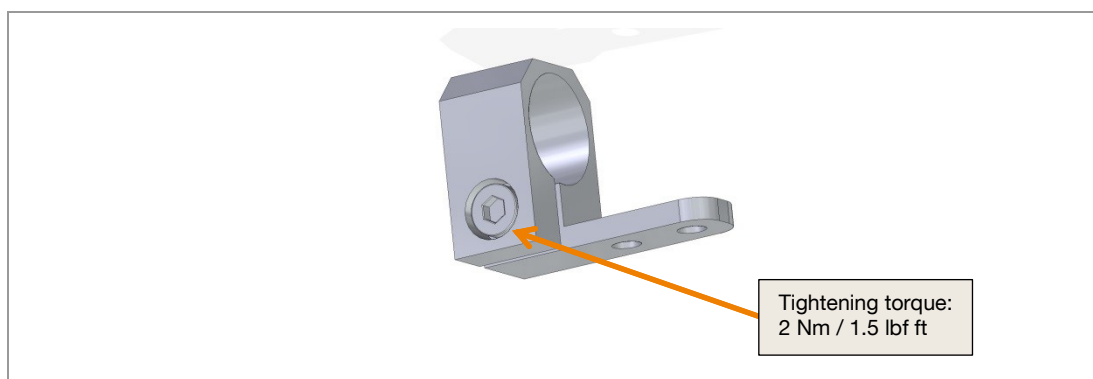


Fig. 7-3: Tightening torque / Mounting bracket Ø 12 mm

A rod system for the Ø 12 mm mounting bracket is available. The screws of this rod system have to be tightened with a torque of 2 Nm.

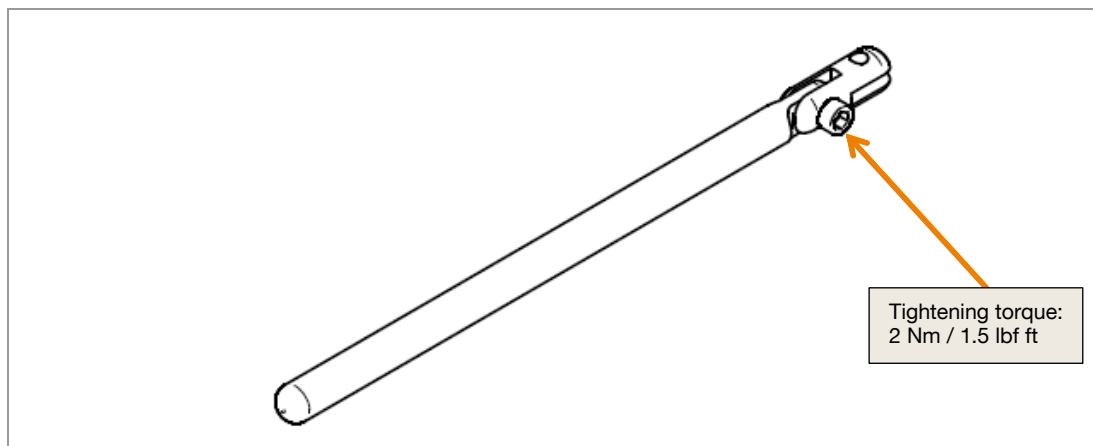


Fig. 7-4: Tightening torque / Rod system

7.4 Mounting bracket with mounting aid (optionally available)

Mounting brackets with a mounting aid are available to facilitate the maintenance.

These mounting brackets contain a threaded rod with a knurled nut for easy positioning of the scanner during installation.

