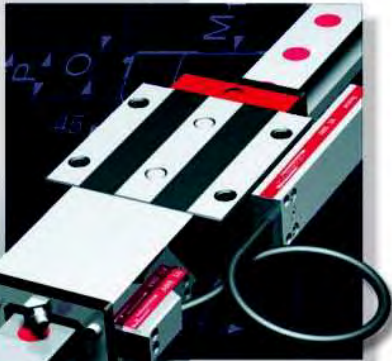


SCHNEEBERGER

LINEAR TECHNOLOGY



MONORAIL AND AMS

Profiled Linear Guideways
and integrated measuring
systems



1. Product Overview

| | |
|---------------------------------------|------|
| 1.1 Overview of all MONORAIL products | p. 2 |
| 1.2 Features of the MONORAIL system | p. 4 |

2. Technical Data

| | |
|----------------------------|-------|
| 2.1 Guiding | p. 10 |
| 2.2 Guiding and driving | p. 18 |
| 2.3 Guiding and measuring | p. 19 |
| 2.4 Ordering information | p. 28 |
| 2.5 Precautionary measures | p. 30 |

3. Roller-MONORAIL MR



| | |
|--|-------|
| 3. Introduction | p. 31 |
| 3.1 Overview of types, sizes and options | p. 34 |
| 3.2 Technical data | p. 36 |
| 3.3 Accessories | p. 48 |
| 3.4 Order code | p. 55 |

4. Ball-MONORAIL BM



| | |
|--|-------|
| 4. Introduction | p. 57 |
| 4.1 Overview of types, sizes and options | p. 60 |
| 4.2 Technical data | p. 62 |
| 4.3 Accessories | p. 74 |
| 4.4 Order code | p. 80 |

5. MONORAIL BZ toothed rack systems



| | |
|--|-------|
| 5. Introduction | p. 81 |
| 5.1 Overview of types, sizes and options | p. 84 |
| 5.2 Technical data | p. 86 |
| 5.3 Accessories | p. 90 |
| 5.4 Order code | p. 94 |

6. MONORAIL AMSA 3A analog distance measuring system for MR



| | |
|--|--------|
| 6. Introduction | p. 95 |
| 6.1 Overview of types, sizes and options | p. 98 |
| 6.2 Technical data | p. 100 |
| 6.3 Accessories | p. 110 |
| 6.4 Order code | p. 111 |

7. MONORAIL AMSD 3A digital distance measuring system for MR



| | |
|--|--------|
| 7. Introduction | p. 113 |
| 7.1 Overview of types, sizes and options | p. 116 |
| 7.2 Technische Daten | p. 118 |
| 7.3 Accessories | p. 128 |
| 7.4 Order code | p. 129 |

8. MONORAIL AMSA 4A analog distance measuring system for BM



| | |
|--|--------|
| 8. Introduction | p. 131 |
| 8.1 Overview of types, sizes and options | p. 134 |
| 8.2 Technical data | p. 136 |
| 8.3 Accessories | p. 148 |
| 8.4 Order code | p. 149 |

9. MONORAIL AMSD 4A digital distance measuring system for BM



| | |
|--|--------|
| 9. Introduction | p. 151 |
| 9.1 Overview of types, sizes and options | p. 154 |
| 9.2 Technical data | p. 156 |
| 9.3 Accessories | p. 168 |
| 9.4 Order code | p. 169 |

1.1

Product Overview

Overview of all MONORAIL products



MR

High rigidity, great dynamic and static load carrying capacity, outstanding running smoothness and the total enclosure of the carriage are the main features of the MONORAIL guideway. These properties result in higher machining rates while enhancing geometrical accuracy and surface quality of the machined workpieces. Our highly rigid MONORAIL provides improved vibration behavior, smaller vibration amplitudes and thus extends tool life.

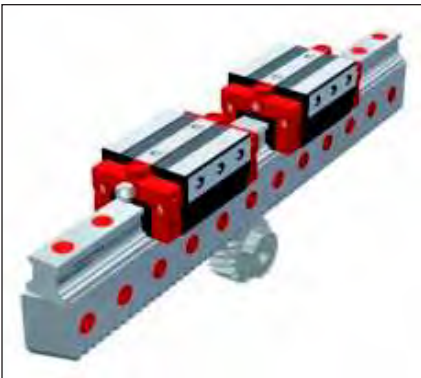
SCHNEEBERGER has systematically applied its many years of experience in the design, production and use of roller-type anti-friction guideways in the development of the MONORAIL. Consequently the MONORAIL MR is a cost-effective anti-friction guideway which meets the challenge presented by modern machine design.



BM

SCHNEEBERGER's MONORAIL BM ball guideway features excellent dynamic properties and many commercial benefits. Designed with a small number of cleverly arranged components, it provides for excellent running properties due to the small number of transitions in the ball tracks, which lead to very quiet running, low pulsation and low friction as well as high travel speeds. The use of a trapezoidal rail section results in an extremely rigid guideway coupled with a substantial reduction in servicing time as additional wipers can be changed without dismantling the carriage. Complete sealing of the carriage guarantees maximum reliability coupled with a long service life.

This robust and economical guideway rounds off SCHNEEBERGER's range of products for industrial applications with high demands on speed, reliability and constant running properties.



BZ

SCHNEEBERGER's MONORAIL BZ systems are high-precision linear guide systems with integral rack drive, based on the company's proven MONORAIL BM profile guideways with balls. The benefits resulting from the integration of a profile guideway and an extremely precise rack drive mainly come into their own in the handling and automation industries, in laser and water-jet cutting tools as well as in woodworking machines.

Outlay on the production of machine beds, the installation and alignment of the guideway and gearing are substantially reduced. Single piece rail systems are available up to a length of 6 metres.

The design of the MONORAIL BZ provides for superb operating characteristics, high load-bearing capacity and rigidity together with a long service life thanks to the use of the tried-and-tested MONORAIL BM profile guideway and to the high transmittable forces, smooth running and optimum positioning accuracy offered by ground, hardened and precise helical gearing of superlative quality.



AMSA 3A

The MONORAIL AMSA 3A is an integrated magneto-resistive measuring system based on the MONORAIL MR roller profile guideway with an analog voltage interface. This results in the provision of a compact axis with linear measurement and guidance specially for machine tool applications. No additional installation and adjustment of the measuring system is required, which provides savings in the design, manufacture and servicing of x machines. The accuracy and process reliability of the machine are improved. The robust housing has a complete wiper system consisting of longitudinal and cross wipers that ensure that the measuring system is extremely well protected. The AMSA 3A version has an analog voltage interface of 1 Vss for connection to all standard control systems.



AMSD 3A

MONORAIL AMSD 3A is an integrated magneto-resistive measuring system based on the MONORAIL MR profile guideway with an incremental, digital interface. The AMSA 3A is the starting point for this product. The profile rails are thus identical and are compatible with both AMSA 3A and AMSD 3A. The AMSD 3A version has an incremental, digital interface and a range of reading head options that permit different resolutions and allow the system to be adapted to control systems with different input frequencies.



AMSA 4A

MONORAIL AMSA 4A is an integrated magneto-resistive measuring system based on the MONORAIL BM profile ball guideway with an analog voltage interface. These products are preferred for use in applications that make major demands on traveling speed and accuracy as well as on their resistance to acceleration and vibration. No additional assembly or adjustment of the measuring system is required, which is reflected by cost savings in machine design, manufacture and servicing. The accuracy and process reliability of the machine are also improved. The sturdy housing for the read-head has a complete wiper system consisting of longitudinal and cross wipers, which provide optimum protection for the measuring system. The AMSA 4A version has an analog voltage interface of 1 Vss for connection to all standard control systems.



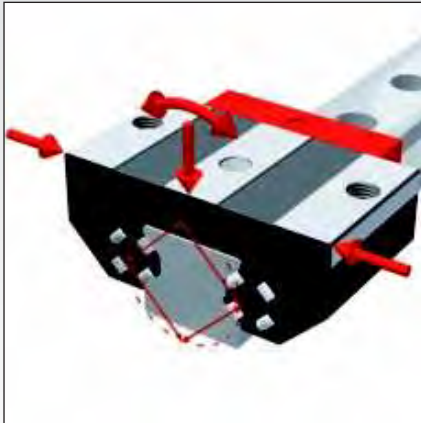
AMSD 4A

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1.2

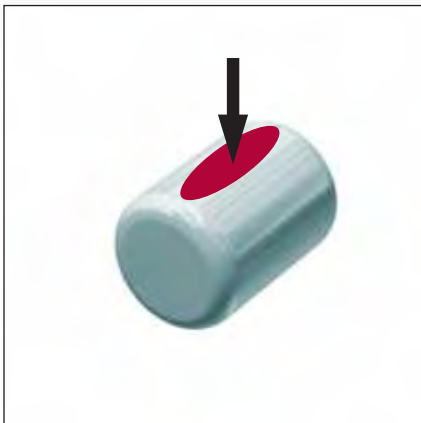
Product Overview

Features of the MONORAIL system



O-geometry

Large internal spacings of the load carrying surfaces are implemented with what is called an O-arrangement of the guideway. In conjunction with roller tracks that are offset by 90°, this achieves a uniform and high absorption of forces from all directions and provides high moment rigidity.

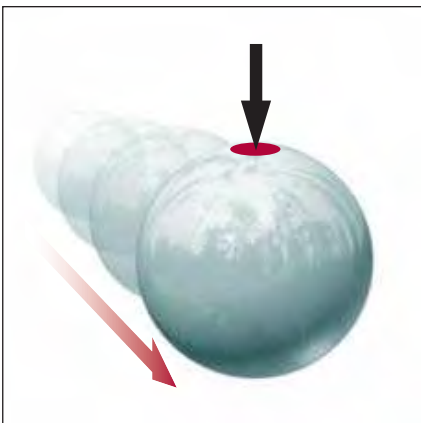


Roller with a convex 'barrel' profile

Linear guideways have a significant influence on the overall rigidity of a machine tool. With roller MONORAIL MR, the demonstrably high degree of rigidity is achieved by using rollers, with a convex profile, as rolling elements and the optimized cross-sections of the carriage and the rail.

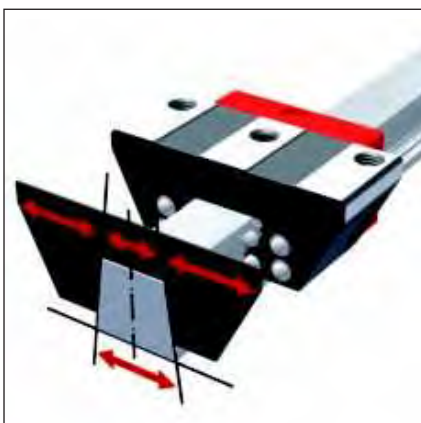
Compared with a ball guide, a roller guide has a flat and much larger contact area, which results in a far greater load carrying capacity.

The barrel shape enables the contact surface to adjust to the particular load and provides a smooth transition from the load zone to the unloaded recirculation area. This results in a significant reduction in wear since it avoids edge loading coupled with minimum roller friction.



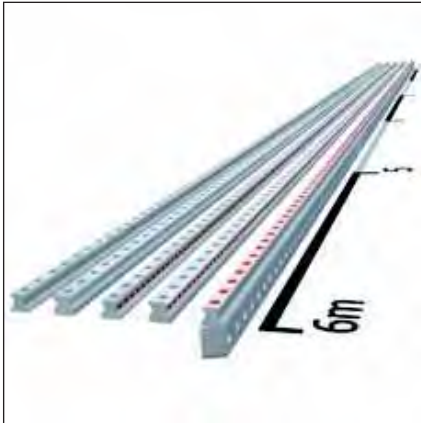
Ball with 2-point contact

The MONORAIL BM is a modern, 4-row ball guide with O-geometry. Even when preloaded and under load, a ball that is in the load zone only contacts the track contour of the rail and the carriage at two diametrically opposed points. Compared to a guide with 4-point contact, the precision fit of the tracks to the ball provides significantly greater load carrying capacity. Friction is minimised as the balls roll more or less without any differential slip, which results in smooth, even running.



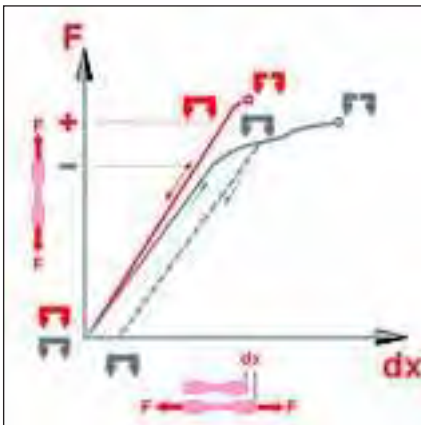
Trapezoidal rail profile

The trapezoidal rail profile meant it was possible to optimize the carriage cross sections and the connection of the base surface of the rail to the sub-structure to achieve the highest possible rigidity. This rail profile enables easy servicing since additional wipers can be replaced directly on the rail without any complicated removal of the carriage.



In one piece up to 6 metres long

SCHNEEBERGER offers guideways for all its products in single piece lengths of up to six metres. As a result, fewer butt joints between rails are required on long guideways. This not only simplifies assembly work, but also offers improved accuracy and extends the service life of the system.



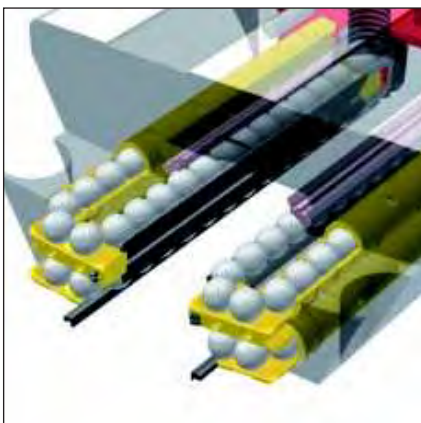
Through-hardened carriages

The steel body of the carriage is a critical element if a machine is to have a long service life with a constant level of precision. In order to satisfy these high demands, even under extreme loads and without any plastic deformation of the carriage throughout its entire period of use, SCHNEEBERGER uses high-grade bearing steels in which not just the running surfaces, but the complete carriage body are hardened. Even when subjected to loads exceeding their recommended levels, MONORAIL carriages maintain their specification as no plastic deformation can occur.



6 attachment holes per carriage

When a carriage is subjected to tensile forces, the rigidity achieved is largely dependent on the way that it is connected to its surrounding structure. In order to achieve the maximum degree of rigidity, all SCHNEEBERGER carriages have six threaded fixing holes in the top of the carriage.



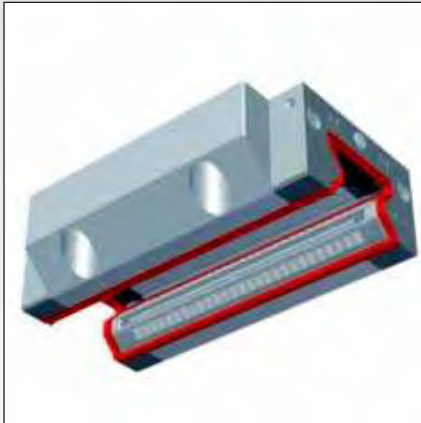
Unique running characteristics

Particular attention was focused on the run-in area of the rollers from the unloaded to the loaded zone. This area was geometrically balanced to provide very smooth operation, i.e. minimum travel pulsation, pitch movement and noise for both low and high speed motion.

1.2

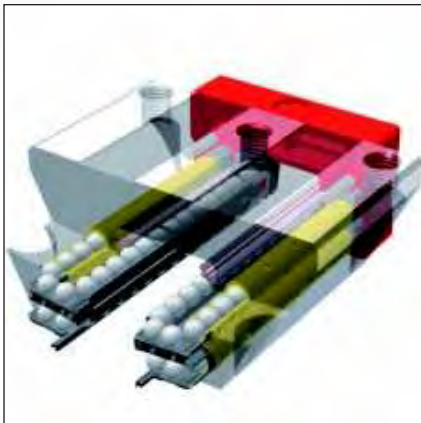
Product Overview

Features of the MONORAIL system



Complete sealing

MONORAIL carriages are equipped as standard with twin-lipped cross wipers on the ends and top and bottom longitudinal wipers. Together with additional sealing of the gaps between the front plate and the steel body, these provide an exceptionally efficient sealing system. The ingress of dirt is therefore effectively prevented and lubrication losses are reduced to a minimum, which results in a significant increase in service life. Correct function of the wipers is improved even further by the smooth, ground surface of all sides of the rail. SCHNEEBERGER also offers various solutions to close the rail fixing holes perfectly flush.



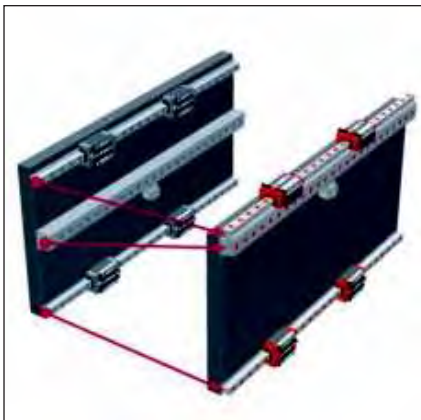
Rolling element recirculation parts made of synthetic material

The return passage of the rolling elements has a substantial influence on the running properties of the carriage. For this reason, all SCHNEEBERGER products are fitted with synthetic recirculation parts. Apart from the reduction in noise, the synthetic components have been designed to form an additional reservoir of lubricant. The additional lubricant can substantially extend the service life of the carriage.



Versatile lubrication connection

Carriages have a range of lubrication connections (on both sides on the front face, at the sides and on top) that can be prepared for connection to a lubrication supply in line with customers' specifications. This allows the connection of the lubrication supply to be connected in the best way to suit the type of lubrication and the specific installation involved. Where oil lubrication for special installation positions is required, both sides of the carriage can also be independently supplied with lubricant.



Integral racks

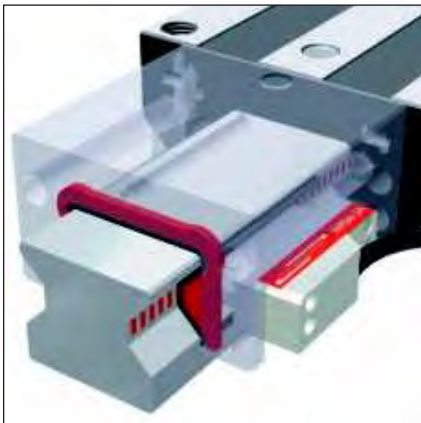
Rack systems offer a high-grade gear rack that is integrated into the guiderail. Single piece rail lengths of 6 metres and the possibility to butt joint rails means very long traverse lengths can be achieved with a high degree of accuracy. Integral construction reduces the amount of manufacturing, assembly and logistics compared with a system with a separate rack, which results in substantial cost savings.

It is now possible to construct a machine axis, that used to require three precision support surfaces with only two. It is no longer necessary to do any time consuming alignment work between the guide system and the rack.



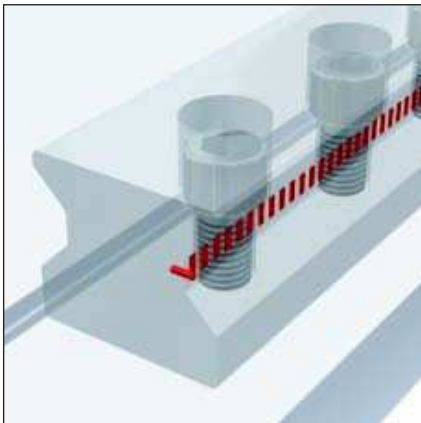
Integrated linear scales

Combining a high-precision linear encoder with a MONORAIL guide rail results in an integrated measuring system that is simple to install without the need for any separate assembly or adjustment work. This provides cost-savings in the design, manufacture and maintenance of equipment. With its integrated systems, SCHNEEBERGER supplies solutions that offer a substantial reduction in complexity when constructing machine axes with direct linear scale systems.



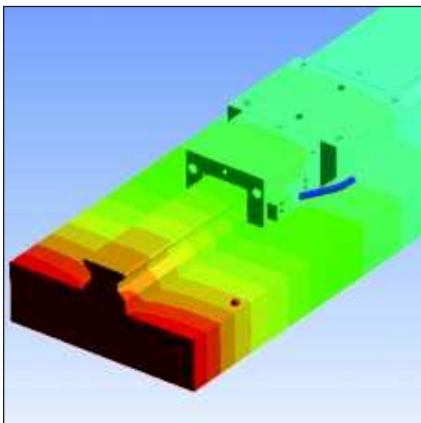
Magneto-resistive measuring principle

The sensor is based on a specially adapted magneto-resistive measuring process. If any relative movement occurs between the sensor and the measuring scale, the change in field strength results in an easily measurable change in electrical resistance. Any interference caused by temperature, superimposed magnetic fields, displacement and ageing is minimised due to the bridge circuit. The sensing head works continuously, which ensures that the function of the sensor is not affected by any particles. The sensing process operates so well that no adjustment work is necessary after service exchange of a measuring head.



Position measurement close to the process

A good thermal connection between the measuring system and the bed of the machine is provided, firstly, by the extensive connection of the guiderail to the integral measuring scale and, secondly, by the rigid attachment of the guiderail to the bed of the machine. The benefit of this is that changes in the temperature of the bed of the machine are transferred directly to the measuring system. The good thermal interconnection between the measuring standard, the guiderail and thus the bed of the machine means that these machines do not require any reference points or temperature sensors to achieve excellent process stability.



Thermal expansion like steel

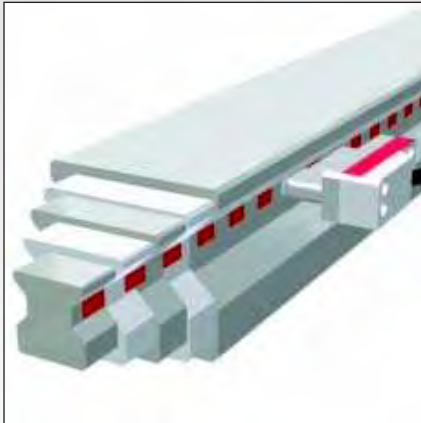
The magnetic measuring scale is installed in a groove in the rail section. Use of a specially adapted ferromagnetic material ensures that the longitudinal expansion of the scale, caused by thermal influences, is identical to the expansion of the steel bed of a machine.

The measuring standard is firmly attached at both ends to the guide rail and has exactly the same rate of expansion as the guide rail. No compensation for temperature is therefore required when machining steel parts.

1.2

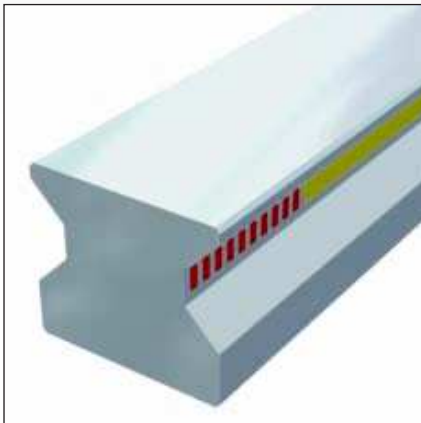
Product Overview

Features of the MONORAIL system



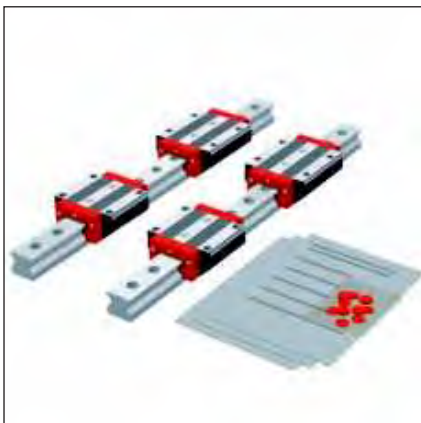
One reading head for all sizes

The measuring scale is positioned identically on all rail sizes, meaning a single reading head can be used for all sizes of the product group concerned. The measuring scale is fixed very robustly in the rail and any effect of wear is taken by the reading head slider. All reading heads can be used on all models of rail supplied. These 3 points mean that only a small service stock of reading heads is needed to support a high volume of installations.



Protected measuring scale

Following production, the integral measuring scale is protected from mechanical damage and magnetic interference by an extremely hard, non-magnetic cover strip. Using a special manufacturing process, the strip is laser welded to the rail which reliably protects the measuring scale from the effects of coolants and wear and tear. Measuring scales are consequently extremely robust and reliable.



Supply of complete axis sets

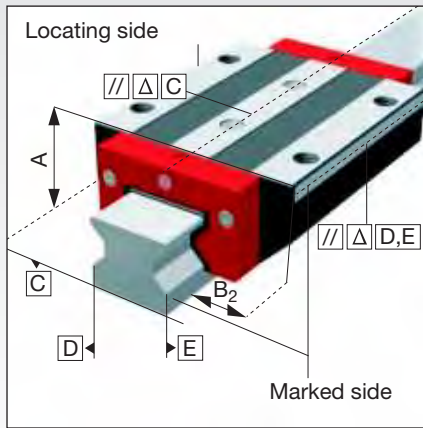
If required, SCHNEEBERGER products can be supplied as sets ready for installation. This means that customers receive complete rail and carriage sets built up and checked to their requirements. The protection required is also adapted to suit individual requirements. Assembly by the customer is therefore limited to essential tasks such as aligning the systems to the surrounding structure, connection to the drive elements and lubrication system as well as hooking up the sensor system connection to the control system.

2.1

Technical Data





Guiding

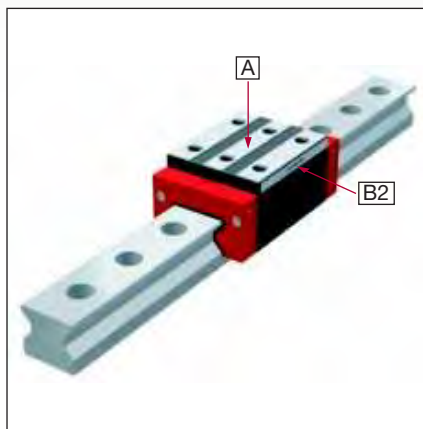
Features and options



Accuracy classes

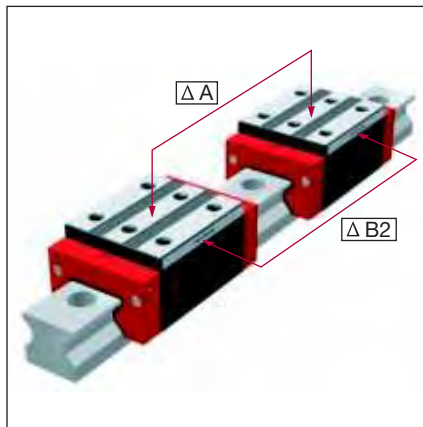
The four accuracy classes allow the user to select both the guiderails and the carriages in line with specific application and design requirements. Accuracy classes define the running accuracy of the rails and determine the dimensional tolerances of the carriages.

-  G0 Highly accurate
-  G1 Very accurate
-  G2 Accurate
-  G3 Standard

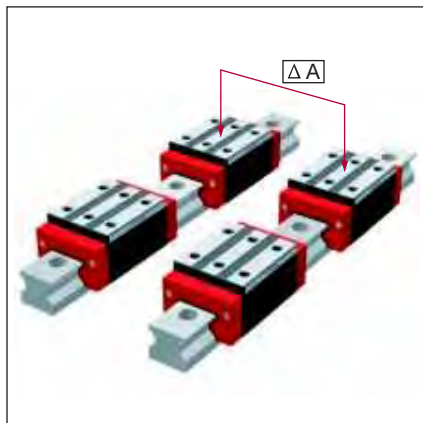


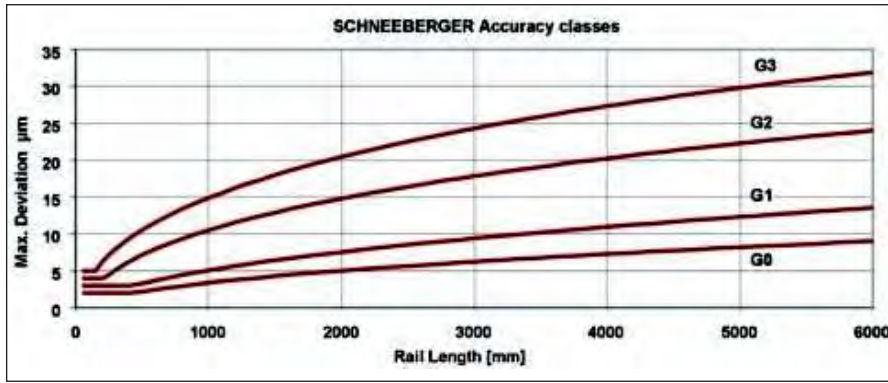
Dimensional tolerances

MONORAIL carriages and rails are manufactured independently of each other, both to very tight tolerances, and are therefore completely interchangeable. This means that any carriage can be used on any rail of the same size without any influence on the preload level because the preload is determined by the rolling elements of the carriage. For the dimensional differences between any carriages on any rail, the values from column one of the following table are applicable.



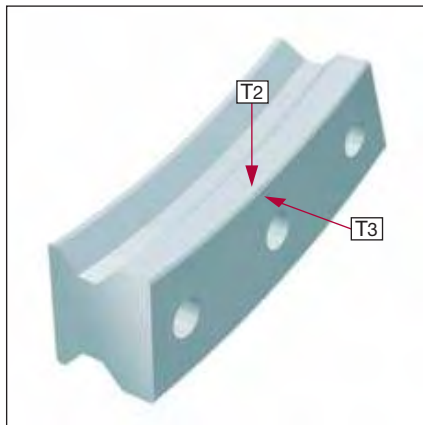
| Accuracy classes | Tolerances between carriages and rails | Max. dimensional difference between the carriages of a rail | Max. dimensional difference of the carriages between 2 or more rails, standard / matched | |
|------------------|---|--|--|------------------|
| | | | ΔA Standard | ΔA Matched |
| G0 | $\pm 5 \mu\text{m}$ | $\Delta A / \Delta B_2$ 3 μm | 10 μm | 5 μm |
| G1 | $\pm 10 \mu\text{m}$ | 5 μm | 20 μm | 7 μm |
| G2 | $\pm 20 \mu\text{m}$ | 7 μm | 40 μm | 10 μm |
| G3 | $\pm 30 \mu\text{m}$ | 25 μm | 60 μm | 25 μm |
| | Measured at the middle of the carriage and in any rail position | Measured at the middle of the carriage and at the same rail position | Measured at the middle of the carriage and at the same rail position, ordering information: -GP matched version to be indicated when the order is placed | |





Running accuracy

The run-out accuracy of the carriages can be either linear or a wave-shaped within the tolerance limits. The maximum permissible deviation is defined by the accuracy class of a rail. The actual tolerance is determined from the above diagram as a function of rail length and accuracy class. Example: L 3 = 2000 mm with G2 accuracy gives a tolerance of 0.015 mm.



Straightness

To install profile guideway sections efficiently, it is essential to know the longitudinal degree of straightness and the curvature of a rail. As the rail section guideways are flexible components, they can deform longitudinally due to their own weight. Deformation can also be caused by the manufacturing process. In order to meet customers' installation requirements, rail straightness is optimised during manufacture. In addition to standard tolerances for rail deformation, SCHNEEBERGER offers special tolerances and / or inspection reports to a specific customer requirement.



Preload classes

The roller guideways are preloaded to enable them to work free of play under different load conditions. Basically, while preloading increases the rigidity of the guideway, it also affects operational life and increases the push force. SCHNEEBERGER guideways are available in various preload classes to address specific application requirements. The preload classes are dependent on the dynamic loading capacity C.

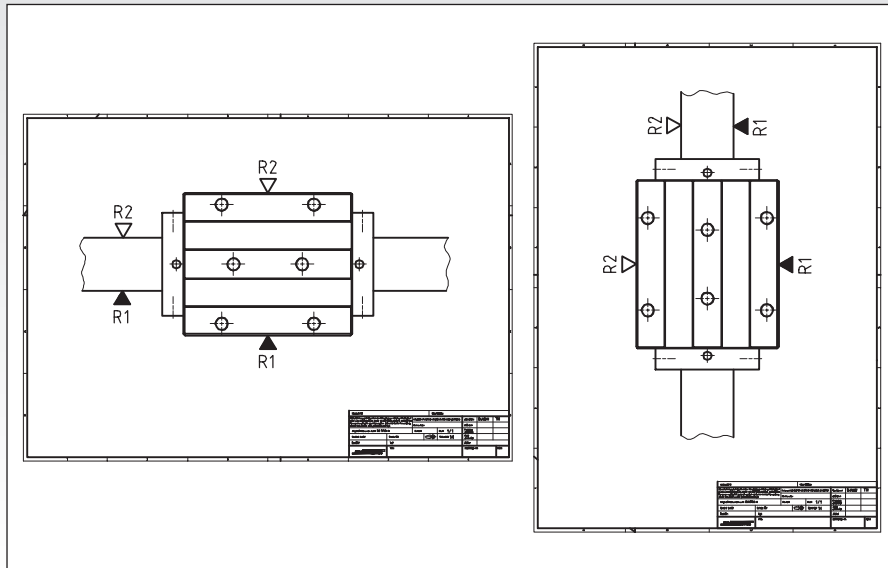
- V0 Very low
- V1 Low
- V2 Medium
- V3 High

| Preload classes | V0 | V1 | V2 | V3 |
|-----------------------------|---|---|--|---|
| Preload | | | | |
| | 0 - 0.02 x C ₁₀₀ | 0.03 x C ₁₀₀ | 0.08 x C ₁₀₀ | 0.13 x C ₁₀₀ |
| Operating conditions | | | | |
| | Very low-friction guideways for uniform loads, minimum vibrations | Low-friction guideways for uniform loads, slight vibrations | For high rigidity, medium, changing loads and vibrations | For highest rigidity, high impact / shock loads and vibrations, strongly changing, high loads and torques |
| Characteristics | | | | |
| | | | | |
| | Rigidity | Service lifetime | Moving resistance | |

2.1

Technical Data



Guiding



Reference sides

Dependent on installation conditions of the products, the reference sides (attachment side) of the carriages and the section rails must be stated when placing an order.

A drawing of the products is the basis for this. R1 means below or right, R2 means top or left.

-  R1 Reference bottom
-  R2 Reference top



Coating

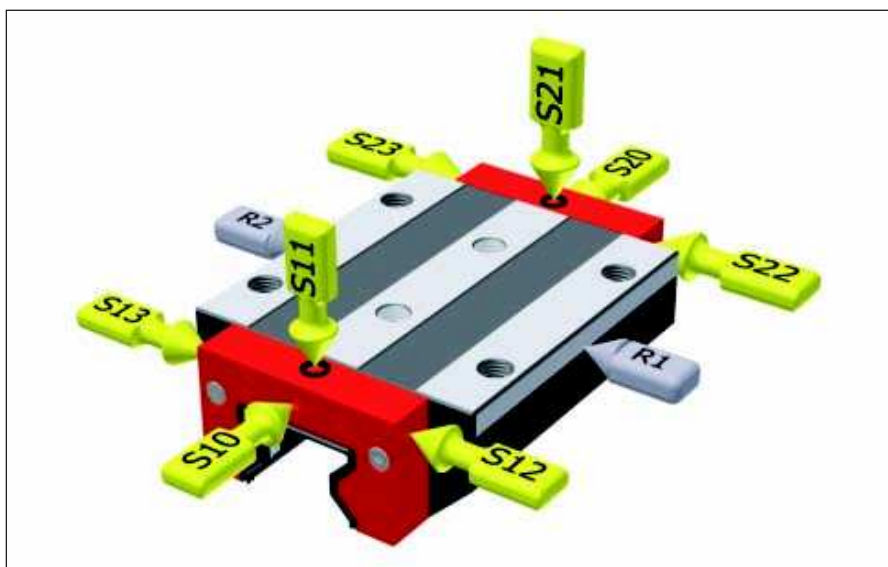
MONORAIL rails and carriages can also be supplied with hard chrome plating for applications requiring special corrosion protection, e.g. in clean-room or vacuum applications, where high relative humidity is an issue or when increased resistance against surface wear is required.

The essential advantages of this electroplating are:

- Excellent corrosion protection
- Very good wear resistance and surface load bearing capacity
- Smooth and good emergency running characteristics due to its micropore structure
- Exceptional adhesion
- Consistent depth of coating

Please note that holes, threads and operating elements are not chrome-plated.












-  CN None
-  CH Hard chromium



Lubrication connections

Front plates and carriage bodies have a wide range of options for lubrication connection. It is therefore possible to optimise the lubrication supply to the carriage to meet structural design. Either a lubricating nipple or a central lubrication system can be screwed into each connection. As standard, all four tracks are lubricated through one connection. As a special feature for certain installation positions, SCHNEEBERGER systems provide for the independent lubrication of both sides of a carriage. This enhances the lubrication of the guideway and thus the service life of the machine.






-  S10 Left center
-  S20 Right center
-  S11 Top left
-  S21 Top right
-  S12 Lower left side
-  S22 Lower right side
-  S13 Upper left side
-  S23 Upper right side
-  S32 Left side
-  S42 Right side
-  S60 Center

Lubrication as delivered condition

The carriages fitted to guideways can be supplied with a wide variety of lubricants according to the demands of the application, storage life and the final type of lubrication. For applications that provide continuous lubrication during installation and operating phases, oiling with oil (LN) or a light application of grease (LG) are enough.

A full application of grease (LV) is recommended for applications with manual lubrication.

-  LN Oil protect
-  LG Grease protect
-  LV Full greasing

Friction

Push force is an important value within the system properties of a guideway. In the case of profile guideways, this is largely dependent on the friction of the sealing system. There is also friction from rolling contact and sliding friction when changing direction and returning.

Application specific frictional forces, such as the type of lubrication, the amount of external load as well as speed, are also present.

To minimize friction, SCHNEEBERGER profile guideways are manufactured with special plastics. To adjust friction from seals, sealing systems are available which have been adjusted to the application.

2.1

Technical Data

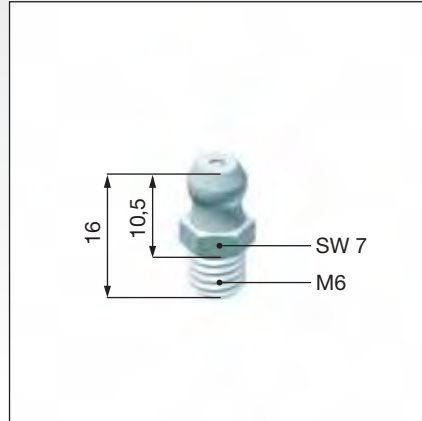
Guiding

Accessories for lubrication

Grease nipples

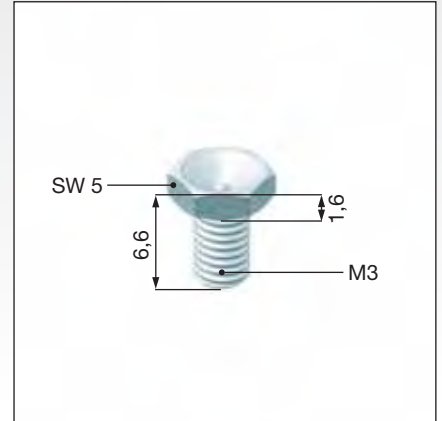
Grease nipple SN 6

Hydraulic-type grease nipple straight



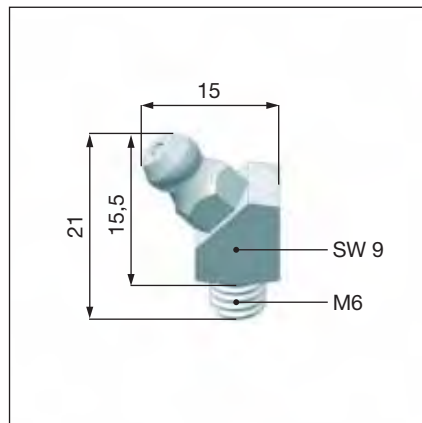
Grease nipple SN 3-T

Flush type grease nipple M 3



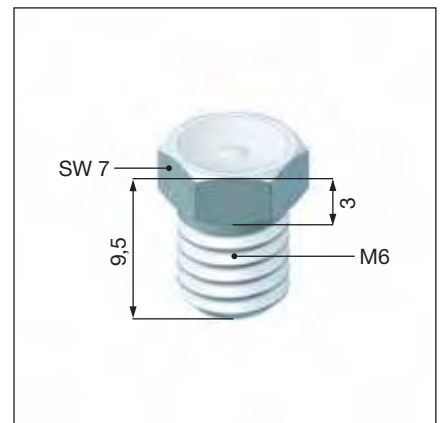
Grease nipple SN 6-45

Hydraulic-type grease nipple 45°



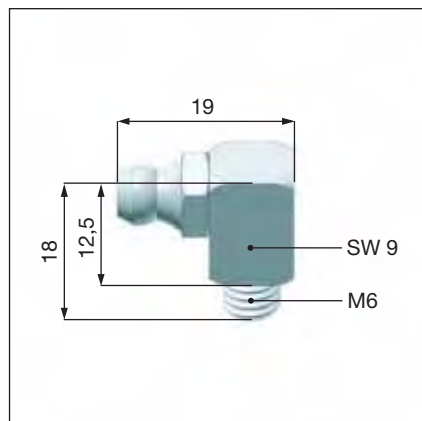
Grease nipple SN 6-T

Flush type grease nipple M 6



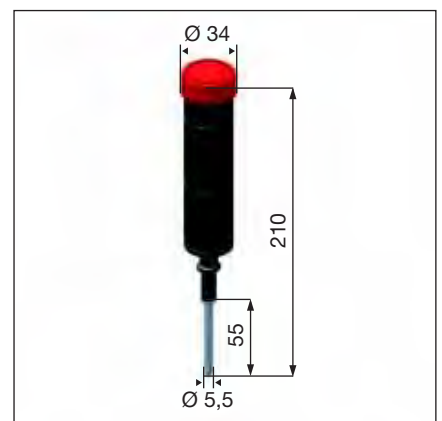
Grease nipple SN 6-90

Hydraulic-type grease nipple 90°



Grease gun SFP-T3

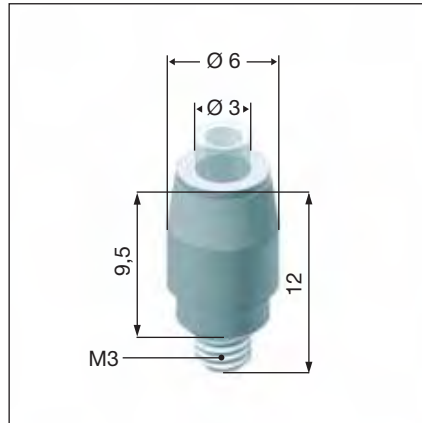
Grease gun for SN3-T and SN6-T



Lubrication adapters

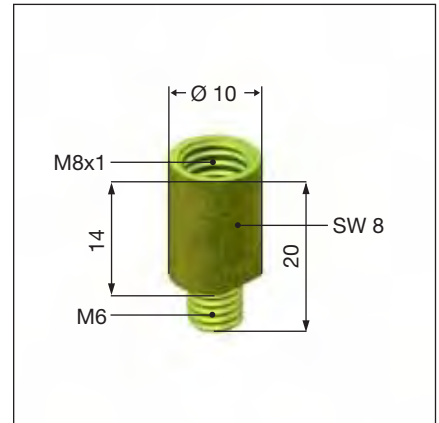
Lubrication adapter SA 3-D3

Screw-in connection M 3



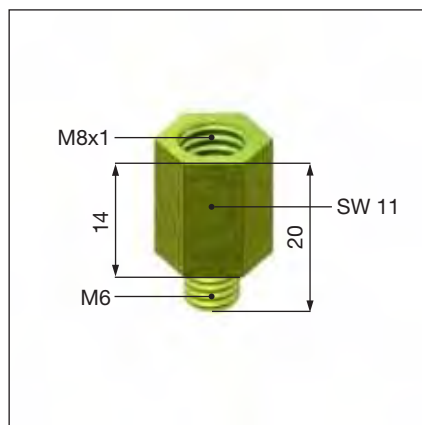
Lubrication adapter SA 6-RD-M8

Lubrication adapter M 8 round-head



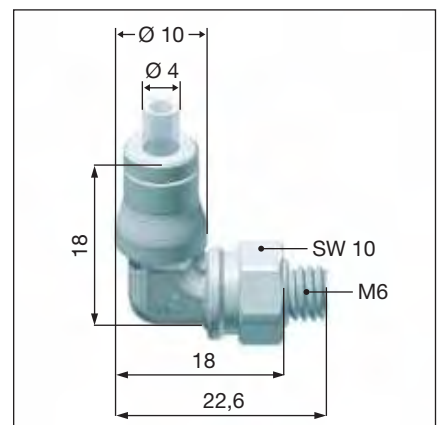
Lubrication adapter SA 6-6KT-M8

Lubrication adapter M 8 hexagon head



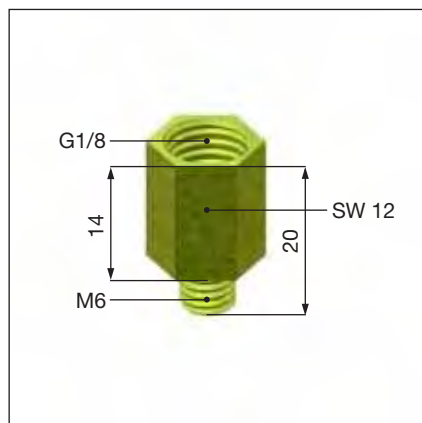
Swivel screw connection SV 6-D4

Swivel screw connection for hose connection 4mm



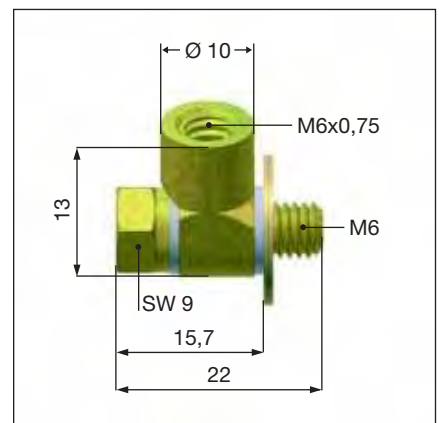
Lubrication adapter SA 6-6KT-G1/8

Lubrication adapter G1/8 hexagon head



Swivel screw connection SV 6-M6

Swivel screw connection M 6 (aluminum sealing)



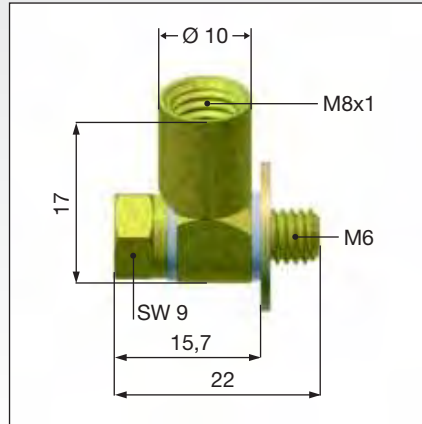
2.1

Technical Data

Guiding

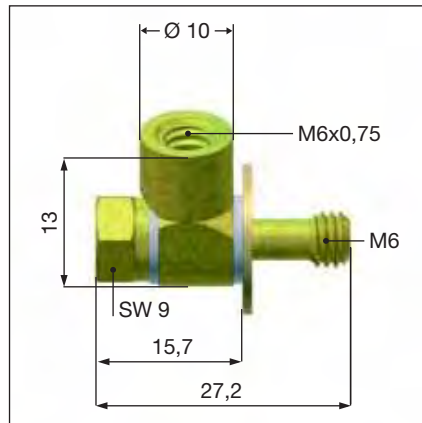
Swivel screw connection SV 6-M8

Swivel screw connection M 8 (aluminum sealing)



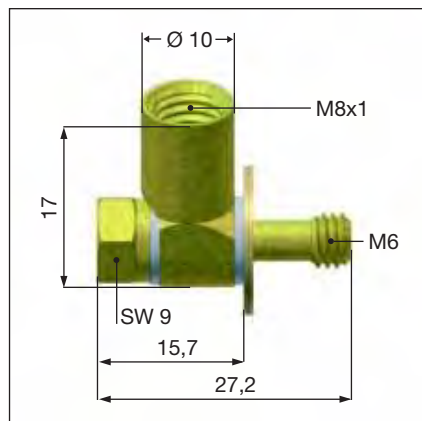
Swivel screw connection SV 6-M6-L

Swivel screw connection M 6 long (aluminum sealing)



Swivel screw connection SV 6-M8-L

Swivel screw connection M 8 long (aluminum sealing)



General technical data

General area of application under normal conditions of use

| Movement | MR | BM |
|----------------------|---------------------|----------------------|
| Maximum speed | 3 m/s | 5 m/s |
| Maximum acceleration | 50 m/s ² | 100 m/s ² |

Higher values are permissible, but are dependent on the type of carriage, lubrication, position when installed, pretension and load. If this is the case, please contact a SCHNEEBERGER agency before proceeding.

| Working environment | MR | BM |
|----------------------------|---------------|---------------|
| Working temperature | -40°C - +80°C | -40°C - +80°C |
| Storage temperature | -40°C - +80°C | -40°C - +80°C |
| Vibration / impact | 30 g | 30 g |

Materials

| | |
|-----------------|---|
| Rail | Roller bearing steel, hardened surfaces |
| Carriage | Roller bearing steel, fully hardened |
| Rolling element | Roller bearing steel, fully hardened |
| Synthetic parts | POM, PAPA, TPU injection moulded |

2.2

Technical Data

Guiding and driving

Features and options

Special characteristics

The product concept for BZ MONORAIL guides provides for the manufacture of one-piece section rail guides with integral racks up to 6 metres in length. These one-piece modules can be linked together to make axes of any length.

