

## SCHNEEBERGER Handling and Installation Guidelines

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Crossroller Linear Bearings

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Slides and Linear Tables

### SCHNEEBERGER Handling and Installation Guidelines for R, RN and RNG linear bearings

Linear bearings are high-precision components. Hereafter are recommendations which must be followed in order to ensure satisfying running behavior.

#### 1 Transport Handling and Storage



HANDLE WITH CARE

The linear bearings must always be transported in their original packaging which protect them from damage, dust and corrosion (VCI). It is also vital that they are being stored at room temperature and in a dry environment. Improper handling of the guideways may lead to preliminary damage and thus to premature failure. Therefore, once unpacked the linear guideways should always be touched by wearing gloves and handled with care. Unpacking, inspection and their assembly may only be undertaken by expert professional staff.



**IMPORTANT NOTE: AFTER UNPACKING IMMEDIATELY PROTECT GUIDEWAYS WITH OIL.**

#### 2 Installation Procedure



APPLY WITH EXCELLENCE

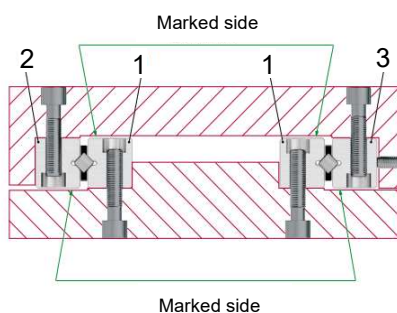
With careful, clean work environment and preparation and a step by step approach, by adopting a rational procedure, a precise linear guide system is achieved.

- a. To guarantee an accurate support for the guide rails, any remaining burrs or ridges are to be removed with a fine whetstone.
- b. Before installation, the linear guideways and supporting surfaced should be cleaned using a solvent-free cleaner and lint-free cloth. By means of a subsequent lubrication of the guiding profile, they will be protected from any consequential damage. Use a rust-protection oil to prevent the other surfaces from rust.



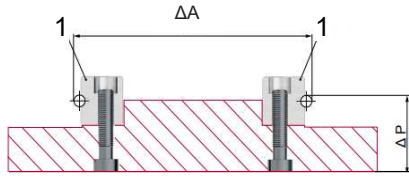
Important remarks:

Accuracy of mounting surfaces should be according the needed accuracy of the linear bearing rails. Due to the bore hole tolerances of the rails, the fastening holes in the supporting surfaces should be drilled according to the holes in the linear guideways. By using fastening screws with a thin shaft, differences in hole spacings can also be evened out (see chapter 5 in our product catalogue).



The marked side of the guide rail may not be used as a supporting surface!

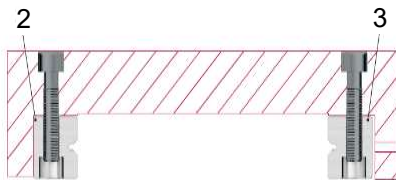
**Installation order:**



**Step 1**

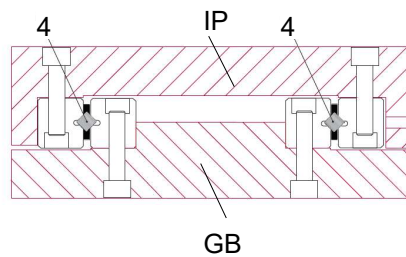
The fixed pair of linear guideways (1) is pressed against the support surfaces using an appropriate clamping element and the fastening screws are tightened (use a torque wrench!). Find tightening torque values in the table below. Check parallelism  $\Delta A$  and  $\Delta P$ . The parallelisms measured must fall within the tolerances of the linear guideway (see chapter 7.1 in our product catalogue).

Max tightening torque in Ncm <sup>2</sup>					
Sizes	Fastening screws DIN 912	Fastening screws with thin shaft, type GD or GDN	Sizes	Fastening screws DIN 912	Fastening screws with thin shaft, type GD or GDN
M 2	35	-	M 8	2400	1838
M 2.5	73	54	M 10	4800	3840
M 3	128	94	M 12	8300	6579
M 4	290	221	M 14	13200	10631
M 5	575	463	M 16	20000	-



**Step 2**

Install the fixed rail (2) of the opposing pair. Install the rail (3) and in so doing only lightly tighten the fastening screws. The loose rail should be movable slightly.



