

Press release SCHNEEBERGER MINISCALE PLUS

High-precision miniature guideway with integrated distance measuring system for tight spaces

Lightning-fast high-tech miniature guideways

For designers who have to fit high-precision linear technology with integrated distance measurement in very small spaces, SCHNEEBERGER now offers the new MINISCALE PLUS optical incremental distance measuring system. Based on the MINIRAIL linear guideway system, the measuring system combines guidance and measurement functionality in a highly integrated design. The extremely compact miniature package also significantly simplifies installation.

Measuring just 9.2 x 17 x 16.1 mm, nearly twelve of the smallest members of the MINISCALE PLUS family can fit in a single matchbox. This unbeatably small size results from the integration of the measuring sensor in the carriage. This eliminates the need for additional installation space as well as the cost of a separate distance measuring system. The MINISCALE PLUS has the measuring scale laser-marked on the guide rail and the optical sensor integrated into the carriage. A flexible circuit board connects the sensor to the interface module that handles signal processing. With the development of the MINISCALE PLUS, SCHNEEBERGER meets the customer requirement for even higher resolution and the desire to be able to choose between analogue and digital interface modules.

Structure and operation

The high precision measuring scale forms part of the surface of the hardened rail and has a scale increment of 100 µm. The sensor illuminates the measuring scale and captures the optical signals, which are conditioned by analogue or digital electronics in the interface module for subsequent processing. Measurement takes place directly on the guideway, significantly reducing the risk of alignment errors. SCHNEEBERGER guarantees consistent accuracy, thanks in part to the vibration and shock immunity of the MINISCALE PLUS. Locating the measuring scale directly on the rail reduces the need for analysis of thermal expansion and complex compensation routines in the related controller. Like the MINIRAIL miniature guideway, the MINISCALE PLUS works very reliably over an extended service life.

Impressive specifications

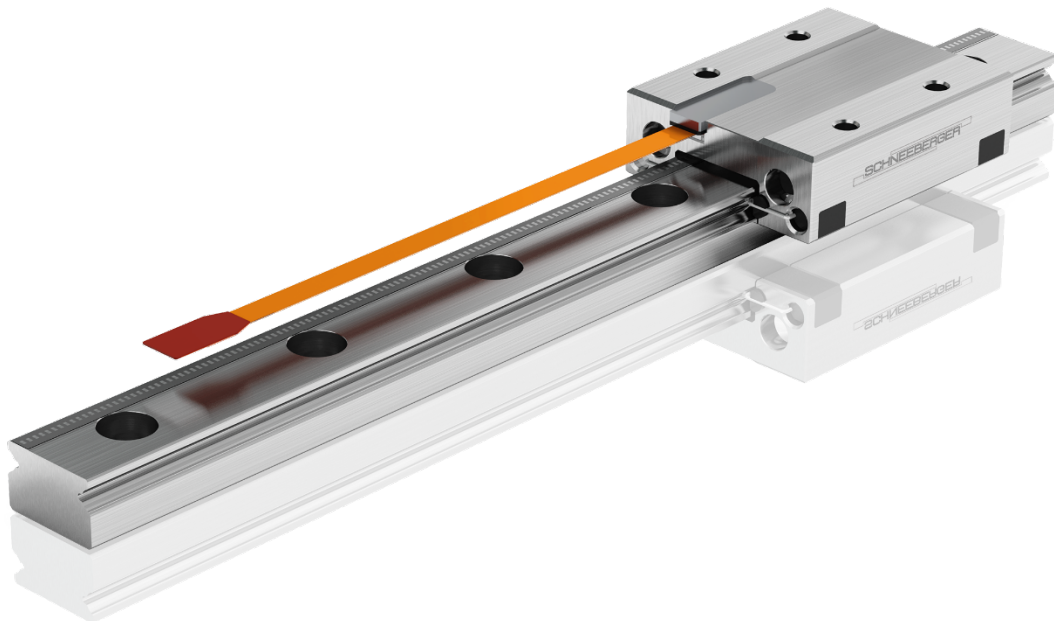
The maximum acceleration of the tiny speedster is 300 m/s² at a maximum speed of 5 m/s. The rail, carriage and balls are made from through-hardened, corrosion-resistant steel, and ball recirculators are made from POM. The miniature guideways can be used at temperatures from -40 to +80°C, and

they have a cleanroom class rating of ISO 7 or ISO 6. The maximum linearity deviation over a length of 1 m is $\pm 10 \mu\text{m}$, with $\pm 5 \mu\text{m}$ also available on request. The repeatability is $\pm 0.1 \mu\text{m}$ unidirectional and $\pm 0.2 \mu\text{m}$ bidirectional.