A prerequisite for this is that the butt transition joints are machined in a process specially developed for this purpose. The individual parts are installed and aligned using fixtures that are available separately.

Special cross-members are available for the safe transportation of the long individual rails. These aluminium trusses are designed to remain attached to the component while the toothed rail is installed and aligned and only finally removed after the latter has been finally fixed in place. This ensures that the rack can be safely transported, fitted and aligned without suffering any deformation.

In comparison to other screwed systems, BZ has a large number of connections between the rack and the guide rail thanks to the use of BM MONORAIL guides with fixing holes spaced half the normal distance apart. This means that very high lateral forces can be absorbed and compact designs with a high power density are possible.

Tooth quality

SCHNEEBERGER MONORAIL BZ guideways are fitted with integral racks. The gearing used is specially designed for machine tool applications. 19°31'42" helical gearing using module 2.5 and module 2.0 is employed to reduce noise and to achieve smooth running.

Dependent on customers' requirements, the teeth can be formed in two different qualities

Order code:

DIN quality 5, hardened and ground **-Q5H-**

DIN quality 6, soft, milled **-Q6S-**

Comparison with other drive systems

Compared with other drive solutions used for linear movements, rack drives with BZ MONORAIL offer a number of benefits.

Where ball screws are concerned, these are a way of implementing several independent movements on a guide system.

BZ MONORAIL has a superior drive rigidity, which is independent of the length of the axis and independent of temperature thanks to the modular style of construction.

The rack elements are partially exchangeable when worn.

Accurately machined section rail guides and exceptionally precise rack segments result in a very smooth running pinion. The preload of the drive system thus remains constant along the full length and does not change in operation over time.

In combination with suitable motors or gearboxes, self-locking vertical drives can be implemented in the event of power failure.

In comparison to linear motors, BZ MONORAIL systems represent an economical and simple alternative that offers a high degree of efficiency. They are the ideal solution when machining a wide range of materials on long axes and in the face of adverse operating conditions.

General technical data

General technical data q.v. chapter 2.1 Technical Data Guiding

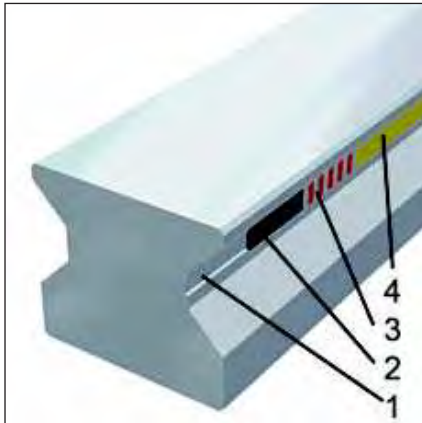
2.3

Technical Data

Guiding and measuring

Magneto-resistive measuring method

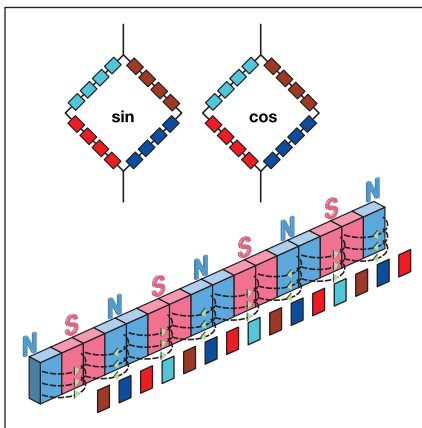
Measuring method



How the measuring scale is made

The measuring strip contains two magnetic tracks: the fine incremental track with alternate N & S poles spaced at 200 μm intervals, and the reference track to determine the absolute position. The reference track can either have distance coded marks, marks set at regular intervals or even with only a single reference mark.

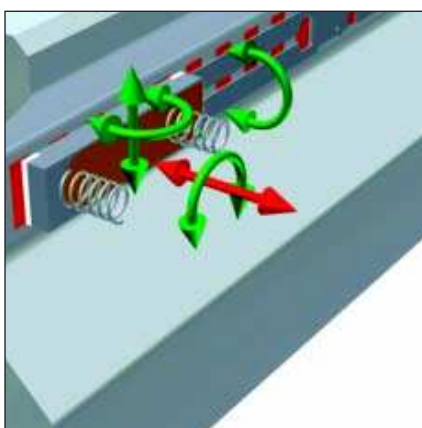
The measuring strip is fully integrated into the rail section. It is manufactured by first grinding a slot (1) into the finished rail section into which a strip of magnetic material (2) is inserted. This magnetic material is ground and magnetized (3). To protect the scale, a through-hardened cover strip, that is magnetically permeable is used and welded to the rail (4).



Magneto-resistive position sensor

A relative movement between the sensor and the scale, results in a change in field strength in the magneto-resistive material leading to a change in electrical resistance that can be easily measured. The electrical circuitry of the Wheatstone bridge sensor elements means that interference from fluctuations in temperature, ageing and magnetic interference fields are kept to a minimum.

Two sinusoidal shaped signals with a 90° phase shift are obtained from the incremental magnetisation as a result of the arrangement of the sickle-shaped sensor elements. To improve accuracy, the signals from 104 individual elements, in line with the direction of measurement, are averaged. As the structure of the sensor is adapted to the magnetic division period, the influence of magnetic interference is heavily suppressed.

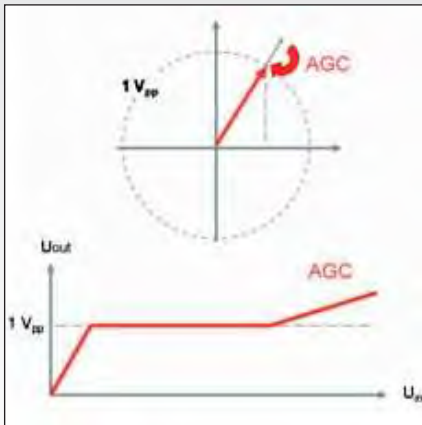


Positional independency of the sensor

All accuracy determining properties of the measuring signals (phase, differences in amplitude, harmonic wave characteristics, etc.) are anchored within the sensor. Therefore, even major deviations in position and twisting of the sensor do not lead to any reduction in signal quality: "The circuit remains stable."

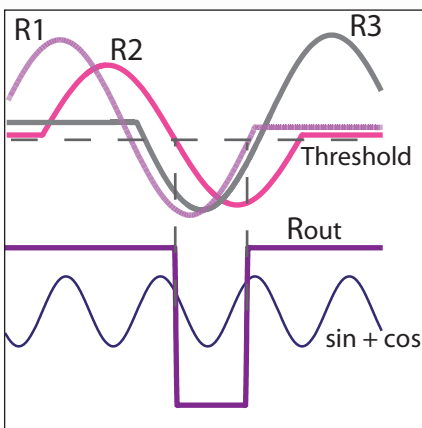
The direct benefits are a simple exchange of the measuring head without any need for adjustment, enhanced resistance against vibration and shock as well as a wide tolerance band for the operation of the measuring heads.

Automatic gain control AGC



Operating method of AGC

The current amplitude (represented by the periodic signals) is continually determined in the electronic measuring system. In the event of any deviations, the amplitude is adjusted. Therefore, a standard output signal is provided even in exceptional cases (installation errors, external errors or removal of the slider).



Reference point identification

The second track carries the AMS reference marks to determine the absolute position and reference the system. The accuracy of the reference points is decisive for the machine's zero or home position. A reference point is represented by three magnetic reference markers on the reference point magnetisation. The rising and falling flanks of the reference impulse each represent one piece of reference information. The third piece of reference information is redundant and is employed to increase the operational reliability of the reference point identification system. This operating principle thus suppresses any magnetic interference and, in dubious circumstances, does not provide a reference signal whenever any interference is encountered.

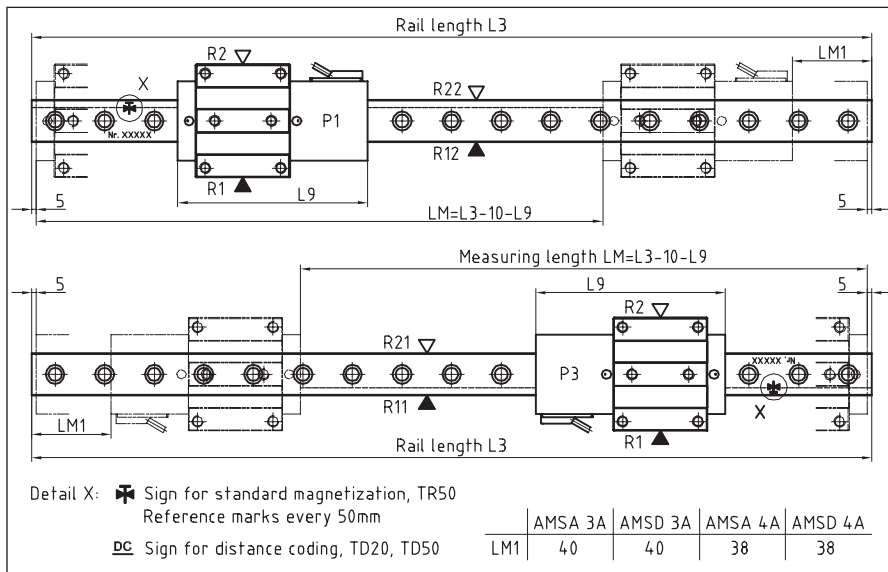
2.3

Technical Data

Guiding and measuring

Features and options

Magnetization



AMS MONORAIL products are available with different reference marks that are surface-engraved by a laser. The illustration shows the position of the measuring carriage when registering the first reference mark.

TR50: AMS with 50mm reference mark grid.

TD50: AMS with distance coded reference marks
 Reference marks spaced at 50.2/49.8/50.4/49.6/50.6/49.4/.../... mm.

TD20: AMS with distance coded reference marks
 Further reference marks spaced at 20.2/19.8/20.4/19.6/20.6/19.4/.../...mm.
 This option is only available on measuring lengths of up to 2.8 metres.

 Reference points, 50mm pattern

 Distance code, 50mm pattern


 Distance code, 20mm pattern


Reading head position and attachment sides

In the order designation, SCHNEEBERGER denotes the attachment position of the reading head, the position of the scale and the reference sides of rail and carriage as they are shown in the drawing above. For drawings in portrait format, the drawing shown must be rotated counter-clockwise by 90°. The following information must be included when placing an order:

Attachment side of the rail and scale position:


 Reference bottom, scale bottom

 Reference bottom, scale top

 Reference top, scale bottom

 Reference top, scale top

Reading head position:

 External (mounting) housing right, reading head top

 External (mounting) housing left, reading head bottom

Attachment side of carriage:

 Reference bottom

 Reference top

Read head interfaces

Interface layout



Interface TSU / TSD

12 pole round plug with union nut and female thread

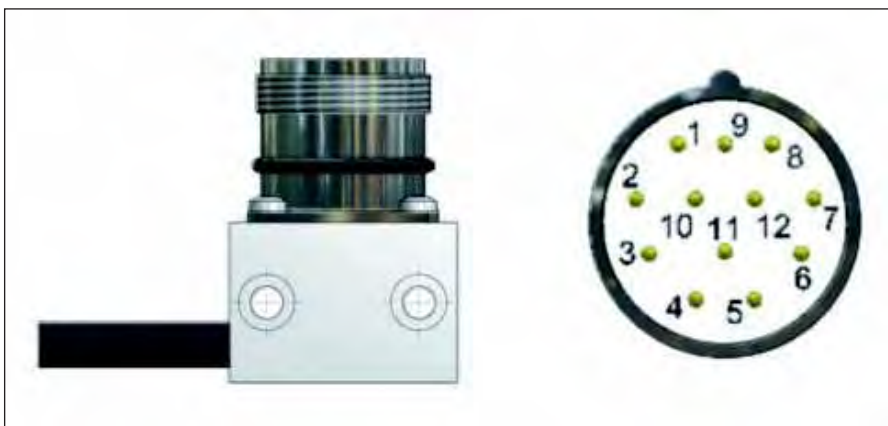
Cable length: 3m



Interface TRU / TRD

12 pole round plug with male thread

Cable length: 3m



Interface TMU / TMD

12 pole round plug built in a mounting base

Cable length: 0,3m



2.3

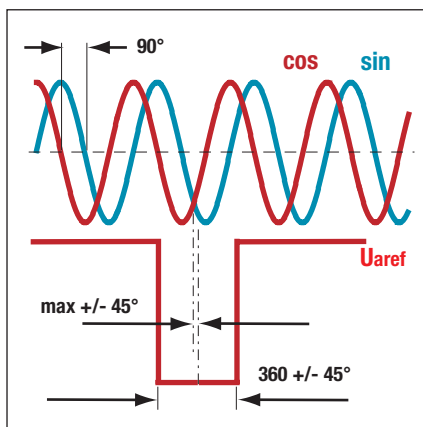
Technical Data

Guiding and measuring

Terminal layout

| Contact | Interfaces TSU / TRU / TMU | | Interfaces TSD / TRD / TMD | |
|---------|----------------------------|--------------------------|----------------------------|---|
| | Signal | Signaltype | Signal | Signaltype |
| 1 | -Ua2 | - Cosine | - Ua2 | A quad B signal |
| 2 | +5V Sensor | Supply voltage feed back | +5V Sensor | Supply voltage feed back |
| 3 | +Ua0 | Reference signal | +Ua0 | Reference signal synchronized |
| 4 | -Ua0 | Reference signal | -Ua0 | Reference signal synchronized |
| 5 | +Ua1 | + Sine | +Ua1 | A quad B signal |
| 6 | -Ua1 | - Sine | -Ua1 | A quad B signal |
| 7 | -Uas | NC | -Uas | Error signal active low, minimum duration 20 ms |
| 8 | +Ua2 | + Cosine | + Ua2 | A quad B signal |
| 9 | - | NC | - | NC |
| 10 | 0V (GND) | Supply voltage | 0V (GND) | Supply voltage |
| 11 | 0V Sensor | Supply voltage feed back | 0V Sensor | Supply voltage feed back |
| 12 | +5 V | Supply voltage | +5V | Supply voltage |

TSU/TRU/TMU analog voltage interfaces

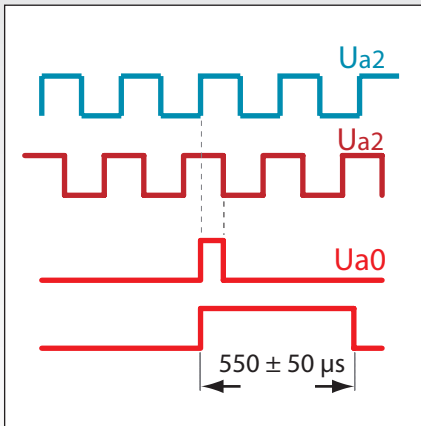


The signals are shown inverted according to differential gain. The incremental signals are displaced by exactly 90° in their phasing. The levels after differential gain of the incremental signals and of the reference signals are 1 +/- 0.1 Vss. The incremental signals supply valid values between 0.6 Vss and 1.2 Vss.

On production standards, the reference pulse is set symmetrically to the intersection of sine and cosine (at 45°). The width and the phasing of the reference pulse is limited as shown in the illustration. On the receiver side, the precision of the reference mark can thus be increased by the additional use of the incremental information.

This interface works with all standard control systems that support a 1 Vss voltage interface.

TSD/TRD/TMD digital interfaces



The incremental signals A+, A-, B+, B- and the reference signals R+, R- transmit the data complementary according to RS 422. The illustration shows the positive signals. The levels of the individual signals are:

High > 2,5 V
 Low < 0,5 V

Rise and fall times are less than 20 ns. The minimum signal distances can be calculated from the maximum output frequency. The downstream electronics must be able to process the maximum output frequency without any problems.

Option **ZN**: The reference pulse is strictly synchronised with the incremental signals

Option **ZF**: The reference pulse is extended to 550 µs +/- 50 µs. This option is used with evaluation electronics that cannot process multiple short-term reference impulses

The following combinations of **interpolation factor**, **maximum output frequency** and **reference impulse implementation** are available for all reading head interfaces.

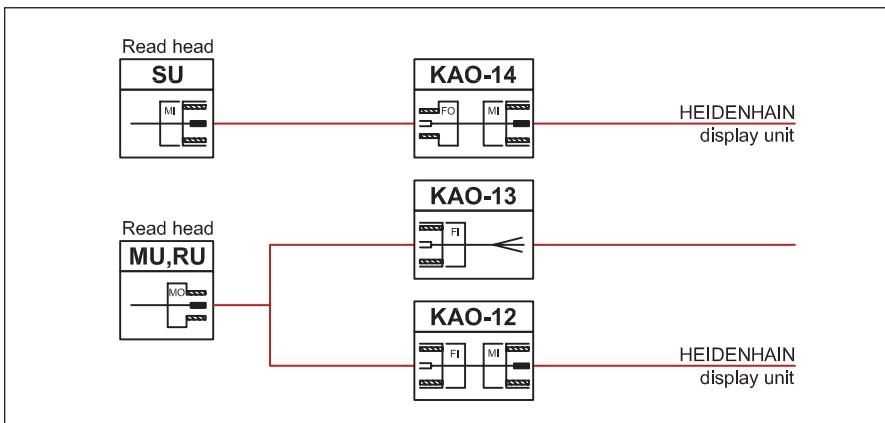
- 010-80-ZN 5 µm, interpolation 10x, max. output frequency 8 MHz
- 050-80-ZN 1 µm, interpolation 50x, max. output frequency 8 MHz
- 250-80-ZN 0,2 µm, interpolation 250x, max. output frequency 8 MHz
- 010-80-ZF 5 µm, interpolation 10x, max. output frequency 8 MHz
- 050-80-ZF 1 µm, interpolation 50x, max. output frequency 8 MHz
- 250-80-ZF 0,2 µm, interpolation 250x, max. output frequency 8 MHz

Order code:

-010-80-ZN- interpolation 10fach, max. output frequency 8 MHz, reference impulse standard

Accessories - Cables

Overview



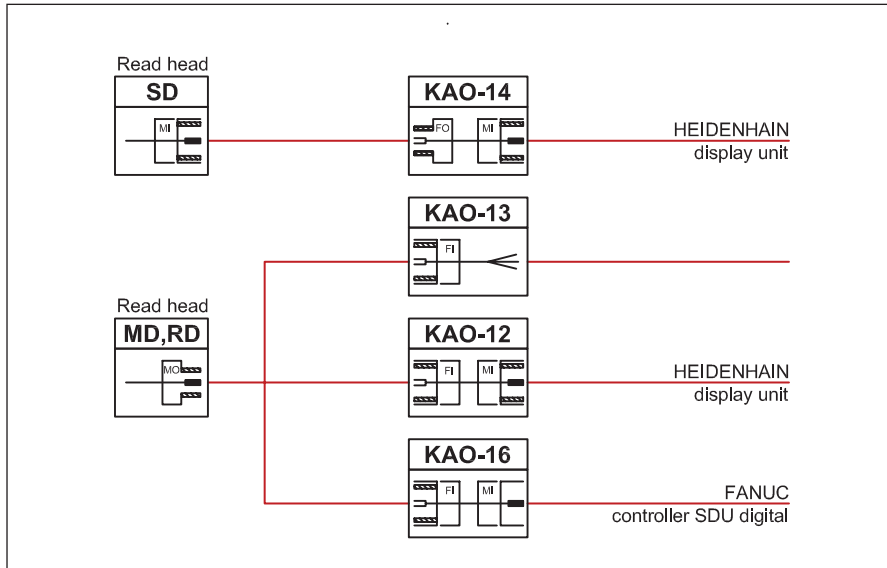
Cable for analog reading heads

2.3

Technical Data

Guiding and measuring

Cable for digital reading heads



KAO 12

Connecting cable, 12 pole, socket with female thread - plug with female thread

Order code: **KAO 12-xx**

xx = length in m, available lengths
 3, 5, 10, 15 and 20m

Order example: KAO 12-5



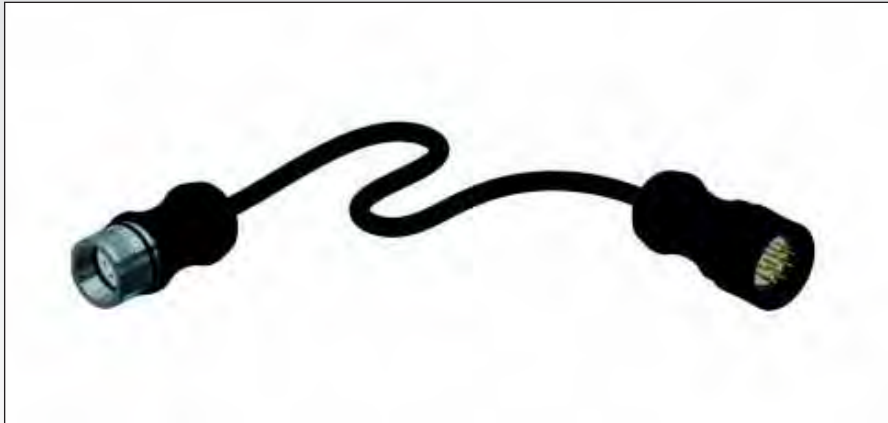
KAO 13

Connecting cable, 12 pole, socket with female thread - open ends

Order code: **KAO 13-xx**

xx = length in m, available lengths
 3, 5, 10, 15 and 20m

Order example: KAO 13-5



KAO 14

Extension cable, 12 pole, socket with male thread - plug with female thread

Order code: **KAO 14-xx**

xx = length in m, available lengths 3, 5, 10, 15 and 20m

Order example: KAO 14-5



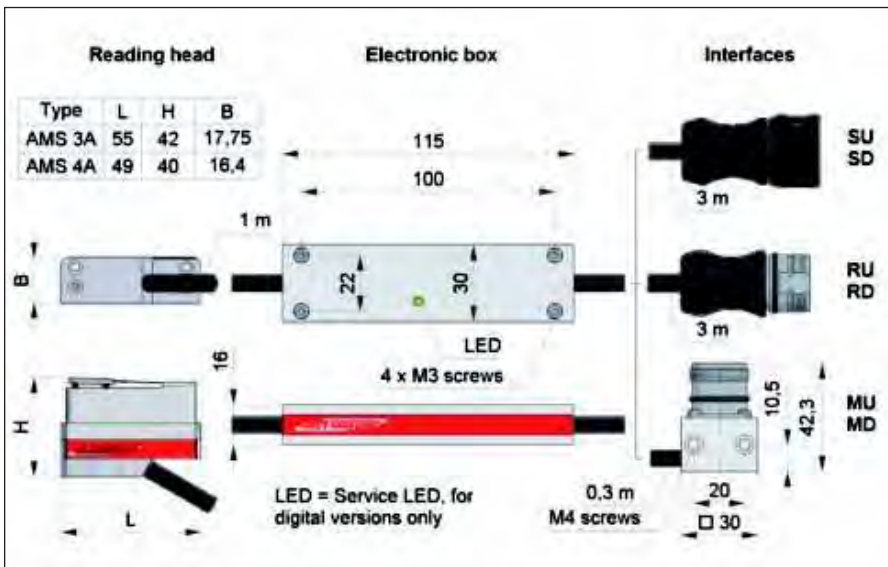
KAO 16

Connecting cable, 12 pole, socket with female thread - FANUC plug

Order code: **KAO 16-xx**

xx = length in m, available lengths 3, 5, 10, 15 and 20m

Order example: KAO 16-5



Dimensions reading head

2.3

Technical Data

Guiding and measuring

General technical data

System properties

| | |
|----------------------------|---|
| Material measure | Magnetically hard periodic N-S graduation |
| Signal period | 200 µm |
| Working environment | |
| Protection category | IP 67 |
| Working temperature | 0°C - +70°C |
| Storage temperature | -20°C - +70°C |
| Vibration / impact | 30 g |

AMSA 3A and AMSA 4A

Accuracy

| | |
|--------------------|--|
| Accuracy class | +/- 5 µm / 1000 mm +/- 2 µm / 40 mm |
| Periodic deviation | +/- 0,7 µm |
| Resolution | max. 0,0625 µm |
| Hysteresis | < 0,5 - 1 µm |

Interfaces

| | |
|---------------------|-------------------------|
| Analog | Voltage interface 1 Vss |
| Voltage supply | 5 V +/- 0,25 V |
| Current consumption | 40 mA per reading head |

AMSD 3A and AMSD 4A

Accuracy

| | |
|--------------------|--|
| Accuracy class | +/- 5 µm / 1000 mm +/- 2 µm / 40 mm |
| Periodic deviation | +/- 1,0 µm |
| Resolution | 0,2 µm / 1,0 µm / 5,0 µm |
| Hysteresis | < 0,5 mm or digitally adjustable |

Interfaces

| | |
|---------------------|--|
| Digital | Quadratur signals RS 422 with reference and error signals Reference pulse width 90° or 500 µs (for FANUC-CNC) |
| Voltage supply | 5 V +/- 0,25 V |
| Current consumption | 110 mA per reading head |

2.4

Technical Data

Ordering information

In order to make the product structure easier to understand, the order keys and the ordering procedure for MONORAIL guide-ways have been revised in the new issue of the catalogue.

The new order codes will now enable you to place clear orders both for individual products, e.g. for spare parts or for individual combinations of guide rails and carriages as well as complete sets of MONORAIL guides.

Rails, carriages and accessories are always denoted by separate order codes. This also applies to different versions of rails and carriages.

The order codes for individual rails, carriages and accessories are in the data section of this catalogue from section 3 on. An attempt has been made here to code all versions by position in order to reduce the error rate in the ordering procedure.

Please use the following order schedule for orders that are to be supplied preassembled:

Order code for MONORAIL systems

Set consisting of:

/ n x S

/ n x W

/ n x W (optional)

/ n x S (optional)

/ n x W (optional)

/ n x Z

NB

S = complete order code for a rail

W = complete order code for a carriage

Z = complete order code for an accessory

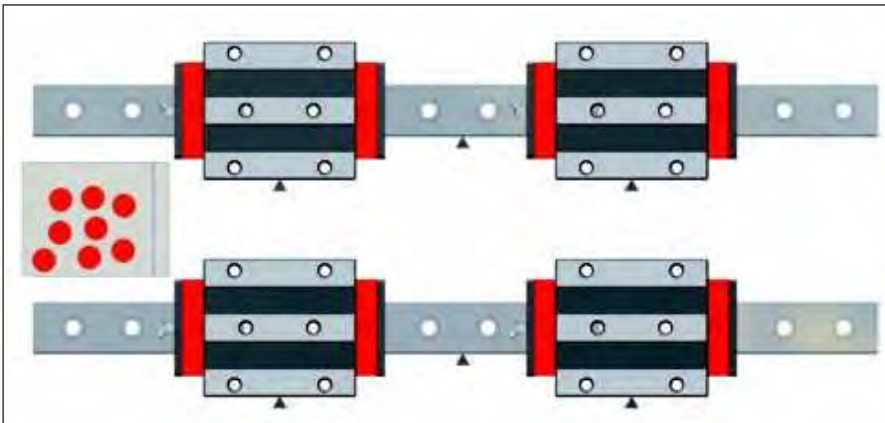
"/" = indicates everything that belongs to a set in an order

n = number, indicates products of the same type

If no customer-related information is available, the rails and carriages are assembled in accordance with the sequence of the items ordered, i.e. the first rail at the top followed by the carriages on the first rail from left to right; then the second rail below it with the carriages from left to right et cetera, cf example 2.

This means that - if rail types and carriage types are different in the order placed - the carriages are always immediately below the relevant rail and in the assembly sequence from left to right.

Example 1: Order without a layout sketch - same types of component



2 identical rails each with 2 identical carriages, accessories (additional wipers) can be clearly allocated due to the number.

Plugs for the rails are always supplied unfitted.

Set consisting of:

/ 2 x MR S 35-N-G1-KC-R1-918-19-19-CN

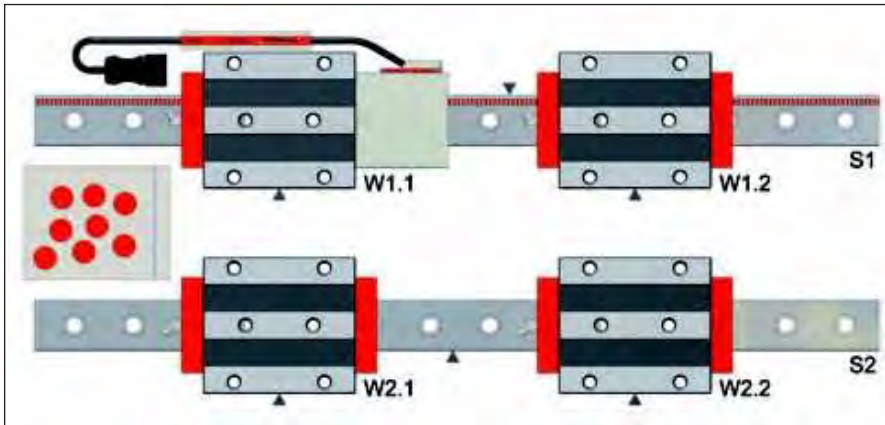
/ 4 x MR W 35-B-G1-V3-R1-CN-S10-LN

/ 2 x MRK 35 (50 pieces)

/ 8 x ZCN 35

/ 4 x SN 6-45

Example 2: Order without a layout sketch - different types of component

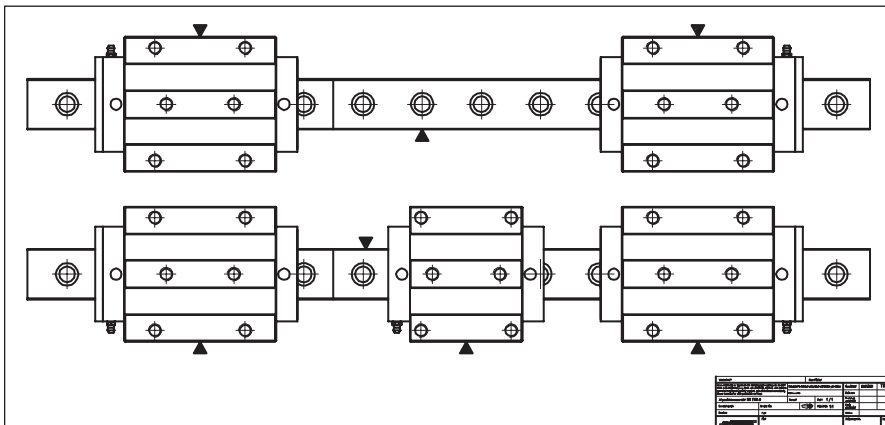


2 different rails and 2 different carriage types, uniform lubrication accessories, allocation and sequence of rails and carriages acc. to the sequence of the items in the order.

Set consisting of:

- / 1 x AMSA 3A S 35-N-G1-KC-R22-918-19-19-CN-TR50 (S1)
- / 1 x AMSA 3A W 35-B-P1-G1-V3-R1-CN-S10-LN-TSU (W1.1)
- / 1 x MR W 35-B-G1-V3-R1-CN-S10-LN (W1.2)
- / 1 x MR S 35-N-G1-KC-R1-918-19-19-CN (S2)
- / 2 x MR W 35-B-G1-V3-R1-CN-S10-LN (W2.1 + W2.2)
- / 2 x MRK 35 (50 pieces)
- / 4 x SN 6-45

Example 3: Order according to customer's layout sketch - different components



2 different rails, 2-part in each case, 5 different carriages.

The rails, carriages and accessories are impossible to allocate clearly without a layout sketch.

Set consisting of:

- / 1 x MR S 35-ND-G1-KC-R1-2478-19-19-CN (part-lengths L3 = 999mm/1479mm)
- / 1 x MR W 35-B-G1-V3-R2-CN-S13-LN
- / 1 x MR W 35-B-G1-V3-R2-CN-S23-LN
- / 1 x MR S 35-ND-G1-KC-R2-2478-19-19-CN (part-lengths L3 = 999mm/1479mm)
- / 1 x MR W 35-B-G1-V3-R1-CN-S12-LN
- / 1 x MR W 35-A-G1-V3-R1-CN-S12-LN
- / 1 x MR W 35-B-G1-V3-R1-CN-S22-LN
- / 5 x MRK 35 (125 pieces)
- / 4 x ZCN 35
- / 5 x SN 6

Important:

Apart from the order designation, further information is required for the troublefree order processing of special versions of MONORAIL systems. For this purpose, the order must include a layout sketch containing the following information:

- Part-lengths and the sequence of the segments for multipart rails
- Carriage type and position in the event of different carriage types on one rail
- Position of additional wipers, lubricating panels and lubricating accessories

2.5

Technical Data

Precautionary measures

General pointers

Please note the following pointers to ensure that your MONORAIL guideways remain in peak working condition throughout their service life:

All SCHNEEBERGER products are precision components that are appropriately protected and packaged at the factory for the purpose of transport. Systems must therefore be protected from vibrations, shock and humidity when being transported and stored.

Please note the pointers on transport and installation that accompany the measuring systems.

Installation of the guideways and the covering of the holes in the rails must be carried out by qualified staff. Please refer to the Download section of www.schneeberger.com for pointers on installation.

Guideways must be adequately supplied with a lubricant that is suited to their movements and load profile as well as to the conditions under which they are expected to operate. If necessary, please contact a lubricant supplier, who will be pleased to advise you on the choice of the correct lubricant. Recommendations will also be found at www.schneeberger.com.

Prior to use, the compatibility of coolants and lubricants must be checked and verified by the user in order to preclude any detrimental effect(s) on the guideway.

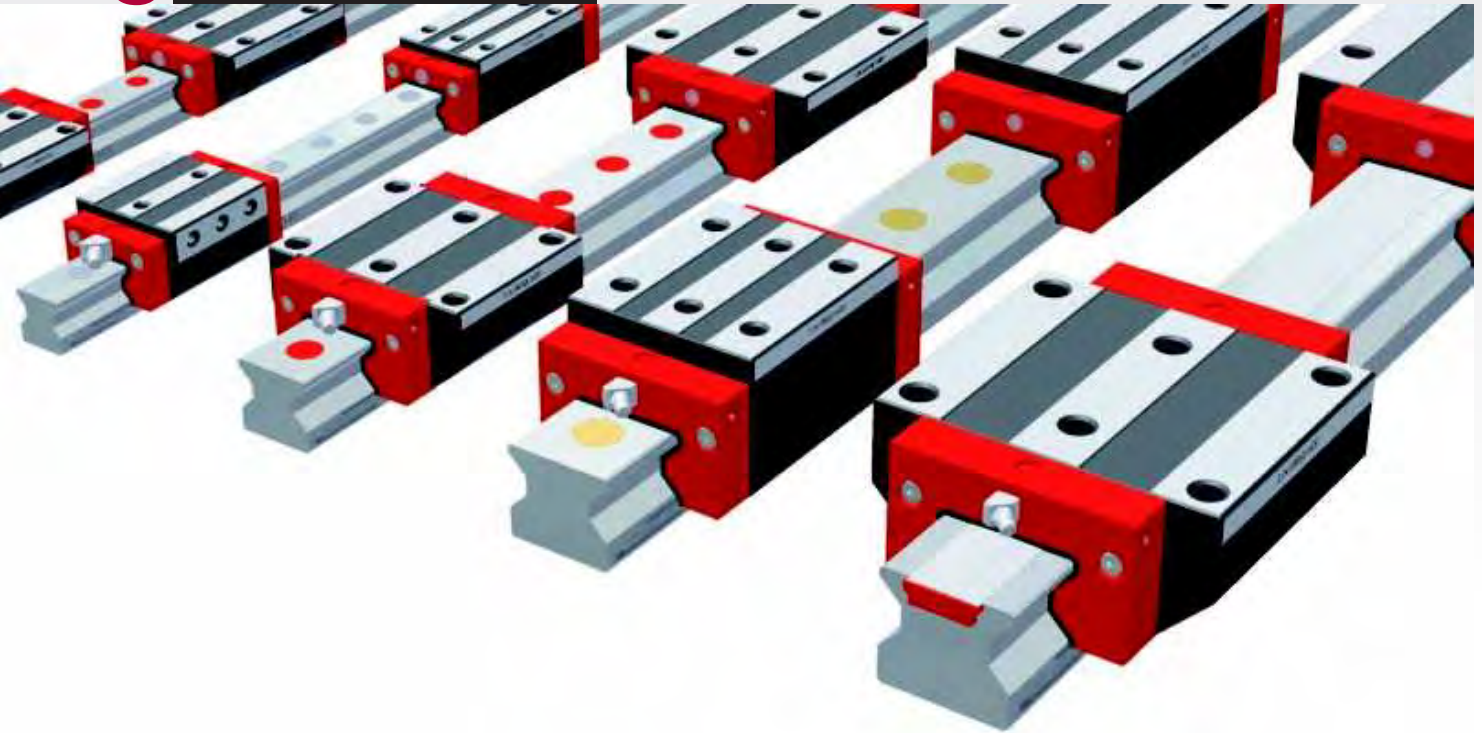
To protect them from dirt, hot metal chips and any direct contact with coolants, guideways should have covers fitted or be appropriately positioned.

If contact with dirt or coolant is anticipated in the course of machining operations, the fitting of additional wipers to the products is necessary. The long-term serviceability of these components must be assured by amended service intervals. Please refer to www.schneeberger.com for pointers on these products.

The wipers on the ends as well as the additional wipers fitted to MONORAIL carriages must be examined at regular intervals for wear and tear and replaced if necessary.

SCHNEEBERGER
 LINEAR TECHNOLOGY

3 **MONORAIL MR**



Exceptional rigidity, high dynamic and static load-carrying capacities, outstanding smooth running and a fully sealed carriage are the main features of the MONORAIL MR Roller Guideway. Specifically designed for machine tools, these properties result in higher machining rates plus enhanced geometrical accuracy and surface quality of the machined component. The exceptional all-round rigidity of the products and the method of connection with the surrounding structure provide improved vibration behaviour at lower amplitudes therefore extending tool life.

Many years of experience in the design, production and use of roller-type guideways as well as the most advanced technologies in product development and volume production are consistently applied and continuously improved. The MONORAIL MR Guideway is a cost-effective solution that meets the demands of modern machine-tool design.