**Step 3**

Assemble interface plate (IP) and guiding block (GB). Insert and center the cages (4). Please make sure the stroke is limited by a mechanical stop to prevent from overrunning. Finally mount the end screws or endplates.

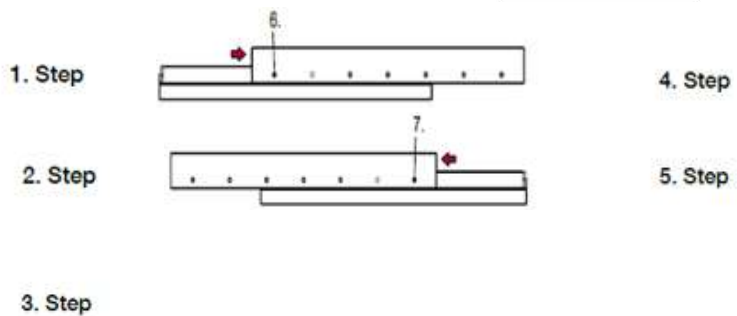
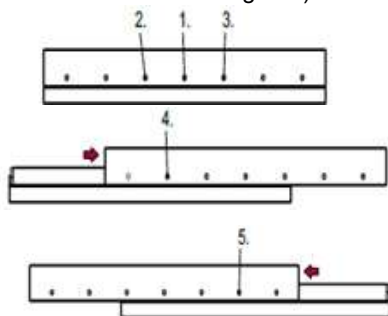
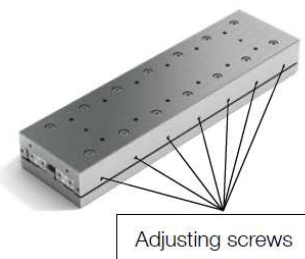


**Important remark:** Please make sure the linear bearings are always operated in an environment which prevents of too high operating temperature (recommended - 40°C to + 80°C), excessive strokes/vibrations, excessive preload/load or dust and foreign particles. In order to gain accuracy and rigidity, the linear bearings must be preloaded before usage.

**3 Applying Preload**

The specific preload is depending on the operational conditions. Normally the appropriate range lies between 2% to 20% of C. It is strongly recommended to use a torque wrench for tightening the adjusting screws.

Applying the preload by using the adjusting screws should be carried out from the center of the rail outwards using the following steps (the sequence can be worked out from the figures):



#### **4 Maintenance and Lubrication**



MAINTAIN  
REGULARLY

Lubrication is a design element and must therefore be defined during the development phase of a machine or application. If the lubrication is only selected after design and construction is complete, based on experience this is likely to lead to considerable difficulties. A carefully thought out lubrication concept is therefore a sign of a state-of-the-art and well devised design.

Subsequent lubrication intervals depend on the operating conditions as well as external influences and cannot therefore be calculated. Hereafter you will find a general recommendation of necessary steps during repetitive maintenance work (interval of 12 month recommended):

- a) Clean-up dirty and surplus of lubrication. Use of cleaning agent with solvents integrated is not allowed for Formula-S cages creeping system.
- b) Check visual damages on running surfaces, roller cages and gear racks. Also check running behaviour.
- c) Exchange damaged sets if necessary.
- d) Subsequent lubrication by moving the guidance to the hard stop on both sides or dismount the entire linear bearing set.
- e) Use a lint-free cloth, don't use a brush. Apply just a thin even film to the running profile of the rails and to the cages or apply the amount of grease you have determined.
- f) Wipe off surplus lubrication. Don't use too much grease.

#### **5 Packaging Instruction in case of any return**

Pack the linear bearings back in the original SCHNEEBERGER packaging. Please handle them still with care so that they can be analyzed by SCHNEEBERGER. It is much appreciated if the failure is reported as detailed as possible.