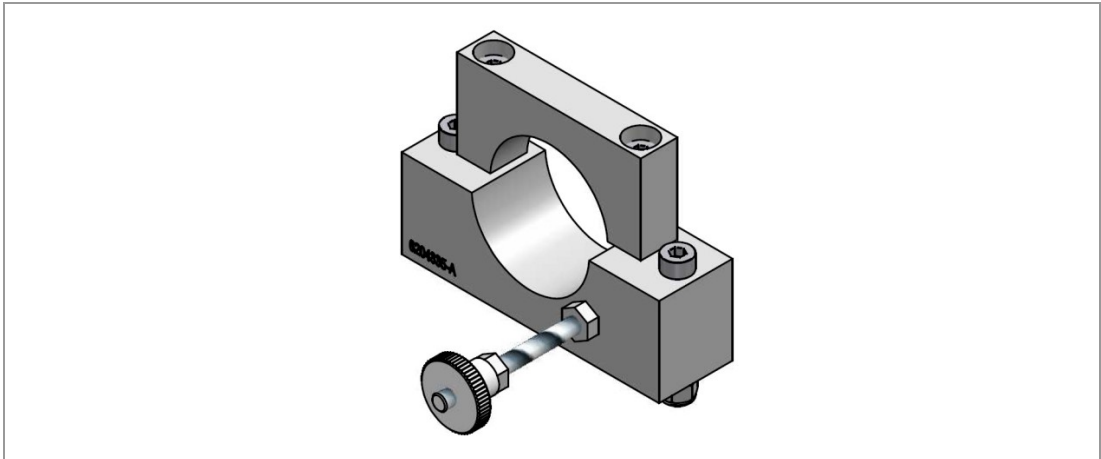


Fig. 7-5: Mounting bracket with mounting aid

In order to use the assembly aid, the scanner has to be fixed once during the first installation in the machine (see chapter "Orientation of the scanner").

When the scanner is fixed the knurled nut can be positioned close to the scanner. The knurled nut and the threaded rod have to be fixed in position with the lock nuts.

In maintenance for example when the scanner is removed and installed again, the position of the scanner is defined through the rod and the knurled nut.

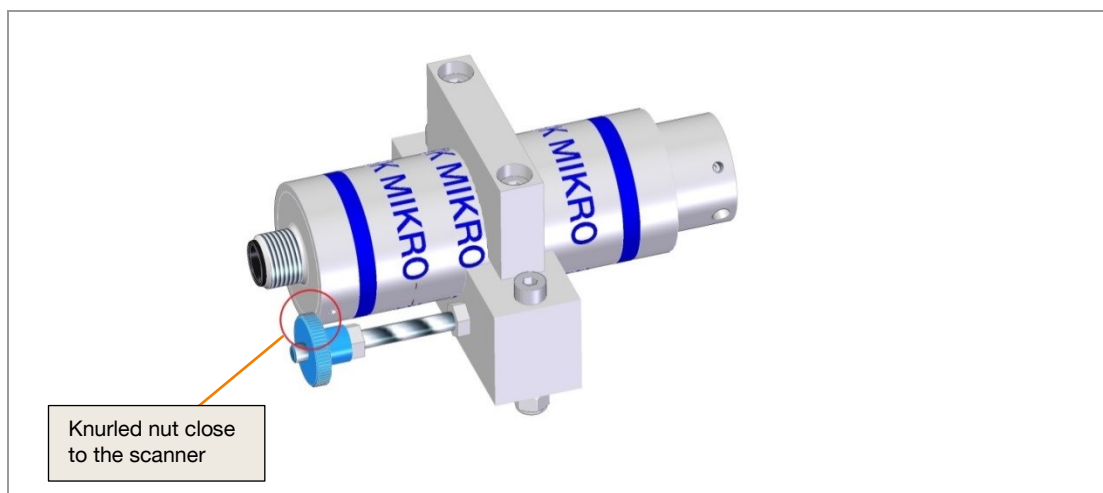


Fig. 7-6: Mounting bracket with mounting aid and scanner

8 Additional assembly information

8.1 Scanner axis

The BK Mikro scanners are precise measuring systems with an accuracy up to 0.05° .

Avoid during the installation high forces on the scanner axis and the wand holder or the scanning wand.