Features of System MONORAIL MR

Details see chapter 1

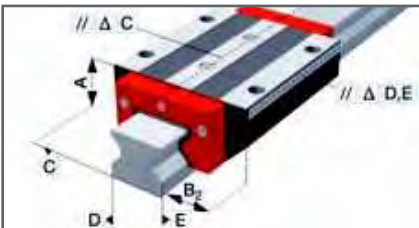


3.1 Overview of Types, Sizes and available Options



| | |
|---------------------------------|-------|
| > Product overview MR Rails | p. 34 |
| > Product overview MR Carriages | p. 35 |

3.2 Technical data and Options



| | |
|----------|-------|
| > MR 25 | p. 36 |
| > MR 35 | p. 38 |
| > MR 45 | p. 40 |
| > MR 55 | p. 42 |
| > MR 65 | p. 44 |
| > MR 100 | p. 46 |

3.3 Accessories MONORAIL MR



| | |
|----------------------------------|-------|
| > Accessories overview | p. 48 |
| > MR Rails accessory details | p. 49 |
| > MR Carriages accessory details | p. 52 |

3.4 Order key



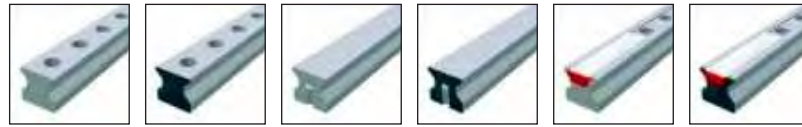
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|--------------------------|-------|
| > Order key MR Rails | p. 55 |
| > Order key MR Carriages | p. 55 |

3.1

MONORAIL MR

Overview of Types, Sizes and available Options

Product overview MR Rails



| | N standard | ND standard, through hardened | NU with tapped holes at the bottom | NUD with tapped holes, through hardened | C for cover strip | CD for cover strip, through hardened |
|---|----------------------|---|--|---|-----------------------------|--|
| Buildsizes / Rail build forms | | | | | | |
| Size 25 | MR S 25-N | MR S 25-ND | MR S 25-NU | | MR S 25-C | MR S 25-CD |
| Size 35 | MR S 35-N | MR S 35-ND | MR S 35-NU | MR S 35-NUD | MR S 35-C | |
| Size 45 | MR S 45-N | MR S 45-ND | MR S 45-NU | | MR S 45-C | |
| Size 55 | MR S 55-N | | MR S 55-NU | | MR S 55-C | |
| Size 65 | MR S 65-N | | MR S 65-NU | | MR S 65-C | |
| Size 100 | MR S 100-N | | | | | |
| Features | | | | | | |
| Screwable from above | • | • | | | • | • |
| Screwable from below | | | • | • | | |
| Small assembly effort | | | • | • | • | • |
| Great single-part system length | • | | • | | • | |
| Usable for bombardment with metal chips | | | | • | | |
| For the support of metal covers | | • | | • | | |

Available options for MR Rails

Details see chapter 2

Accuracy

- G0 Highly accurate
- G1 Very accurate
- G2 Accurate
- G3 Standard

Straightness

- KC Standard

Reference side

- R1 Ref. at bottom
- R2 Ref. on top

Coating

- CN None
- CH Hard chromium

Available accessories for MR Rails

Details see chapter 3.3

Plugs

Cover strips

Assembly tools

Product overview MR Carriages







| | A standard | B standard, long | C compact, high | D compact, high, long | E compact, high, for lateral fixation |
|--|---------------|---------------------|--------------------|--------------------------|--|
| Buildsizes / Carriage build forms | | | | | |
| Size 25 | MR W 25-A | MR W 25-B | MR W 25-C | MR W 25-D | MR W 25-E |
| Size 35 | MR W 35-A | MR W 35-B | MR W 35-C | MR W 35-D | MR W 35-E |
| Size 45 | MR W 45-A | MR W 45-B | MR W 45-C | MR W 45-D | |
| Size 55 | MR W 55-A | MR W 55-B | MR W 55-C | MR W 55-D | |
| Size 65 | | MR W 65-B | | MR W 65-D | |
| Size 100 | | MR W 100-B | | | |
| Features | | | | | |
| Screwable from above | • | • | • | • | |
| Screwable from below | • | • | | | |
| Screwable from the side | | | | | • |
| For high loads and moments | | • | | • | |
| For medium loads and moments | • | | • | | • |




Available options for MR Carriages

Details see chapter 2



Accuracy

-  G0 Highly accurate
-  G1 Very accurate
-  G2 Accurate
-  G3 Standard



Preload

-  V1 Low
-  V2 Medium
-  V3 High












Reference side

-  R1 Ref. at bottom
-  R2 Ref. on top




Coating

-  CN None
-  CH Hard chromium

Lube connections

-  S10 Left center
-  S20 Right center
-  S11 Top left
-  S21 Top right
-  S12 Lower left side
-  S22 Lower right side
-  S13 Upper left side
-  S23 Upper right side
-  S32 Left side
-  S42 Right side
-  S60 Center

Lubrication

-  LN Oil protect
-  LG Grease protect
-  LV Full greasing

Available accessories for MR Carriages

Details see chapter 3.3 and 2.1

Additional wipers
Front plates

Bellows
Lube nipples

Assembly rails
Lube adapters

Lubrication plates

MR S 25 Dimensions



| | MR S 25-N | MR S 25-ND | MR S 25-NU | MR S 25-C | MR S 25-CD |
|--|-----------|------------|------------|-----------|------------|
| B1: Rail width | 23 | 23 | 23 | 23 | 23 |
| J1: Rail height | 24.5 | 24.5 | 24.5 | 24.5 | 24.5 |
| L3: Rail length max. | 6 000 | 1 500 | 6 000 | 3 000 | 1 500 |
| L4: Spacing of fixing holes | 30 | 30 | 30 | 30 | 30 |
| L5/L10: Position of first/last fixing hole | 13.5 | 13.5 | 13.5 | 13.5 | 13.5 |
| Gew: Rail weight, specific (kg/m) | 3.4 | 3.4 | 3.8 | 3.3 | 3.3 |

Available options for MR S 25



MR W 25 Dimensions and capacities



| | MR W 25-A | MR W 25-B | MR W 25-C | MR W 25-D | MR W 25-E |
|--|-----------|-----------|-----------|-----------|-----------|
| A: System height | 36 | 36 | 40 | 40 | 40 |
| B: Carriage width | 70 | 70 | 48 | 48 | 57 |
| B2: Distance between locating faces | 23.5 | 23.5 | 12.5 | 12.5 | 17 |
| C1: Position of center front lube hole | 5.5 | 5.5 | 9.5 | 9.5 | 9.5 |
| C3: Position of lateral lube hole | - | - | - | - | - |
| C4: Position of lateral lube hole | - | - | - | - | - |
| C7: Position of top lube hole | 12 | 23.2 | 17 | 20.7 | 17 |
| J: Carriage height | 29.5 | 29.5 | 33.5 | 33.5 | 33.5 |
| L: Carriage length | 81 | 103.4 | 81 | 103.4 | 81 |
| L1: Exterior fixing hole spacing | 45 | 45 | 35 | 50 | 35 |
| L2: Interior fixing hole spacing | 40 | 40 | - | - | 35 |
| L6: Steel body length | 60 | 79.4 | 57 | 79.4 | 57 |
| N: Lateral fixing hole spacing | 57 | 57 | 35 | 35 | - |
| O: Reference face height | 7.5 | 7.5 | 7.5 | 7.5 | 15 |

Capacities and weights

| | | | | | |
|---|--------|--------|--------|--------|--------|
| C0: Static load capacity (N) | 49 800 | 70 300 | 49 800 | 70 300 | 49 800 |
| C100: Dynamic load capacity (N) | 27 700 | 39 100 | 27 700 | 39 100 | 27 700 |
| MOQ: Static cross moment capacity (Nm) | 733 | 1 035 | 733 | 1 035 | 733 |
| MOL: Static longitudinal moment capacity (Nm) | 476 | 936 | 476 | 936 | 476 |
| MQ: Dynamic cross moment capacity (Nm) | 408 | 576 | 408 | 576 | 408 |
| ML: Dynamic longitudinal moment capacity (Nm) | 265 | 521 | 265 | 521 | 265 |
| Gew: Carriage weight (kg) | 0.7 | 0.9 | 0.6 | 0.7 | 0.7 |

Available options for MR W 25



MR S 35 Dimensions



| | MR S 35-N | MR S 35-ND | MR S 35-NU | MR S 35-NUD | MR S 35-C |
|--|-----------|------------|------------|-------------|-----------|
| B1: Rail width | 34 | 34 | 34 | 34 | 34 |
| J1: Rail height | 32 | 32 | 32 | 32 | 32 |
| L3: Rail length max. | 6 000 | 1 500 | 6 000 | 1 500 | 6 000 |
| L4: Spacing of fixing holes | 40 | 40 | 40 | 40 | 40 |
| L5/L10: Position of first/last fixing hole | 18.5 | 18.5 | 18.5 | 18.5 | 18.5 |
| Gew: Rail weight, specific (kg/m) | 6.5 | 6.5 | 7.1 | 7.1 | 6.3 |

Available options for MR S 35



MR W 35 Dimensions and capacities



| | MR W 35-A | MR W 35-B | MR W 35-C | MR W 35-D | MR W 35-E |
|--|-----------|-----------|-----------|-----------|-----------|
| A: System height | 48 | 48 | 55 | 55 | 55 |
| B: Carriage width | 100 | 100 | 70 | 70 | 76 |
| B2: Distance between locating faces | 33 | 33 | 18 | 18 | 21 |
| C1: Position of center front lube hole | 7 | 7 | 14 | 14 | 14 |
| C3: Position of lateral lube hole | 7 | 7 | 14 | 14 | 14 |
| C4: Position of lateral lube hole | 17 | 30.5 | 23 | 25.5 | 23 |
| C7: Position of top lube hole | 14 | 27.5 | 20 | 22.5 | 20 |
| J: Carriage height | 40 | 40 | 47 | 47 | 47 |
| L: Carriage length | 109 | 136 | 109 | 136 | 109 |
| L1: Exterior fixing hole spacing | 62 | 62 | 50 | 72 | 50 |
| L2: Interior fixing hole spacing | 52 | 52 | - | - | 50 |
| L6: Steel body length | 80 | 103 | 76 | 103 | 76 |
| N: Lateral fixing hole spacing | 82 | 82 | 50 | 50 | - |
| O: Reference face height | 8 | 8 | 8 | 8 | 22 |

Capacities and weights

| | | | | | |
|---|--------|---------|--------|---------|--------|
| C0: Static load capacity (N) | 93 400 | 128 500 | 93 400 | 128 500 | 93 400 |
| C100: Dynamic load capacity (N) | 52 000 | 71 500 | 52 000 | 71 500 | 52 000 |
| MOQ: Static cross moment capacity (Nm) | 2 008 | 2 762 | 2 008 | 2 762 | 2 008 |
| MOL: Static longitudinal moment capacity (Nm) | 1 189 | 2 214 | 1 189 | 2 214 | 1 189 |
| MQ: Dynamic cross moment capacity (Nm) | 1 118 | 1 537 | 1 118 | 1 537 | 1 118 |
| ML: Dynamic longitudinal moment capacity (Nm) | 662 | 1 232 | 662 | 1 232 | 662 |
| Gew: Carriage weight (kg) | 1.6 | 2.2 | 1.5 | 2.0 | 1.8 |

Available options for MR W 35



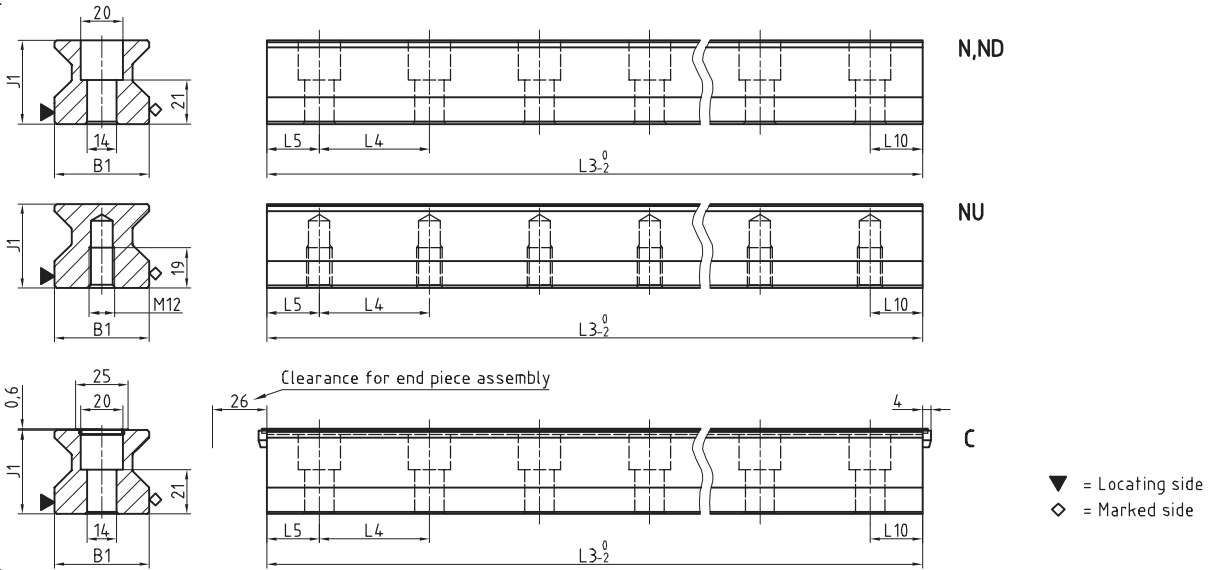
3.2

MONORAIL MR

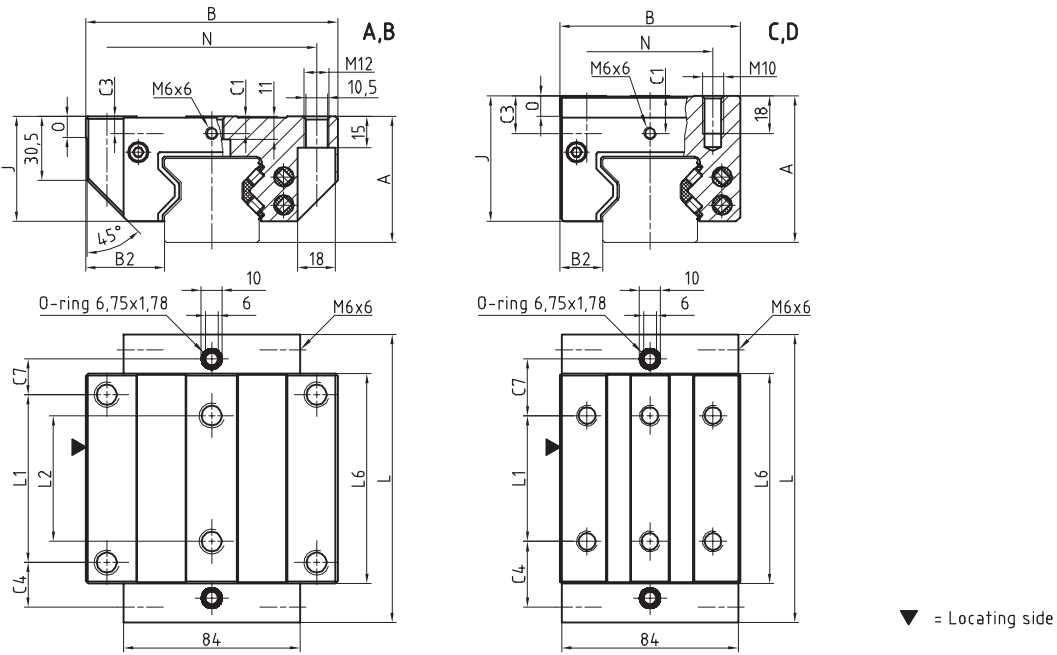
MR 45

Technical Data

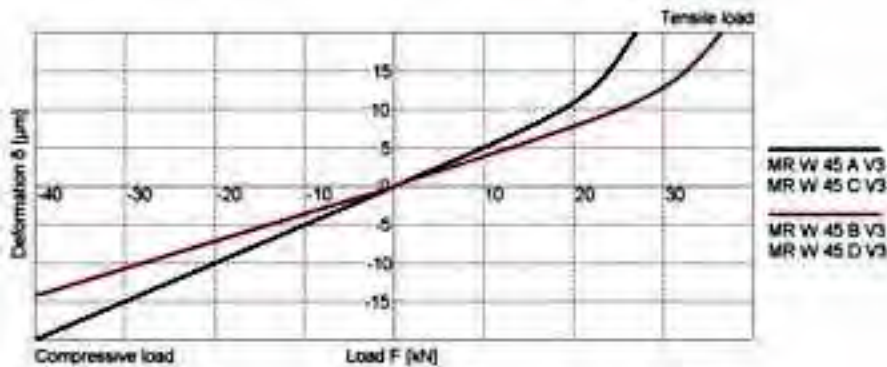
MR 45 Rail Drawings



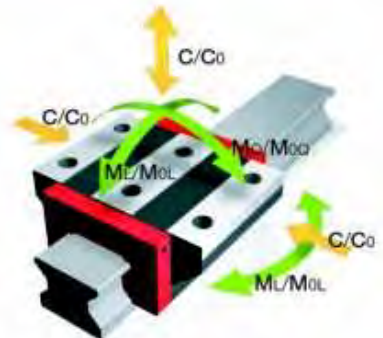
MR 45 Carriage Drawings



MR 45 Rigidity diagram



MR 45 load rating



MR S 45 Dimensions

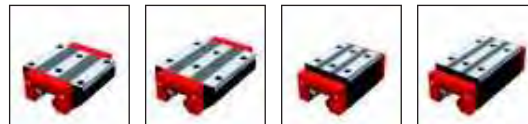


| | MR S 45-N | MR S 45-ND | MR S 45-NU | MR S 45-C | | |
|--|-----------|------------|------------|-----------|--|--|
| B1: Rail width | 45 | 45 | 45 | 45 | | |
| J1: Rail height | 40 | 40 | 40 | 40 | | |
| L3: Rail length max. | 6 000 | 1 500 | 6 000 | 6 000 | | |
| L4: Spacing of fixing holes | 52.5 | 52.5 | 52.5 | 52.5 | | |
| L5/L10: Position of first/last fixing hole | 25 | 25 | 25 | 25 | | |
| Gew: Rail weight, specific (kg/m) | 10.8 | 10.8 | 11.8 | 10.6 | | |

Available options for MR S 45



MR W 45 Dimensions and capacities



| | MR W 45-A | MR W 45-B | MR W 45-C | MR W 45-D | | |
|--|-----------|-----------|-----------|-----------|--|--|
| A: System height | 60 | 60 | 70 | 70 | | |
| B: Carriage width | 120 | 120 | 86 | 86 | | |
| B2: Distance between locating faces | 37.5 | 37.5 | 20.5 | 20.5 | | |
| C1: Position of center front lube hole | 8 | 8 | 18 | 18 | | |
| C3: Position of lateral lube hole | 8 | 8 | 18 | 18 | | |
| C4: Position of lateral lube hole | 21.25 | 38.75 | 31.25 | 38.75 | | |
| C7: Position of top lube hole | 17 | 34.5 | 27 | 34.5 | | |
| J: Carriage height | 50 | 50 | 60 | 60 | | |
| L: Carriage length | 137.5 | 172.5 | 137.5 | 172.5 | | |
| L1: Exterior fixing hole spacing | 80 | 80 | 60 | 80 | | |
| L2: Interior fixing hole spacing | 60 | 60 | - | - | | |
| L6: Steel body length | 100 | 135 | 100 | 135 | | |
| N: Lateral fixing hole spacing | 100 | 100 | 60 | 60 | | |
| O: Reference face height | 10 | 10 | 10 | 10 | | |

Capacities and weights

| | | | | | | |
|---|---------|---------|---------|---------|--|--|
| C0: Static load capacity (N) | 167 500 | 229 500 | 167 500 | 229 500 | | |
| C100: Dynamic load capacity (N) | 93 400 | 127 800 | 93 400 | 127 800 | | |
| MOQ: Static cross moment capacity (Nm) | 4 621 | 6 333 | 4 621 | 6 333 | | |
| MOL: Static longitudinal moment capacity (Nm) | 2 790 | 5 161 | 2 790 | 5 161 | | |
| MQ: Dynamic cross moment capacity (Nm) | 2 577 | 3 527 | 2 577 | 3 527 | | |
| ML: Dynamic longitudinal moment capacity (Nm) | 1 556 | 2 874 | 1 556 | 2 874 | | |
| Gew: Carriage weight (kg) | 3.2 | 4.3 | 3.0 | 4.0 | | |

Available options for MR W 45



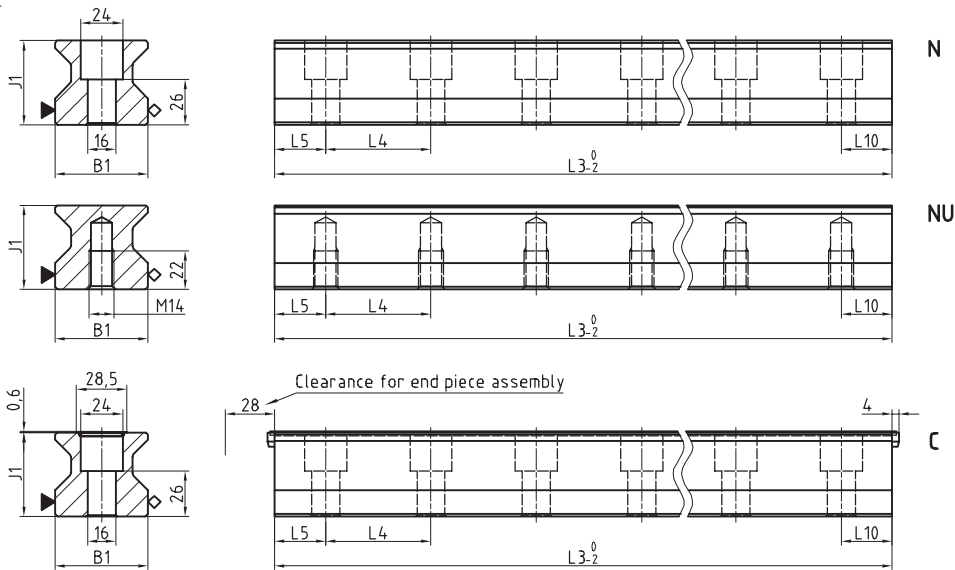
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MONORAIL MR

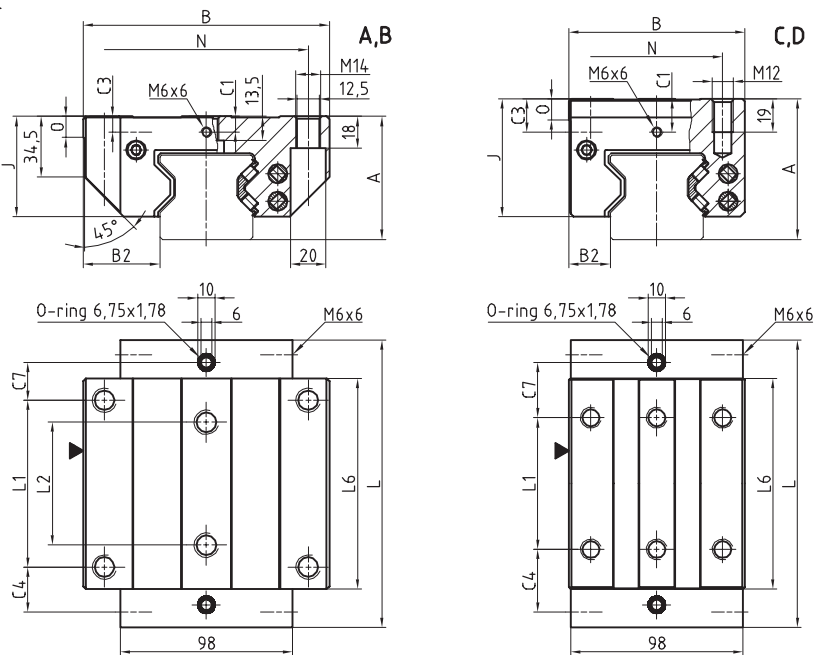
MR 55

Technical Data

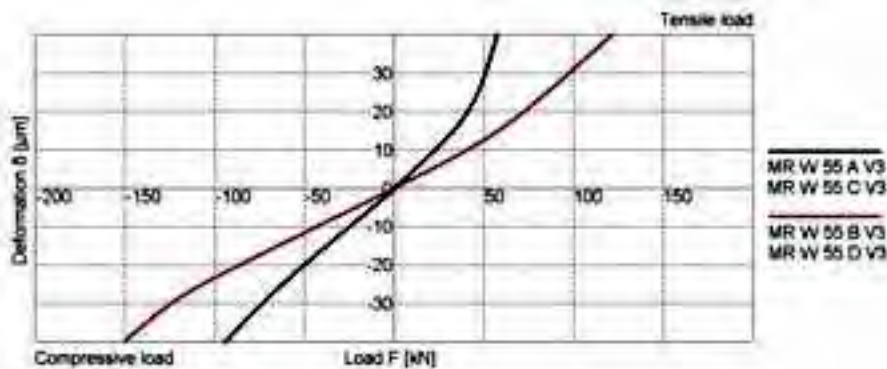
MR 55 Rail Drawings



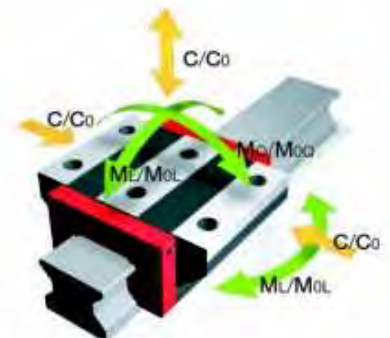
MR 55 Carriage Drawings



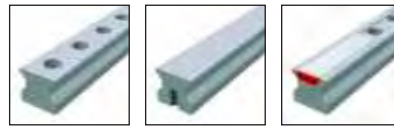
MR 55 Rigidity diagram



MR 55 load rating



MR S 55 Dimensions



| | MR S 55-N | MR S 55-NU | MR S 55-C | | | |
|--|-----------|------------|-----------|--|--|--|
| B1: Rail width | 53 | 53 | 53 | | | |
| J1: Rail height | 48 | 48 | 48 | | | |
| L3: Rail length max. | 6 000 | 6 000 | 6 000 | | | |
| L4: Spacing of fixing holes | 60 | 60 | 60 | | | |
| L5/L10: Position of first/last fixing hole | 28.5 | 28.5 | 28.5 | | | |
| Gew: Rail weight, specific (kg/m) | 15.2 | 16.6 | 14.9 | | | |

Available options for MR S 55



MR W 55 Dimensions and capacities



| | MR W 55-A | MR W 55-B | MR W 55-C | MR W 55-D | | |
|--|-----------|-----------|-----------|-----------|--|--|
| A: System height | 70 | 70 | 80 | 80 | | |
| B: Carriage width | 140 | 140 | 100 | 100 | | |
| B2: Distance between locating faces | 43.5 | 43.5 | 23.5 | 23.5 | | |
| C1: Position of center front lube hole | 9 | 9 | 19 | 19 | | |
| C3: Position of lateral lube hole | 9 | 9 | 19 | 19 | | |
| C4: Position of lateral lube hole | 25.75 | 46.75 | 35.75 | 46.75 | | |
| C7: Position of top lube hole | 21.5 | 42.5 | 31.5 | 42.5 | | |
| J: Carriage height | 57 | 57 | 67 | 67 | | |
| L: Carriage length | 163.5 | 205.5 | 163.5 | 205.5 | | |
| L1: Exterior fixing hole spacing | 95 | 95 | 75 | 95 | | |
| L2: Interior fixing hole spacing | 70 | 70 | - | - | | |
| L6: Steel body length | 120 | 162 | 120 | 162 | | |
| N: Lateral fixing hole spacing | 116 | 116 | 75 | 75 | | |
| O: Reference face height | 12 | 12 | 12 | 12 | | |

Capacities and weights

| | | | | | | |
|---|---------|---------|---------|---------|--|--|
| C0: Static load capacity (N) | 237 000 | 324 000 | 237 000 | 324 000 | | |
| C100: Dynamic load capacity (N) | 131 900 | 180 500 | 131 900 | 180 500 | | |
| MOQ: Static cross moment capacity (Nm) | 7 771 | 10 624 | 7 771 | 10 624 | | |
| MOL: Static longitudinal moment capacity (Nm) | 4 738 | 8 745 | 4 738 | 8 745 | | |
| MQ: Dynamic cross moment capacity (Nm) | 4 325 | 5 919 | 4 325 | 5 919 | | |
| ML: Dynamic longitudinal moment capacity (Nm) | 2 637 | 4 872 | 2 637 | 4 872 | | |
| Gew: Carriage weight (kg) | 5.0 | 6.8 | 4.5 | 6.1 | | |

Available options for MR W 55



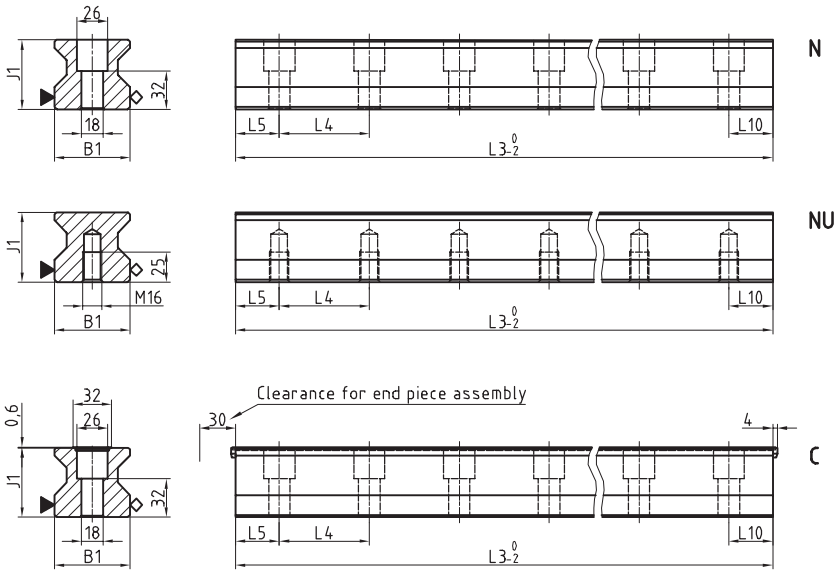
3.2

MONORAIL MR

MR 65

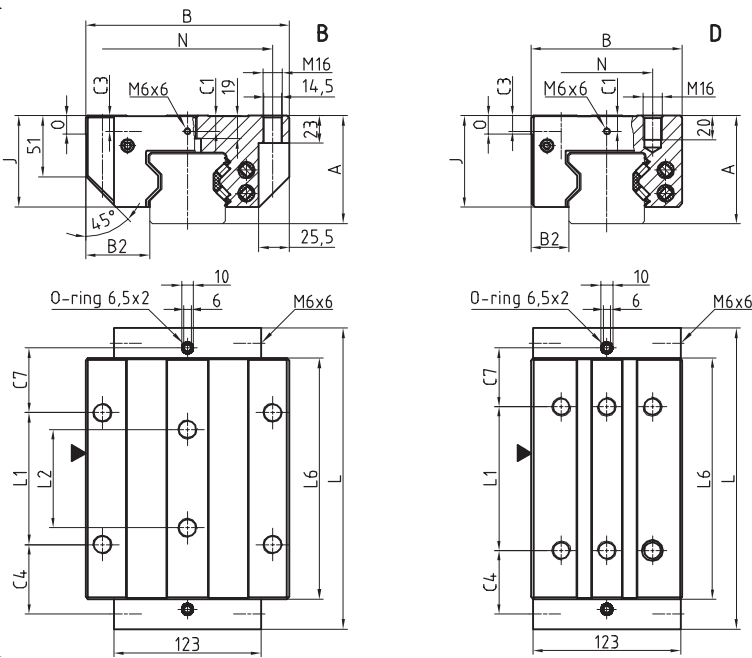
Technical Data

MR 65 Rail Drawings



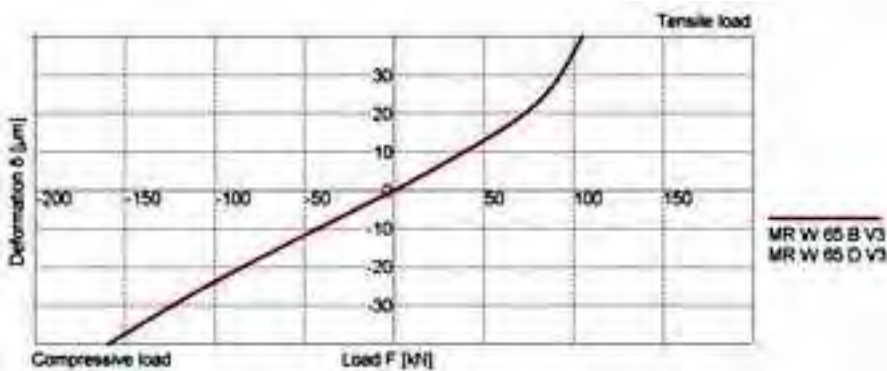
▼ = Locating side
 ◇ = Marked side

MR 65 Carriage Drawings

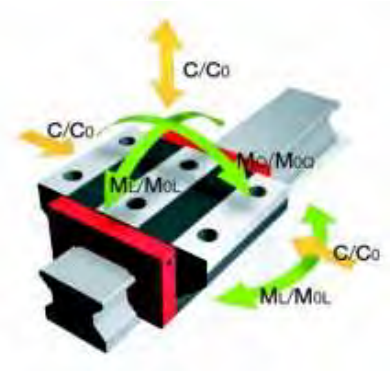


▼ = Locating side

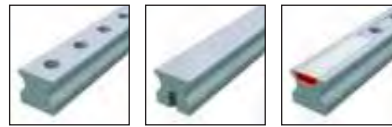
MR 65 Rigidity diagram



MR 65 load rating



MR S 65 Dimensions



| | MR S 65-N | MR S 65-NU | MR S 65-C | | | |
|--|-----------|------------|-----------|--|--|--|
| B1: Rail width | 63 | 63 | 63 | | | |
| J1: Rail height | 58 | 58 | 58 | | | |
| L3: Rail length max. | 6 000 | 6 000 | 6 000 | | | |
| L4: Spacing of fixing holes | 75 | 75 | 75 | | | |
| L5/L10: Position of first/last fixing hole | 36 | 36 | 36 | | | |
| Gew: Rail weight, specific (kg/m) | 22.8 | 24.5 | 22.5 | | | |

Available options for MR S 65



MR W 65 Dimensions and capacities



| | MR W 65-B | MR W 65-D | | | | |
|--|-----------|-----------|--|--|--|--|
| A: System height | 90 | 90 | | | | |
| B: Carriage width | 170 | 126 | | | | |
| B2: Distance between locating faces | 53.5 | 31.5 | | | | |
| C1: Position of center front lube hole | 13 | 13 | | | | |
| C3: Position of lateral lube hole | 13 | 13 | | | | |
| C4: Position of lateral lube hole | 58 | 53 | | | | |
| C7: Position of top lube hole | 54 | 49 | | | | |
| J: Carriage height | 76 | 76 | | | | |
| L: Carriage length | 251 | 251 | | | | |
| L1: Exterior fixing hole spacing | 110 | 120 | | | | |
| L2: Interior fixing hole spacing | 82 | - | | | | |
| L6: Steel body length | 201 | 201 | | | | |
| N: Lateral fixing hole spacing | 142 | 76 | | | | |
| O: Reference face height | 15 | 15 | | | | |

Capacities and weights

| | | | | | | |
|---|---------|---------|--|--|--|--|
| C0: Static load capacity (N) | 530 000 | 530 000 | | | | |
| C100: Dynamic load capacity (N) | 295 000 | 295 000 | | | | |
| MOQ: Static cross moment capacity (Nm) | 20 912 | 20 912 | | | | |
| MOL: Static longitudinal moment capacity (Nm) | 17 930 | 17 930 | | | | |
| MQ: Dynamic cross moment capacity (Nm) | 11 640 | 11 640 | | | | |
| ML: Dynamic longitudinal moment capacity (Nm) | 9 980 | 9 980 | | | | |
| Gew: Carriage weight (kg) | 13.5 | 10.4 | | | | |

Available options for MR W 65



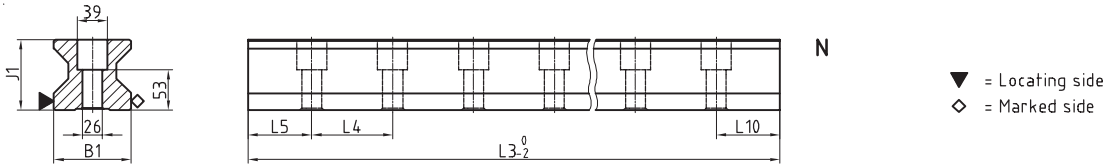
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MONORAIL MR

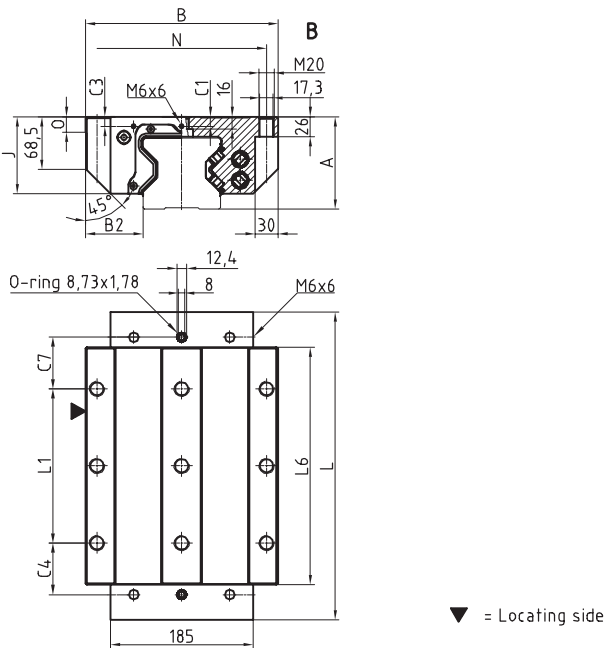
MR 100

Technical Data

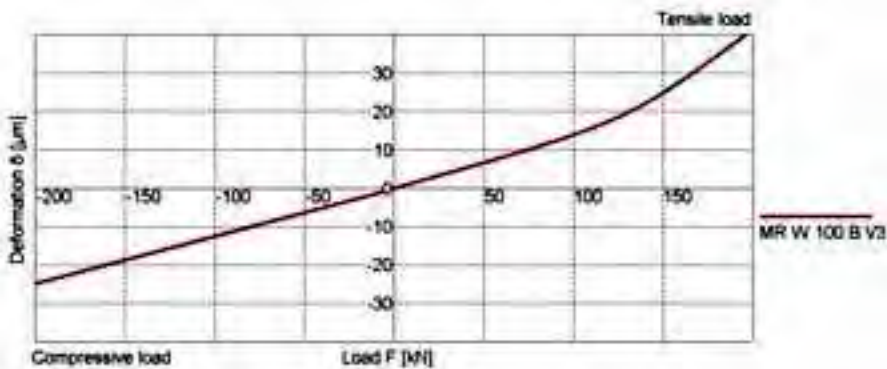
MR 100 Rail Drawings



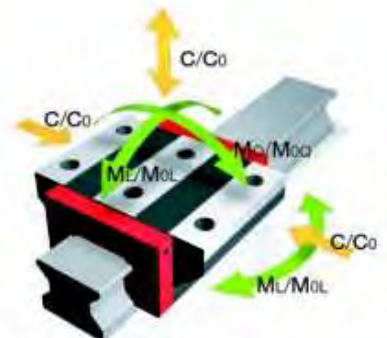
MR 100 Carriage Drawings



MR 100 Rigidity diagram



MR 100 load rating



MR S 100 Dimensions



| | MR S 100-N | | | |
|--|------------|--|--|--|
| B1: Rail width | 100 | | | |
| J1: Rail height | 92 | | | |
| L3: Rail length max. | 3 000 | | | |
| L4: Spacing of fixing holes | 105 | | | |
| L5/L10: Position of first/last fixing hole | 51 | | | |
| Gew: Rail weight, specific (kg/m) | 55.0 | | | |

Available options for MR S 100



MR W 100 Dimensions and capacities



| | MR W 100-B | | | |
|--|------------|--|--|--|
| A: System height | 120 | | | |
| B: Carriage width | 250 | | | |
| B2: Distance between locating faces | 75 | | | |
| C1: Position of center front lube hole | 12.5 | | | |
| C3: Position of lateral lube hole | 12.5 | | | |
| C4: Position of lateral lube hole | 67 | | | |
| C7: Position of top lube hole | 67 | | | |
| J: Carriage height | 100 | | | |
| L: Carriage length | 400 | | | |
| L1: Exterior fixing hole spacing | 200 | | | |
| L2: Interior fixing hole spacing | - | | | |
| L6: Steel body length | 308 | | | |
| N: Lateral fixing hole spacing | 220 | | | |
| O: Reference face height | 20 | | | |

Capacities and weights

| | | | | |
|---|-----------|--|--|--|
| C0: Static load capacity (N) | 1 470 000 | | | |
| C100: Dynamic load capacity (N) | 605 000 | | | |
| MOQ: Static cross moment capacity (Nm) | 91 471 | | | |
| MOL: Static longitudinal moment capacity (Nm) | 39 432 | | | |
| MQ: Dynamic cross moment capacity (Nm) | 37 646 | | | |
| ML: Dynamic longitudinal moment capacity (Nm) | 16 229 | | | |
| Gew: Carriage weight (kg) | 40.0 | | | |

Available options for MR W 100



3.3

MONORAIL MR

Accessories

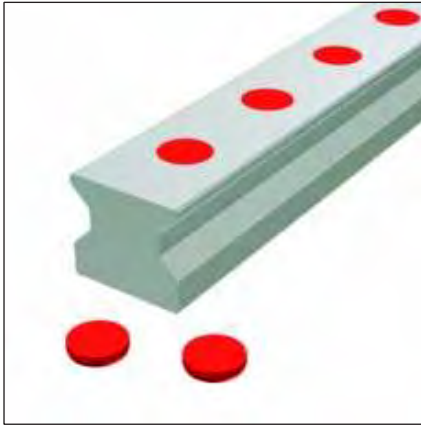
MR Rails accessories overview

| Accessories | MR S 25 | MR S 35 | MR S 45 | MR S 55 | MR S 65 | MR S 100 | |
|--|------------|------------|------------|------------|------------|----------|--|
| Plugs: | | | | | | | |
| Plastic plugs | MRK 25 | MRK 35 | MRK 45 | MRK 55 | MRK 65 | - | |
| Brass plugs | MRS 25 | MRS 35 | MRS 45 | MRS 55 | MRS 65 | MRS 100 | |
| Steel plugs | MRZ 25 | MRZ 35 | MRZ 45 | MRZ 55 | MRZ 65 | MRZ 100 | |
| Cover strips: | | | | | | | |
| Cover strip (spare part) | MAC 25 | MAC 35 | MAC 45 | MAC 55 | MAC 65 | - | |
| End piece for cover strip (spare part) | EST 25-MAC | EST 35-MAC | EST 45-MAC | EST 55-MAC | EST 65-MAC | - | |
| Assembly tools: | | | | | | | |
| Installation tool for steel plugs | MWH 25 | MWH 35 | MWH 45 | MWH 55 | MWH 65 | MWH 100 | |
| Hydraulic cylinder for MWH | MZH | MZH | MZH | MZH | MZH | MZH | |
| Installation tool for cover strip | MWC 25 | MWC 35 | MWC 45 | MWC 55 | MWC 65 | - | |

MR Carriages accessories overview

| Accessories | MR W 25 | MR W 35 | MR W 45 | MR W 55 | MR W 65 | MR W 100 | |
|---|------------|---------------|---------------|---------------|---------------|---------------|--|
| Additional wipers: | | | | | | | |
| Additional wiper NBR | ZCN 25 | ZCN 35 | ZCN 45 | ZCN 55 | ZCN 65 | ZCN 100 | |
| Additional wiper Viton | ZCV 25 | ZCV 35 | ZCV 45 | ZCV 55 | ZCV 65 | ZCV 100 | |
| Metal wiper | ASM 25 | ASM 35 | ASM 45 | ASM 55 | ASM 65 | ASM 100 | |
| Bellows: | | | | | | | |
| Bellows | FBM 25 | FBM 35 | FBM 45 | FBM 55 | FBM 65 | - | |
| Adapter plate for bellows (spare part) | ZPL 25 | ZPL 35 | ZPL 45 | ZPL 55 | ZPL 65 | - | |
| End plate for bellows (spare part) | EPL 25 | EPL 35 | EPL 45 | EPL 55 | EPL 65 | - | |
| Assembly rails: | | | | | | | |
| Assembly rail | MRM 25 | MRM 35 | MRM 45 | MRM 55 | MRM 65 | MRM 100 | |
| Lubrication plates: | | | | | | | |
| Lubrication plate | SPL 25-MR | SPL 35-MR | SPL 45-MR | SPL 55-MR | SPL 65-MR | - | |
| Front plates: | | | | | | | |
| Front plate (spare part) | STP 25-EK | STP 35-EK | STP 45-EK | STP 55-EK | STP 65-EK | STP 100-EK | |
| Lube nipples: | | | | | | | |
| Hydraulic-type grease nipple straight | SN 6 | SN 6 | SN 6 | SN 6 | SN 6 | SN 6 | |
| Hydraulic-type grease nipple 45° | SN 6-45 | SN 6-45 | SN 6-45 | SN 6-45 | SN 6-45 | SN 6-45 | |
| Hydraulic-type grease nipple 90° | SN 6-90 | SN 6-90 | SN 6-90 | SN 6-90 | SN 6-90 | SN 6-90 | |
| Flush type grease nipple M6 | SN 6-T | SN 6-T | SN 6-T | SN 6-T | SN 6-T | SN 6-T | |
| Grease gun for SN 3-T and SN 6-T | SFP-T3 | SFP-T3 | SFP-T3 | SFP-T3 | SFP-T3 | SFP-T3 | |
| Lube adapters: | | | | | | | |
| Lubrication adapter M8 round-head | SA 6-RD-M8 | SA 6-RD-M8 | SA 6-RD-M8 | SA 6-RD-M8 | SA 6-RD-M8 | SA 6-RD-M8 | |
| Lubrication adapter M8 hexagon head | - | SA 6-6KT-M8 | SA 6-6KT-M8 | SA 6-6KT-M8 | SA 6-6KT-M8 | SA 6-6KT-M8 | |
| Lubrication adapter G1/8 hexagon head | - | SA 6-6KT-G1/8 | SA 6-6KT-G1/8 | SA 6-6KT-G1/8 | SA 6-6KT-G1/8 | SA 6-6KT-G1/8 | |
| Swivel screw connection for pipe d=4 mm | SV 6-D4 | SV 6-D4 | SV 6-D4 | SV 6-D4 | SV 6-D4 | SV 6-D4 | |
| Swivel screw connection M6 | SV 6-M6 | SV 6-M6 | SV 6-M6 | SV 6-M6 | SV 6-M6 | SV 6-M6 | |
| Swivel screw connection M6 long | SV 6-M6-L | SV 6-M6-L | SV 6-M6-L | SV 6-M6-L | SV 6-M6-L | SV 6-M6-L | |
| Swivel screw connection M8 | SV 6-M8 | SV 6-M8 | SV 6-M8 | SV 6-M8 | SV 6-M8 | SV 6-M8 | |
| Swivel screw connection M8 long | SV 6-M8-L | SV 6-M8-L | SV 6-M8-L | SV 6-M8-L | SV 6-M8-L | SV 6-M8-L | |

MR Rails accessory details



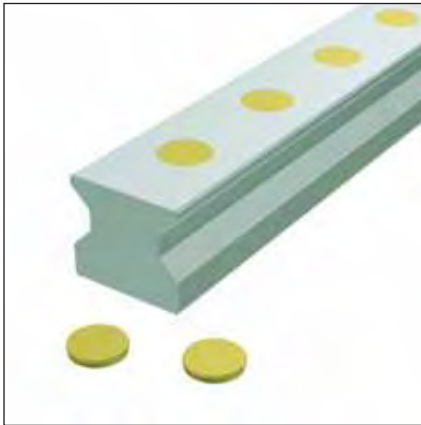
Plastic plugs

MRK plastic plugs are used as a low-cost method of closing off the rail attachment holes. They can be fitted manually with fairly simple tools. Plastic plugs are recommended for use with protected axes or in environments with low levels of contamination, e.g. handling.

Quantity supplied: Pack of 25 pcs.

Order code: **MRK xx**

xx = Size, Sample order: 6 x MRK 65



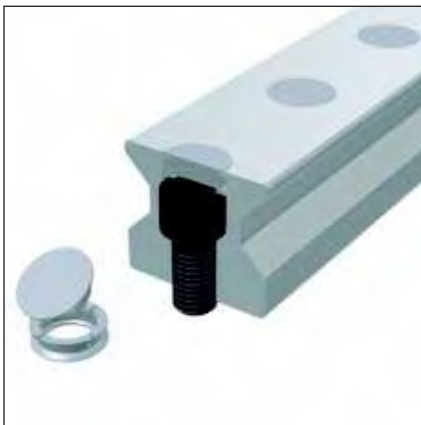
Brass plugs

Brass plugs are used in applications with increased contamination or external temperature influences, e.g., in the case of chip impact or whenever a smooth and gap-free rail surface is required.

A hydraulic MWH fitting tool is recommended for correct installation.

Order code: **MRS xx**

xx = Size, Sample order: 48 x MRS 65



Steel plugs

Made of stainless steel, the two-part steel plugs are suitable for applications with greater demands on the mechanical stability of rail surfaces, e.g. when mechanical loads are higher or in open chip spaces. They combine the advantages of simple and very precise installation and a high degree of mechanical stability.

Function:

The clamping ring lies loosely on the screw head in the hole in the rail. When the slightly conical plug is pressed in, the ring is expanded to establish a positive frictional connection between the plug and the hole in the rail.

When fitted, the plug is flush with the rail surface where it ensures that the wipers operate to the optimum degree and have an optimum service life.

A hydraulic MWH fitting tool is necessary for correct installation.

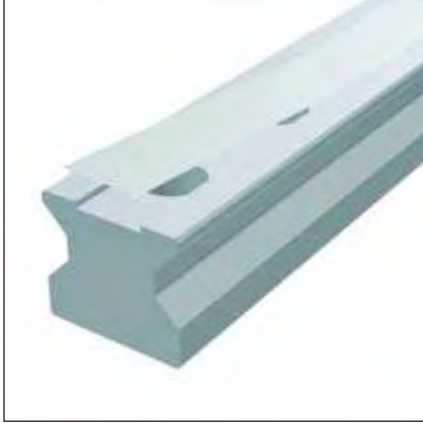
Order code: **MRZ xx**

xx = Size, Sample order: 48 x MRZ 65

3.3

MONORAIL MR

Accessories



Cover strip (spare part)

A SCHNEEBERGER MAC cover strip combines technical functionality with simple handling and neat appearance. Made of stainless spring steel, the strip is suitable for demanding applications with increased contamination or external temperature influences.

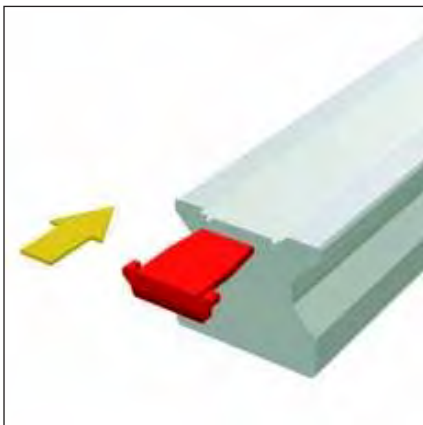
It provides the following advantages:

- Reliable fixing along the length as it is clipped into a special groove
- Additional fixing of the ends of the strips using locking parts (EST xx-MAC)
- Very robust thanks to the substantial thickness of the material
- The strip free top surface of the rail can be used to support covers
- Can be fitted and removed several times
- Protection of the wipers during installation as the rail holes are recessed in the groove
- Single piece cover strip lengths of upto 6 meters

When ordering guide rails with cover strips, they are included in the scope of supply.