## SCHNEEBERGER Handling and Installation Guidelines for Slides and Linear Tables

Linear Guides such as Slides and Linear Tables are high-precision components. Hereafter you will find recommendations which must be followed in order to ensure satisfying running behavior.

### 1 Transport, Handling and Storage



HANDLE WITH CARE

The linear bearings must always be transported in their original packaging which protect them from damage, dust and corrosion.

Improper handling of the linear guides may lead to preliminary damage and thus to premature failure. Therefore, once unpacked the linear guides should always be handled with care and protected against any impacts. Unpacking, inspection and their assembly may only be undertaken by expert professional staff.

### 2 General Safety and Protective Measures



- a) Before working on electrical equipment, switch off or disconnect the power supply and ensure that it cannot be switched on or connected again unintentionally.
- b) Country-specific regulations, standards and guidelines for accident prevention must be observed.
- c) The MINISLIDE MSQscale is sensitive to electrostatic discharge! The electronics can be damaged if precautions are not taken against ESD; ESD regulations should therefore be observed when handling ESD-vulnerable parts (EN 100015-1). Please also refer to the mounting instruction of MSQscale: [https://www.schneeberger.com/fileadmin/documents/downloadcenter/04\\_mounting\\_instructions/MSQscale\\_Mounting\\_instructions\\_EN\\_low.pdf](https://www.schneeberger.com/fileadmin/documents/downloadcenter/04_mounting_instructions/MSQscale_Mounting_instructions_EN_low.pdf)
- d) Do not store the products outdoors, and protect them against moisture (10% - 70% relative humidity, non-condensing).
- e) Observe the specified temperature range (-40 °C to +80 °C)
- f) Only remove the products from their original packaging at their installation location and immediately prior to installation.
- g) The products are pre-lubricated in the factory and supplied ready for installation. Check the condition of the lubricant (the service life of the lubricant is limited).
- h) Ensure that the linear guides are always prevented from excessive strokes/vibrations, excessive load or dust and foreign particles.

### 3 Installation Procedure



APPLY WITH EXCELLENCE

With careful, clean work environment and preparation and a step by step approach, by adopting a rational procedure, a precise linear guide system is achieved.



- a) Check locating surfaces of the machine bed and mounting plate for shape and position accuracy.
- b) Clean all locating surfaces thoroughly. Remove ridges and surface irregularities with an oil stone.
- c) Clean the locating and supporting surfaces of the rail and carriage with a clean, lint-free cloth.
- d) Before installation, the guides, machine bed, mounting plate and fastening screws must all be at room temperature.
- e) **The MINISLIDE MSQscale sensor is an electrostatically vulnerable component and is delivered in ESD-protective packaging. To ensure the sensor remains protected, the ESD-protective packaging should not be removed during installation of the MINISLIDE MSQscale guideway.**
- f) Always tighten the fastening screws with a torque wrench. Find tightening torques further below.
- g) With relatively long guides, tighten the fastening screws alternately starting at the middle of the guideway.
- h) Always brace the locating surface of the guides against the locating surface of the machine bed. The guides can be located on both sides, the locating side of the carriage is the opposite side of the carriage with the company logo/type designation.
- i) The screws can be inserted and tightened through the opening in the carriage.

#### 4 Tightening torques for the fastening screws

The recommended torque values can be found in the table. These values apply to oiled screws.

The friction coefficient  $\mu$  can be reduced by up to half when using greases containing MoS<sub>2</sub>. The corresponding torque values should be reduced by half.

The following table shows the torque values for the fastening screws of strength class 12.9 (friction coefficient 0.125) and of the strength class A2-70 (friction coefficient 0.2) in accordance with DIN 912:

Thread size	Tightening torque in Ncm	
	Strength class 12.9	Strength class A2-70
M1.6	28	20
M2	60	30
M3	210	110
M4	500	260

#### 5 Maintenance and Lubrication



Lubrication is a design element and must therefore be defined during the development phase of a machine or application. If the lubrication is only selected after design and construction is complete, based on experience this is likely to lead to considerable difficulties. A carefully thought out lubrication concept is therefore a sign of a state-of-the-art and well devised design.