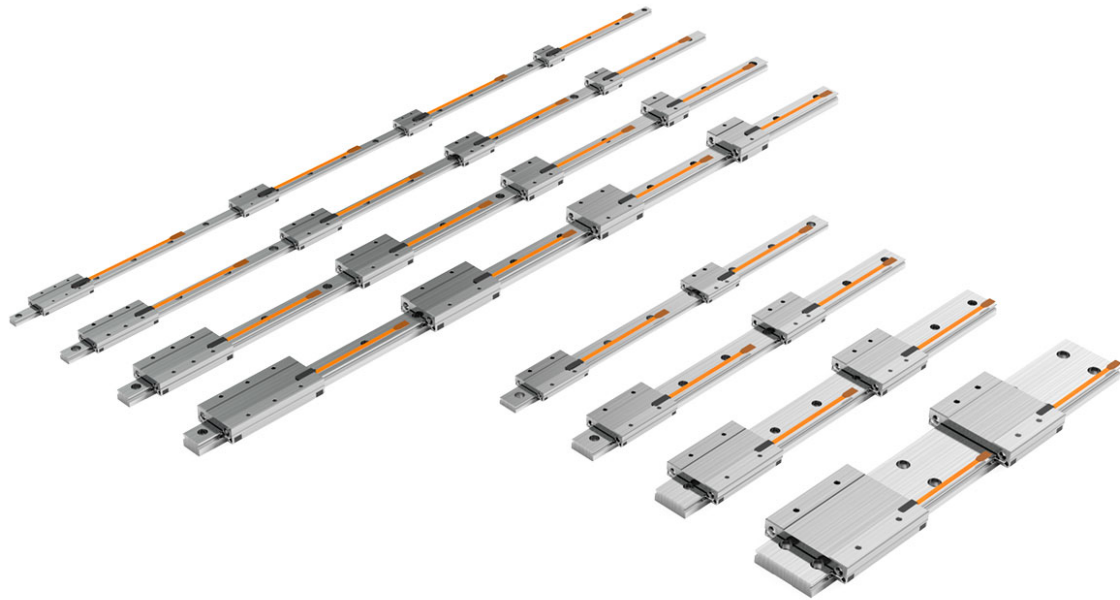
Installation is remarkably easy, since the MINISCALE PLUS is delivered ready to install. There is no need for additional components or additional machining for installation, such as is required with glass scales. Separate calibration of distance measurement is also unnecessary. The signals are available to the user on a 9-pin Sub-D connector. This enables users to choose their own cable type for connection to the machine controller.

Highly diverse applications

The miniature measuring system is particularly suitable for use in constrained spaces, such as are often found in optical devices for medical technology. For especially demanding applications requiring a defined preload or displacement force on the guideway, SCHNEEBERGER offers matched sets of carriage and rail. Other custom adaptations, such as specific carriage heights or special lubricants, and a variety of accessories are also available. The MINISCALE PLUS option is available for the entire MINIRAIL range.



B01: At MINISCALE PLUS is the optical sensor integrated into the carriage.



B02: The miniature guideways with integrated measuring system offers maximum acceleration of 300 m/s² at a maximum speed of 5 m/s.

SCHNEEBERGER group

SCHNEEBERGER® serves original equipment manufacturers operating (OEM) in various industries worldwide – from **machine tool**, **solar technology** and **semiconductor technology** to **electrical engineering** and **medical engineering** and others. Linear bearings, profiled linear guideways, **measuring systems**, **gear racks**, **slides**, **positioning systems** and **mineral casting** are all part of SCHNEEBERGER's product and manufacturing range. **A.MANNESMANN** has been part of the SCHNEEBERGER Group since October 2017. A.MANNESMANN is a leading supplier for the production of ballscrew drives, telescopic actuators and drill spindles. A further expansion of the SCHNEEBERGER Group, an additional site was founded in Poland. The new company SCHNEEBERGER Components Poland (SPO) officially started on November 19, 2020 and has already commenced operations, producing precision parts for the entire Group. The core competence lies in the production of rolling bearing rollers. Also as part of its strategic development, the Business Unit Systems has established the company "SCHNEEBERGER Precision Motion Systems (Shenzhen)". With the establishment of the new technology center for systems in Shenzhen with development, production, sales and service, SCHNEEBERGER will be closer to its Asian customers and thus be able to serve them even better with high-precision single and multi-axis systems.

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