Order code: **MAC xx-yy**

xx = Size, yy = Rail length in mm, Sample order: 1 x MAC 65-4320



End piece for cover strip (spare part)

EST end pieces are used to close the ends of MAC cover strips. To do this, these plastic parts are inserted on both ends of the rail into the gap under the cover strip. Their special design prevents the ends of the cover strip from lifting and reduces the danger of injury on the sharp edges of the cover strip.

Order code: **EST xx-MAC**

xx = Size, Sample order: 2 x EST 65-MAC

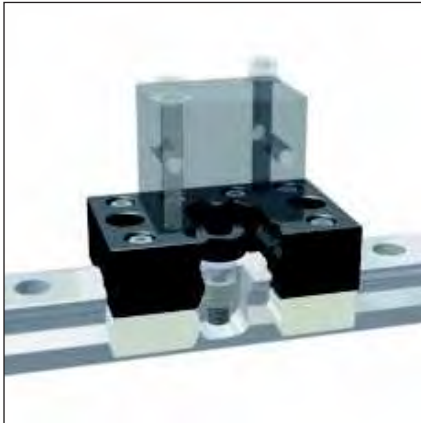


Installation tool for cover strip

A MWC fitting tool is used to simplify the fitting of an MAC cover strip. At the same time, it ensures that the cover strip sits securely in the rail groove without any gaps.

Order code: **MWC xx**

xx = Size, Sample order: 1 x MWC 65

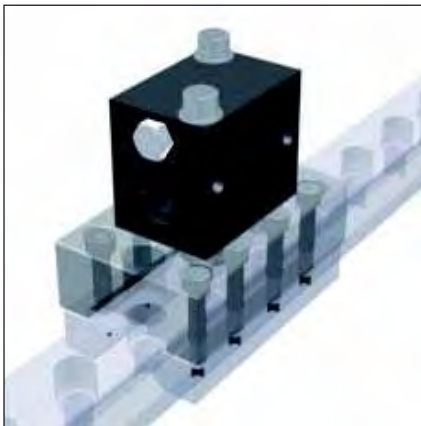


Installation tool for steel plugs

An MWH fitting tool is used to insert MRZ two-part steel plugs hydraulically. It consists of a specially sized shoe and insertion ram. The fitting tool also requires an MZH hydraulic cylinder. For assembly the shoe and the insertion ram must be screwed to the hydraulic cylinder.

Order code: **MWH xx**

xx = Size, Sample order: 1 x MWH 35



Hydraulic cylinder for MWH

An MZH hydraulic cylinder is a single-action block cylinder used to create the required insertion force. A standard hydraulic unit that provides the pressure required for the insertion process is connected to the 1/4" threaded connection. The hydraulic cylinder fits all sizes of MWH fitting tool and must be ordered separately.

Order code: **MZH**

Sample order: 1 x MZH

3.3

MONORAIL MR

Accessories

MR Carriages accessory details



Additional wiper NBR

ZCN nitrile wipers provide additional protection of the carriages in heavily contaminated environments. Thanks to their flexibility, they can be fitted directly over the rail cross section. ZCN wipers can also be used in combination with ASM metal wipers.

Order code: **ZCN xx**

xx = Size, Sample order: 2 x ZCN 65



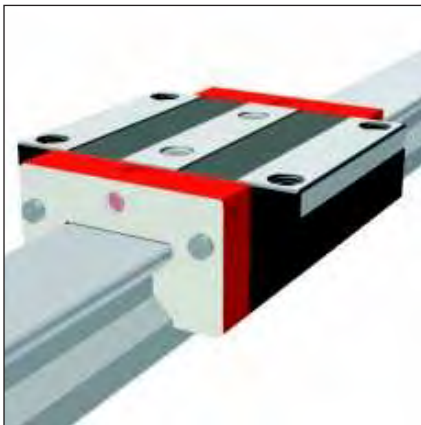
Additional wiper Viton

Like ZCN wipers, ZCV additional wipers provide extra protection of the carriages in heavily contaminated environments. Made of Viton® (fluoroelastomer), they are suitable for use with aggressive coolants.

As their flexibility allows them to be pushed over the rail cross section, retrofitting is possible without the need to remove the carriage from the rail. ZCV wipers can also be used in combination with ASM metal wipers.

Order code: **ZCV xx**

xx = Size, Sample order: 2 x ZCV 65



Metal wiper

Made of stainless steel, ASM metal wipers are used to protect the sealing lips of carriages and additional wipers against hot metal chips. Large and loose dirt particles are pushed away and cannot get jammed due to the controlled dimension of the gap with the rail. Specially adapted types are available for rails using AMS measuring systems.

Metal wipers are ideally used in combination with ZCN/ZCV additional wipers.

Order code: **ASM xx**

xx= Size, Sample order: 1 x ASM 65



Bellows

Standard bellows are available for MONORAIL sizes MR 25 – MR 65, the purpose of which is to provide additional protection against dust and water splashes. The bellows are made of synthetic fabric coated on both sides with plastic. The bellows cover the entire length of the rail and their cross section matches the faceplate of the carriage. The external dimensions of the carriage are thus not exceeded by the bellows.

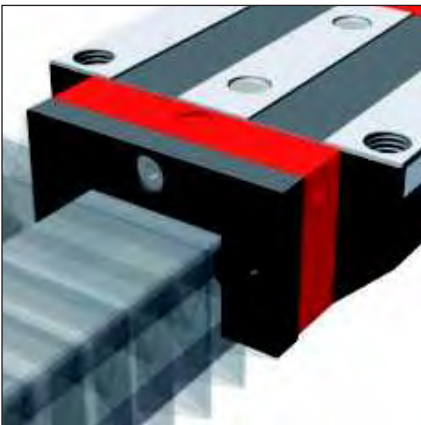
Installation is simple and takes little time. A ZPL adapter plate is required to attach the bellows to the carriage. The adapter plate is screwed to the front plate of the carriage using a central screw. An EPL end plate is screwed to the end face of the rail. The bellows are fastened by two rivets to both the adapter plate and the front plate.

Retrofitting can only be realised with induction hardened rails as the rail ends have to be drilled for the attachment of the EPL end plates.

The required adapter and end plates, the attachment screws and rivet plugs are supplied with each order for a complete set of bellows. The attachment holes for the end plate are also prepared in the rail when a guideway with bellows is ordered.

Order code: **FBM xx-yy**

xx = Size, yy = Number of folds, Sample order: 1 x FBM 65-137



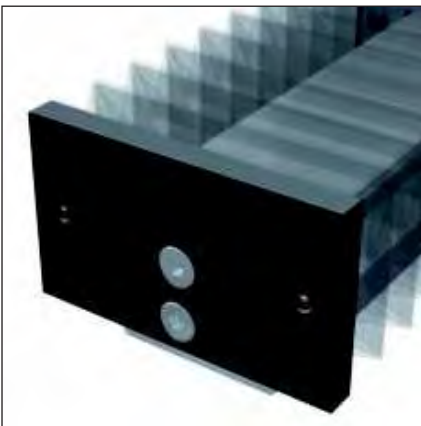
Adapter plate for bellows (spare part)

The adapter plate is used to attach the bellows to the carriage and is included with every order for bellows. It is made of black anodized aluminium. On an MR 25 size, the adapter plate is also used for a lateral lubrication connection.

The outer contour of the adapter plate corresponds to that of the carriage front plate, the bellows and the end plate. The central fastening screw is included in the scope of supply.

Order code: **ZPL xx**

XX = Size, Sample order: 2 x ZPL 65



End plate for bellows (spare part)

Made of black anodized aluminium, the end plate is used to attach the bellows to the end of the rail. It is included with every order for a set of bellows.

The attaching holes must be drilled in the rail if the bellows are to be retrofitted. For this reason, we recommend the use of induction-hardened rails for retrofits.

The external dimensions of the end plate correspond to that of the carriage front plate, the bellows and the adapter plate. Both fastening screws are supplied with the end plate.

Order code: **EPL xx**

xx = Size, Sample order: 2 x EPL 65

3.3

MONORAIL MR

Accessories



Assembly rail

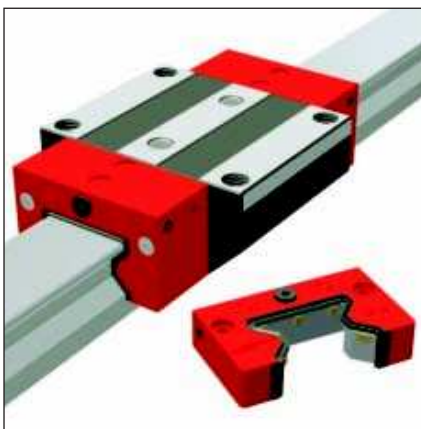
The assembly rail is required when a carriage has to be removed from the rail and then reinstalled during the installation of the MONORAIL.

It is advisable to leave the assembly rail in the carriage to protect the rollers against contamination.

If necessary, the two internal carriage attaching screws can be fitted and tightened through the two holes in the assembly rail.

Order code: **MRM xx**

xx = Size, Sample order: 1 x MRM 65



Lubrication plate

An SPL lubrication plate is used wherever long lubrication intervals are required. Thanks to its integral oil reservoir, the rolling elements are supplied with an automatic and uniform supply of lubrication over an extended period.

It is ideally used in dry and clean environments as in handling technology or on the ancillary axes of machine tools.

The advantages are:

- Assured supply of lubrication in any installation position
- Long lubrication intervals of up to 5,000 km or 12 months according to use
- Refill apertures closed with screws
- Reduced outlay on lubrication and accessories
- Low environmental impact thanks to minimum consumption of lubricant
- Wipers have a long service life as oil is also supplied to the top surface of the rail

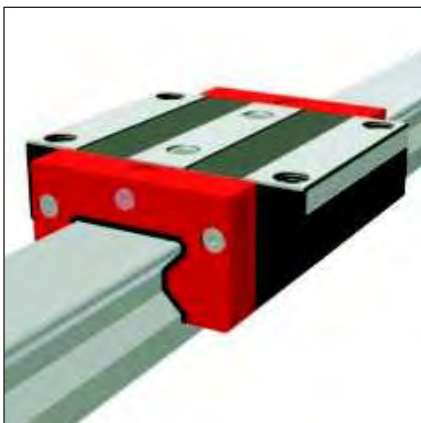
For maximum travel distances without re-lubrication, the lubrication plates are always used in pairs and the carriages are given an additional filling of grease.

The lubrication plates have the same dimensions as the carriage front plates and are installed in front of these. Retrofitting is possible.

Additional ZBN-U/ZBV-U wipers must be provided in applications in which particles of dirt can come into contact with the guideways.

Order code: **SPL xx-MR**

xx = Size, Sample order: 2 x SPL 65-MR



Front plate (spare part)

The red front plates have two essential functions:

- To supply lubricant
- To seal a MONORAIL carriage

Lubrication can be supplied to the carriages through several integrated lubrication connection ports. Lubrication channels inside the front plate directly distribute the lubrication to the rollers.

Integral twin-lip cross wipers seal the carriage at the ends and prevent the ingress of dirt and the loss of lubrication. Because the cross wipers are subject to wear, the front plates have to be examined regularly and if necessary replaced.

Order code: **STP xx-EK**

xx = Size, Sample order: 1 x STP 65-EK

3.4

MONORAIL MR

Order code

Individual guide rails and carriages are ordered in accordance with the order codes described below.

Q.v. chapter 2.1 and chapter 3.3 for the order key for accessories.

Separate order codes are used in each case for rails, carriages and accessories. This also applies to different versions of rails and carriages.

All guide components are supplied individually as standard, i.e. unassembled.

If required, SCHNEEBERGER can also supply rails and carriages assembled incl. accessories as complete systems. Please note the ordering instructions in chapter 2.4 if this applies.

Order code for MR rails

| | 2x | MR S | 35 | -N | -G1 | -KC | -R1 | -918 | -19 | -19 | -CN |
|----------------------------------|----|------|----|----|-----|-----|-----|------|-----|-----|-----|
| Quantity | | | | | | | | | | | |
| Rail | | | | | | | | | | | |
| Size | | | | | | | | | | | |
| Type | | | | | | | | | | | |
| Accuracy | | | | | | | | | | | |
| Straightness | | | | | | | | | | | |
| Reference side | | | | | | | | | | | |
| Rail length L3 | | | | | | | | | | | |
| Position of first fixing hole L5 | | | | | | | | | | | |
| Position of last fixing hole L10 | | | | | | | | | | | |
| Coating | | | | | | | | | | | |

NB

Q.v. chapter 3.1 to 3.3 for an overview of types, details of shapes, available options and accessories.

Q.v. chapter 2 for a description of the options.

If possible, standard lengths are preferred for L3 rail length.

These are calculated with the table values in chapter 3.2 using the following formula: $L3 = n \times L4 + L5 + L10 \leq L3max$.

Order code for MR carriages

| | 4x | MR W | 35 | -A | -G1 | -V3 | -R1 | -CN | -S10 | -LN |
|------------------------------------|----|------|----|----|-----|-----|-----|-----|------|-----|
| Quantity | | | | | | | | | | |
| Carriage | | | | | | | | | | |
| Size | | | | | | | | | | |
| Type | | | | | | | | | | |
| Accuracy | | | | | | | | | | |
| Preload | | | | | | | | | | |
| Reference side | | | | | | | | | | |
| Coating | | | | | | | | | | |
| Lube connection | | | | | | | | | | |
| Lubrication as delivered condition | | | | | | | | | | |

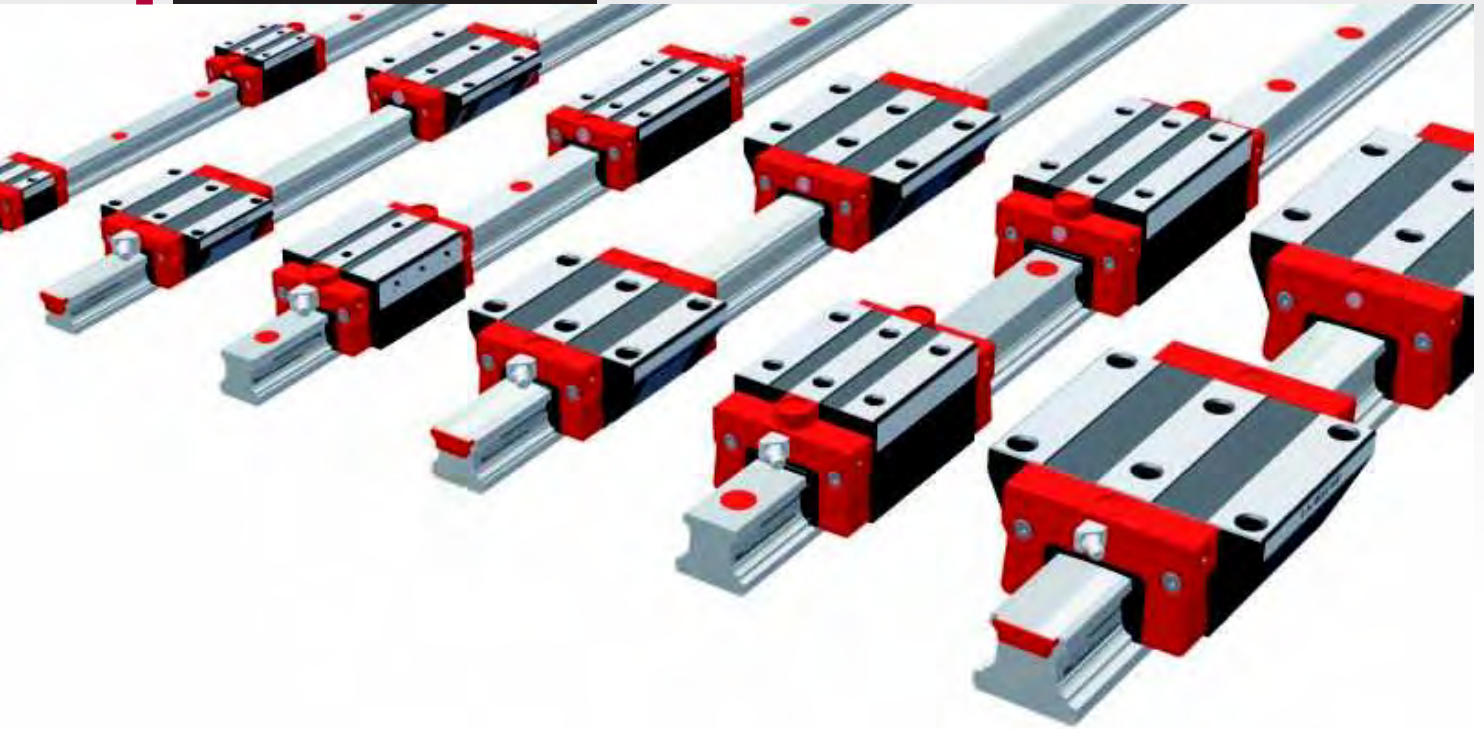
NB

Q.v. chapter 3.1 to 3.3 for an overview of types, details of shapes, available options and accessories.

Q.v. chapter 2 for a description of the options.

SCHNEEBERGER
 LINEAR TECHNOLOGY

4 MONORAIL BM



Very good dynamic characteristics and superb economy are the distinguishing features of the MONORAIL BM ball guideway. Thanks to the small number of transitions in the ball tracks, this novel design with its low number of optimally designed components provides outstanding running characteristics, which are distinguished by smooth running, low pulsation, reduced friction values and high travelling speeds.

The trapezoidal rail section guideway results in a highly rigid guideway and also substantially reduces the amount of maintenance required since parts subject to wear can be replaced without the need to dismantle the guideway. Complete sealing of the carriages is a guarantee of unparalleled reliability matched by a long service life. This robust and versatile guideway thus ideally complements the MONORAIL MR roller guideway.

Features of System MONORAIL BM

Details see chapter 1

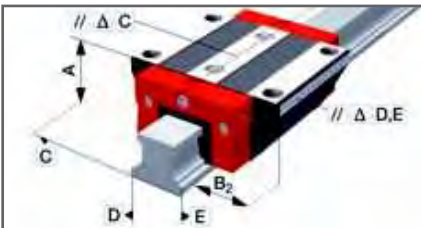


4.1 Overview of Types, Sizes and available Options



| | |
|---------------------------------|-------|
| > Product overview BM Rails | p. 60 |
| > Product overview BM Carriages | p. 61 |

4.2 Technical data and Options



| | |
|---------|-------|
| > BM 15 | p. 62 |
| > BM 20 | p. 64 |
| > BM 25 | p. 66 |
| > BM 30 | p. 68 |
| > BM 35 | p. 70 |
| > BM 45 | p. 72 |

4.3 Accessories MONORAIL BM



| | |
|----------------------------------|-------|
| > Accessories overview | p. 74 |
| > BM Rails accessory details | p. 75 |
| > BM Carriages accessory details | p. 77 |

4.4 Order key



| | |
|--------------------------|-------|
| > Order key BM Rails | p. 80 |
| > Order key BM Carriages | p. 80 |

4.1

MONORAIL BM

Overview of Types, Sizes and available Options

Product overview BM Rails







| | N standard | ND standard, through hardened | NXD standard, half pitch, through hardened | NU with tapped holes at the bottom | C for cover strip | CD for cover strip, through hardened |
|---|----------------------|---|--|--|-----------------------------|--|
| Buildsizes / Rail build forms | | | | | | |
| Size 15 | | BM S 15-ND | BM S 15-NXD | | | BM S 15-CD |
| Size 20 | BM S 20-N | | | BM S 20-NU | BM S 20-C | |
| Size 25 | BM S 25-N | | | BM S 25-NU | BM S 25-C | |
| Size 30 | BM S 30-N | | | BM S 30-NU | BM S 30-C | |
| Size 35 | BM S 35-N | | | BM S 35-NU | BM S 35-C | |
| Size 45 | BM S 45-N | | | BM S 45-NU | BM S 45-C | |
| Features | | | | | | |
| Screwable from above | • | • | • | | • | • |
| Screwable from below | | | | • | | |
| Small assembly effort | | | | • | • | • |
| Highly acc. mounting without lateral locating surface | | | • | | | |
| Great single-part system length | • | | | • | • | |
| For the support of metal covers | | • | • | | | |

Available options for BM Rails

Details see chapter 2



Accuracy

-  **G0** Highly accurate
-  **G1** Very accurate
-  **G2** Accurate
-  **G3** Standard



Straightness

-  **KC** Standard

Reference side

-  **R1** Ref. at bottom
-  **R2** Ref. on top

Coating

-  **CN** None
-  **CH** Hard chromium

Available accessories for BM Rails

Details see chapter 4.3

Plugs

Cover strips

Assembly tools

Product overview BM Carriages



| | A standard | B standard, long | C compact, high | D compact, high, long | E compact, high, for lateral fixing | F compact | G compact, long |
|--|---------------|---------------------|--------------------|--------------------------|--|--------------|--------------------|
|--|---------------|---------------------|--------------------|--------------------------|--|--------------|--------------------|

Buildsizes / Carriage build forms

| | | | | | | | |
|---------|-----------|-----------|-----------|-----------|-----------|-----------|-----------|
| Size 15 | BM W 15-A | | BM W 15-C | | | BM W 15-F | |
| Size 20 | BM W 20-A | BM W 20-B | BM W 20-C | BM W 20-D | | | |
| Size 25 | BM W 25-A | BM W 25-B | BM W 25-C | BM W 25-D | BM W 25-E | BM W 25-F | BM W 25-G |
| Size 30 | BM W 30-A | BM W 30-B | BM W 30-C | BM W 30-D | BM W 30-E | BM W 30-F | BM W 30-G |
| Size 35 | BM W 35-A | BM W 35-B | BM W 35-C | BM W 35-D | BM W 35-E | BM W 35-F | BM W 35-G |
| Size 45 | BM W 45-A | BM W 45-B | BM W 45-C | BM W 45-D | | | |





Features

| | | | | | | | |
|------------------------------|---|---|---|---|---|---|---|
| Screwable from above | • | • | • | • | | • | • |
| Screwable from below | • | • | | | | | |
| Screwable from the side | | | | | • | | |
| For high loads and moments | | • | | • | | | • |
| For medium loads and moments | • | | • | | • | • | • |
| For limited space conditions | | | | | | • | • |





Available options for BM Carriages

Details see chapter 2



Accuracy

| | |
|--|-----------------|
|  G0 | Highly accurate |
|  G1 | Very accurate |
|  G2 | Accurate |
|  G3 | Standard |



Preload

| | |
|--|----------|
|  V0 | Very low |
|  V1 | Low |
|  V2 | Medium |
|  V3 | High |












Reference side

| | |
|--|----------------|
|  R1 | Ref. at bottom |
|  R2 | Ref. on top |




Coating

| | |
|--|---------------|
|  CN | None |
|  CH | Hard chromium |

Lube connections

| | | | |
|---|------------------|---|------------------|
|  S10 | Left center |  S13 | Upper left side |
|  S20 | Right center |  S23 | Upper right side |
|  S11 | Top left |  S32 | Left side |
|  S21 | Top right |  S42 | Right side |
|  S12 | Lower left side |  S60 | Center |
|  S22 | Lower right side | | |

Lubrication

| | |
|--|----------------|
|  LN | Oil protect |
|  LG | Grease protect |
|  LV | Full greasing |

Available accessories for BM Carriages

Details see chapter 4.3 and 2.1

| | | | |
|-------------------|--------------|----------------|--------------------|
| Additional wipers | Bellows | Assembly rails | Lubrication plates |
| Front plates | Lube nipples | Lube adapters | |

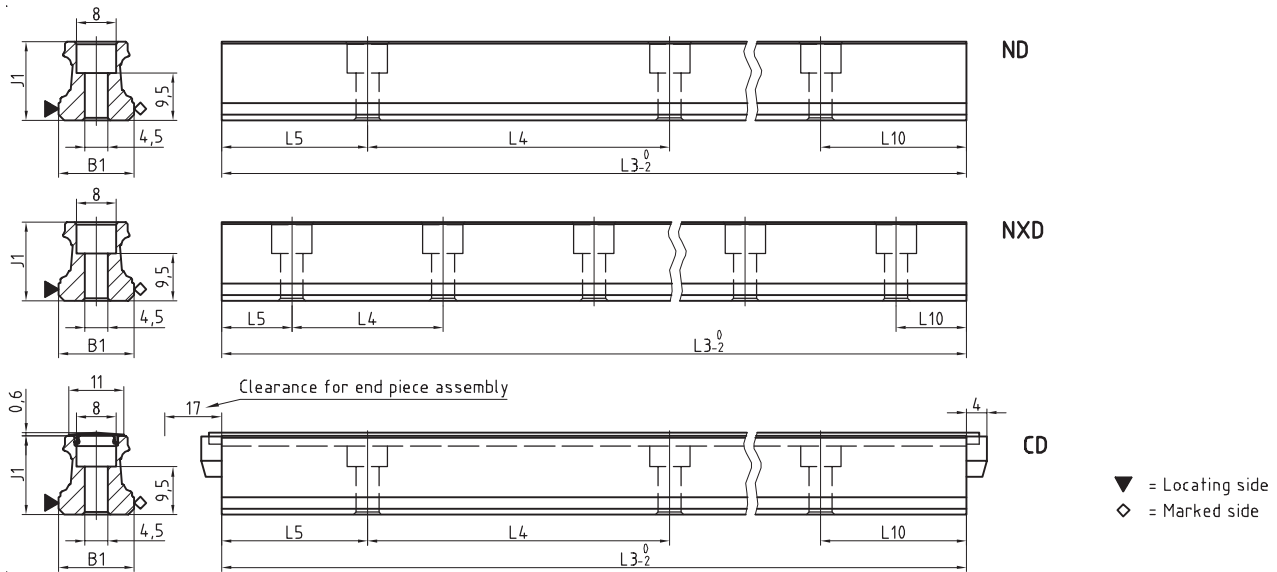
4.2

MONORAIL BM

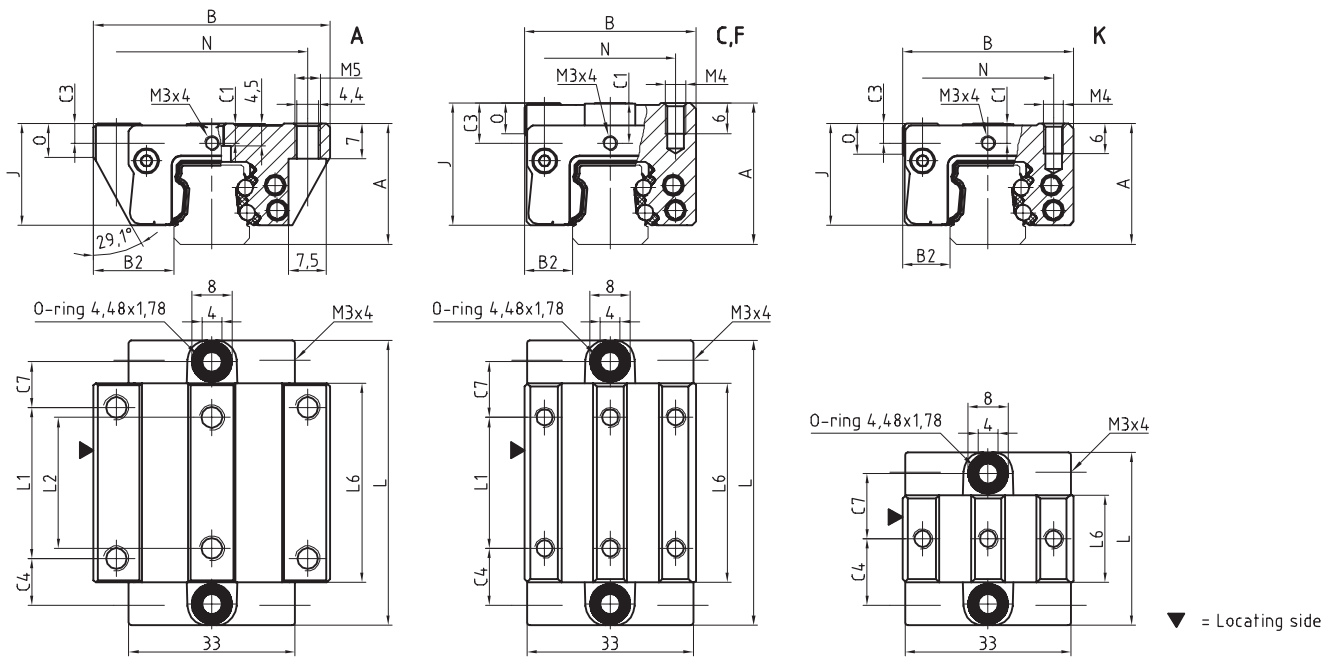
BM 15

Technical Data

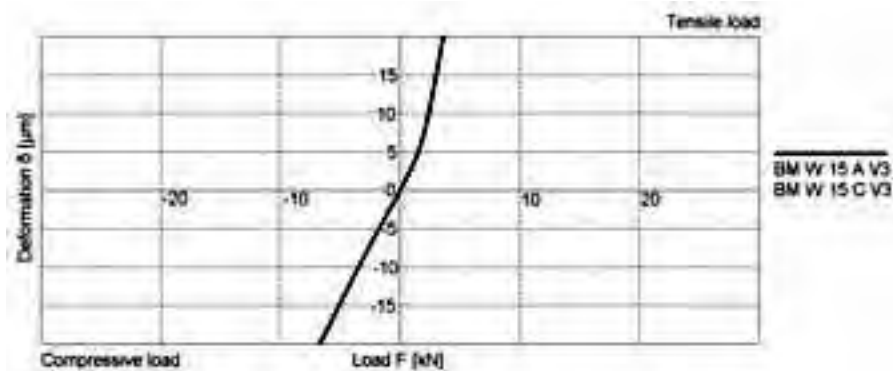
BM 15 Rail Drawings



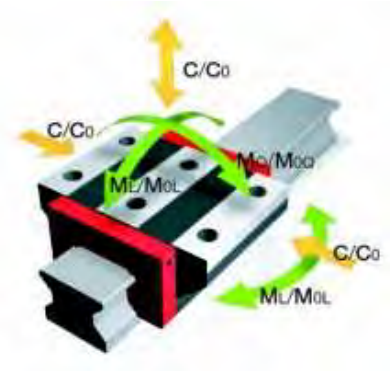
BM 15 Carriage Drawings



BM 15 Rigidity diagram



BM 15 load rating



BM S 15 Dimensions



| | BM S 15-ND | BM S 15-NXD | BM S 15-CD | | | |
|--|------------|-------------|------------|--|--|--|
| B1: Rail width | 15 | 15 | 15 | | | |
| J1: Rail height | 15.7 | 15.7 | 15.7 | | | |
| L3: Rail length max. | 1 500 | 1 500 | 1 500 | | | |
| L4: Spacing of fixing holes | 60 | 30 | 60 | | | |
| L5/L10: Position of first/last fixing hole | 28.5 | 13.5 | 28.5 | | | |
| Gew: Rail weight, specific (kg/m) | 1.4 | 1.4 | 1.3 | | | |

Available options for BM S 15



BM W 15 Dimensions and capacities



| | BM W 15-A | BM W 15-C | BM W 15-F | BM W 15-K | | |
|--|-----------|-----------|-----------|-----------|--|--|
| A: System height | 24 | 28 | 24 | 24 | | |
| B: Carriage width | 47 | 34 | 34 | 34 | | |
| B2: Distance between locating faces | 16 | 9.5 | 9.5 | 9.5 | | |
| C1: Position of center front lube hole | 4 | 8 | 4 | 4 | | |
| C3: Position of lateral lube hole | 4 | 8 | 4 | 4 | | |
| C4: Position of lateral lube hole | 9.3 | 11.3 | 11.3 | 14.8 | | |
| C7: Position of top lube hole | 9.05 | 11.05 | 11.05 | 14.55 | | |
| J: Carriage height | 20.2 | 24.2 | 20.2 | 20.2 | | |
| L: Carriage length | 56.6 | 56.6 | 56.6 | 37.6 | | |
| L1: Exterior fixing hole spacing | 30 | 26 | 26 | - | | |
| L2: Interior fixing hole spacing | 26 | - | - | - | | |
| L6: Steel body length | 39.6 | 39.6 | 39.6 | 20.6 | | |
| N: Lateral fixing hole spacing | 38 | 26 | 26 | 26 | | |
| O: Reference face height | 7 | 6 | 5.5 | 6 | | |

Capacities and weights

| | | | | | | |
|---|--------|--------|--------|-------|--|--|
| C0: Static load capacity (N) | 19 600 | 19 600 | 19 600 | 8 500 | | |
| C100: Dynamic load capacity (N) | 9 000 | 9 000 | 9 000 | 5 200 | | |
| MOQ: Static cross moment capacity (Nm) | 181 | 181 | 181 | 78 | | |
| MOL: Static longitudinal moment capacity (Nm) | 146 | 146 | 146 | 30 | | |
| MQ: Dynamic cross moment capacity (Nm) | 83 | 83 | 83 | 48 | | |
| ML: Dynamic longitudinal moment capacity (Nm) | 67 | 67 | 67 | 18 | | |
| Gew: Carriage weight (kg) | 0.2 | 0.3 | 0.2 | 0.2 | | |

Available options for BM W 15



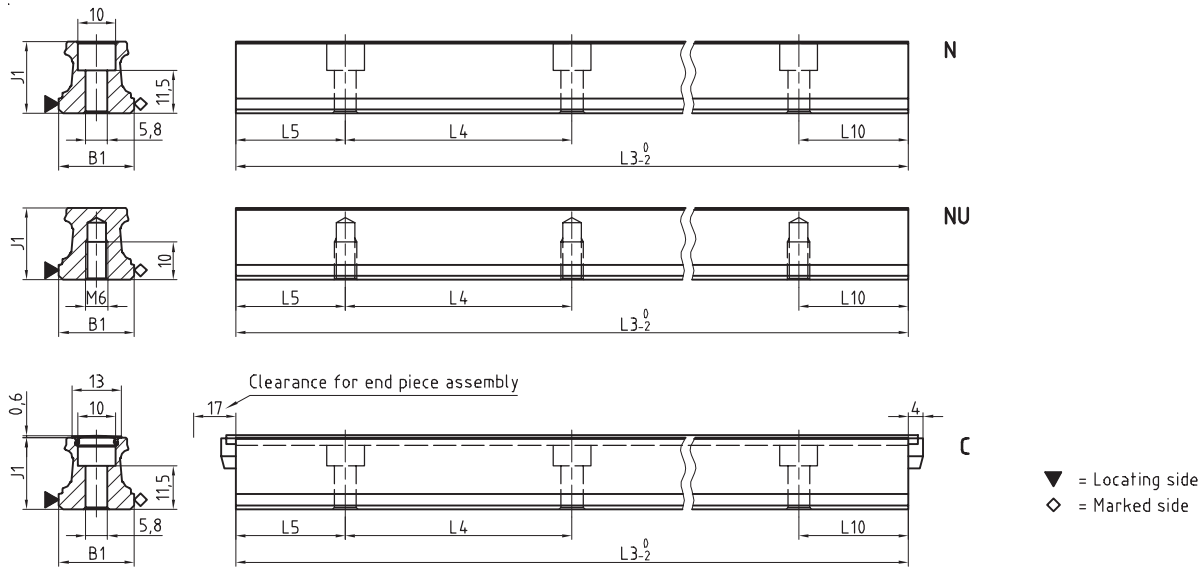
4.2

MONORAIL BM

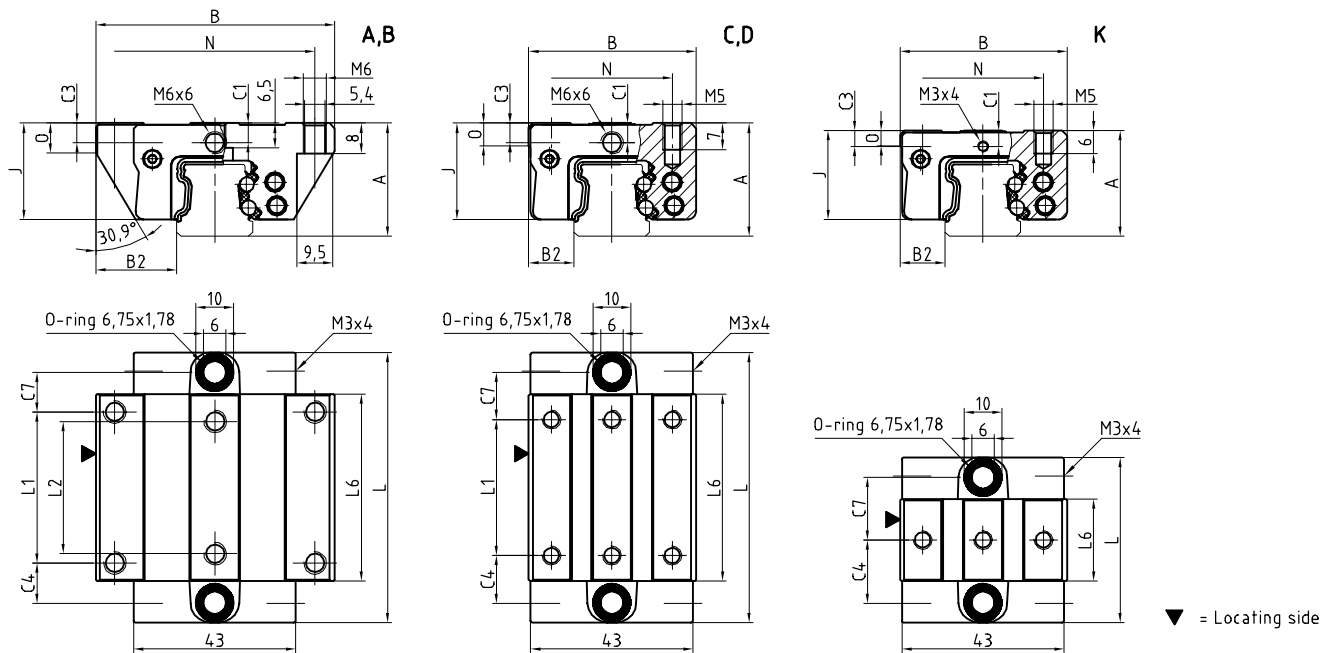
BM 20

Technical Data

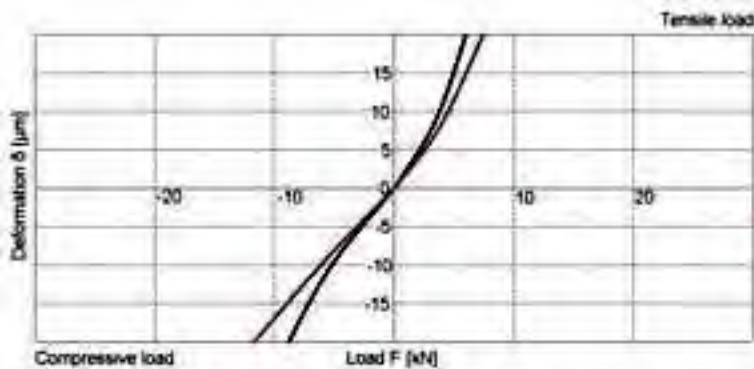
BM 20 Rail Drawings



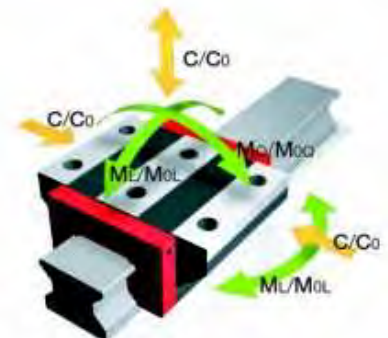
BM 20 Carriage Drawings



BM 20 Rigidity diagram



BM 20 load rating



BM S 20 Dimensions



| | BM S 20-N | BM S 20-NU | BM S 20-C | | | |
|--|-----------|------------|-----------|--|--|--|
| B1: Rail width | 20 | 20 | 20 | | | |
| J1: Rail height | 19 | 19 | 19 | | | |
| L3: Rail length max. | 3 000 | 3 000 | 3 000 | | | |
| L4: Spacing of fixing holes | 60 | 60 | 60 | | | |
| L5/L10: Position of first/last fixing hole | 28.5 | 28.5 | 28.5 | | | |
| Gew: Rail weight, specific (kg/m) | 2.2 | 2.3 | 2.1 | | | |

Available options for BM S 20



BM W 20 Dimensions and capacities



| | BM W 20-A | BM W 20-B | BM W 20-C | BM W 20-D | BM W 20-K | |
|--|-----------|-----------|-----------|-----------|-----------|--|
| A: System height | 30 | 30 | 30 | 30 | 28 | |
| B: Carriage width | 63 | 63 | 44 | 44 | 44 | |
| B2: Distance between locating faces | 21.5 | 21.5 | 12 | 12 | 12 | |
| C1: Position of center front lube hole | 5.2 | 5.2 | 5.2 | 5.2 | 4.2 | |
| C3: Position of lateral lube hole | 5.2 | 5.2 | 5.2 | 5.2 | 4.2 | |
| C4: Position of lateral lube hole | 10.75 | 18.75 | 12.75 | 13.75 | 18.85 | |
| C7: Position of top lube hole | 10.25 | 18.25 | 12.25 | 13.25 | 18.35 | |
| J: Carriage height | 25.5 | 25.5 | 25.5 | 25.5 | 23.5 | |
| L: Carriage length | 71.5 | 87.5 | 71.5 | 87.5 | 47.7 | |
| L1: Exterior fixing hole spacing | 40 | 40 | 36 | 50 | - | |
| L2: Interior fixing hole spacing | 35 | 35 | - | - | - | |
| L6: Steel body length | 49.5 | 65.5 | 49.5 | 65.5 | 25.7 | |
| N: Lateral fixing hole spacing | 53 | 53 | 32 | 32 | 32 | |
| O: Reference face height | 8 | 8 | 6 | 6 | 4 | |

Capacities and weights

| | | | | | | |
|---|--------|--------|--------|--------|--------|--|
| C0: Static load capacity (N) | 31 400 | 41 100 | 31 400 | 41 100 | 13 100 | |
| C100: Dynamic load capacity (N) | 14 400 | 17 400 | 14 400 | 17 400 | 8 400 | |
| MOQ: Static cross moment capacity (Nm) | 373 | 490 | 373 | 490 | 150 | |
| MOL: Static longitudinal moment capacity (Nm) | 292 | 495 | 292 | 495 | 58 | |
| MQ: Dynamic cross moment capacity (Nm) | 171 | 206 | 171 | 206 | 99 | |
| ML: Dynamic longitudinal moment capacity (Nm) | 134 | 208 | 134 | 208 | 37 | |
| Gew: Carriage weight (kg) | 0.5 | 0.6 | 0.4 | 0.5 | 0.3 | |

Available options for BM W 20



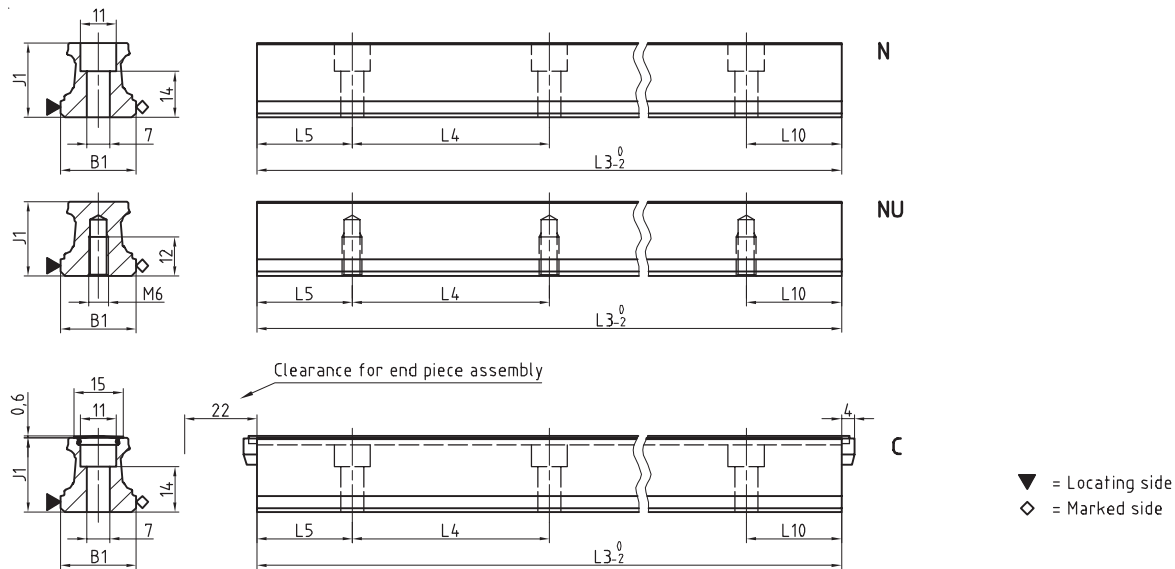
4.2

MONORAIL BM

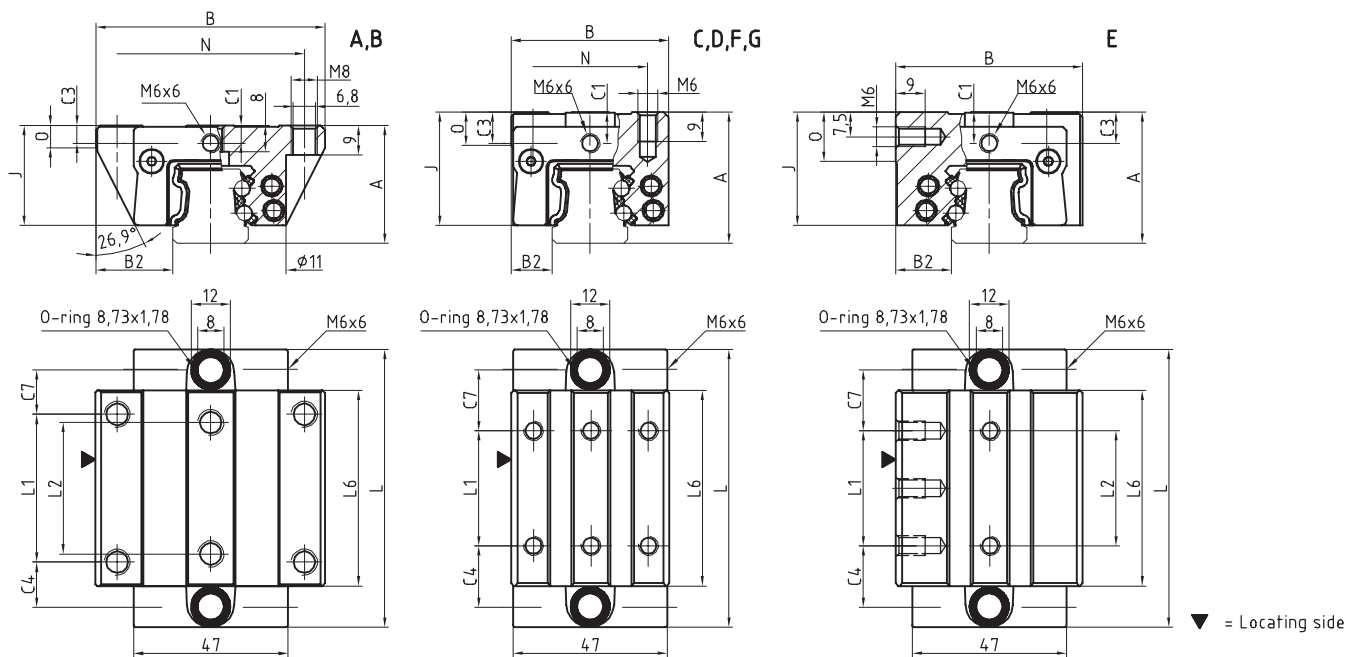
BM 25

Technical Data

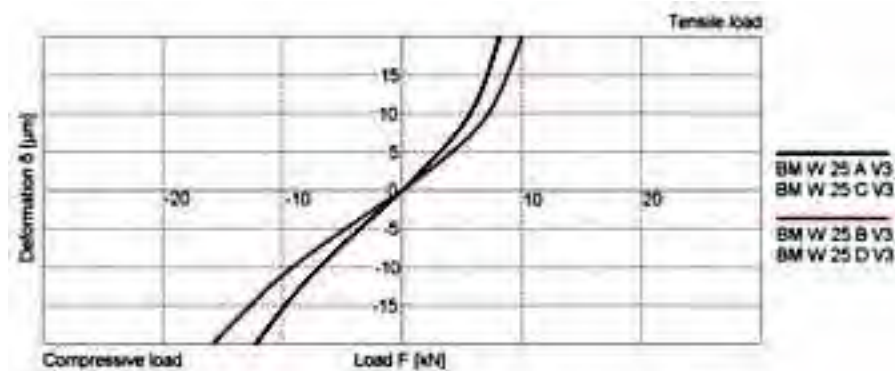
BM 25 Rail Drawings



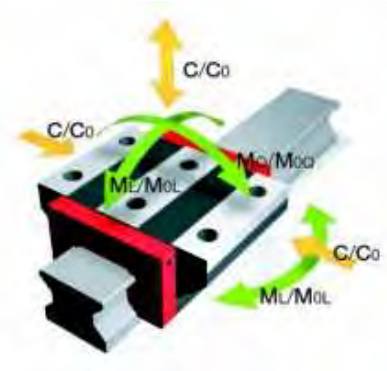
BM 25 Carriage Drawings



BM 25 Rigidity diagram



BM 25 load rating



BM S 25 Dimensions



| | BM S 25-N | BM S 25-NU | BM S 25-C | | | |
|--|-----------|------------|-----------|--|--|--|
| B1: Rail width | 23 | 23 | 23 | | | |
| J1: Rail height | 22.7 | 22.7 | 22.7 | | | |
| L3: Rail length max. | 6 000 | 6 000 | 3 000 | | | |
| L4: Spacing of fixing holes | 60 | 60 | 60 | | | |
| L5/L10: Position of first/last fixing hole | 28.5 | 28.5 | 28.5 | | | |
| Gew: Rail weight, specific (kg/m) | 3.0 | 3.1 | 2.8 | | | |