Subsequent lubrication intervals depend on the operating conditions as well as external influences and can therefore not be calculated. Hereafter you will find a general recommendation of necessary steps during repetitive maintenance work (interval of 12 month recommended):



- a) **Clean-up dirty and surplus of lubrication. Use of cleaning agent with solvents integrated, such as nitro thinner or acetone is not allowed. If the dimensional scale is very dirty at the ends of the guideway, it can be wiped with a clean, lint-free cloth. Never use liquid cleaning products!**
- b) Check visual damages on the tracks. Also check running behaviour.
- c) Exchange damaged slides/tables if necessary.
- d) Subsequent lubrication by moving the guide to the hard stop on both sides.
- e) Use a lint-free cloth or a syringe, don't use a brush. Apply only a thin even film to the track or apply the amount of grease you have determined, since overlubrication can cause failure of the optical sensors of the MSQscale.
- f) Wipe off surplus lubrication. Don't use too much grease.



**Use white spirit or alcohol for cleaning. Do not use nitro thinner or acetone, since they can damage the measuring system. Never use compressed air!**

#### 6 Packaging Instruction in case of any return

Pack the linear guides back in the original SCHNEEBERGER packaging. Please handle them still with care so that they can be analyzed by SCHNEEBERGER. It is much appreciated if the failure is reported as detailed as possible. Do not handle high precision parts as bulk good. Returns in inappropriate packaging might be refused.

For more information see the respective product catalogue or the MSQscale Mounting Instruction available on [www.schneeberger.com](http://www.schneeberger.com)



## 7 Installation Procedure of the Measuring System for MSQscale

- a) Connect the Flexible Sensor Print to the Interface Module with caution. Carefully remove the glue strip and the ESD protective packaging from the sensor print on the carriage.
- b) Open the ZIF (Zero Insertion Force) connector on the interface module. To do so, grasp both ends of the black tab and pull it carefully out (approx. 1 mm).
- c) Gently insert the flexible sensor print approximately 3 mm into the ZIF connector. Make sure that the surfaces of the flexible sensor print are facing upwards to make proper contact.



**No force is necessary for insertion. Excessive strain on the ZIF connector or on the flexible sensor print can cause damages on the contacting point and prevent electrical transmission.**

- d) lock the ZIF connector again by pushing the black tabs toward the PCB (Printed Circuit Board).



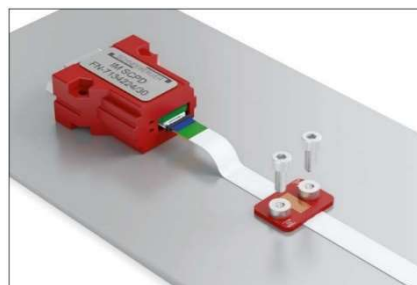
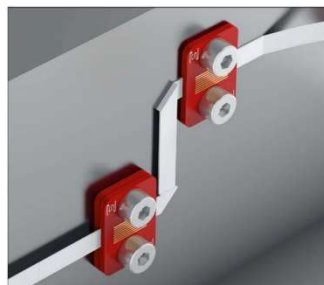
**The flexible sensor print between the sensor and the interface module may only be used statically. The minimum allowable bending radius of the flexible sensor print is 2 mm.**

- e) Connect the FFC (Flat Flex Cable) to the adaptor board with the right orientation. For this pay attention to the color coding. When connecting the cable, ensure that the same color is visible on the cable end and the connector. The metalized shield is covered by an insulation layer to prevent short circuits with other machine parts. Make sure that the contact surfaces of the flexible sensor print and the FFC are facing downwards (toward the adaptor board) to make proper contact.



**The recommended minimum bending radius of the FFC cable for dynamic loads is 10 mm.**

- f) Lay cable. Single folds in the FFC cable are allowed for cable routing. This allows a large degree of design freedom.



For more information see the respective product catalogue or the MSQscale Mounting Instruction available on [www.schneeberger.com](http://www.schneeberger.com).