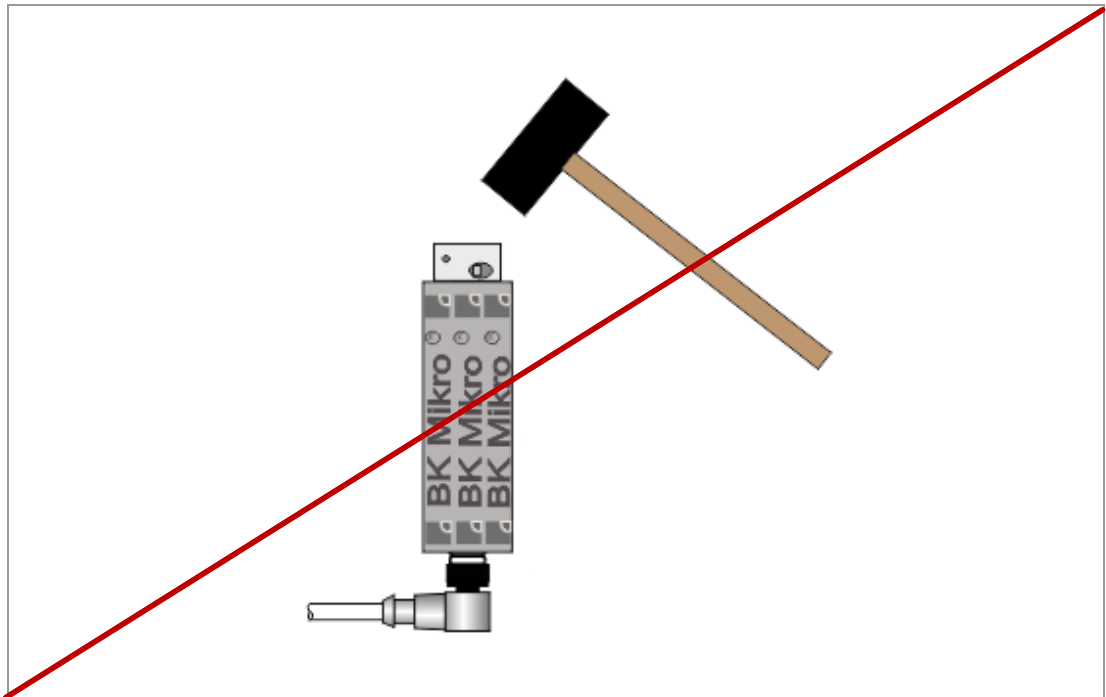


Fig. 8-1: Assembly information (force to the scanner axis)



Note:

High force to scanner axis can cause measurement errors and damage the scanner.

8.2 Compressed air & coolant

Compressed air or coolant jet must not be routed directly to the scanning wand, especially to the plate (if present).

Wrong adjusted compressed air or coolant jets can cause measurement errors or block the rotation completely.

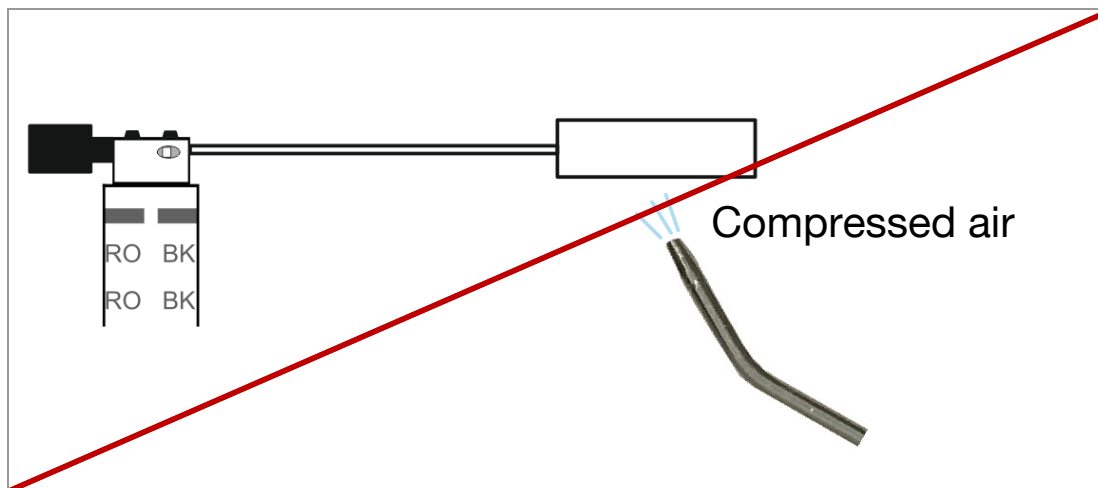


Fig. 8-2: Assembly information (compressed air and coolant jet)



Note:

Compressed air or coolant jets which are directly routed to the scanning wand can cause measurement errors and block the rotation of the scanner.

9 For direct contact

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