Available options for BM S 25



BM W 25 Dimensions and capacities



| | BM W 25-A | BM W 25-B | BM W 25-C | BM W 25-D | BM W 25-E | BM W 25-F | BM W 25-G |
|--|-----------|-----------|-----------|-----------|-----------|-----------|-----------|
| A: System height | 36 | 36 | 40 | 40 | 40 | 36 | 36 |
| B: Carriage width | 70 | 70 | 48 | 48 | 57 | 48 | 48 |
| B2: Distance between locating faces | 23.5 | 23.5 | 12.5 | 12.5 | 17 | 12.5 | 12.5 |
| C1: Position of center front lube hole | 5.5 | 5.5 | 9.5 | 9.5 | 9.5 | 5.5 | 5.5 |
| C3: Position of lateral lube hole | 5.5 | 5.5 | 9.5 | 9.5 | 9.5 | 5.5 | 5.5 |
| C4: Position of lateral lube hole | 13.75 | 23.25 | 18.75 | 20.75 | 18.75 | 18.75 | 20.75 |
| C7: Position of top lube hole | 13.5 | 23 | 18.5 | 20.5 | 18.5 | 18.5 | 20.5 |
| J: Carriage height | 30.5 | 30.5 | 34.5 | 34.5 | 34.5 | 30.5 | 30.5 |
| L: Carriage length | 84.5 | 103.5 | 84.5 | 103.5 | 84.5 | 84.5 | 103.5 |
| L1: Exterior fixing hole spacing | 45 | 45 | 35 | 50 | 35 | 35 | 50 |
| L2: Interior fixing hole spacing | 40 | 40 | - | - | 35 | - | - |
| L6: Steel body length | 59.5 | 78.5 | 59.5 | 78.5 | 59.5 | 59.5 | 78.5 |
| N: Lateral fixing hole spacing | 57 | 57 | 35 | 35 | - | 35 | 35 |
| O: Reference face height | 7 | 7 | 11 | 11 | 15 | 7.1 | 7.1 |

Capacities and weights

| | | | | | | | |
|---|--------|--------|--------|--------|--------|--------|--------|
| C0: Static load capacity (N) | 46 100 | 60 300 | 46 100 | 60 300 | 46 100 | 46 100 | 60 300 |
| C100: Dynamic load capacity (N) | 21 100 | 25 500 | 21 100 | 25 500 | 21 100 | 21 100 | 25 500 |
| MOQ: Static cross moment capacity (Nm) | 631 | 825 | 631 | 825 | 631 | 631 | 825 |
| MOL: Static longitudinal moment capacity (Nm) | 513 | 863 | 513 | 863 | 513 | 513 | 863 |
| MQ: Dynamic cross moment capacity (Nm) | 289 | 349 | 289 | 349 | 289 | 289 | 349 |
| ML: Dynamic longitudinal moment capacity (Nm) | 235 | 365 | 235 | 365 | 235 | 235 | 365 |
| Gew: Carriage weight (kg) | 0.7 | 0.9 | 0.6 | 0.8 | 0.7 | 0.6 | 0.7 |

Available options for BM W 25



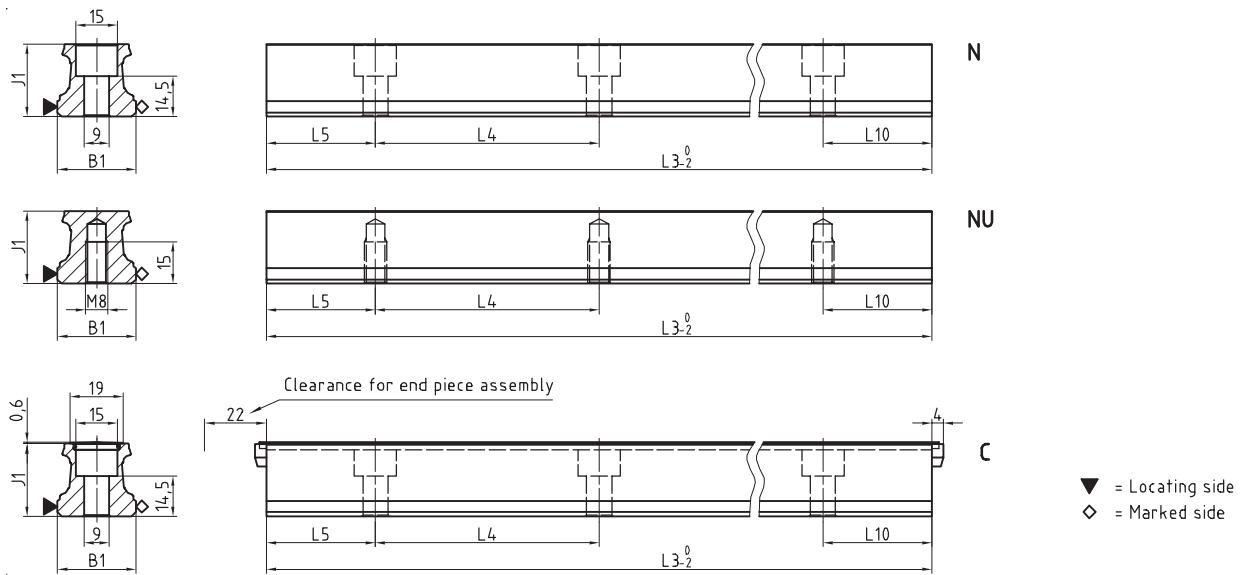
4.2

MONORAIL BM

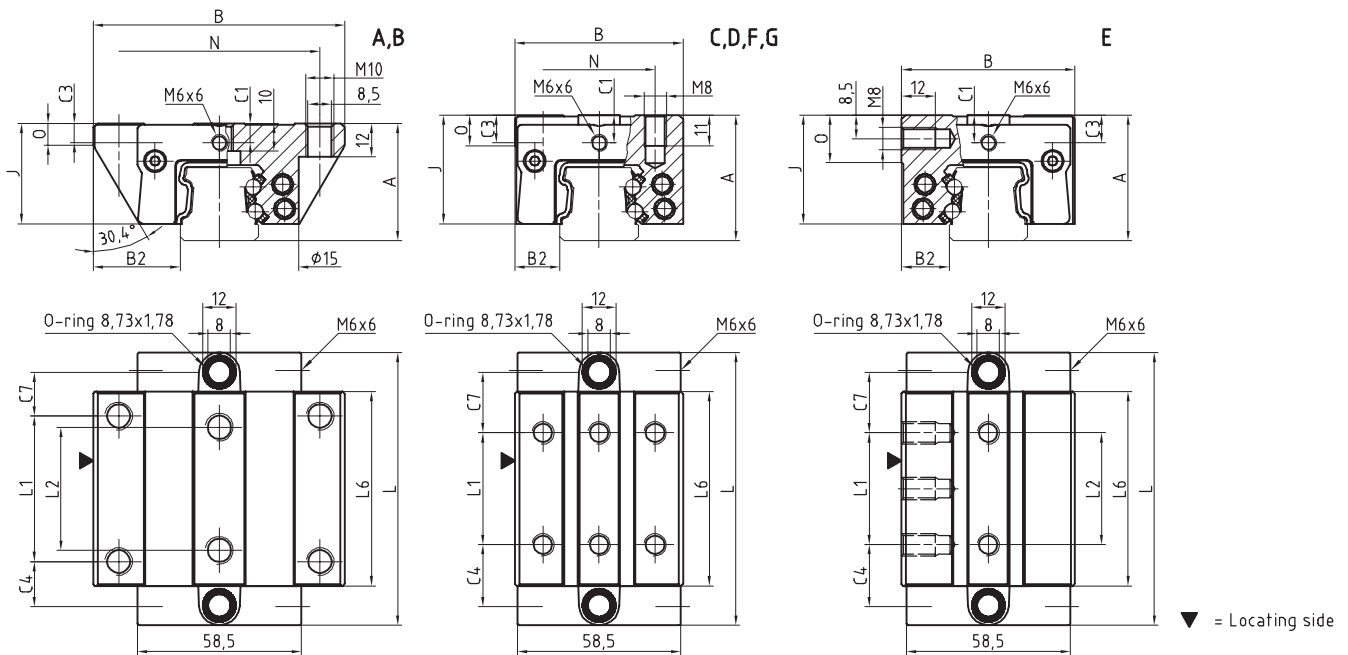
BM 30

Technical Data

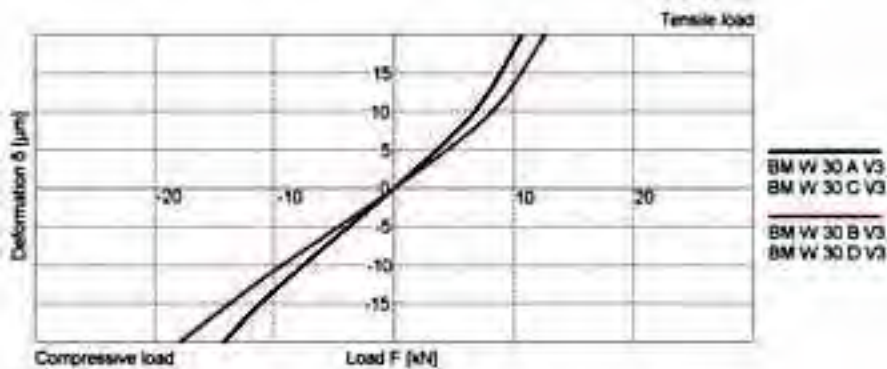
BM 30 Rail Drawings



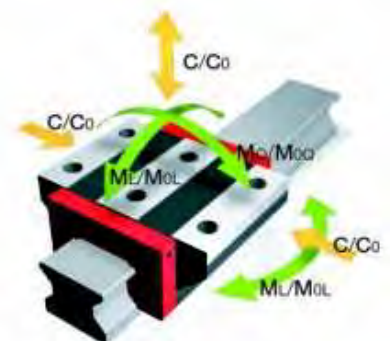
BM 30 Carriage Drawings



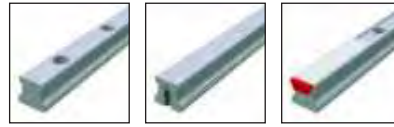
BM 30 Rigidity diagram



BM 30 load rating



BM S 30 Dimensions



| | BM S 30-N | BM S 30-NU | BM S 30-C | | | |
|--|-----------|------------|-----------|--|--|--|
| B1: Rail width | 28 | 28 | 28 | | | |
| J1: Rail height | 26 | 26 | 26 | | | |
| L3: Rail length max. | 6 000 | 6 000 | 6 000 | | | |
| L4: Spacing of fixing holes | 80 | 80 | 80 | | | |
| L5/L10: Position of first/last fixing hole | 38.5 | 38.5 | 38.5 | | | |
| Gew: Rail weight, specific (kg/m) | 4.3 | 4.5 | 4.1 | | | |

Available options for BM S 30



BM W 30 Dimensions and capacities



| | BM W 30-A | BM W 30-B | BM W 30-C | BM W 30-D | BM W 30-E | BM W 30-F | BM W 30-G |
|--|-----------|-----------|-----------|-----------|-----------|-----------|-----------|
| A: System height | 42 | 42 | 45 | 45 | 45 | 42 | 42 |
| B: Carriage width | 90 | 90 | 60 | 60 | 62 | 60 | 60 |
| B2: Distance between locating faces | 31 | 31 | 16 | 16 | 17 | 16 | 16 |
| C1: Position of center front lube hole | 7 | 7 | 10 | 10 | 10 | 7 | 7 |
| C3: Position of lateral lube hole | 7 | 7 | 10 | 10 | 10 | 7 | 7 |
| C4: Position of lateral lube hole | 16.2 | 27.2 | 22.2 | 23.2 | 22.2 | 22.2 | 23.2 |
| C7: Position of top lube hole | 15.7 | 26.7 | 21.7 | 22.7 | 21.7 | 21.7 | 22.7 |
| J: Carriage height | 35.9 | 35.9 | 38.9 | 38.9 | 38.9 | 35.9 | 35.9 |
| L: Carriage length | 97.4 | 119.4 | 97.4 | 119.4 | 97.4 | 97.4 | 119.4 |
| L1: Exterior fixing hole spacing | 52 | 52 | 40 | 60 | 40 | 40 | 60 |
| L2: Interior fixing hole spacing | 44 | 44 | - | - | 40 | - | - |
| L6: Steel body length | 69.4 | 91.4 | 69.4 | 91.4 | 69.4 | 69.4 | 91.4 |
| N: Lateral fixing hole spacing | 72 | 72 | 40 | 40 | - | 40 | 40 |
| O: Reference face height | 7.8 | 7.8 | 11 | 11 | 17 | 8 | 8 |

Capacities and weights

| | | | | | | | |
|---|--------|--------|--------|--------|--------|--------|--------|
| C0: Static load capacity (N) | 63 700 | 83 300 | 63 700 | 83 300 | 63 700 | 63 700 | 83 300 |
| C100: Dynamic load capacity (N) | 29 200 | 35 300 | 29 200 | 35 300 | 29 200 | 29 200 | 35 300 |
| MOQ: Static cross moment capacity (Nm) | 1 084 | 1 414 | 1 084 | 1 414 | 1 084 | 1 084 | 1 414 |
| MOL: Static longitudinal moment capacity (Nm) | 829 | 1 390 | 829 | 1 390 | 829 | 829 | 1 390 |
| MQ: Dynamic cross moment capacity (Nm) | 497 | 599 | 497 | 599 | 497 | 497 | 599 |
| ML: Dynamic longitudinal moment capacity (Nm) | 380 | 589 | 380 | 589 | 380 | 380 | 589 |
| Gew: Carriage weight (kg) | 1.2 | 1.5 | 1.0 | 1.3 | 1.0 | 0.9 | 1.2 |

Available options for BM W 30



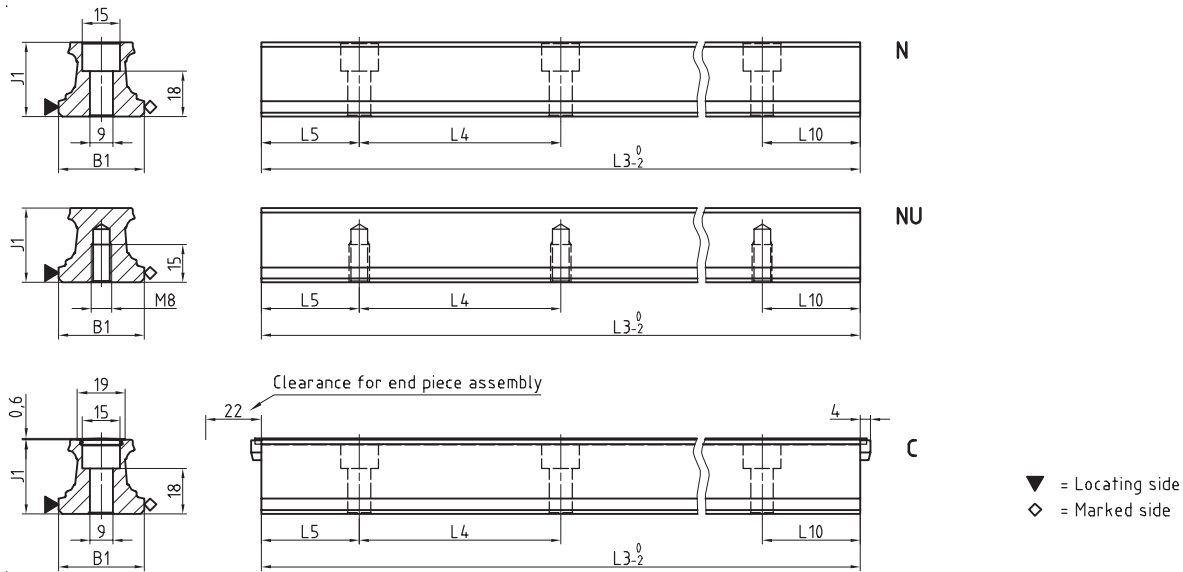
4.2

MONORAIL BM

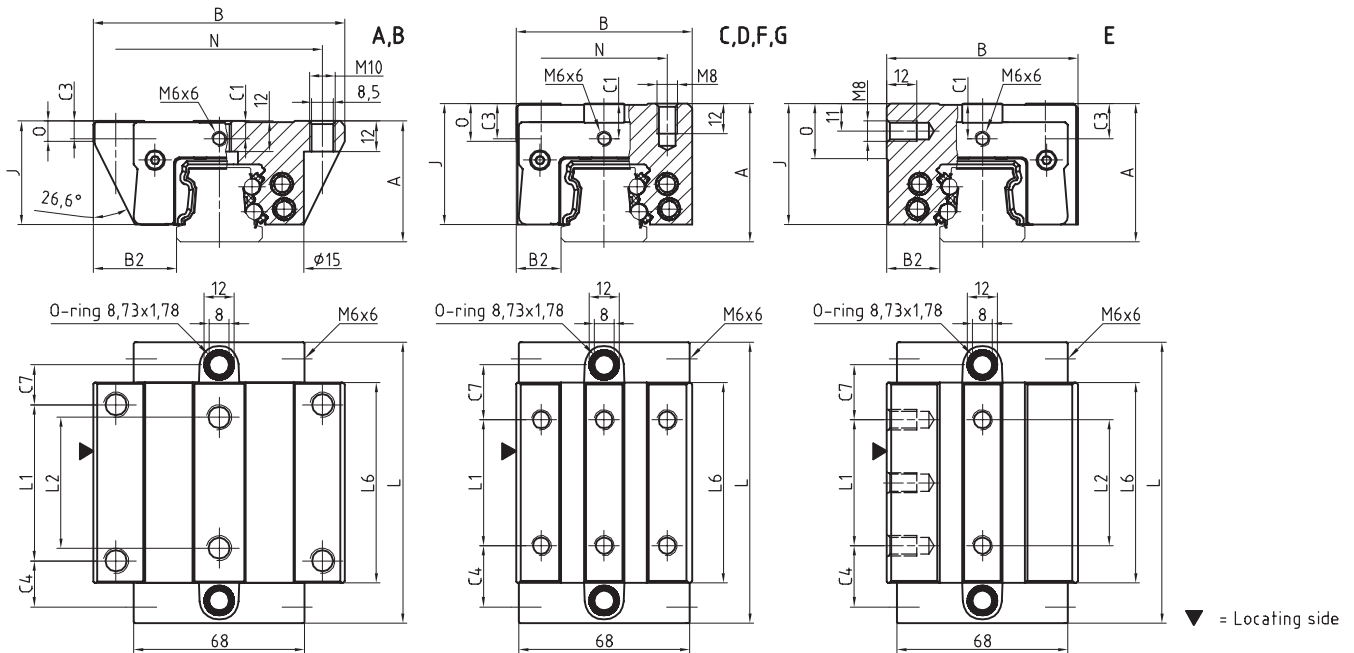
BM 35

Technical Data

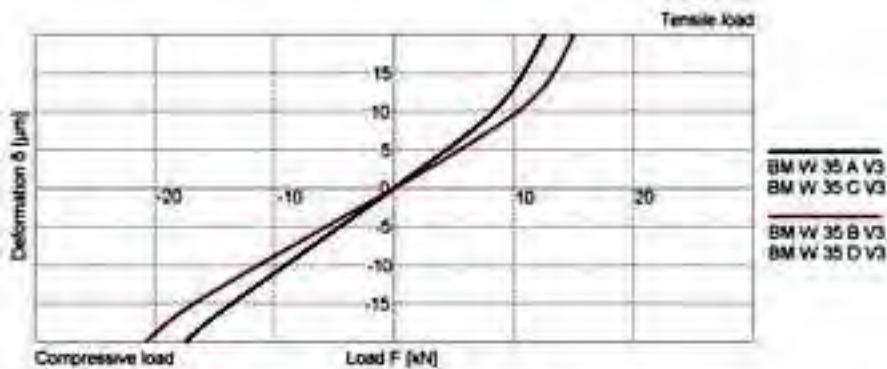
BM 35 Rail Drawings



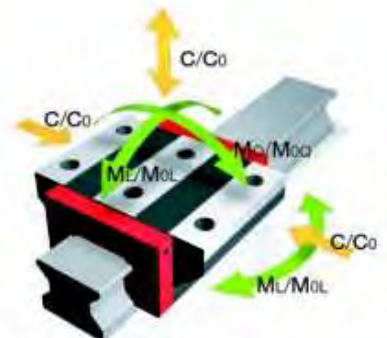
BM 35 Carriage Drawings



BM 35 Rigidity diagram



BM 35 load rating



BM S 35 Dimensions



| | BM S 35-N | BM S 35-NU | BM S 35-C | | | |
|--|-----------|------------|-----------|--|--|--|
| B1: Rail width | 34 | 34 | 34 | | | |
| J1: Rail height | 29.5 | 29.5 | 29.5 | | | |
| L3: Rail length max. | 6 000 | 6 000 | 6 000 | | | |
| L4: Spacing of fixing holes | 80 | 80 | 80 | | | |
| L5/L10: Position of first/last fixing hole | 38.5 | 38.5 | 38.5 | | | |
| Gew: Rail weight, specific (kg/m) | 5.4 | 5.7 | 5.2 | | | |

Available options for BM S 35



BM W 35 Dimensions and capacities



| | BM W 35-A | BM W 35-B | BM W 35-C | BM W 35-D | BM W 35-E | BM W 35-F | BM W 35-G |
|--|-----------|-----------|-----------|-----------|-----------|-----------|-----------|
| A: System height | 48 | 48 | 55 | 55 | 55 | 48 | 48 |
| B: Carriage width | 100 | 100 | 70 | 70 | 76 | 70 | 70 |
| B2: Distance between locating faces | 33 | 33 | 18 | 18 | 21 | 18 | 18 |
| C1: Position of center front lube hole | 7 | 7 | 14 | 14 | 14 | 7 | 7 |
| C3: Position of lateral lube hole | 7 | 7 | 14 | 14 | 14 | 7 | 7 |
| C4: Position of lateral lube hole | 18.3 | 31.05 | 24.3 | 26.05 | 24.3 | 24.3 | 26.05 |
| C7: Position of top lube hole | 15.8 | 28.55 | 21.8 | 23.55 | 21.8 | 21.8 | 23.55 |
| J: Carriage height | 41 | 41 | 48 | 48 | 48 | 41 | 41 |
| L: Carriage length | 111.6 | 137.1 | 111.6 | 137.1 | 111.6 | 111.6 | 137.1 |
| L1: Exterior fixing hole spacing | 62 | 62 | 50 | 72 | 50 | 50 | 72 |
| L2: Interior fixing hole spacing | 52 | 52 | - | - | 50 | - | - |
| L6: Steel body length | 79.6 | 105.1 | 79.6 | 105.1 | 79.6 | 79.6 | 105.1 |
| N: Lateral fixing hole spacing | 82 | 82 | 50 | 50 | - | 50 | 50 |
| O: Reference face height | 8 | 8 | 15 | 15 | 22 | 8 | 8 |

Capacities and weights

| | | | | | | | |
|---|--------|---------|--------|---------|--------|--------|---------|
| C0: Static load capacity (N) | 84 400 | 110 300 | 84 400 | 110 300 | 84 400 | 84 400 | 110 300 |
| C100: Dynamic load capacity (N) | 38 700 | 46 700 | 38 700 | 46 700 | 38 700 | 38 700 | 46 700 |
| MOQ: Static cross moment capacity (Nm) | 1 566 | 2 048 | 1 566 | 2 048 | 1 566 | 1 566 | 2 048 |
| MOL: Static longitudinal moment capacity (Nm) | 1 252 | 2 104 | 1 252 | 2 104 | 1 252 | 1 252 | 2 104 |
| MQ: Dynamic cross moment capacity (Nm) | 718 | 867 | 718 | 867 | 718 | 718 | 867 |
| ML: Dynamic longitudinal moment capacity (Nm) | 574 | 891 | 574 | 891 | 574 | 574 | 891 |
| Gew: Carriage weight (kg) | 1.8 | 2.3 | 1.7 | 2.2 | 1.9 | 1.4 | 1.8 |

Available options for BM W 35



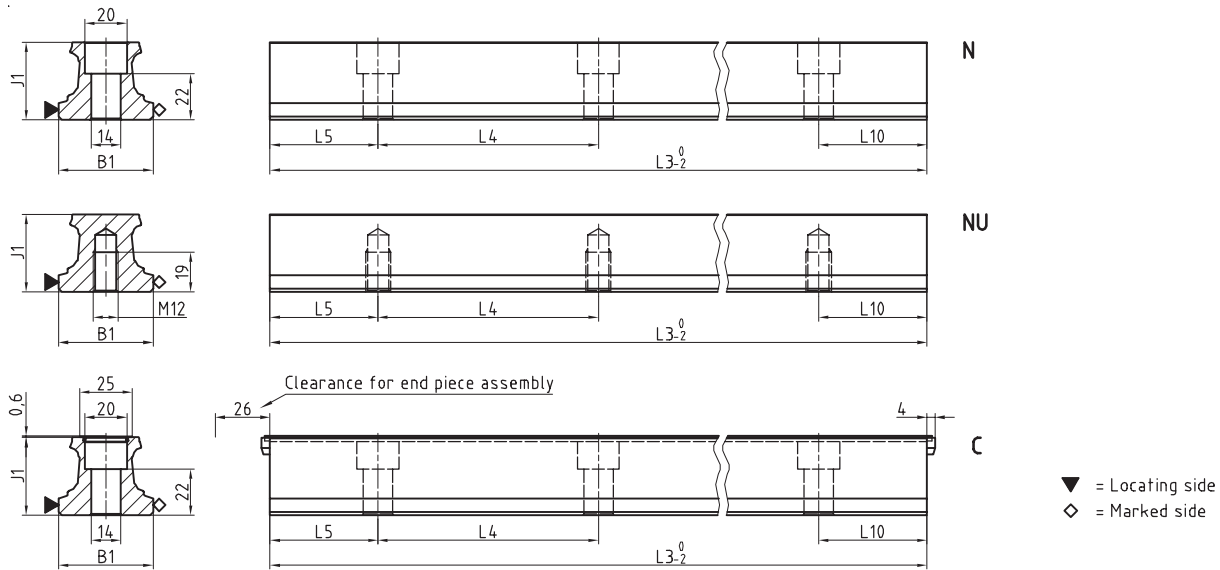
4.2

MONORAIL BM

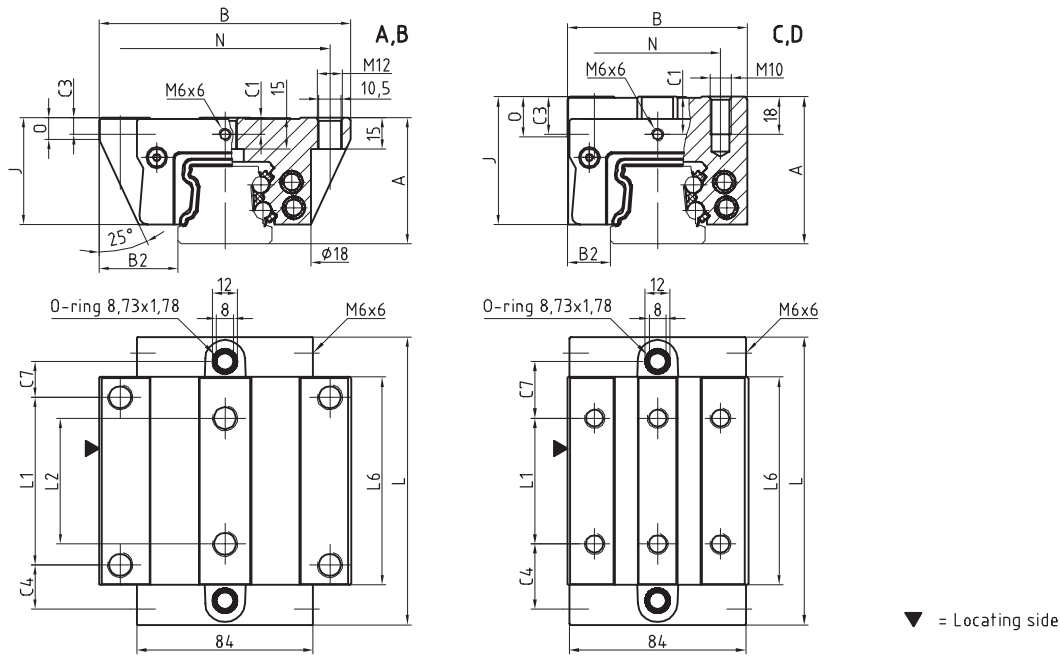
BM 45

Technical Data

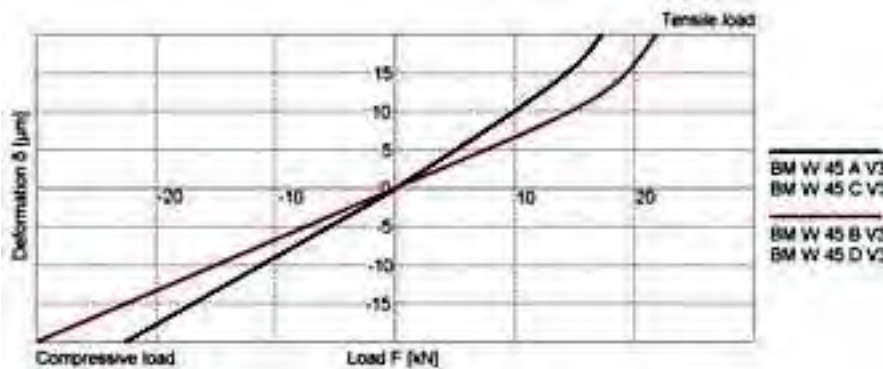
BM 45 Rail Drawings



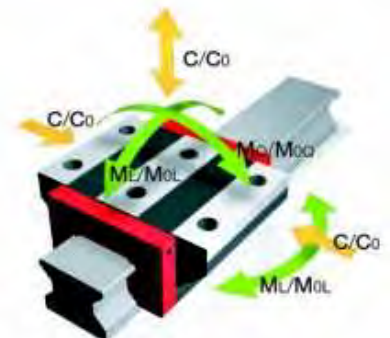
BM 45 Carriage Drawings



BM 45 Rigidity diagram



BM 45 load rating



BM S 45 Dimensions



| | BM S 45-N | BM S 45-NU | BM S 45-C | | |
|--|-----------|------------|-----------|--|--|
| B1: Rail width | 45 | 45 | 45 | | |
| J1: Rail height | 37 | 37 | 37 | | |
| L3: Rail length max. | 6 000 | 6 000 | 6 000 | | |
| L4: Spacing of fixing holes | 105 | 105 | 105 | | |
| L5/L10: Position of first/last fixing hole | 51 | 51 | 51 | | |
| Gew: Rail weight, specific (kg/m) | 8.8 | 9.3 | 8.6 | | |

Available options for BM S 45



BM W 45 Dimensions and capacities



| | BM W 45-A | BM W 45-B | BM W 45-C | BM W 45-D | | |
|--|-----------|-----------|-----------|-----------|--|--|
| A: System height | 60 | 60 | 70 | 70 | | |
| B: Carriage width | 120 | 120 | 86 | 86 | | |
| B2: Distance between locating faces | 37.5 | 37.5 | 20.5 | 20.5 | | |
| C1: Position of center front lube hole | 8 | 8 | 18 | 18 | | |
| C3: Position of lateral lube hole | 8 | 8 | 18 | 18 | | |
| C4: Position of lateral lube hole | 21.05 | 36.8 | 31.05 | 36.8 | | |
| C7: Position of top lube hole | 17.05 | 32.8 | 27.05 | 32.8 | | |
| J: Carriage height | 50.8 | 50.8 | 60.8 | 60.8 | | |
| L: Carriage length | 137.1 | 168.6 | 137.1 | 168.6 | | |
| L1: Exterior fixing hole spacing | 80 | 80 | 60 | 80 | | |
| L2: Interior fixing hole spacing | 60 | 60 | - | - | | |
| L6: Steel body length | 99.1 | 130.6 | 99.1 | 130.6 | | |
| N: Lateral fixing hole spacing | 100 | 100 | 60 | 60 | | |
| O: Reference face height | 10 | 10 | 19 | 19 | | |

Capacities and weights

| | | | | | | |
|---|---------|---------|---------|---------|--|--|
| C0: Static load capacity (N) | 134 800 | 176 300 | 134 800 | 176 300 | | |
| C100: Dynamic load capacity (N) | 61 900 | 74 700 | 61 900 | 74 700 | | |
| MOQ: Static cross moment capacity (Nm) | 3 193 | 4 175 | 3 193 | 4 175 | | |
| MOL: Static longitudinal moment capacity (Nm) | 2 498 | 4 199 | 2 498 | 4 199 | | |
| MQ: Dynamic cross moment capacity (Nm) | 1 466 | 1 769 | 1 466 | 1 769 | | |
| ML: Dynamic longitudinal moment capacity (Nm) | 1 147 | 1 779 | 1 147 | 1 779 | | |
| Gew: Carriage weight (kg) | 3.3 | 4.2 | 3.3 | 4.3 | | |

Available options for BM W 45



4.3

MONORAIL BM

Accessories

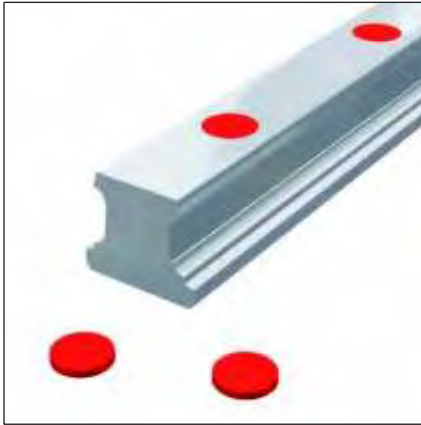
BM Rails accessories overview

| Accessories | BM S 15 | BM S 20 | BM S 25 | BM S 30 | BM S 35 | BM S 45 |
|--|------------|------------|------------|------------|------------|------------|
| Plugs: | | | | | | |
| Plastic plugs | BRK 15 | BRK 20 | BRK 25 | BRK 30 | BRK 35 | BRK 45 |
| Cover strips: | | | | | | |
| Cover strip (spare part) | BAC 15 | BAC 20 | BAC 25 | BAC 30 | BAC 35 | BAC 45 |
| End piece for cover strip (spare part) | EST 15-BAC | EST 20-BAC | EST 25-BAC | EST 30-BAC | EST 35-BAC | EST 45-BAC |
| Assembly tools: | | | | | | |
| Installation tool for cover strip | BWC 15 | BWC 20 | BWC 25 | BWC 30 | BWC 35 | BWC 45 |

BM Carriages accessories overview

| Accessories | BM W 15 | BM W 20 | BM W 25 | BM W 30 | BM W 35 | BM W 45 |
|--|------------|------------|------------|---------------|---------------|---------------|
| Additional wipers: | | | | | | |
| Additional wiper NBR | ZBN 15-U | ZBN 20-U | ZBN 25-U | ZBN 30-U | ZBN 35-U | ZBN 45-U |
| Additional wiper Viton | ZBV 15-U | ZBV 20-U | ZBV 25-U | ZBV 30-U | ZBV 35-U | ZBV 45-U |
| Metal wiper | ABM 15 | ABM 20 | ABM 25 | ABM 30 | ABM 35 | ABM 45 |
| Bellows: | | | | | | |
| Bellows | - | FBB 20 | FBB 25 | FBB 30 | FBB 35 | FBB 45 |
| Adapter plate for bellows (spare part) | - | ZPB 20 | ZPB 25 | ZPB 30 | ZPB 35 | ZPB 45 |
| End plate for bellows (spare part) | - | EPB 20 | EPB 25 | EPB 30 | EPB 35 | EPB 45 |
| Assembly rails: | | | | | | |
| Assembly rail | MBM 15 | MBM 20 | MBM 25 | MBM 30 | MBM 35 | MBM 45 |
| Lubrication plates: | | | | | | |
| Lubrication plate | SPL 15-BM | SPL 20-BM | SPL 25-BM | SPL 30-BM | SPL 35-BM | SPL 45-BM |
| Front plates: | | | | | | |
| Cross wiper for front plate (spare part) | QAS 15-STB | QAS 20-STB | QAS 25-STB | QAS 30-STB | QAS 35-STB | QAS 45-STB |
| Lube nipples: | | | | | | |
| Hydraulic-type grease nipple straight | - | SN 6 | SN 6 | SN 6 | SN 6 | SN 6 |
| Hydraulic-type grease nipple 45° | - | SN 6-45 | SN 6-45 | SN 6-45 | SN 6-45 | SN 6-45 |
| Hydraulic-type grease nipple 90° | - | SN 6-90 | SN 6-90 | SN 6-90 | SN 6-90 | SN 6-90 |
| Flush type grease nipple M3 | SN 3-T | SN 3-T | - | - | - | - |
| Flush type grease nipple M6 | - | SN 6-T | SN 6-T | SN 6-T | SN 6-T | SN 6-T |
| Grease gun for SN 3-T and SN 6-T | SFP-T3 | SFP-T3 | SFP-T3 | SFP-T3 | SFP-T3 | SFP-T3 |
| Lube adapters: | | | | | | |
| Straight screw-in connection M3 | SA 3-D3 | SA 3-D3 | - | - | - | - |
| Lubrication adapter M8 round-head | - | SA 6-RD-M8 | SA 6-RD-M8 | SA 6-RD-M8 | SA 6-RD-M8 | SA 6-RD-M8 |
| Lubrication adapter M8 hexagon head | - | - | - | SA 6-6KT-M8 | SA 6-6KT-M8 | SA 6-6KT-M8 |
| Lubrication adapter G1/8 hexagon head | - | - | - | SA 6-6KT-G1/8 | SA 6-6KT-G1/8 | SA 6-6KT-G1/8 |
| Swivel screw connection for pipe d=4 mm | - | SV 6-D4 | SV 6-D4 | SV 6-D4 | SV 6-D4 | SV 6-D4 |
| Swivel screw connection M6 | - | SV 6-M6 | SV 6-M6 | SV 6-M6 | SV 6-M6 | SV 6-M6 |
| Swivel screw connection M6 long | - | SV 6-M6-L | SV 6-M6-L | SV 6-M6-L | SV 6-M6-L | SV 6-M6-L |
| Swivel screw connection M8 | - | SV 6-M8 | SV 6-M8 | SV 6-M8 | SV 6-M8 | SV 6-M8 |
| Swivel screw connection M8 long | - | SV 6-M8-L | SV 6-M8-L | SV 6-M8-L | SV 6-M8-L | SV 6-M8-L |

BM Rails accessory details



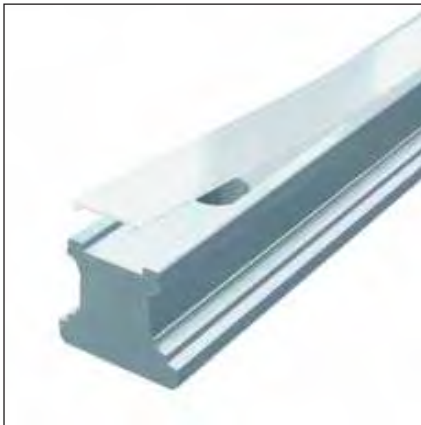
Plastic plugs

BRK plastic plugs are used as a low-cost method of closing off the rail attachment holes. They can be fitted manually with fairly simple tools. Plastic plugs are recommended for use with protected axes or in environments with low levels of contamination, e.g. handling.

Quantity supplied: Pack of 25 pcs

Order code: **BRK xx**

xx = Size, Sample order: 3 x BRK 35 (75 pcs)



Cover strip (spare part)

A BAC cover strip combines technical functionality with simple installation and neat appearance.

Made of stainless spring steel, the strip is suitable for demanding applications with enhanced mechanical and thermal loading.

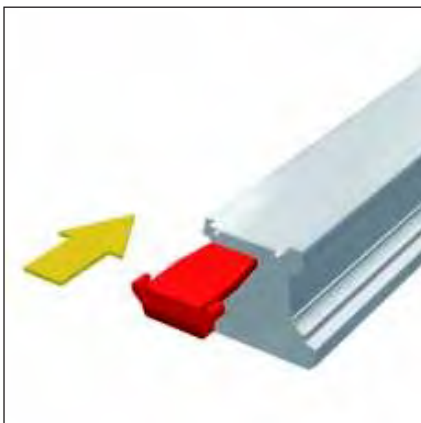
It provides the following advantages:

- Reliable fixing along the length as it is clipped into a special groove
- Additional fixing of the ends of the strips using locking parts (EST xx-BAC)
- Very robust due to the substantial thickness of the material
- Can be fitted and removed several times
- Protection of the wipers during installation as the rail fixing holes are recessed in the groove
- Single piece cover strip lengths up to 6 metres

When ordering guide rails with cover strips, they are included in the scope of supply.

Order code: **BAC xx-yy**

xx = Size, yy= Rail length in mm, Sample order: 1 x BAC 35-4560



End piece for cover strip (spare part)

EST end pieces are used to close the ends of BAC cover strips. To do this, these plastic parts are inserted on both ends of the rail into the gap under the cover strip. Their special design prevents the ends of the cover strip from lifting and reduces the danger of injury on the sharp edges of the cover strip.

Order code: **EST xx-BAC**

xx = Size, Sample order: 2 x EST 35-BAC

4.3

MONORAIL BM

Accessories



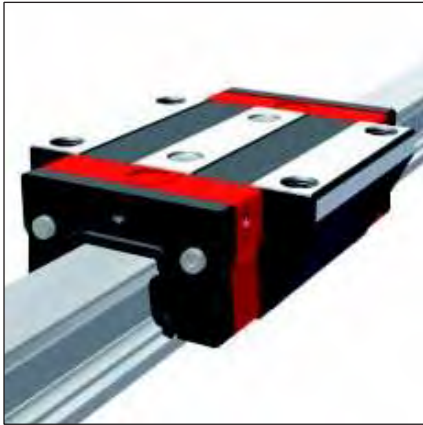
Installation tool for cover strip

A BWC fitting tool is used to simplify the fitting of a BAC cover strip. At the same time, it ensures that the cover strip sits securely in the rail groove without any gaps.

Order code: **BWC xx**

xx = Size, Sample order: 1 x BWC 35

BM Carriages accessory details



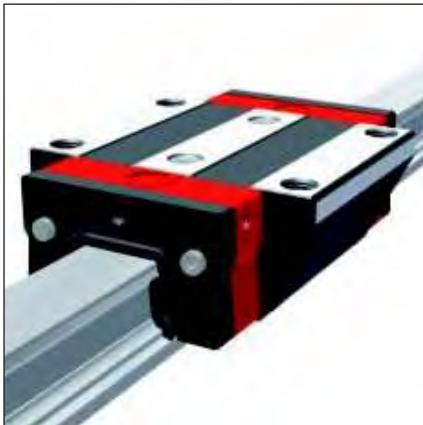
Additional wiper NBR

Additional ZBN-U nitrile wipers provide additional protection of the carriages in heavily contaminated environments. Due to their flexibility, they can be fitted directly over the rail cross section. It is therefore not necessary to remove the carriage from the rail.

ZBN-U wipers can also be used in combination with ABM metal wipers.

Order code: **ZBN xx-U**

xx = Size, Sample order: 2 x ZBN 35-U

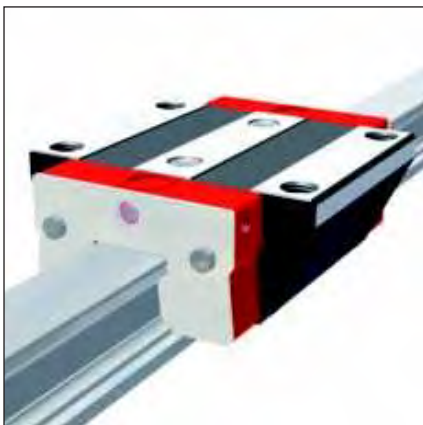


Additional wiper Viton

Like ZBN-U wipers, ZBV-U additional wipers provide additional protection of the carriages in heavily contaminated environments. Made of Viton® (fluoroelastomer), they are also suitable for use with aggressive coolants. Since they can be pushed over the rail cross section due to their flexibility, retrofitting is possible without any need to remove the carriage from the rail. ZBV-U wipers can also be used in combination with ABM metal wipers.

Order code: **ZBV xx-U**

xx = Size, Sample order: 2 x ZBV 35-U



Metal wiper

Made of stainless steel, ABM metal wipers are used to protect the sealing lips of carriages and additional wipers against hot metal chips. Large and loose dirt particles are pushed away and cannot get jammed due to the controlled dimension of the gap with the rail. Specially adapted types are available for rails using AMS measuring systems.

Metal wipers are ideally used in combination with ZBN-U/ZCV-U additional wipers.

Order code: **ABM xx**

xx= Size, Sample order: 1 x ABM 35

4.3

MONORAIL BM

Accessories



Bellows

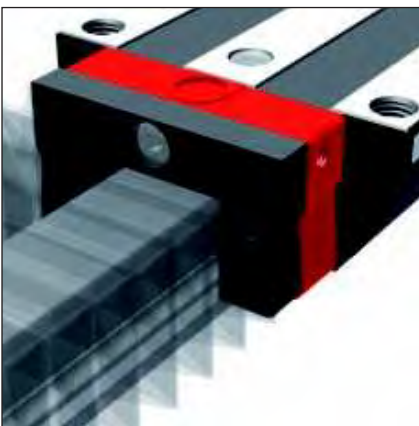
A standard FBB bellows is available for MONORAIL sizes BM 20 – BM 45, the purpose of which is mainly to provide additional protection against dust and water splashes. The bellows are made of synthetic fabric coated on both sides with plastic. The bellows cover the entire length of the rail profile matching the relevant faceplate of the carriage. The external dimensions of the carriage are not exceeded by the bellows.

Installation is simple and takes little time. A ZPB adapter plate is required to attach the bellows to the carriage. The adapter plate is screwed to the front plate of the carriage using a central screw. An EPB end plate is screwed to the end face of the rail. The bellows are fastened by two rivets to both the adapter plate and the front plate.

The required adapter and end plates, attachment screws and rivets are supplied with each order for a complete set of bellows. The attachment holes for the end plate are also prepared in the rail when a guideway with bellows is ordered.

Order code: **FBB xx-yy**

xx = Size, yy = Number of folds, Sample order: 1 x FBB 35-146

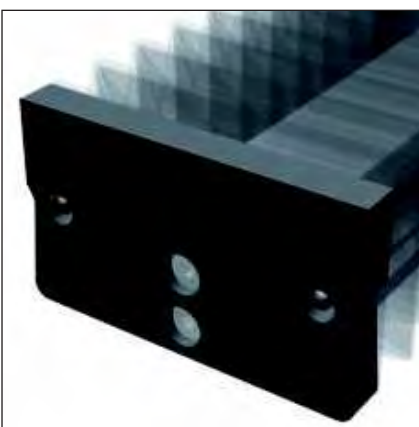


Adapter plate for bellows (spare part)

A ZPB adapter plate is used to attach FBB bellows to the carriage and is included with every order for a bellows. It is made of black anodized aluminium. The outer contour of the adapter plate corresponds to that of the carriage front plate, the bellows and the end plate. The central fastening screw is included in the scope of supply.

Order code: **ZPB xx**

xx = Size, Sample order: 2 x ZPB 35



End plate for bellows (spare part)

Made of black anodized aluminium, an EPB end plate is used to attach the FBB bellows to the end of the rail. It is included with every order for a set of bellows. The attachment holes must be drilled in the rail if the bellows are to be retrofitted. For this reason, we recommend the use of induction-hardened rails for retrofits. The outer contour of the end plate corresponds to that of the carriage front plate, the bellows and the adapter plate. Both fastening screws are supplied with the end plate.

Order code: **EPB xx**

xx = Size, Sample order: 2 x EPB 35



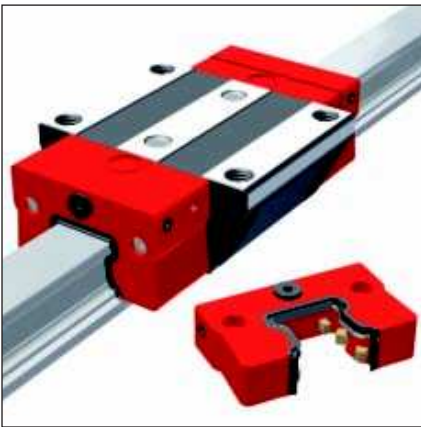
Assembly rail

An MBM assembly rail is required when a carriage has to be removed from the rail and then reinstalled during the installation of the MONORAIL guideway.

It is advisable to leave the assembly rail in the carriage to protect the balls against contamination. If necessary, the two internal carriage attaching screws can be fitted and tightened through the two holes in the assembly rail.

Order code: **MBM xx**

xx = Size, Sample order: 1 x MBM 35



Lubrication plate

An SPL lubrication plate is used wherever long lubrication intervals are required. Thanks to its integral oil reservoir, the rolling elements are supplied with an automatic and uniform supply of lubrication over an extended period.

It is ideally used in dry and clean environments as in handling technology or on the ancillary axes of machine tools.

The advantages are:

- Assured supply of lubrication in any installation position
- Long lubrication intervals of up to 5,000 km or 12 months according to use
- Refill apertures closed with screws
- Reduced outlay on lubrication and accessories
- Low environmental impact thanks to minimum consumption of lubricant
- Wipers have a long service life as oil is also supplied to the top surface of the rail

For maximum travel distances without re-lubrication, the lubrication plates are always used in pairs and the carriages are given an additional filling of grease.

The lubrication plates have the same dimensions as the carriage front plates and are installed in front of these. Retrofitting is possible.

Additional ZBN-U/ZBV-U wipers must be provided in applications in which particles of dirt can come into contact with the guideways.

Order code: **SPL xx-BM**

xx = Size, Sample order: 2 x SPL 35-BM



Cross wiper for front plate (spare part)

QAS twin-lip cross wipers, integrated into the end plate, seal the carriage at the ends, thus preventing the ingress of dirt and the loss of lubricant.

As the cross wipers are subject to normal wear, they must be examined regularly and replaced if necessary.

Order code: **QAS xx-STB**

xx = Size, Sample order: 1 x QAS 35-STB

4.4

MONORAIL BM

Order code

Individual guide rails and carriages are ordered in accordance with the order codes described below.

Q.v. chapter 2.1 and chapter 4.3 for the order key for accessories.

Separate order codes are used in each case for rails, carriages and accessories. This also applies to different versions of rails and carriages.

All guide components are supplied individually as standard, i.e. unassembled.

If required, SCHNEEBERGER can also supply rails and carriages assembled incl. accessories as complete systems. Please note the ordering instructions in chapter 2.4 if this applies.

Order code for BM rails

| | 2x | BM S | 25 | -N | -G3 | -KC | -R1 | -958 | -29 | -29 | -CN |
|----------------------------------|----|------|----|----|-----|-----|-----|------|-----|-----|-----|
| Quantity | | | | | | | | | | | |
| Rail | | | | | | | | | | | |
| Size | | | | | | | | | | | |
| Type | | | | | | | | | | | |
| Accuracy | | | | | | | | | | | |
| Straightness | | | | | | | | | | | |
| Reference side | | | | | | | | | | | |
| Rail length L3 | | | | | | | | | | | |
| Position of first fixing hole L5 | | | | | | | | | | | |
| Position of last fixing hole L10 | | | | | | | | | | | |
| Coating | | | | | | | | | | | |

NB

Q.v. chapter 4.1 to 4.3 for an overview of types, details of shapes, available options and accessories.

Q.v. chapter 2 for a description of the options.

If possible, standard lengths are preferred for L3 rail length.

These are calculated with the table values in chapter 4.2 using the following formula: $L3 = n \times L4 + L5 + L10 \leq L3max$.

Order code for BM carriages

| | 4x | BM W | 25 | -A | -G3 | -V1 | -R1 | -CN | -S10 | -LN |
|------------------------------------|----|------|----|----|-----|-----|-----|-----|------|-----|
| Quantity | | | | | | | | | | |
| Carriage | | | | | | | | | | |
| Size | | | | | | | | | | |
| Type | | | | | | | | | | |
| Accuracy | | | | | | | | | | |
| Preload | | | | | | | | | | |
| Reference side | | | | | | | | | | |
| Coating | | | | | | | | | | |
| Lube connection | | | | | | | | | | |
| Lubrication as delivered condition | | | | | | | | | | |

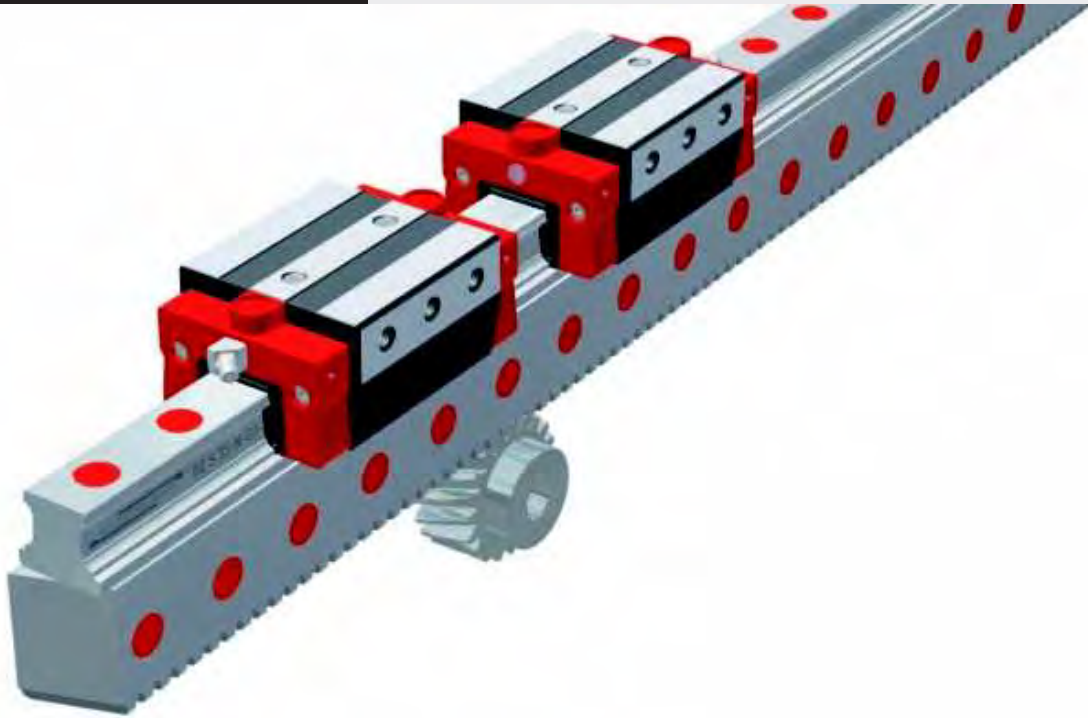
NB

Q.v. chapter 4.1 to 4.3 for an overview of types, details of shapes, available options and accessories.

Q.v. chapter 2 for a description of the options.

SCHNEEBERGER
 LINEAR TECHNOLOGY

5 MONORAIL BZ



With its BZ MONORAIL, SCHNEEBERGER offers linear guide systems that extend the characteristic properties of the company's BM MONORAIL profile rail guides to include the advantages of an integral and high-precision rack drive.

Customers gain the following decisive benefits:

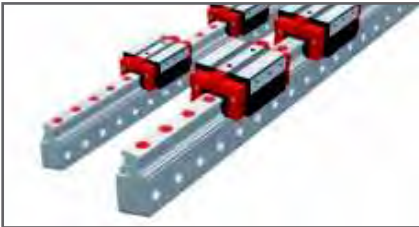
- One-piece system up to 6,000mm long
- High-quality gear rack(hardened and ground)
- Cost savings of up to 25% due to reduced outlay on manufacturing and assembly
- Superlative operating properties, high load carrying capacity and a long service life based on our proven MONORAIL linear guides
- Oriented towards customer requirements due to the large number of carriage types available with BM ball guides and a comprehensive range of accessories and customised gear types and grades.

Features of System MONORAIL BZ

Details see chapter 1

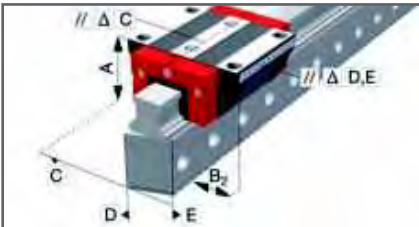


5.1 Overview of Types, Sizes and available Options



| | |
|---------------------------------|-------|
| > Product overview BZ Rails | p. 84 |
| > Product overview BM Carriages | p. 85 |

5.2 Technical data and Options



| | |
|---------|-------|
| > BZ 25 | p. 86 |
| > BZ 35 | p. 88 |

5.3 Accessories MONORAIL BZ



| | |
|----------------------------------|-------|
| > Accessories overview | p. 90 |
| > BZ Rails accessory details | p. 91 |
| > BM Carriages accessory details | p. 92 |

5.4 Order key



| | |
|--------------------------|-------|
| > Order key BZ Rails | p. 94 |
| > Order key BM Carriages | p. 94 |

5.1

MONORAIL BZ

Overview of Types, Sizes and available Options

Product overview BZ Rails



NX
 standard, half
 pitch



Buildsizes / Rail build forms

| | | | | | |
|---|------------|--|--|--|--|
| Size 25 | BZ S 25-NX | | | | |
| Size 35 | BZ S 35-NX | | | | |
| Features | | | | | |
| Screwable from the side | ● | | | | |
| Good accessibility of the fixing screws | ● | | | | |
| Great single-part system length | ● | | | | |



Available options for BZ Rails

Details see chapter 2



Toothing quality

-  Q6, smooth, milled
-  Q5, hard, ground

Reference side

-  R1 Ref. at bottom
-  R2 Ref. on top

Coating

-  CN None
-  CH Hard chromium

Available accessories for BZ Rails

Details see chapter 5.3

Plugs

Pinions

Others

Product overview BM Carriages



| | A standard | B standard, long | C compact, high | D compact, high, long | E compact, high, for lateral fixing | F compact | G compact, long |
|--|----------------------|----------------------------|---------------------------|---------------------------------|---|---------------------|---------------------------|
|--|----------------------|----------------------------|---------------------------|---------------------------------|---|---------------------|---------------------------|

Buildsizes / Carriage build forms

| | | | | | | | |
|---------|-----------|-----------|-----------|-----------|-----------|-----------|-----------|
| Size 25 | BM W 25-A | BM W 25-B | BM W 25-C | BM W 25-D | BM W 25-E | BM W 25-F | BM W 25-G |
| Size 35 | BM W 35-A | BM W 35-B | BM W 35-C | BM W 35-D | BM W 35-E | BM W 35-F | BM W 35-G |

Features

| | | | | | | | |
|------------------------------|---|---|---|---|---|---|---|
| Screwable from above | • | • | • | • | | • | • |
| Screwable from below | • | • | | | | | |
| Screwable from the side | | | | | • | | |
| For high loads and moments | | • | | • | | | • |
| For medium loads and moments | • | | • | | • | • | |
| For limited space conditions | | | | | | • | • |

Available options for BM Carriages

Details see chapter 2

Accuracy

- G0** Highly accurate
- G1** Very accurate
- G2** Accurate
- G3** Standard

Preload

- V0** Very low
- V1** Low
- V2** Medium
- V3** High

Reference side

- R1** Ref. at bottom
- R2** Ref. on top

Coating

- CN** None
- CH** Hard chromium

Lube connections

- S10** Left center
- S20** Right center
- S11** Top left
- S21** Top right
- S12** Lower left side
- S22** Lower right side
- S13** Upper left side
- S23** Upper right side
- S32** Left side
- S42** Right side

Lubrication

- LN** Oil protect
- LG** Grease protect
- LV** Full greasing

Available accessories for BM Carriages

Details see chapter 4.3 and 2.1

- Additional wipers
- Front plates
- Bellows
- Lube nipples
- Assembly rails
- Lube adapters
- Lubrication plates

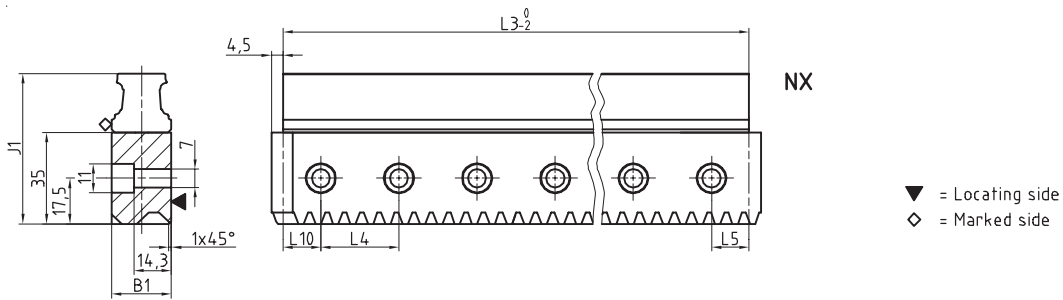
5.2

MONORAIL BZ

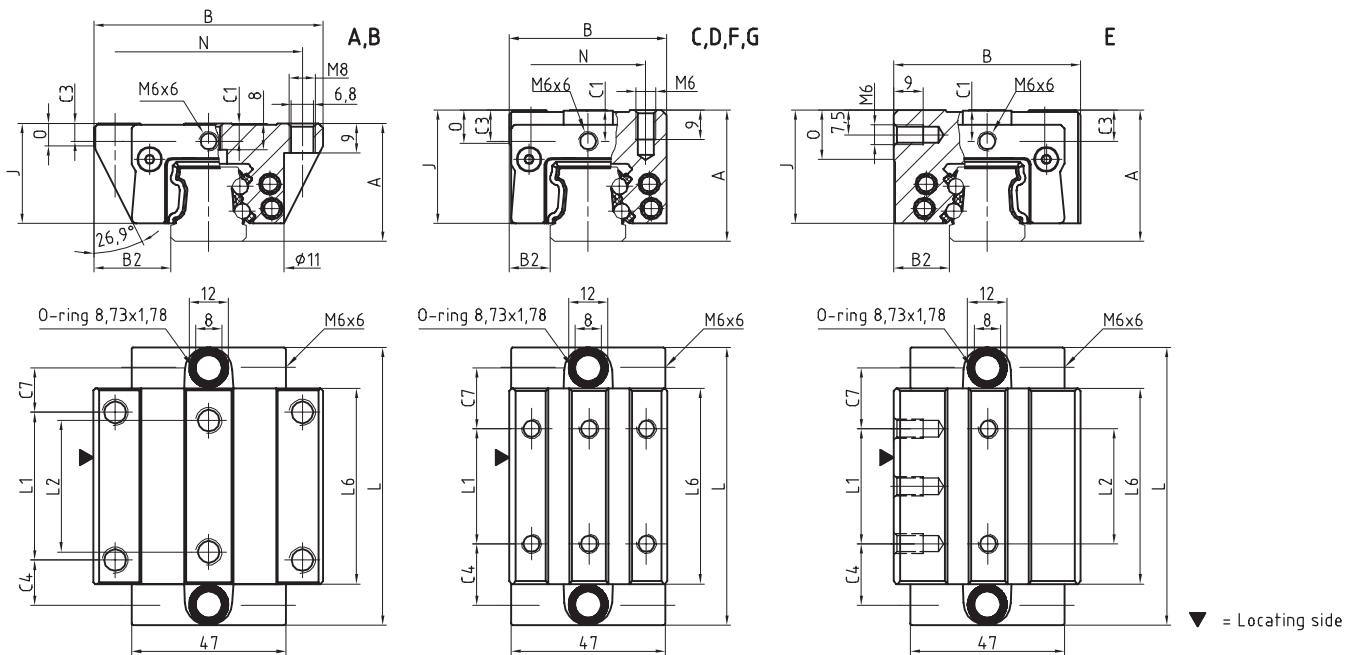
BZ 25

Technical Data

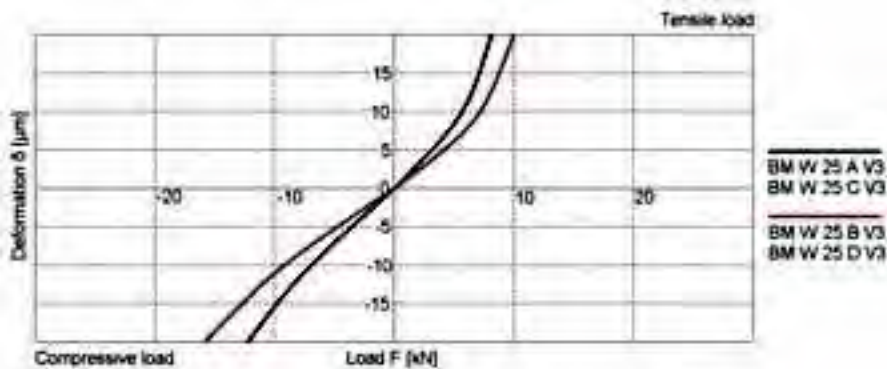
BZ 25 Rail Drawings



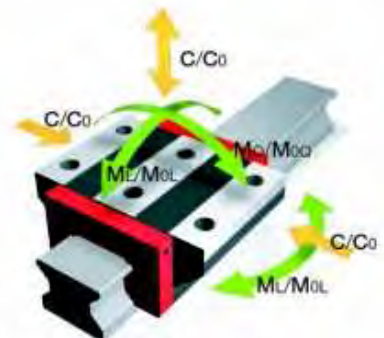
BM 25 Carriage Drawings



BZ 25 Rigidity diagram



BZ 25 load rating



BZ S 25 Dimensions



| | BZ S 25-NX | | | | |
|--|------------|--|--|--|--|
| B1: Rail width | 23 | | | | |
| J1: Rail height | 57.7 | | | | |
| L3: Rail length max. | 6 000 | | | | |
| L4: Spacing of fixing holes | 30 | | | | |
| L5/L10: Position of first/last fixing hole | 15 | | | | |
| m: Module | 2 | | | | |
| α: Helix angle | 19°31'42" | | | | |
| Gew: Rail weight, specific (kg/m) | 8.9 | | | | |

Available options for BZ S 25



BM W 25 Dimensions and capacities



| | BM W 25-A | BM W 25-B | BM W 25-C | BM W 25-D | BM W 25-E | BM W 25-F | BM W 25-G |
|--|-----------|-----------|-----------|-----------|-----------|-----------|-----------|
| A: System height | 71 | 71 | 75 | 75 | 75 | 71 | 71 |
| B: Carriage width | 70 | 70 | 48 | 48 | 57 | 48 | 48 |
| B3: Distance between locating faces | 46.5 | 46.5 | 35.5 | 35.5 | 40 | 35.5 | 35.5 |
| C1: Position of center front lube hole | 5.5 | 5.5 | 9.5 | 9.5 | 9.5 | 5.5 | 5.5 |
| C3: Position of lateral lube hole | 5.5 | 5.5 | 9.5 | 9.5 | 9.5 | 5.5 | 5.5 |
| C4: Position of lateral lube hole | 13.75 | 23.25 | 18.75 | 20.75 | 18.75 | 18.75 | 20.75 |
| C7: Position of top lube hole | 13.5 | 23 | 18.5 | 20.5 | 18.5 | 18.5 | 20.5 |
| J: Carriage height | 30.5 | 30.5 | 34.5 | 34.5 | 34.5 | 30.5 | 30.5 |
| L: Carriage length | 84.5 | 103.5 | 84.5 | 103.5 | 84.5 | 84.5 | 103.5 |
| L1: Exterior fixing hole spacing | 45 | 45 | 35 | 50 | 35 | 35 | 50 |
| L2: Interior fixing hole spacing | 40 | 40 | - | - | 35 | - | - |
| L6: Steel body length | 59.5 | 78.5 | 59.5 | 78.5 | 59.5 | 59.5 | 78.5 |
| N: Lateral fixing hole spacing | 57 | 57 | 35 | 35 | - | 35 | 35 |
| O: Reference face height | 7 | 7 | 11 | 11 | 15 | 7.1 | 7.1 |

Capacities and weights

| | | | | | | | |
|---|--------|--------|--------|--------|--------|--------|--------|
| C0: Static load capacity (N) | 46 100 | 60 300 | 46 100 | 60 300 | 46 100 | 46 100 | 60 300 |
| C100: Dynamic load capacity (N) | 21 100 | 25 500 | 21 100 | 25 500 | 21 100 | 21 100 | 25 500 |
| MOQ: Static cross moment capacity (Nm) | 631 | 825 | 631 | 825 | 631 | 631 | 825 |
| MOL: Static longitudinal moment capacity (Nm) | 513 | 863 | 513 | 863 | 513 | 513 | 863 |
| MQ: Dynamic cross moment capacity (Nm) | 289 | 349 | 289 | 349 | 289 | 289 | 349 |
| ML: Dynamic longitudinal moment capacity (Nm) | 235 | 365 | 235 | 365 | 235 | 235 | 365 |
| Gew: Carriage weight (kg) | 0.7 | 0.9 | 0.6 | 0.8 | 0.7 | 0.6 | 0.7 |

Available options for BM W 25



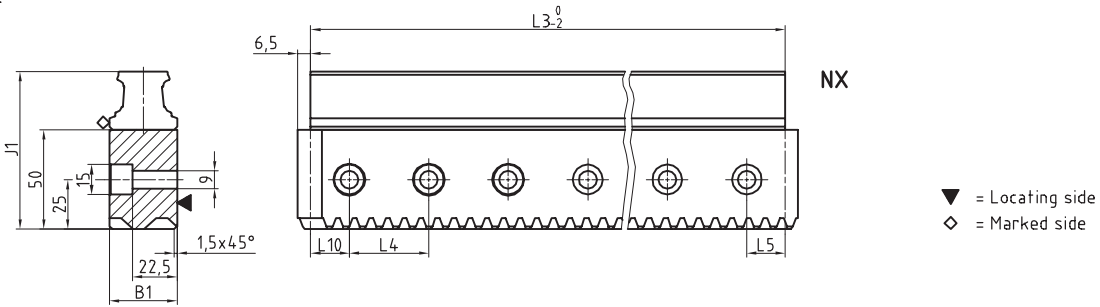
5.2

MONORAIL BZ

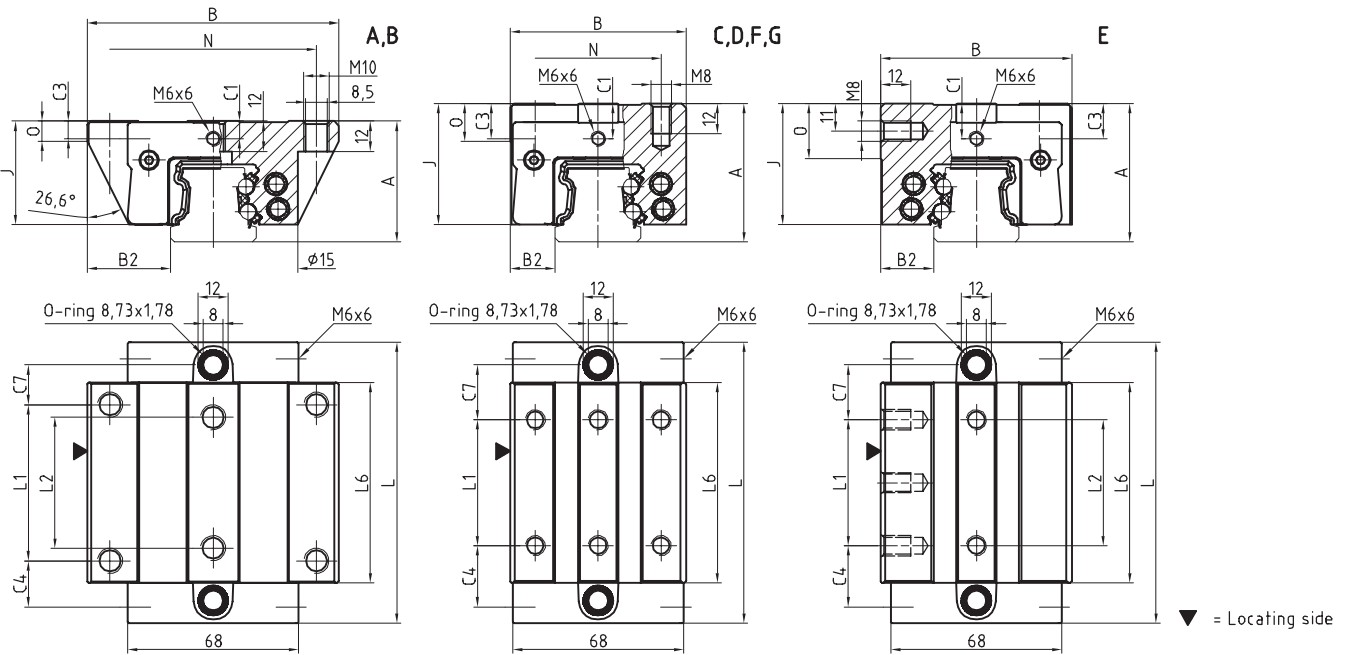
BZ 35

Technical Data

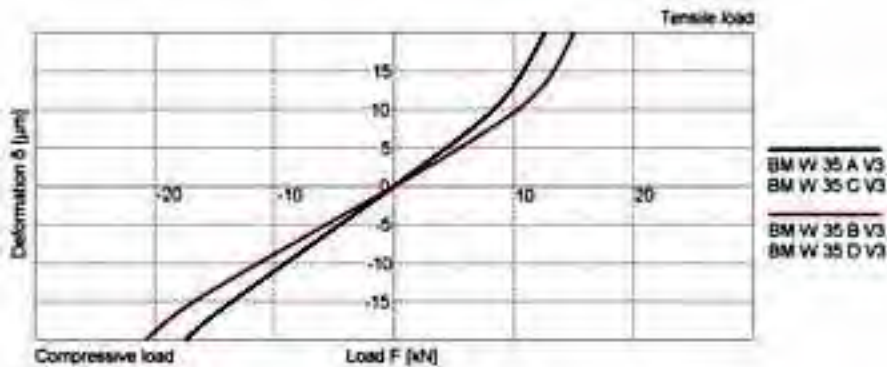
BZ 35 Rail Drawings



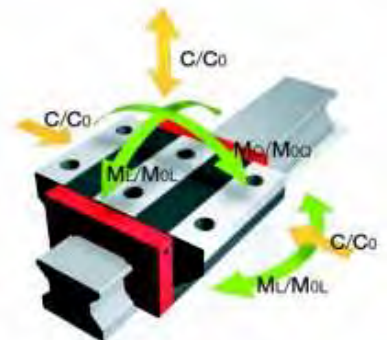
BM 35 Carriage Drawings



BZ 35 Rigidity diagram



BZ 35 load rating



BZ S 35 Dimensions



| | BZ S 35-NX | | | | |
|--|------------|--|--|--|--|
| B1: Rail width | 34 | | | | |
| J1: Rail height | 79.5 | | | | |
| L3: Rail length max. | 6 000 | | | | |
| L4: Spacing of fixing holes | 40 | | | | |
| L5/L10: Position of first/last fixing hole | 20 | | | | |
| m: Module | 2.5 | | | | |
| α: Helix angle | 19°31'42" | | | | |
| Gew: Rail weight, specific (kg/m) | 17.9 | | | | |

Available options for BZ S 35



BM W 35 Dimensions and capacities



| | BM W 35-A | BM W 35-B | BM W 35-C | BM W 35-D | BM W 35-E | BM W 35-F | BM W 35-G |
|--|-----------|-----------|-----------|-----------|-----------|-----------|-----------|
| A: System height | 98 | 98 | 105 | 105 | 105 | 98 | 98 |
| B: Carriage width | 100 | 100 | 70 | 70 | 76 | 70 | 70 |
| B3: Distance between locating faces | 67 | 67 | 52 | 52 | 55 | 52 | 52 |
| C1: Position of center front lube hole | 7 | 7 | 14 | 14 | 14 | 7 | 7 |
| C3: Position of lateral lube hole | 7 | 7 | 14 | 14 | 14 | 7 | 7 |
| C4: Position of lateral lube hole | 18.3 | 31.05 | 24.3 | 26.05 | 24.3 | 24.3 | 26.05 |
| C7: Position of top lube hole | 15.8 | 28.55 | 21.8 | 23.55 | 21.8 | 21.8 | 23.55 |
| J: Carriage height | 41 | 41 | 48 | 48 | 48 | 41 | 41 |
| L: Carriage length | 111.6 | 137.1 | 111.6 | 137.1 | 111.6 | 111.6 | 137.1 |
| L1: Exterior fixing hole spacing | 62 | 62 | 50 | 72 | 50 | 50 | 72 |
| L2: Interior fixing hole spacing | 52 | 52 | - | - | 50 | - | - |
| L6: Steel body length | 79.6 | 105.1 | 79.6 | 105.1 | 79.6 | 79.6 | 105.1 |
| N: Lateral fixing hole spacing | 82 | 82 | 50 | 50 | - | 50 | 50 |
| O: Reference face height | 8 | 8 | 15 | 15 | 22 | 8 | 8 |

Capacities and weights

| | | | | | | | |
|---|--------|---------|--------|---------|--------|--------|---------|
| C0: Static load capacity (N) | 84 400 | 110 300 | 84 400 | 110 300 | 84 400 | 84 400 | 110 300 |
| C100: Dynamic load capacity (N) | 38 700 | 46 700 | 38 700 | 46 700 | 38 700 | 38 700 | 46 700 |
| MOQ: Static cross moment capacity (Nm) | 1 566 | 2 048 | 1 566 | 2 048 | 1 566 | 1 566 | 2 048 |
| MOL: Static longitudinal moment capacity (Nm) | 1 252 | 2 104 | 1 252 | 2 104 | 1 252 | 1 252 | 2 104 |
| MQ: Dynamic cross moment capacity (Nm) | 718 | 867 | 718 | 867 | 718 | 718 | 867 |
| ML: Dynamic longitudinal moment capacity (Nm) | 574 | 891 | 574 | 891 | 574 | 574 | 891 |
| Gew: Carriage weight (kg) | 1.8 | 2.3 | 1.7 | 2.2 | 1.9 | 1.4 | 1.8 |

Available options for BM W 35



5.3

MONORAIL BZ

Accessories

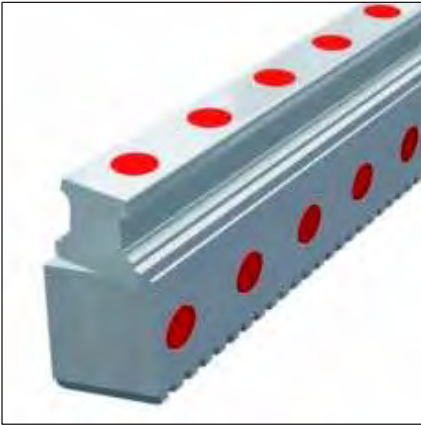
BZ Rails accessories overview

| Accessories | BZ S 25 | BZ S 35 | | | | |
|-------------------------------------|----------------|----------------|--|--|--|--|
| Plugs: | | | | | | |
| Plastic plugs | BRK 25 | BRK 35 | | | | |
| Pinions: | | | | | | |
| Pinion with through bore | BZR 25-... | BZR 35-... | | | | |
| Pinion with through bore and keyway | BZR 25-...-K | BZR 35-...-K | | | | |
| Pinion with shaft | BZR 25-S-... | BZR 35-S-... | | | | |
| Pinion with shaft and keyway | BZR 25-S-...-K | BZR 35-S-...-K | | | | |
| Others: | | | | | | |
| Lubricating pinion | BZR 25-L-... | BZR 35-L-... | | | | |
| Pinion hub for lubricating pinion | BZR 25-LN | BZR 35-LN | | | | |
| Assembly fixture for BZ systems | BZM 25-..... | BZM 35-..... | | | | |

BM Carriages accessories overview

| Accessories | BM W 25 | BM W 35 | | | | |
|--|------------|---------------|--|--|--|--|
| Additional wipers: | | | | | | |
| Additional wiper NBR | ZBN 25-U | ZBN 35-U | | | | |
| Additional wiper Viton | ZBV 25-U | ZBV 35-U | | | | |
| Metal wiper | ABM 25 | ABM 35 | | | | |
| Bellows: | | | | | | |
| Bellows | FBB 25 | FBB 35 | | | | |
| Adapter plate for bellows (spare part) | ZPB 25 | ZPB 35 | | | | |
| End plate for bellows (spare part) | EPB 25 | EPB 35 | | | | |
| Assembly rails: | | | | | | |
| Assembly rail | MBM 25 | MBM 35 | | | | |
| Lubrication plates: | | | | | | |
| Lubrication plate | SPL 25-BM | SPL 35-BM | | | | |
| Front plates: | | | | | | |
| Cross wiper for front plate (spare part) | QAS 25-STB | QAS 35-STB | | | | |
| Lube nipples: | | | | | | |
| Hydraulic-type grease nipple straight | SN 6 | SN 6 | | | | |
| Hydraulic-type grease nipple 45° | SN 6-45 | SN 6-45 | | | | |
| Hydraulic-type grease nipple 90° | SN 6-90 | SN 6-90 | | | | |
| Flush type grease nipple M3 | - | - | | | | |
| Flush type grease nipple M6 | SN 6-T | SN 6-T | | | | |
| Grease gun for SN 3-T and SN 6-T | SFP-T3 | SFP-T3 | | | | |
| Lube adapters: | | | | | | |
| Straight screw-in connection M3 | - | - | | | | |
| Lubrication adapter M8 round-head | SA 6-RD-M8 | SA 6-RD-M8 | | | | |
| Lubrication adapter M8 hexagon head | - | SA 6-6KT-M8 | | | | |
| Lubrication adapter G1/8 hexagon head | - | SA 6-6KT-G1/8 | | | | |
| Swivel screw connection for pipe d=4 mm | SV 6-D4 | SV 6-D4 | | | | |
| Swivel screw connection M6 | SV 6-M6 | SV 6-M6 | | | | |
| Swivel screw connection M6 long | SV 6-M6-L | SV 6-M6-L | | | | |
| Swivel screw connection M8 | SV 6-M8 | SV 6-M8 | | | | |
| Swivel screw connection M8 long | SV 6-M8-L | SV 6-M8-L | | | | |

BZ Rails accessory details



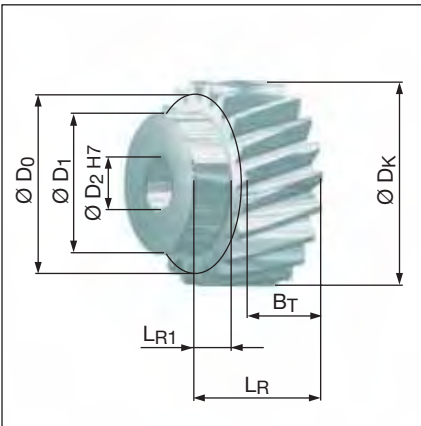
Plastic plugs

If required, the attachment holes on the sides of BZ rails can be closed with BRK plastic plugs. However, this is not essential as the holes are located outside the carriage's area of movement.

Scope of supply: Pack of 25 pcs

Order code: **BRK xx**

xx = Size, Sample order: 3 x BRK 25 (75 pcs)



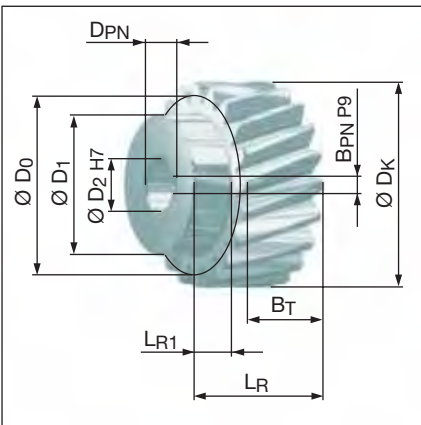
Pinion with through bore

The pinion has hardened and ground helical teeth in quality 6. The bore is soft and can be machined by customers to suit their individual requirements. This pinion is also available with a keyway (see next paragraph). For dimensions, please refer to the BZR xx columns in the table of dimensions.

Order code:

Size 25: **BZR 25-2.0-20-S6**

Size 35: **BZR 35-2.5-20-S6**



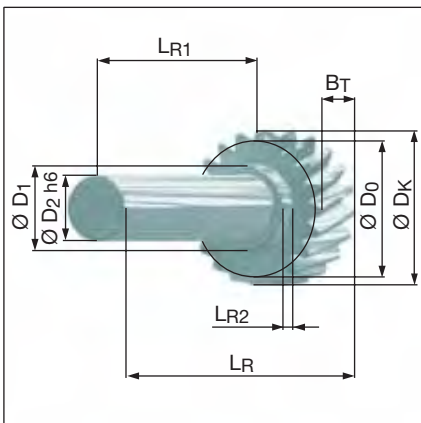
Pinion with through bore and keyway

This pinion is similar to the pinion with a through bore but also has a keyway to specification DIN 6885-A to facilitate its attachment to a drive shaft. For dimensions, please refer to the BZR xx-K columns in the table of dimensions.

Order code:

Size 25: **BZR 25-2.0-20-S6-K**

Size 35: **BZR 35-2.5-20-S6-K**



Pinion with shaft

This pinion with hardened and ground helical teeth in quality 6 has a plain shaft. This is left unhardened to permit subsequent machining. This pinion is also available with a keyway (see next paragraph). For dimensions, please refer to the BZR xx-S columns in the table of dimensions.

Order code:

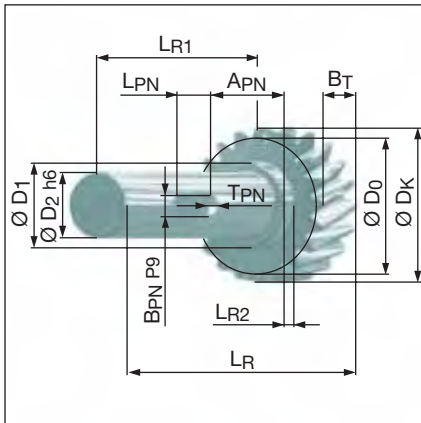
Size 25: **BZR 25-S-2.0-20-S6**

Size 35: **BZR 35-S-2.5-20-S6**

5.3

MONORAIL BZ

Accessories



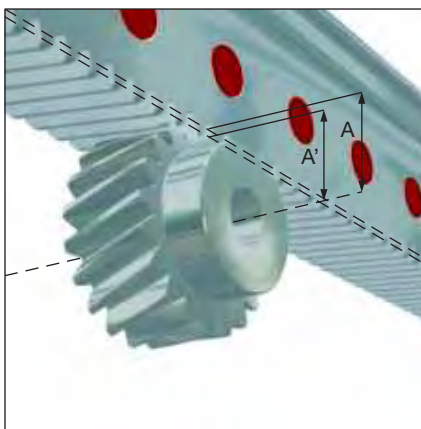
Pinion with shaft and keyway

This pinion is similar to the pinion with a shaft, but also has a keyway to specification DIN 6885-A. For attachment For dimensions, please refer to the BZR xx-S-K columns in the table of dimensions.

Order code:

Size 25: **BZR 25-S-2.0-20-S6-K**

Size 35: **BZR 35-S-2.5-20-S6-K**



Measure A and A'

Dimension table pinions

| | BZR 25 | BZR 35 | BZR 25-K | BZR 35-K | BZR 25-S | BZR 35-S | BZR 25-S-K | BZR 35-S-K |
|---|-----------|-----------|-----------|-----------|-----------|-----------|------------|------------|
| z: Number of teeth | 20 | 20 | 20 | 20 | 20 | 20 | 20 | 20 |
| m: Module | 2.0 | 2.5 | 2.0 | 2.5 | 2.0 | 2.5 | 2.0 | 2.5 |
| α : Helix angle | 19°31'42" | 19°31'42" | 19°31'42" | 19°31'42" | 19°31'42" | 19°31'42" | 19°31'42" | 19°31'42" |
| A: Distance axis - reference circle | 21.22 | 26.53 | 21.22 | 26.53 | 21.22 | 26.53 | 21.22 | 26.53 |
| A': Distance axis - tooth crest of rack | 19.22 | 24.03 | 19.22 | 24.03 | 19.22 | 24.03 | 19.22 | 24.03 |
| BT: Tooth width | 20 | 25 | 20 | 25 | 20 | 25 | 20 | 25 |
| DK: Outside diameter | 46.44 | 58.05 | 46.44 | 58.05 | 46.44 | 58.05 | 46.44 | 58.05 |
| D0: Reference diameter | 42.44 | 53.05 | 42.44 | 53.05 | 42.44 | 53.05 | 42.44 | 53.05 |
| D1: Shoulder diameter | 35 | 40 | 35 | 40 | 32 | 32 | 32 | 32 |
| D2: Bore / shaft diameter | 15 | 15 | 15 | 15 | 25 | 25 | 25 | 25 |
| LR: Total length | 30 | 37 | 30 | 37 | 140 | 145 | 140 | 145 |
| LR1: Shaft length | 10 | 12 | 10 | 12 | 120 | 120 | 120 | 120 |
| LR2: Shoulder length | - | - | - | - | 8 | 8 | 8 | 8 |
| APN: Keyway distance | - | - | - | - | - | - | 43.5 | 43.5 |
| BPN: Keyway width | - | - | 5 | 5 | - | - | 8 | 8 |
| DPN: Diameter of bore with keyway | - | - | 17.3 | 17.3 | - | - | - | - |
| LPN: Keyway length | - | - | - | - | - | - | 25 | 25 |
| TPN: Keyway depth | - | - | - | - | - | - | 4 | 4 |



Assembly fixture for BZ systems

An assembly fixture is available for the alignment of butt-jointed BZ rails. It consists of a rack segment designed to match BZ teeth. During assembly, the segment is inserted into the racks on both sides of the butt joint which connects and aligns them precisely.

Order code:

Size 25: **BZM 25-2.0-7-S5**

Size 35: **BZM 35-2.5-6-S5**



Lubricating pinion

Felt lubricating pinions are available to lubricate the racks. These can be supplied with oil either manually or with an automatic lubrication system.

Order code:

Size 25: **BZR 25-L-2.0-16-S**

Size 35: **BZR 35-L-2.5-16-S**



Pinion hub for lubricating pinion

Pinion hubs are used in combination with lubricating pinions. Lubricating oil can be fed through the hub to the felt pinion through via a special arrangement of lubricating channels.

Order code:

Size 25: **BZR 25-LN**

Size 35: **BZR 35-LN**

5.4

MONORAIL BZ

Order code

Individual guide rails and carriages are ordered in accordance with the order codes described below.

All MONORAIL BM carriages can be used with BZ rails.

Q.v. chapter 2.1, chapter 4.3 and 5.3 for the order key for accessories.

Separate order codes are used in each case for rails, carriages and accessories. This also applies to different versions of rails and carriages.

All guide components are supplied individually as standard, i.e. unassembled.

If required, SCHNEEBERGER can also supply rails and carriages assembled incl. accessories as complete systems. Please note the ordering instructions in chapter 2.4 if this applies.

Order code for BZ rails

| | 2x | BZ S | 25 | -Q6S | -R1 | -960 | -15 | -15 | -CN |
|----------------------------------|----|------|----|------|-----|------|-----|-----|-----|
| Quantity | | | | | | | | | |
| Rail | | | | | | | | | |
| Size | | | | | | | | | |
| Toothing quality | | | | | | | | | |
| Reference side | | | | | | | | | |
| Rail length L3 | | | | | | | | | |
| Position of first fixing hole L5 | | | | | | | | | |
| Position of last fixing hole L10 | | | | | | | | | |
| Coating | | | | | | | | | |

NB

Q.v. chapter 5.1 to 5.3 for an overview of types, details of shapes, available options and accessories.

Q.v. chapter 2 for a description of the options.

If possible, standard lengths are preferred for L3 rail length.

These are calculated with the table values in chapter 5.2 using the following formula: $L3 = n \times L4 + L5 + L10 \leq L3max.$

Order code for BM carriages

| | 4x | BM W | 25 | -A | -G3 | -V1 | -R1 | -CN | -S10 | -LN |
|------------------------------------|----|------|----|----|-----|-----|-----|-----|------|-----|
| Quantity | | | | | | | | | | |
| Carriage | | | | | | | | | | |
| Size | | | | | | | | | | |
| Type | | | | | | | | | | |
| Accuracy | | | | | | | | | | |
| Preload | | | | | | | | | | |
| Reference side | | | | | | | | | | |
| Coating | | | | | | | | | | |
| Lube connection | | | | | | | | | | |
| Lubrication as delivered condition | | | | | | | | | | |

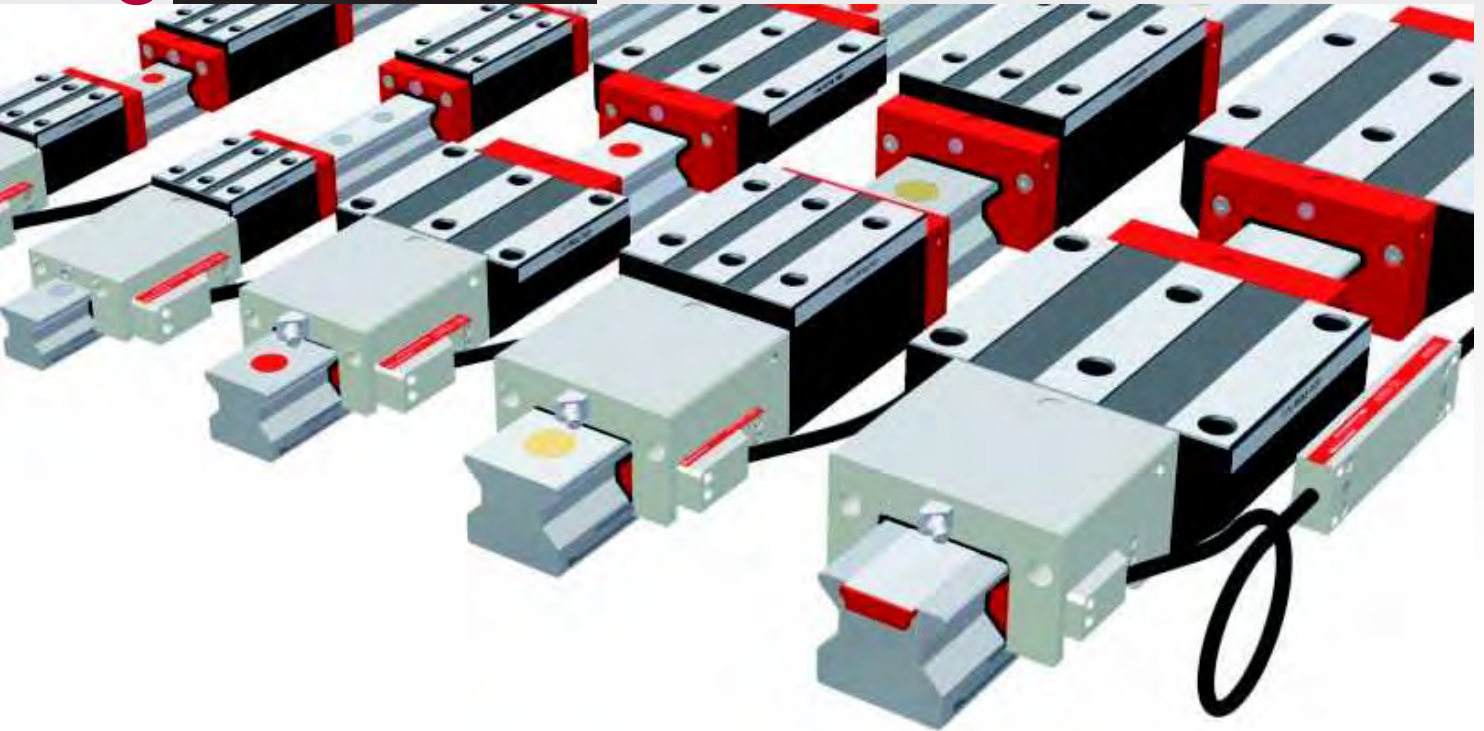
NB

Q.v. chapter 5.1 to 5.3 for an overview of types, details of shapes, available options and accessories.

Q.v. chapter 2 for a description of the options.

SCHNEEBERGER
 LINEAR TECHNOLOGY

6 **MONORAIL AMSA 3A**



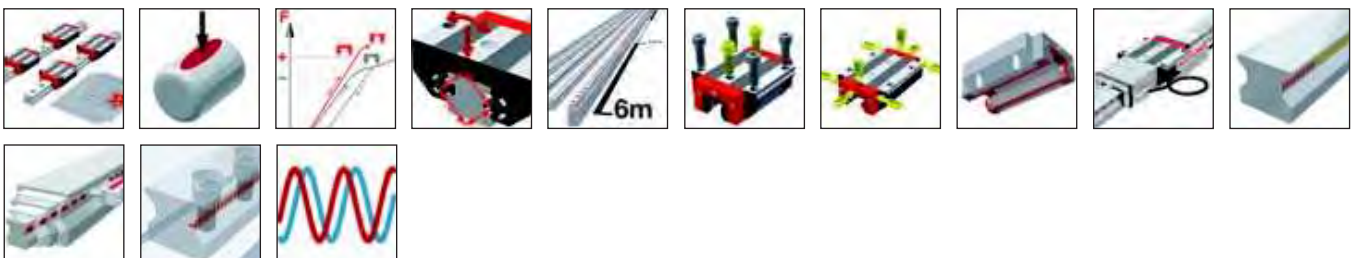
SCHNEEBERGER's AMSA 3A MONORAIL is an integrated linear encoder system for use on all protected machine tool axes with high demands on system precision. Mechanically the AMSA 3A is based on SCHNEEBERGER's MR Monorail roller guide with lengths up to 6 metres. The integration of the measurement system allows very compact axes to be put together.

An analog 1Vss (200 µm signal period) interface, with different cable lengths, is available as the interface with the control system. Combined with SCHNEEBERGER's SMEa interpolation electronics, very high-resolution and fast digital signals can be provided. Reference marks can be set at 50mm intervals or distance coded.

Different options for carriage lubrication and sealing permit the best possible degree of adaptation to application requirements. The easily interchangeable reading head is identical for all sizes.

Features of System MONORAIL AMSA 3A

Details see chapter 1

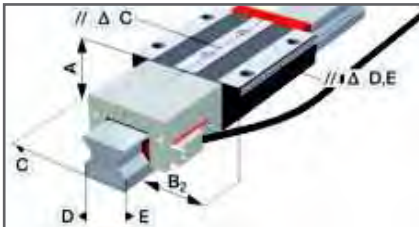


6.1 Overview of Types, Sizes and available Options



| | |
|--------------------------------------|-------|
| > Product overview AMSA 3A Rails | p. 98 |
| > Product overview AMSA 3A Carriages | p. 99 |

6.2 Technical data and Options



| | |
|--------------|--------|
| > AMSA 3A 25 | p. 100 |
| > AMSA 3A 35 | p. 102 |
| > AMSA 3A 45 | p. 104 |
| > AMSA 3A 55 | p. 106 |
| > AMSA 3A 65 | p. 108 |

6.3 Accessories MONORAIL AMSA 3A



| | |
|---------------------------------------|--------|
| > Accessories overview | p. 110 |
| > AMSA 3A Rails accessory details | p. 110 |
| > AMSA 3A Carriages accessory details | p. 110 |

6.4 Order key



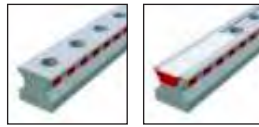
| | |
|-------------------------------|--------|
| > Order key AMSA 3A Rails | p. 111 |
| > Order key AMSA 3A Carriages | p. 111 |

6.1

MONORAIL AMSA 3A

Overview of Types, Sizes and available Options

Product overview AMSA 3A Rails



| | N standard | C for cover strip | | | | |
|--------------------------------------|----------------------|-----------------------------|--|--|--|--|
| Buildsizes / Rail build forms | | | | | | |
| Size 25 | AMSA 3A S 25-N | AMSA 3A S 25-C | | | | |
| Size 35 | AMSA 3A S 35-N | AMSA 3A S 35-C | | | | |
| Size 45 | AMSA 3A S 45-N | AMSA 3A S 45-C | | | | |
| Size 55 | AMSA 3A S 55-N | AMSA 3A S 55-C | | | | |
| Size 65 | AMSA 3A S 65-N | AMSA 3A S 65-C | | | | |
| Features | | | | | | |
| Screwable from above | ● | ● | | | | |
| Small assembly effort | | ● | | | | |
| Great single-part system length | ● | ● | | | | |

Available options for AMSA 3A Rails

Details see chapter 2

Accuracy

- G0** Highly accurate
- G1** Very accurate
- G2** Accurate
- G3** Standard

Straightness

- KC** Standard

Coating

- CN** None
- CH** Hard chromium

Locating sides

- R11** Ref.bottom, scale bottom
- R12** Ref.bottom, scale top
- R21** Ref.top, scale bottom
- R22** Ref.top, scale top

Magnetization

- TR50** 50mm pattern
- TD20** 20mm code
- TD50** 50mm code

Available accessories for AMSA 3A Rails

Details see chapter 3.3

- Plugs
- Cover strips
- Assembly tools

Product overview AMSA 3A Carriages



A standard
B standard, long
C compact, high
D compact, high, long
E compact, high, for lateral fixing

Buildsizes / Carriage build forms

| | | | | | |
|---------|----------------|----------------|----------------|----------------|----------------|
| Size 25 | AMSA 3A W 25-A | AMSA 3A W 25-B | AMSA 3A W 25-C | AMSA 3A W 25-D | AMSA 3A W 25-E |
| Size 35 | AMSA 3A W 35-A | AMSA 3A W 35-B | AMSA 3A W 35-C | AMSA 3A W 35-D | AMSA 3A W 35-E |
| Size 45 | AMSA 3A W 45-A | AMSA 3A W 45-B | AMSA 3A W 45-C | AMSA 3A W 45-D | |
| Size 55 | AMSA 3A W 55-A | AMSA 3A W 55-B | AMSA 3A W 55-C | AMSA 3A W 55-D | |
| Size 65 | | AMSA 3A W 65-B | | AMSA 3A W 65-D | |

Features

| | | | | | |
|------------------------------|---|---|---|---|---|
| Screwable from above | • | • | • | • | |
| Screwable from below | • | • | | | |
| Screwable from the side | | | | | • |
| For high loads and moments | | • | | • | |
| For medium loads and moments | • | | • | | • |

Available options for AMSA 3A Carriages

Details see chapter 2

Accuracy

- G0** Highly accurate
- G1** Very accurate
- G2** Accurate
- G3** Standard

Preload

- V1** Low
- V2** Medium
- V3** High

Reference side

- R1** Ref. at bottom
- R2** Ref. on top

Coating

- CN** None
- CH** Hard chromium

Lube connections

- S10** Left center
- S20** Right center
- S11** Top left
- S21** Top right
- S12** Lower left side
- S22** Lower right side

- S13** Upper left side
- S23** Upper right side
- S32** Left side
- S42** Right side

Lubrication

- LN** Oil protect
- LG** Grease protect
- LV** Full greasing

Interface

- TMU** TMU, analog, 0,3m
- TRU** TRU, analog, 3m
- TSU** TSU, analog, 3m

Reading head position

- P1** Right top
- P3** Left bottom

Available accessories for AMSA 3A Carriages

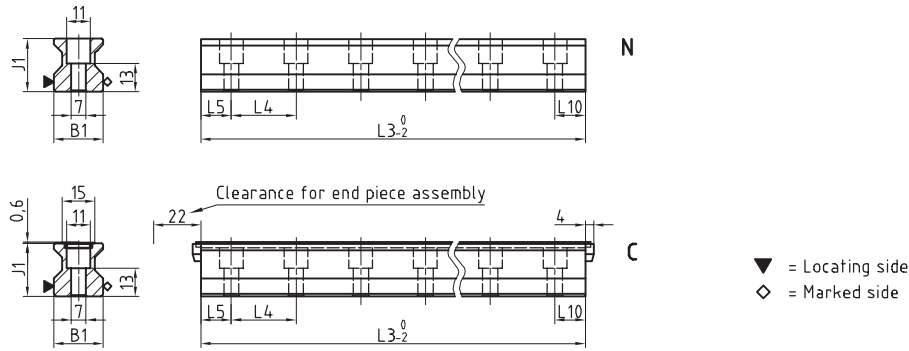
Details see chapter 2.1 and 3.3

- Additional wipers
- Bellows
- Assembly rails
- Lubrication plates
- Front plates
- Lube nipples
- Lube adapters
- Cables

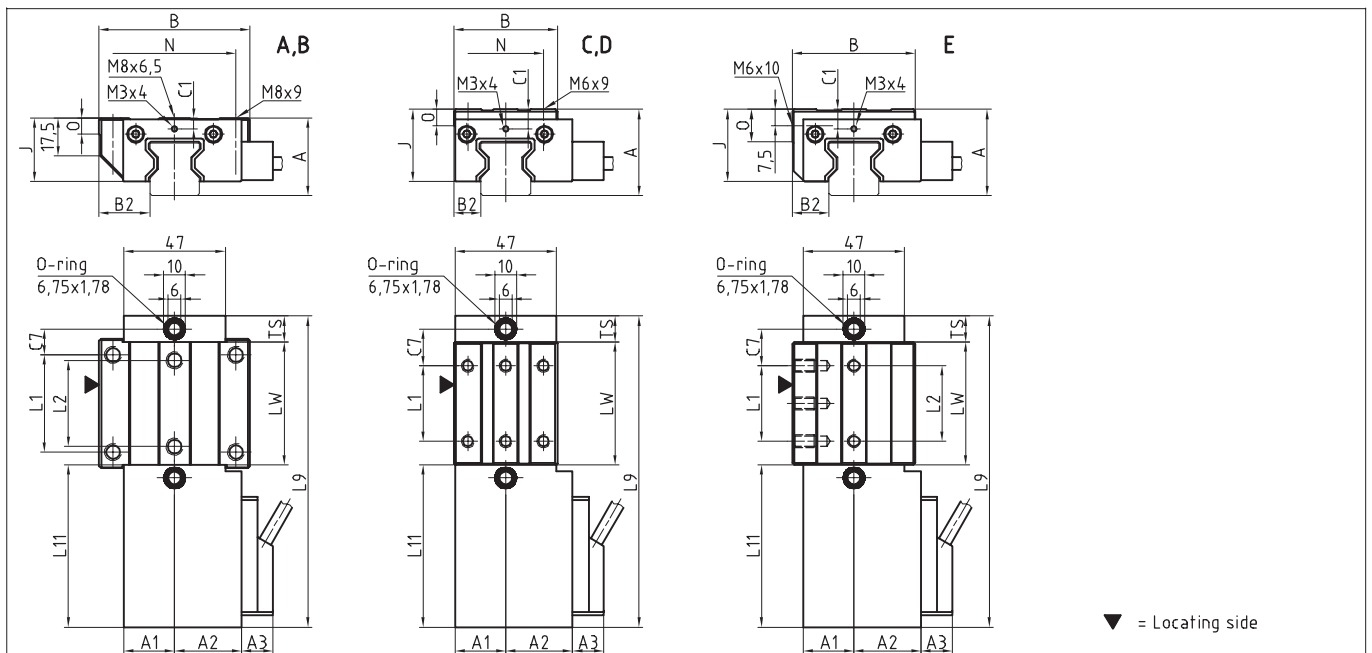
6.2

MONORAIL AMSA 3A AMSA 3A 25 Technical Data

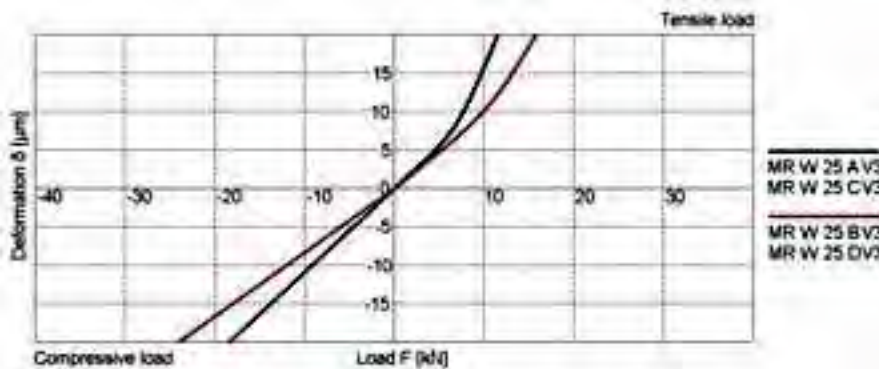
AMSA 3A 25 Rail Drawings



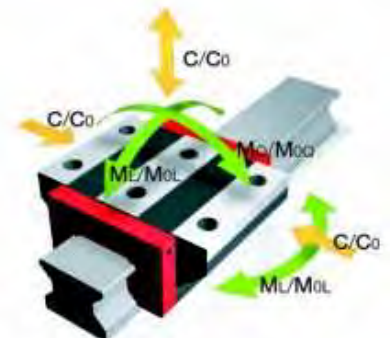
AMSA 3A 25 Carriage Drawings



AMSA 3A 25 Rigidity diagram



AMSA 3A 25 load rating



AMSA 3A S 25 Dimensions



| | AMSA 3A S 25-N | AMSA 3A S 25-C | | | | |
|--|----------------|----------------|--|--|--|--|
| B1: Rail width | 23 | 23 | | | | |
| J1: Rail height | 24.5 | 24.5 | | | | |
| L3: Rail length max. | 6 000 | 3 000 | | | | |
| L4: Spacing of fixing holes | 30 | 30 | | | | |
| L5/L10: Position of first/last fixing hole | 13.5 | 13.5 | | | | |
| Gew: Rail weight, specific (kg/m) | 3.4 | 3.3 | | | | |

Available options for AMSA 3A S 25



AMSA 3A W 25 Dimensions and capacities



| | AMSA 3A W 25-A | AMSA 3A W 25-B | AMSA 3A W 25-C | AMSA 3A W 25-D | AMSA 3A W 25-E | |
|--|----------------|----------------|----------------|----------------|----------------|--|
| A: System height | 36 | 36 | 40 | 40 | 40 | |
| A1: Half width of housing on opposite side | 23.5 | 23.5 | 23.5 | 23.5 | 23.5 | |
| A2: Half width of housing on reading head side | 31 | 31 | 31 | 31 | 31 | |
| A3: Projection of reading head | 14.5 | 14.5 | 14.5 | 14.5 | 14.5 | |
| B: Carriage width | 70 | 70 | 48 | 48 | 57 | |
| B2: Distance between locating faces | 23.5 | 23.5 | 12.5 | 12.5 | 17 | |
| C1: Position of center front lube hole * | 5 / 5.5 | 5 / 5.5 | 9 / 9.5 | 9 / 9.5 | 9 / 9.5 | |
| C3: Position of lateral lube hole | - | - | - | - | - | |
| C4: Position of lateral lube hole | - | - | - | - | - | |
| C7: Position of top lube hole | 12 | 23.2 | 17 | 20.7 | 17 | |
| J: Carriage height | 29.5 | 29.5 | 33.5 | 33.5 | 33.5 | |
| L1: Exterior fixing hole spacing | 45 | 45 | 35 | 50 | 35 | |
| L2: Interior fixing hole spacing | 40 | 40 | - | - | 35 | |
| L9: Carriage length with housing | 144.2 | 166.6 | 144.2 | 166.6 | 144.2 | |
| L11: Housing length | 75.2 | 75.2 | 75.2 | 75.2 | 75.2 | |
| Lw: Inner carriage body length | 57 | 79.4 | 57 | 79.4 | 57 | |
| N: Lateral fixing hole spacing | 57 | 57 | 35 | 35 | - | |
| O: Reference face height | 7.5 | 7.5 | 7.5 | 7.5 | 15 | |
| Ts: Front plate thickness | 12 | 12 | 12 | 12 | 12 | |

Capacities and weights

| | | | | | | |
|---|--------|--------|--------|--------|--------|--|
| C0: Static load capacity (N) | 49 800 | 70 300 | 49 800 | 70 300 | 49 800 | |
| C100: Dynamic load capacity (N) | 27 700 | 39 100 | 27 700 | 39 100 | 27 700 | |
| MOQ: Static cross moment capacity (Nm) | 733 | 1 035 | 733 | 1 035 | 733 | |
| MOL: Static longitudinal moment capacity (Nm) | 476 | 936 | 476 | 936 | 476 | |
| MQ: Dynamic cross moment capacity (Nm) | 408 | 576 | 408 | 576 | 408 | |
| ML: Dynamic longitudinal moment capacity (Nm) | 265 | 521 | 265 | 521 | 265 | |
| Gew: Carriage weight (kg) | 1.3 | 1.5 | 1.2 | 1.3 | 1.3 | |

Note: * Values valid for external housing / front plate

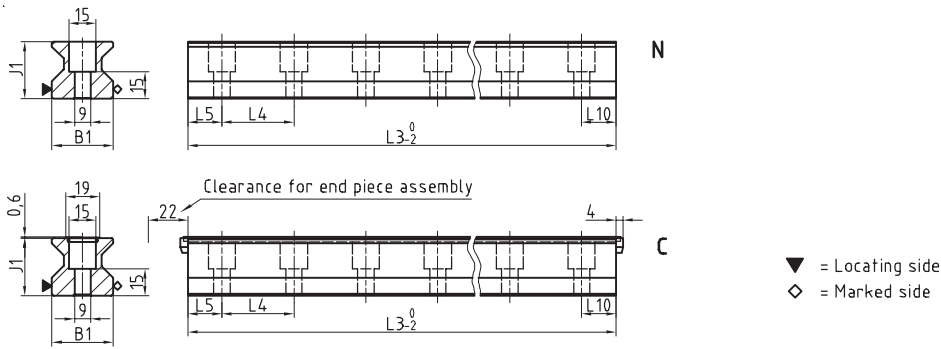
Available options for AMSA 3A W 25



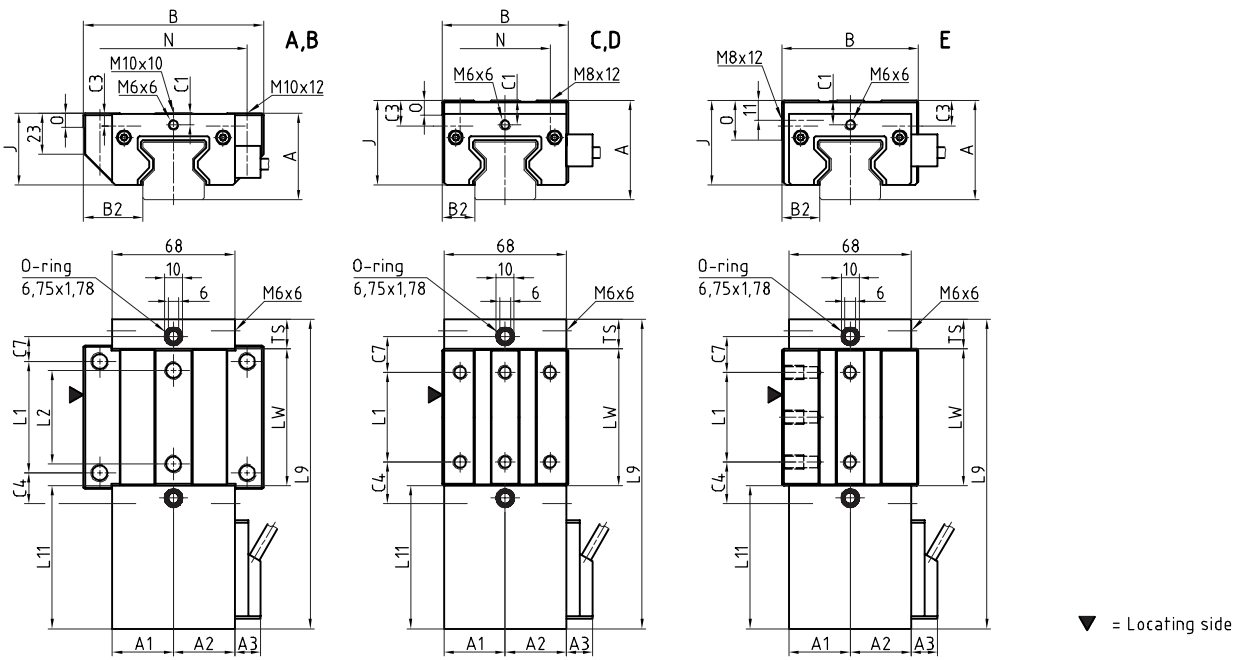
6.2

MONORAIL AMSA 3A AMSA 3A 35 Technical Data

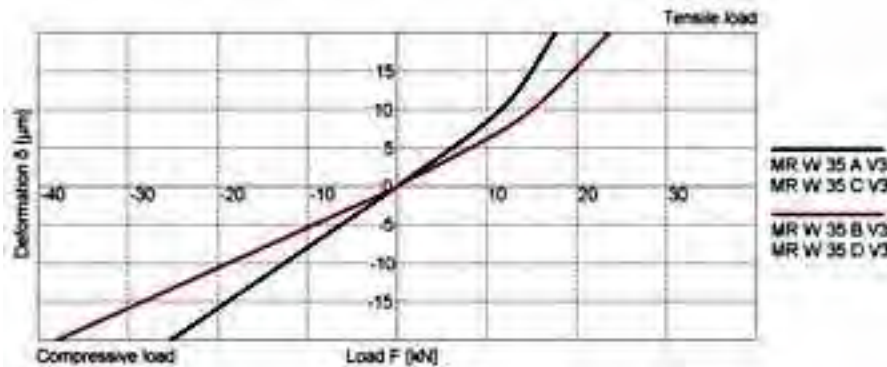
AMSA 3A 35 Rail Drawings



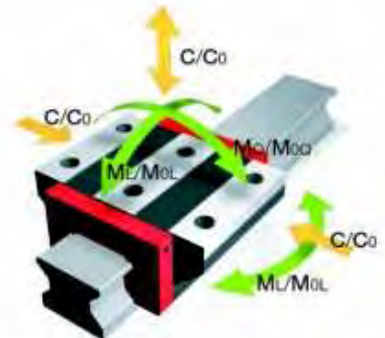
AMSA 3A 35 Carriage Drawings



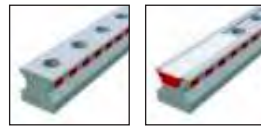
AMSA 3A 35 Rigidity diagram



AMSA 3A 35 load rating



AMSA 3A S 35 Dimensions



| | AMSA 3A S 35-N | AMSA 3A S 35-C | | | | |
|--|----------------|----------------|--|--|--|--|
| B1: Rail width | 34 | 34 | | | | |
| J1: Rail height | 32 | 32 | | | | |
| L3: Rail length max. | 6 000 | 6 000 | | | | |
| L4: Spacing of fixing holes | 40 | 40 | | | | |
| L5/L10: Position of first/last fixing hole | 18.5 | 18.5 | | | | |
| Gew: Rail weight, specific (kg/m) | 6.5 | 6.3 | | | | |

Available options for AMSA 3A S 35



AMSA 3A W 35 Dimensions and capacities



| | AMSA 3A W 35-A | AMSA 3A W 35-B | AMSA 3A W 35-C | AMSA 3A W 35-D | AMSA 3A W 35-E | |
|--|----------------|----------------|----------------|----------------|----------------|--|
| A: System height | 48 | 48 | 55 | 55 | 55 | |
| A1: Half width of housing on opposite side | 34 | 34 | 34 | 34 | 34 | |
| A2: Half width of housing on reading head side | 34 | 34 | 34 | 34 | 34 | |
| A3: Projection of reading head | 14.5 | 14.5 | 14.5 | 14.5 | 14.5 | |
| B: Carriage width | 100 | 100 | 70 | 70 | 76 | |
| B2: Distance between locating faces | 33 | 33 | 18 | 18 | 21 | |
| C1: Position of center front lube hole * | 6.5 / 7 | 6.5 / 7 | 13.5 / 14 | 13.5 / 14 | 13.5 / 14 | |
| C3: Position of lateral lube hole | 7 | 7 | 14 | 14 | 14 | |
| C4: Position of lateral lube hole | 17 | 30.5 | 23 | 25.5 | 23 | |
| C7: Position of top lube hole | 14 | 27.5 | 20 | 22.5 | 20 | |
| J: Carriage height | 40 | 40 | 47 | 47 | 47 | |
| L1: Exterior fixing hole spacing | 62 | 62 | 50 | 72 | 50 | |
| L2: Interior fixing hole spacing | 52 | 52 | - | - | 50 | |
| L9: Carriage length with housing | 172.2 | 199.2 | 172.2 | 199.2 | 172.2 | |
| L11: Housing length | 79.7 | 79.7 | 79.7 | 79.7 | 79.7 | |
| Lw: Inner carriage body length | 76 | 103 | 76 | 103 | 76 | |
| N: Lateral fixing hole spacing | 82 | 82 | 50 | 50 | - | |
| O: Reference face height | 8 | 8 | 8 | 8 | 22 | |
| Ts: Front plate thickness | 16.5 | 16.5 | 16.5 | 16.5 | 16.5 | |

Capacities and weights

| | | | | | | |
|---|--------|---------|--------|---------|--------|--|
| C0: Static load capacity (N) | 93 400 | 128 500 | 93 400 | 128 500 | 93 400 | |
| C100: Dynamic load capacity (N) | 52 000 | 71 500 | 52 000 | 71 500 | 52 000 | |
| MOQ: Static cross moment capacity (Nm) | 2 008 | 2 762 | 2 008 | 2 762 | 2 008 | |
| MOL: Static longitudinal moment capacity (Nm) | 1 189 | 2 214 | 1 189 | 2 214 | 1 189 | |
| MQ: Dynamic cross moment capacity (Nm) | 1 118 | 1 537 | 1 118 | 1 537 | 1 118 | |
| ML: Dynamic longitudinal moment capacity (Nm) | 662 | 1 232 | 662 | 1 232 | 662 | |
| Gew: Carriage weight (kg) | 2.3 | 2.9 | 2.2 | 2.7 | 2.3 | |

Note: * Values valid for external housing / front plate

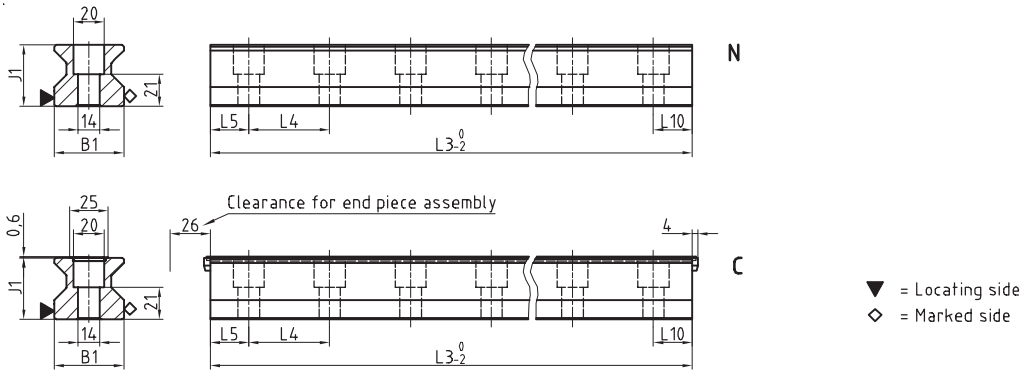
Available options for AMSA 3A W 35



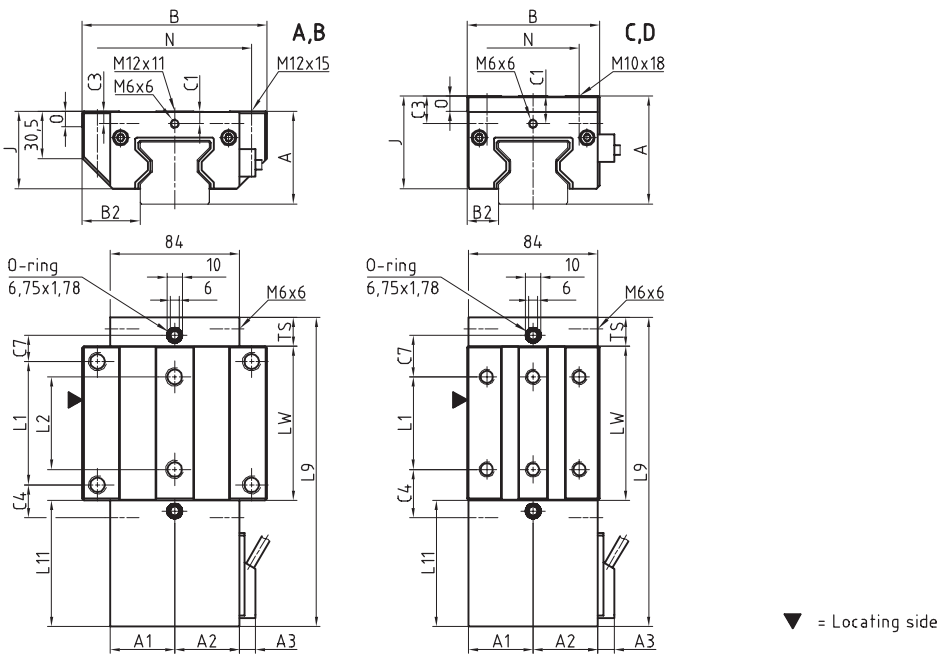
6.2

MONORAIL AMSA 3A AMSA 3A 45 Technical Data

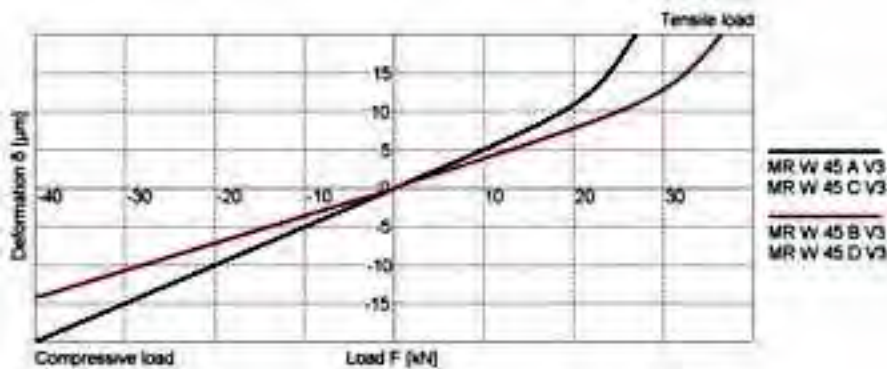
AMSA 3A 45 Rail Drawings



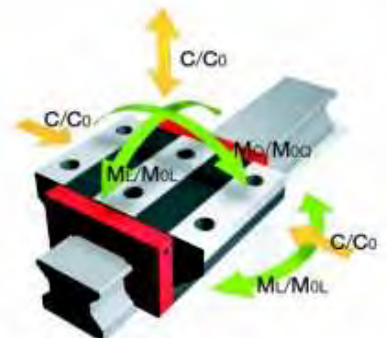
AMSA 3A 45 Carriage Drawings



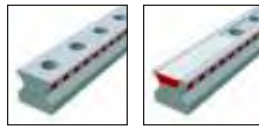
AMSA 3A 45 Rigidity diagram



AMSA 3A 45 load rating



AMSA 3A S 45 Dimensions



| | AMSA 3A S 45-N | AMSA 3A S 45-C | | | |
|--|----------------|----------------|--|--|--|
| B1: Rail width | 45 | 45 | | | |
| J1: Rail height | 40 | 40 | | | |
| L3: Rail length max. | 6 000 | 6 000 | | | |
| L4: Spacing of fixing holes | 52.5 | 52.5 | | | |
| L5/L10: Position of first/last fixing hole | 25 | 25 | | | |
| Gew: Rail weight, specific (kg/m) | 10.8 | 10.6 | | | |

Available options for AMSA 3A S 45



AMSA 3A W 45 Dimensions and capacities



| | AMSA 3A W 45-A | AMSA 3A W 45-B | AMSA 3A W 45-C | AMSA 3A W 45-D | | |
|--|----------------|----------------|----------------|----------------|--|--|
| A: System height | 60 | 60 | 70 | 70 | | |
| A1: Half width of housing on opposite side | 42 | 42 | 42 | 42 | | |
| A2: Half width of housing on reading head side | 42 | 42 | 42 | 42 | | |
| A3: Projection of reading head | 10.5 | 10.5 | 10.5 | 10.5 | | |
| B: Carriage width | 120 | 120 | 86 | 86 | | |
| B2: Distance between locating faces | 37.5 | 37.5 | 20.5 | 20.5 | | |
| C1: Position of center front lube hole | 8 | 8 | 18 | 18 | | |
| C3: Position of lateral lube hole | 8 | 8 | 18 | 18 | | |
| C4: Position of lateral lube hole | 21.25 | 38.75 | 31.25 | 38.75 | | |
| C7: Position of top lube hole | 17 | 34.5 | 27 | 34.5 | | |
| J: Carriage height | 50 | 50 | 60 | 60 | | |
| L1: Exterior fixing hole spacing | 80 | 80 | 60 | 80 | | |
| L2: Interior fixing hole spacing | 60 | 60 | - | - | | |
| L9: Carriage length with housing | 200.7 | 235.7 | 200.7 | 235.7 | | |
| L11: Housing length | 81.9 | 81.9 | 81.9 | 81.9 | | |
| Lw: Inner carriage body length | 100 | 135 | 100 | 135 | | |
| N: Lateral fixing hole spacing | 100 | 100 | 60 | 60 | | |
| O: Reference face height | 10 | 10 | 10 | 10 | | |
| Ts: Front plate thickness | 18.8 | 18.8 | 18.8 | 18.8 | | |

Capacities and weights

| | | | | | | |
|---|---------|---------|---------|---------|--|--|
| C0: Static load capacity (N) | 167 500 | 229 500 | 167 500 | 229 500 | | |
| C100: Dynamic load capacity (N) | 93 400 | 127 800 | 93 400 | 127 800 | | |
| MOQ: Static cross moment capacity (Nm) | 4 621 | 6 333 | 4 621 | 6 333 | | |
| MOL: Static longitudinal moment capacity (Nm) | 2 790 | 5 161 | 2 790 | 5 161 | | |
| MQ: Dynamic cross moment capacity (Nm) | 2 577 | 3 527 | 2 577 | 3 527 | | |
| ML: Dynamic longitudinal moment capacity (Nm) | 1 556 | 2 874 | 1 556 | 2 874 | | |
| Gew: Carriage weight (kg) | 4.0 | 5.1 | 3.8 | 4.8 | | |

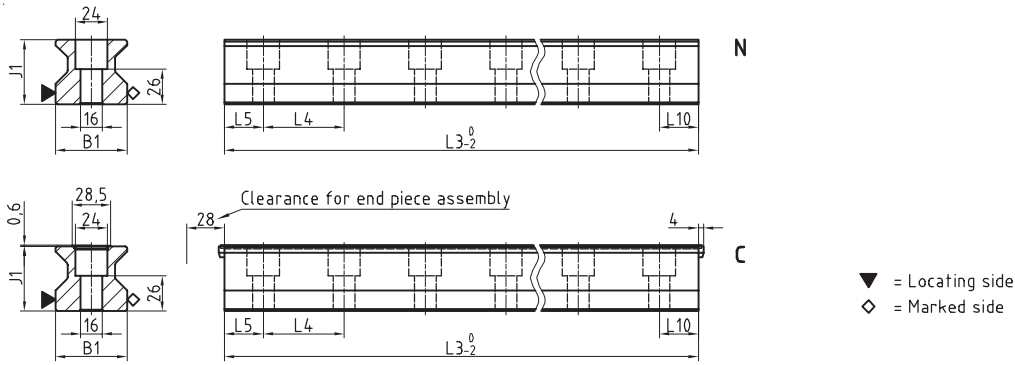
Available options for AMSA 3A W 45



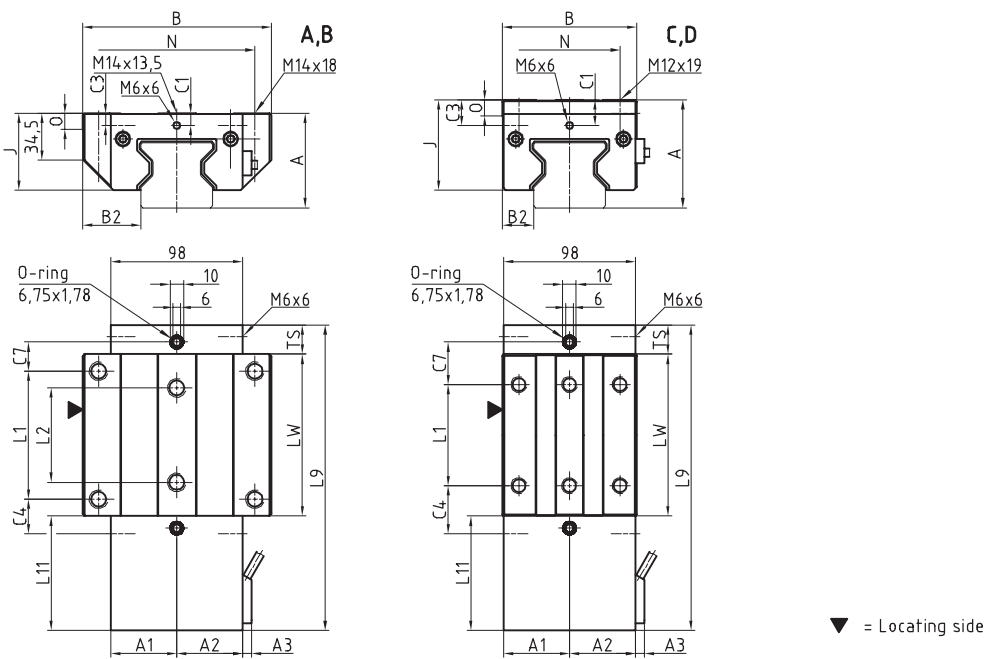
6.2

MONORAIL AMSA 3A AMSA 3A 55 Technical Data

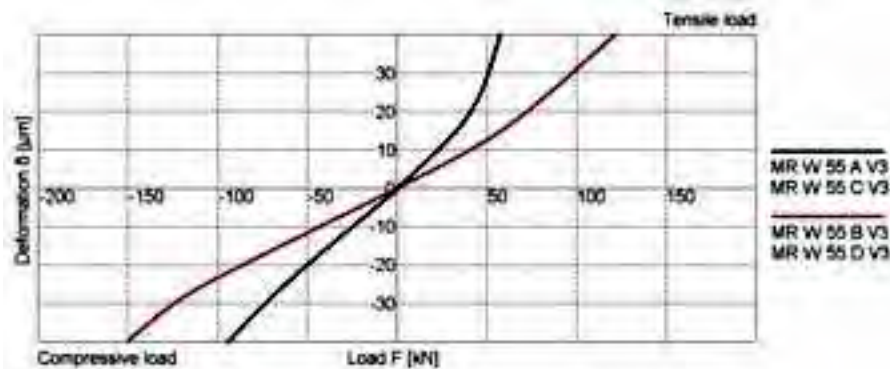
AMSA 3A 55 Rail Drawings



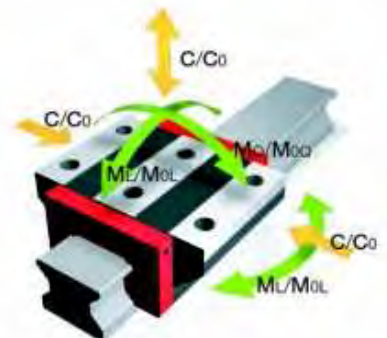
AMSA 3A 55 Carriage Drawings



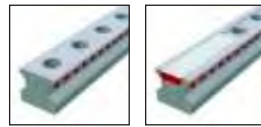
AMSA 3A 55 Rigidity diagram



AMSA 3A 55 load rating



AMSA 3A S 55 Dimensions



| | AMSA 3A S 55-N | AMSA 3A S 55-C | | | |
|--|----------------|----------------|--|--|--|
| B1: Rail width | 53 | 53 | | | |
| J1: Rail height | 48 | 48 | | | |
| L3: Rail length max. | 6 000 | 6 000 | | | |
| L4: Spacing of fixing holes | 60 | 60 | | | |
| L5/L10: Position of first/last fixing hole | 28.5 | 28.5 | | | |
| Gew: Rail weight, specific (kg/m) | 15.2 | 14.9 | | | |

Available options for AMSA 3A S 55



AMSA 3A W 55 Dimensions and capacities



| | AMSA 3A W 55-A | AMSA 3A W 55-B | AMSA 3A W 55-C | AMSA 3A W 55-D | | |
|--|----------------|----------------|----------------|----------------|--|--|
| A: System height | 70 | 70 | 80 | 80 | | |
| A1: Half width of housing on opposite side | 49 | 49 | 49 | 49 | | |
| A2: Half width of housing on reading head side | 49 | 49 | 49 | 49 | | |
| A3: Projection of reading head | 6.5 | 6.5 | 6.5 | 6.5 | | |
| B: Carriage width | 140 | 140 | 100 | 100 | | |
| B2: Distance between locating faces | 43.5 | 43.5 | 23.5 | 23.5 | | |
| C1: Position of center front lube hole | 9 | 9 | 19 | 19 | | |
| C3: Position of lateral lube hole | 9 | 9 | 19 | 19 | | |
| C4: Position of lateral lube hole | 25.75 | 46.75 | 35.75 | 46.75 | | |
| C7: Position of top lube hole | 21.5 | 42.5 | 31.5 | 42.5 | | |
| J: Carriage height | 57 | 57 | 67 | 67 | | |
| L1: Exterior fixing hole spacing | 95 | 95 | 75 | 95 | | |
| L2: Interior fixing hole spacing | 70 | 70 | - | - | | |
| L9: Carriage length with housing | 226.7 | 268.7 | 226.7 | 268.7 | | |
| L11: Housing length | 84.9 | 84.9 | 84.9 | 84.9 | | |
| Lw: Inner carriage body length | 120 | 162 | 120 | 162 | | |
| N: Lateral fixing hole spacing | 116 | 116 | 75 | 75 | | |
| O: Reference face height | 12 | 12 | 12 | 12 | | |
| Ts: Front plate thickness | 21.8 | 21.8 | 21.8 | 21.8 | | |

Capacities and weights

| | | | | | | |
|---|---------|---------|---------|---------|--|--|
| C0: Static load capacity (N) | 237 000 | 324 000 | 237 000 | 324 000 | | |
| C100: Dynamic load capacity (N) | 131 900 | 180 500 | 131 900 | 180 500 | | |
| MOQ: Static cross moment capacity (Nm) | 7 771 | 10 624 | 7 771 | 10 624 | | |
| MOL: Static longitudinal moment capacity (Nm) | 4 738 | 8 745 | 4 738 | 8 745 | | |
| MQ: Dynamic cross moment capacity (Nm) | 4 325 | 5 919 | 4 325 | 5 919 | | |
| ML: Dynamic longitudinal moment capacity (Nm) | 2 637 | 4 872 | 2 637 | 4 872 | | |
| Gew: Carriage weight (kg) | 5.9 | 7.7 | 5.5 | 7.0 | | |

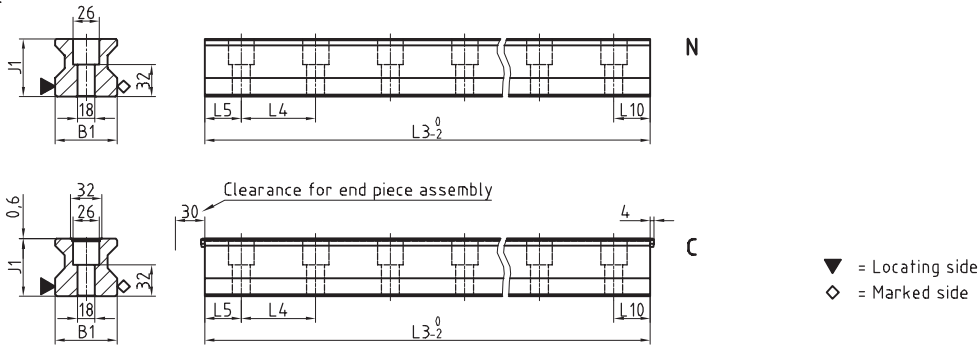
Available options for AMSA 3A W 55



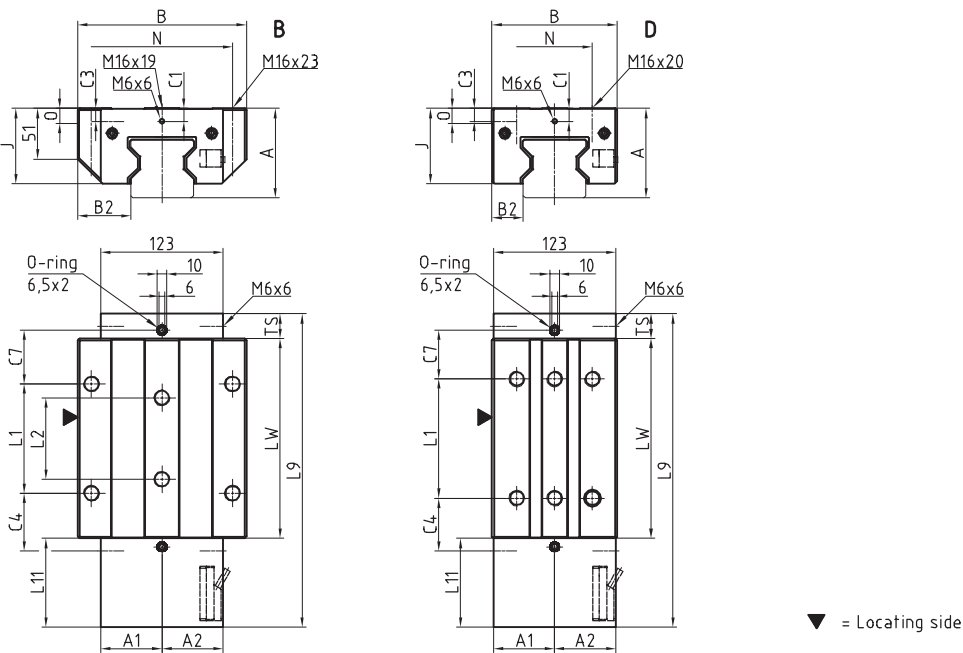
6.2

MONORAIL AMSA 3A AMSA 3A 65 Technical Data

AMSA 3A 65 Rail Drawings



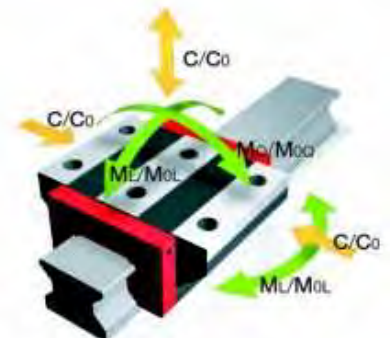
AMSA 3A 65 Carriage Drawings



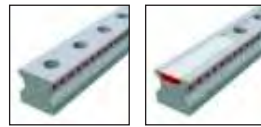
AMSA 3A 65 Rigidity diagram



AMSA 3A 65 load rating



AMSA 3A S 65 Dimensions



| | AMSA 3A S 65-N | AMSA 3A S 65-C | | | |
|--|----------------|----------------|--|--|--|
| B1: Rail width | 63 | 63 | | | |
| J1: Rail height | 58 | 58 | | | |
| L3: Rail length max. | 6 000 | 6 000 | | | |
| L4: Spacing of fixing holes | 75 | 75 | | | |
| L5/L10: Position of first/last fixing hole | 36 | 36 | | | |
| Gew: Rail weight, specific (kg/m) | 22.8 | 22.5 | | | |

Available options for AMSA 3A S 65



AMSA 3A W 65 Dimensions and capacities



| | AMSA 3A W 65-B | AMSA 3A W 65-D | | | |
|--|----------------|----------------|--|--|--|
| A: System height | 90 | 90 | | | |
| A1: Half width of housing on opposite side | 61.5 | 61.5 | | | |
| A2: Half width of housing on reading head side | 61.5 | 61.5 | | | |
| A3: Projection of reading head | 0 | 0 | | | |
| B: Carriage width | 170 | 126 | | | |
| B2: Distance between locating faces | 53.5 | 31.5 | | | |
| C1: Position of center front lube hole | 13 | 13 | | | |
| C3: Position of lateral lube hole | 13 | 13 | | | |
| C4: Position of lateral lube hole | 58 | 53 | | | |
| C7: Position of top lube hole | 54 | 49 | | | |
| J: Carriage height | 76 | 76 | | | |
| L1: Exterior fixing hole spacing | 110 | 120 | | | |
| L2: Interior fixing hole spacing | 82 | - | | | |
| L9: Carriage length with housing | 315 | 315 | | | |
| L11: Housing length | 89 | 89 | | | |
| Lw: Inner carriage body length | 201 | 201 | | | |
| N: Lateral fixing hole spacing | 142 | 76 | | | |
| O: Reference face height | 15 | 15 | | | |
| Ts: Front plate thickness | 25 | 25 | | | |

Capacities and weights

| | | | | | |
|---|---------|---------|--|--|--|
| C0: Static load capacity (N) | 530 000 | 530 000 | | | |
| C100: Dynamic load capacity (N) | 295 000 | 295 000 | | | |
| MOQ: Static cross moment capacity (Nm) | 20 912 | 20 912 | | | |
| MOL: Static longitudinal moment capacity (Nm) | 17 930 | 17 930 | | | |
| MQ: Dynamic cross moment capacity (Nm) | 11 640 | 11 640 | | | |
| ML: Dynamic longitudinal moment capacity (Nm) | 9 980 | 9 980 | | | |
| Gew: Carriage weight (kg) | 14.9 | 11.8 | | | |

Available options for AMSA 3A W 65



6.3

MONORAIL AMSA 3A

Accessories

AMSA 3A Rails accessories overview

| Accessories | AMSA 3A S 25 | AMSA 3A S 35 | AMSA 3A S 45 | AMSA 3A S 55 | AMSA 3A S 65 |
|--|--------------|--------------|--------------|--------------|--------------|
| Plugs: | | | | | |
| Plastic plugs | MRK 25 | MRK 35 | MRK 45 | MRK 55 | MRK 65 |
| Brass plugs | MRS 25 | MRS 35 | MRS 45 | MRS 55 | MRS 65 |
| Steel plugs | MRZ 25 | MRZ 35 | MRZ 45 | MRZ 55 | MRZ 65 |
| Cover strips: | | | | | |
| Cover strip (spare part) | MAC 25 | MAC 35 | MAC 45 | MAC 55 | MAC 65 |
| End piece for cover strip (spare part) | EST 25-MAC | EST 35-MAC | EST 45-MAC | EST 55-MAC | EST 65-MAC |
| Assembly tools: | | | | | |
| Installation tool for steel plugs | MWH 25 | MWH 35 | MWH 45 | MWH 55 | MWH 65 |
| Hydraulic cylinder for MWH | MZH | MZH | MZH | MZH | MZH |
| Installation tool for cover strip | MWC 25 | MWC 35 | MWC 45 | MWC 55 | MWC 65 |

AMSA 3A Carriages accessories overview

| Accessories | AMSA 3A W 25 | AMSA 3A W 35 | AMSA 3A W 45 | AMSA 3A W 55 | AMSA 3A W 65 |
|---|--------------|---------------|---------------|---------------|---------------|
| Additional wipers: | | | | | |
| Additional wiper NBR | ZCN 25 | ZCN 35 | ZCN 45 | ZCN 55 | ZCN 65 |
| Additional wiper Viton | ZCV 25 | ZCV 35 | ZCV 45 | ZCV 55 | ZCV 65 |
| Metal wiper | ASM 25 | ASM 35 | ASM 45 | ASM 55 | ASM 65 |
| Bellows: | | | | | |
| Bellows | FBM 25 | FBM 35 | FBM 45 | FBM 55 | FBM 65 |
| Adapter plate for bellows (spare part) | ZPL 25 | ZPL 35 | ZPL 45 | ZPL 55 | ZPL 65 |
| End plate for bellows (spare part) | EPL 25 | EPL 35 | EPL 45 | EPL 55 | EPL 65 |
| Assembly rails: | | | | | |
| Assembly rail | MRM 25 | MRM 35 | MRM 45 | MRM 55 | MRM 65 |
| Lubrication plates: | | | | | |
| Lubrication plate | SPL 25-MR | SPL 35-MR | SPL 45-MR | SPL 55-MR | SPL 65-MR |
| Front plates: | | | | | |
| Front plate (spare part) | STP 25-EK | STP 35-EK | STP 45-EK | STP 55-EK | STP 65-EK |
| Lube nipples: | | | | | |
| Hydraulic-type grease nipple straight | SN 6 | SN 6 | SN 6 | SN 6 | SN 6 |
| Hydraulic-type grease nipple 45° | SN 6-45 | SN 6-45 | SN 6-45 | SN 6-45 | SN 6-45 |
| Hydraulic-type grease nipple 90° | SN 6-90 | SN 6-90 | SN 6-90 | SN 6-90 | SN 6-90 |
| Flush type grease nipple M3 | SN 3-T | - | - | - | - |
| Flush type grease nipple M6 | SN 6-T | SN 6-T | SN 6-T | SN 6-T | SN 6-T |
| Grease gun for SN 3-T and SN 6-T | SFP-T3 | SFP-T3 | SFP-T3 | SFP-T3 | SFP-T3 |
| Lube adapters: | | | | | |
| Straight screw-in connection M3 | SA 3-D3 | - | - | - | - |
| Lubrication adapter M8 round-head | SA 6-RD-M8 | SA 6-RD-M8 | SA 6-RD-M8 | SA 6-RD-M8 | SA 6-RD-M8 |
| Lubrication adapter M8 hexagon head | - | SA 6-6KT-M8 | SA 6-6KT-M8 | SA 6-6KT-M8 | SA 6-6KT-M8 |
| Lubrication adapter G1/8 hexagon head | - | SA 6-6KT-G1/8 | SA 6-6KT-G1/8 | SA 6-6KT-G1/8 | SA 6-6KT-G1/8 |
| Swivel screw connection for pipe d=4 mm | SV 6-D4 | SV 6-D4 | SV 6-D4 | SV 6-D4 | SV 6-D4 |
| Swivel screw connection M6 | SV 6-M6 | SV 6-M6 | SV 6-M6 | SV 6-M6 | SV 6-M6 |
| Swivel screw connection M6 long | SV 6-M6-L | SV 6-M6-L | SV 6-M6-L | SV 6-M6-L | SV 6-M6-L |
| Swivel screw connection M8 | SV 6-M8 | SV 6-M8 | SV 6-M8 | SV 6-M8 | SV 6-M8 |
| Swivel screw connection M8 long | SV 6-M8-L | SV 6-M8-L | SV 6-M8-L | SV 6-M8-L | SV 6-M8-L |
| Cables: | | | | | |
| Connecting cable, 12-pole | KAO 12-X | KAO 12-X | KAO 12-X | KAO 12-X | KAO 12-X |
| Connecting cable, 12-pole | KAO 13-X | KAO 13-X | KAO 13-X | KAO 13-X | KAO 13-X |
| Extension cable, 12-pole | KAO 14-X | KAO 14-X | KAO 14-X | KAO 14-X | KAO 14-X |
| Connecting cable, 12-pole | KAO 16-X | KAO 16-X | KAO 16-X | KAO 16-X | KAO 16-X |

6.4

MONORAIL AMSA 3A

Order code

Individual guide rails and carriages are ordered in accordance with the order codes described below.

AMSA 3A carriages consist of guide carriage, casing and reading head.

All MONORAIL MR carriages can also be used with AMSA 3A rails.

Q.v. chapter 2 and chapter 3.3 for the order key for accessories.

Separate order codes are used in each case for rails, carriages and accessories. This also applies to different versions of rails and carriages.

All guide components are supplied individually as standard, i.e. unassembled.

If required, SCHNEEBERGER can also supply rails and carriages assembled incl. accessories as complete systems. Please note the ordering instructions in chapter 2.4 if this applies.

Order code for AMSA 3A rails

| | 1x | AMSA 3A S | 35 | -N | -G1 | -KC | -R12 | -918 | -19 | -19 | -CN | -TR50 |
|----------------------------------|----|-----------|----|----|-----|-----|------|------|-----|-----|-----|-------|
| Quantity | | | | | | | | | | | | |
| Rail | | | | | | | | | | | | |
| Size | | | | | | | | | | | | |
| Type | | | | | | | | | | | | |
| Accuracy | | | | | | | | | | | | |
| Straightness | | | | | | | | | | | | |
| Reference sides | | | | | | | | | | | | |
| Rail length L3 | | | | | | | | | | | | |
| Position of first fixing hole L5 | | | | | | | | | | | | |
| Position of last fixing hole L10 | | | | | | | | | | | | |
| Coating | | | | | | | | | | | | |
| Magnetization | | | | | | | | | | | | |

NB

Q.v. chapter 6.1 to 6.3 for an overview of types, details of shapes, available options and accessories.

Q.v. chapter 2 for a description of the options.

If possible, standard lengths are preferred for L3 rail length.

These are calculated with the table values in chapter 6.2 using the following formula: $L3 = n \times L4 + L5 + L10 \leq L3_{max}$.

Order code for AMSA 3A carriages

| | 1x | AMSA 3A W | 35 | -A | -P1 | -G1 | -V3 | -R1 | -CN | -S10 | -LN | -TSU |
|------------------------------------|----|-----------|----|----|-----|-----|-----|-----|-----|------|-----|------|
| Quantity | | | | | | | | | | | | |
| Carriage | | | | | | | | | | | | |
| Size | | | | | | | | | | | | |
| Type | | | | | | | | | | | | |
| Reading head position | | | | | | | | | | | | |
| Accuracy | | | | | | | | | | | | |
| Preload | | | | | | | | | | | | |
| Reference side | | | | | | | | | | | | |
| Coating | | | | | | | | | | | | |
| Lube connection | | | | | | | | | | | | |
| Lubrication as delivered condition | | | | | | | | | | | | |
| Interface | | | | | | | | | | | | |

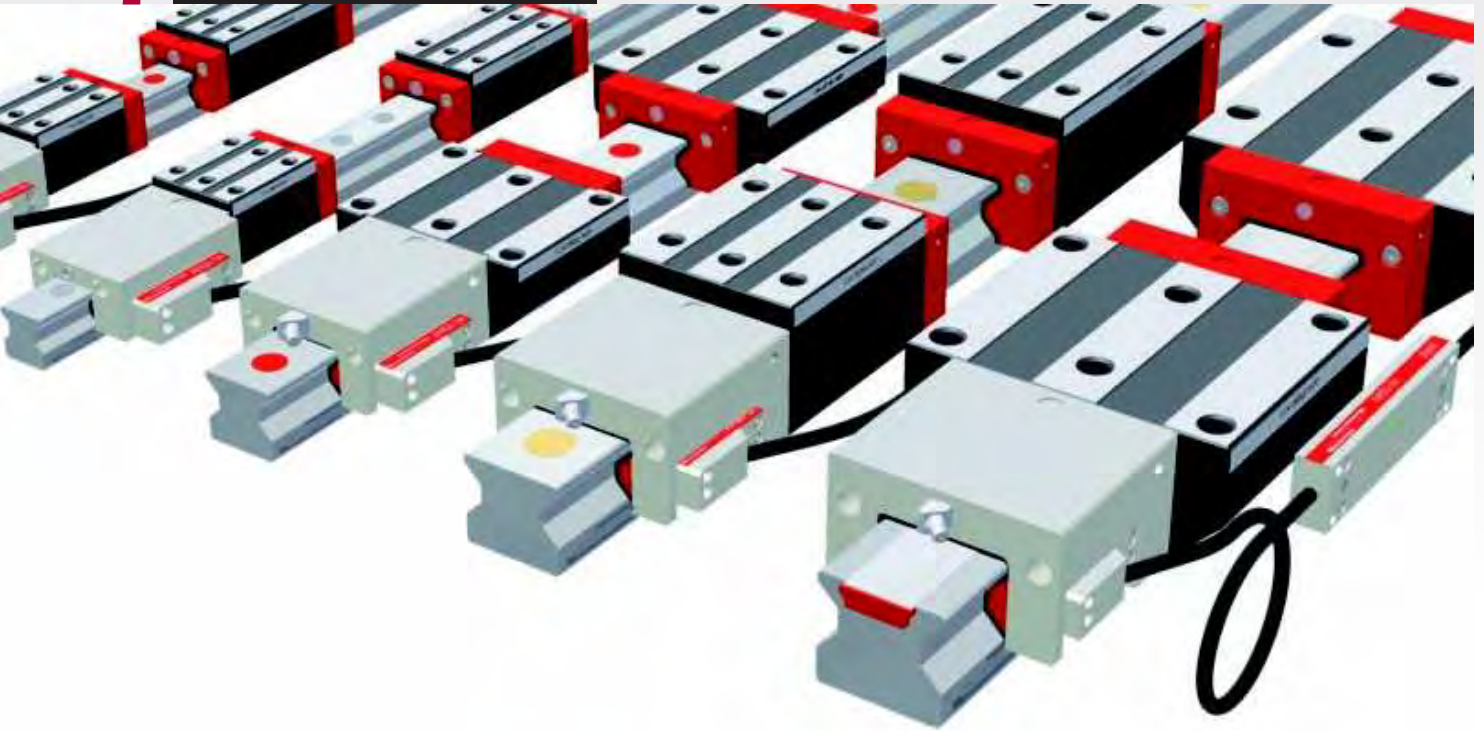
NB

Q.v. chapter 6.1 to 6.3 for an overview of types, details of shapes, available options and accessories.

Q.v. chapter 2 for a description of the options.

SCHNEEBERGER
 LINEAR TECHNOLOGY

7 **MONORAIL AMSD 3A**

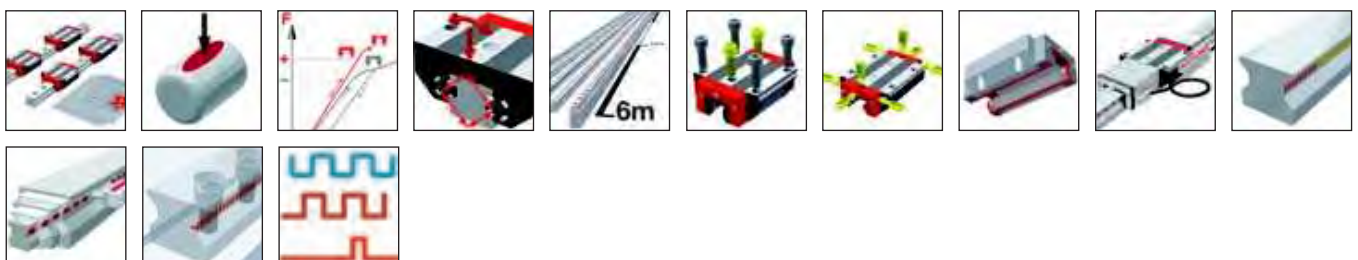


SCHNEEBERGER's AMSD 3A MONORAIL is an integrated linear encoder system for use in automation and handling technology as well as in machine tool design where high forces and precise measurement are required in compact spaces. Mechanically the AMSD 3A is based on SCHNEEBERGER's MR MONORAIL roller guide with lengths up to 6 metres. The integration of the measurement system allows very compact axes to be put together.

Different resolutions with various digital interface speeds are available as control system interfaces. Reference marks can be set at 50mm intervals or distance coded.. Different options for carriage lubrication and sealing permit the best possible degree of adaptation to application requirements. The easily interchangeable reading head is identical for all sizes.

Features of System MONORAIL AMSD 3A

Details see chapter 1

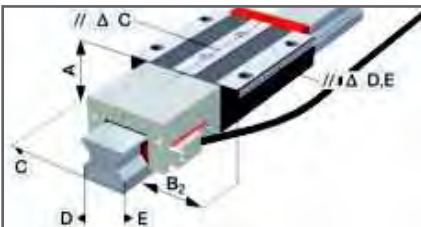


7.1 Overview of Types, Sizes and available Options



| | |
|--------------------------------------|--------|
| > Product overview AMSD 3A Rails | p. 116 |
| > Product overview AMSD 3A Carriages | p. 117 |

7.2 Technical data and Options



| | |
|--------------|--------|
| > AMSD 3A 25 | p. 118 |
| > AMSD 3A 35 | p. 120 |
| > AMSD 3A 45 | p. 122 |
| > AMSD 3A 55 | p. 124 |
| > AMSD 3A 65 | p. 126 |

7.3 Accessories MONORAIL AMSD 3A



| | |
|---------------------------------------|--------|
| > Accessories overview | p. 128 |
| > AMSD 3A Rails accessory details | p. 128 |
| > AMSD 3A Carriages accessory details | p. 128 |

7.4 Order key



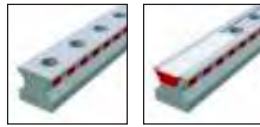
| | |
|-------------------------------|--------|
| > Order key AMSD 3A Rails | p. 129 |
| > Order key AMSD 3A Carriages | p. 129 |

7.1

MONORAIL AMSD 3A

Overview of Types, Sizes and available Options

Product overview AMSD 3A Rails



| | N standard | C for cover strip | | | | |
|--------------------------------------|----------------|----------------------|--|--|--|--|
| Buildsizes / Rail build forms | | | | | | |
| Size 25 | AMSD 3A S 25-N | AMSD 3A S 25-C | | | | |
| Size 35 | AMSD 3A S 35-N | AMSD 3A S 35-C | | | | |
| Size 45 | AMSD 3A S 45-N | AMSD 3A S 45-C | | | | |
| Size 55 | AMSD 3A S 55-N | AMSD 3A S 55-C | | | | |
| Size 65 | AMSD 3A S 65-N | AMSD 3A S 65-C | | | | |
| Features | | | | | | |
| Screwable from above | ● | ● | | | | |
| Small assembly effort | | ● | | | | |
| Great single-part system length | ● | ● | | | | |

Available options for AMSD 3A Rails

Details see chapter 2

Accuracy

- G0 Highly accurate
- G1 Very accurate
- G2 Accurate
- G3 Standard

Straightness

- KC Standard

Coating

- CN None
- CH Hard chromium

Locating sides

- R11 Ref.bottom, scale bottom
- R12 Ref.bottom, scale top
- R21 Ref.top, scale bottom
- R22 Ref.top, scale top

Magnetization

- TR50 50mm pattern
- TD20 20mm code
- TD50 50mm code

Available accessories for AMSD 3A Rails

Details see chapter 3.3

- Plugs
- Cover strips
- Assembly tools

Product overview AMSD 3A Carriages



| | A standard | B standard, long | C compact, high | D compact, high, long | E compact, high, for lateral fixing |
|--|---------------|---------------------|--------------------|-----------------------------|---|
|--|---------------|---------------------|--------------------|-----------------------------|---|

Buildsizes / Carriage build forms

| Buildsize | A | B | C | D | E |
|-----------|----------------|----------------|----------------|----------------|----------------|
| Size 25 | AMSD 3A W 25-A | AMSD 3A W 25-B | AMSD 3A W 25-C | AMSD 3A W 25-D | AMSD 3A W 25-E |
| Size 35 | AMSD 3A W 35-A | AMSD 3A W 35-B | AMSD 3A W 35-C | AMSD 3A W 35-D | AMSD 3A W 35-E |
| Size 45 | AMSD 3A W 45-A | AMSD 3A W 45-B | AMSD 3A W 45-C | AMSD 3A W 45-D | |
| Size 55 | AMSD 3A W 55-A | AMSD 3A W 55-B | AMSD 3A W 55-C | AMSD 3A W 55-D | |
| Size 65 | | AMSD 3A W 65-B | | AMSD 3A W 65-D | |

Features

| Feature | A | B | C | D | E |
|------------------------------|---|---|---|---|---|
| Screwable from above | • | • | • | • | |
| Screwable from below | • | • | | | |
| Screwable from the side | | | | | • |
| For high loads and moments | | • | | • | |
| For medium loads and moments | • | | • | | • |

Available options for AMSD 3A Carriages

Details see chapter 2

Accuracy

- G0 Highly accurate
- G1 Very accurate
- G2 Accurate
- G3 Standard

Preload

- V1 Low
- V2 Medium
- V3 High

Reference side

- R1 Ref. at bottom
- R2 Ref. on top

Coating

- CN None
- CH Hard chromium

Lube connections

- S10 Left center
- S20 Right center
- S11 Top left
- S21 Top right
- S12 Lower left side
- S22 Lower right side

- S13 Upper left side
- S23 Upper right side
- S32 Left side
- S42 Right side

Lubrication

- LN Oil protect
- LG Grease protect
- LV Full greasing

Interface

- TMD TMD, digital, 0,3m
- TRD TRD, digital, 3m
- TSD TSD, digital, 3m

Reading head position

- P1 Right top
- P3 Left bottom

Interpolation

Frequency

Reference pulse

Available accessories for AMSD 3A Carriages

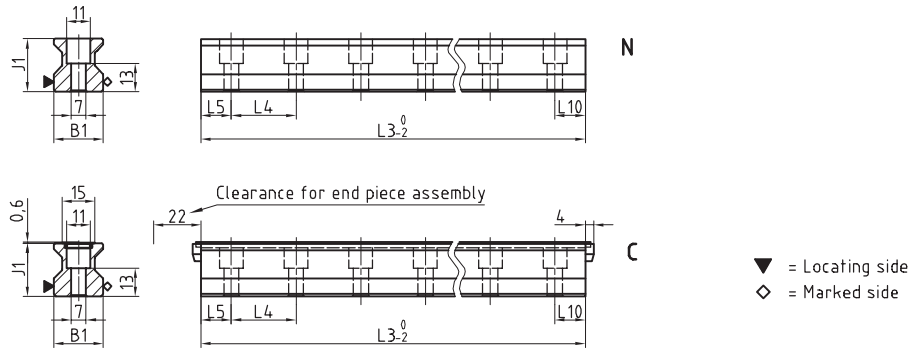
Details see chapter 2.1 and 3.3

- Additional wipers
- Bellows
- Assembly rails
- Lubrication plates
- Front plates
- Lube nipples
- Lube adapters
- Cables

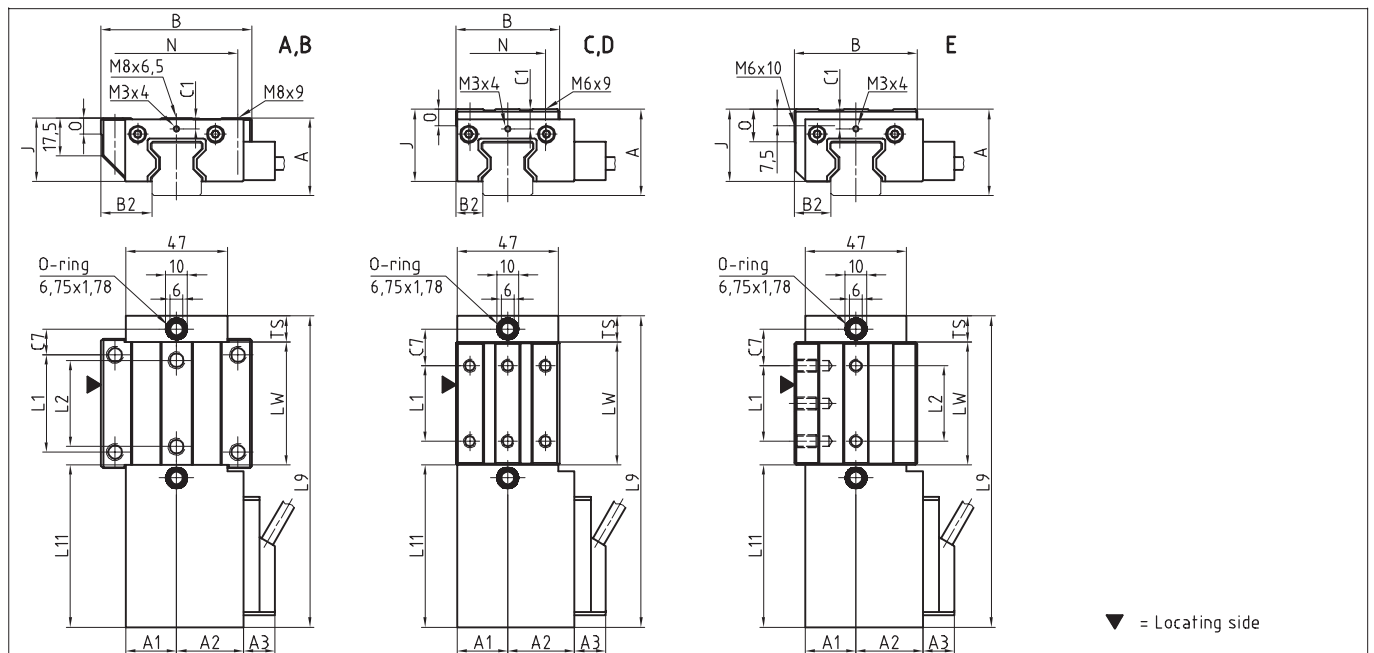
7.2

MONORAIL AMSD 3A AMSD 3A 25 Technical Data

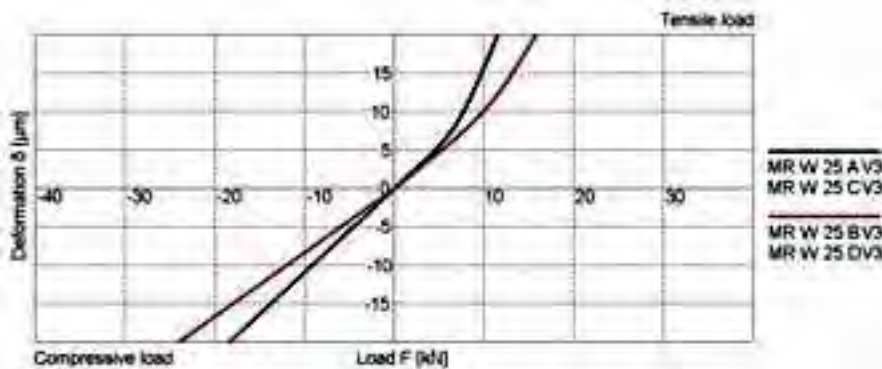
AMSD 3A 25 Rail Drawings



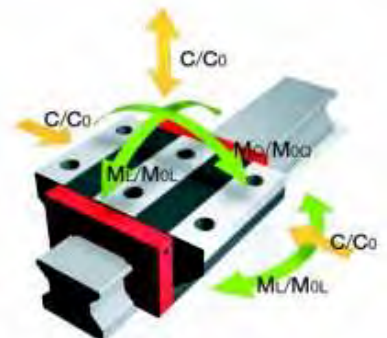
AMSD 3A 25 Carriage Drawings



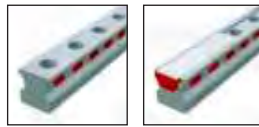
AMSD 3A 25 Rigidity diagram



AMSD 3A 25 load rating



AMSD 3A S 25 Dimensions



| | AMSD 3A S 25-N | AMSD 3A S 25-C | | | | |
|--|----------------|----------------|--|--|--|--|
| B1: Rail width | 23 | 23 | | | | |
| J1: Rail height | 24.5 | 24.5 | | | | |
| L3: Rail length max. | 6 000 | 3 000 | | | | |
| L4: Spacing of fixing holes | 30 | 30 | | | | |
| L5/L10: Position of first/last fixing hole | 13.5 | 13.5 | | | | |
| Gew: Rail weight, specific (kg/m) | 3.4 | 3.3 | | | | |

Available options for AMSD 3A S 25



AMSD 3A W 25 Dimensions and capacities



| | AMSD 3A W 25-A | AMSD 3A W 25-B | AMSD 3A W 25-C | AMSD 3A W 25-D | AMSD 3A W 25-E | |
|--|----------------|----------------|----------------|----------------|----------------|--|
| A: System height | 36 | 36 | 40 | 40 | 40 | |
| A1: Half width of housing on opposite side | 23.5 | 23.5 | 23.5 | 23.5 | 23.5 | |
| A2: Half width of housing on reading head side | 31 | 31 | 31 | 31 | 31 | |
| A3: Projection of reading head | 14.5 | 14.5 | 14.5 | 14.5 | 14.5 | |
| B: Carriage width | 70 | 70 | 48 | 48 | 57 | |
| B2: Distance between locating faces | 23.5 | 23.5 | 12.5 | 12.5 | 17 | |
| C1: Position of center front lube hole * | 5 / 5.5 | 5 / 5.5 | 9 / 9.5 | 9 / 9.5 | 9 / 9.5 | |
| C3: Position of lateral lube hole | - | - | - | - | - | |
| C4: Position of lateral lube hole | - | - | - | - | - | |
| C7: Position of top lube hole | 12 | 23.2 | 17 | 20.7 | 17 | |
| J: Carriage height | 29.5 | 29.5 | 33.5 | 33.5 | 33.5 | |
| L1: Exterior fixing hole spacing | 45 | 45 | 35 | 50 | 35 | |
| L2: Interior fixing hole spacing | 40 | 40 | - | - | 35 | |
| L9: Carriage length with housing | 144.2 | 166.6 | 144.2 | 166.6 | 144.2 | |
| L11: Housing length | 75.2 | 75.2 | 75.2 | 75.2 | 75.2 | |
| Lw: Inner carriage body length | 57 | 79.4 | 57 | 79.4 | 57 | |
| N: Lateral fixing hole spacing | 57 | 57 | 35 | 35 | - | |
| O: Reference face height | 7.5 | 7.5 | 7.5 | 7.5 | 15 | |
| Ts: Front plate thickness | 12 | 12 | 12 | 12 | 12 | |

Capacities and weights

| | | | | | | |
|---|--------|--------|--------|--------|--------|--|
| C0: Static load capacity (N) | 49 800 | 70 300 | 49 800 | 70 300 | 49 800 | |
| C100: Dynamic load capacity (N) | 27 700 | 39 100 | 27 700 | 39 100 | 27 700 | |
| MOQ: Static cross moment capacity (Nm) | 733 | 1 035 | 733 | 1 035 | 733 | |
| MOL: Static longitudinal moment capacity (Nm) | 476 | 936 | 476 | 936 | 476 | |
| MQ: Dynamic cross moment capacity (Nm) | 408 | 576 | 408 | 576 | 408 | |
| ML: Dynamic longitudinal moment capacity (Nm) | 265 | 521 | 265 | 521 | 265 | |
| Gew: Carriage weight (kg) | 1.3 | 1.5 | 1.2 | 1.3 | 1.3 | |

Note: * Values valid for external housing / front plate

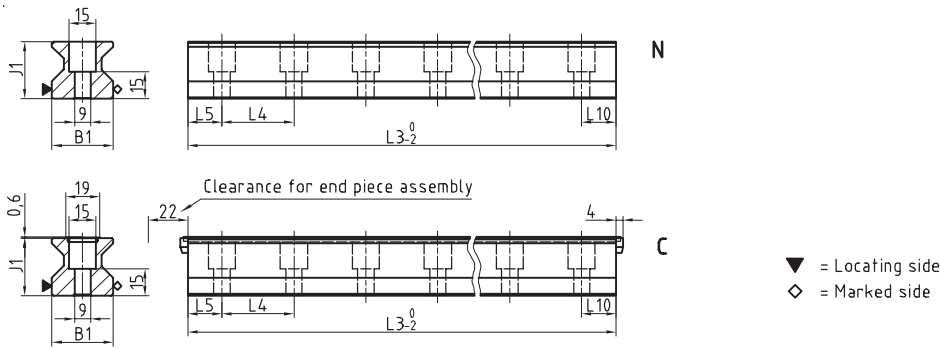
Available options for AMSD 3A W 25



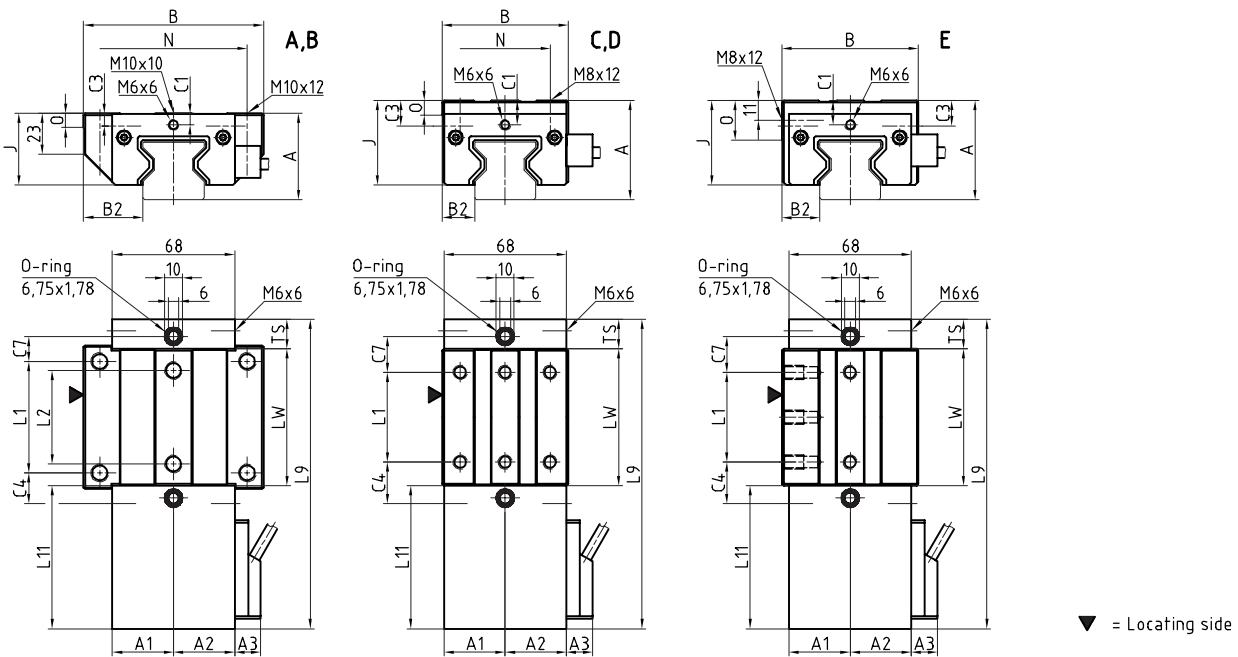
7.2

MONORAIL AMSD 3A AMSD 3A 35 Technical Data

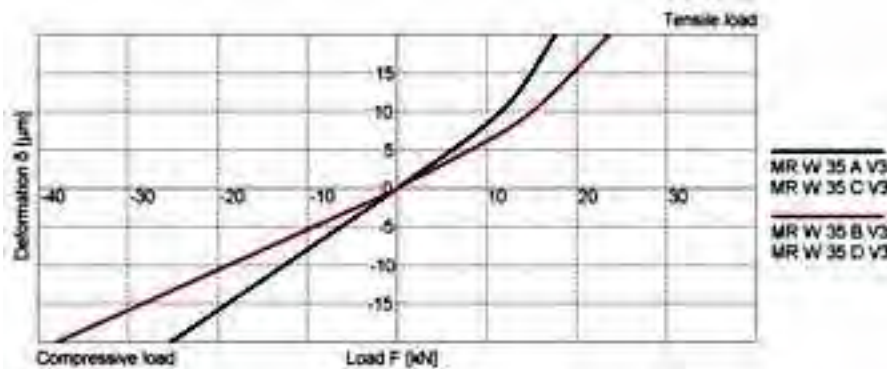
AMSD 3A 35 Rail Drawings



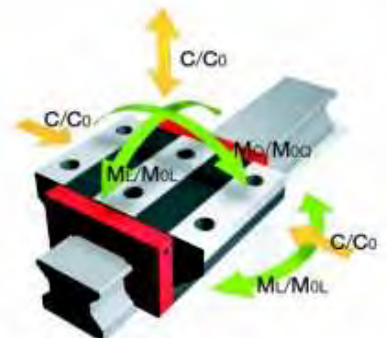
AMSD 3A 35 Carriage Drawings



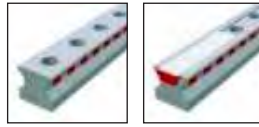
AMSD 3A 35 Rigidity diagram



AMSD 3A 35 load rating



AMSD 3A S 35 Dimensions



| | AMSD 3A S 35-N | AMSD 3A S 35-C | | | |
|--|----------------|----------------|--|--|--|
| B1: Rail width | 34 | 34 | | | |
| J1: Rail height | 32 | 32 | | | |
| L3: Rail length max. | 6 000 | 6 000 | | | |
| L4: Spacing of fixing holes | 40 | 40 | | | |
| L5/L10: Position of first/last fixing hole | 18.5 | 18.5 | | | |
| Gew: Rail weight, specific (kg/m) | 6.5 | 6.3 | | | |

Available options for AMSD 3A S 35



AMSD 3A W 35 Dimensions and capacities



| | AMSD 3A W 35-A | AMSD 3A W 35-B | AMSD 3A W 35-C | AMSD 3A W 35-D | AMSD 3A W 35-E |
|--|----------------|----------------|----------------|----------------|----------------|
| A: System height | 48 | 48 | 55 | 55 | 55 |
| A1: Half width of housing on opposite side | 34 | 34 | 34 | 34 | 34 |
| A2: Half width of housing on reading head side | 34 | 34 | 34 | 34 | 34 |
| A3: Projection of reading head | 14.5 | 14.5 | 14.5 | 14.5 | 14.5 |
| B: Carriage width | 100 | 100 | 70 | 70 | 76 |
| B2: Distance between locating faces | 33 | 33 | 18 | 18 | 21 |
| C1: Position of center front lube hole * | 6.5 / 7 | 6.5 / 7 | 13.5 / 14 | 13.5 / 14 | 13.5 / 14 |
| C3: Position of lateral lube hole | 7 | 7 | 14 | 14 | 14 |
| C4: Position of lateral lube hole | 17 | 30.5 | 23 | 25.5 | 23 |
| C7: Position of top lube hole | 14 | 27.5 | 20 | 22.5 | 20 |
| J: Carriage height | 40 | 40 | 47 | 47 | 47 |
| L1: Exterior fixing hole spacing | 62 | 62 | 50 | 72 | 50 |
| L2: Interior fixing hole spacing | 52 | 52 | - | - | 50 |
| L9: Carriage length with housing | 172.2 | 199.2 | 172.2 | 199.2 | 172.2 |
| L11: Housing length | 79.7 | 79.7 | 79.7 | 79.7 | 79.7 |
| Lw: Inner carriage body length | 76 | 103 | 76 | 103 | 76 |
| N: Lateral fixing hole spacing | 82 | 82 | 50 | 50 | - |
| O: Reference face height | 8 | 8 | 8 | 8 | 22 |
| Ts: Front plate thickness | 16.5 | 16.5 | 16.5 | 16.5 | 16.5 |

Capacities and weights

| | | | | | |
|---|--------|---------|--------|---------|--------|
| C0: Static load capacity (N) | 93 400 | 128 500 | 93 400 | 128 500 | 93 400 |
| C100: Dynamic load capacity (N) | 52 000 | 71 500 | 52 000 | 71 500 | 52 000 |
| MOQ: Static cross moment capacity (Nm) | 2 008 | 2 762 | 2 008 | 2 762 | 2 008 |
| MOL: Static longitudinal moment capacity (Nm) | 1 189 | 2 214 | 1 189 | 2 214 | 1 189 |
| MQ: Dynamic cross moment capacity (Nm) | 1 118 | 1 537 | 1 118 | 1 537 | 1 118 |
| ML: Dynamic longitudinal moment capacity (Nm) | 662 | 1 232 | 662 | 1 232 | 662 |
| Gew: Carriage weight (kg) | 2.3 | 2.9 | 2.2 | 2.7 | 2.3 |

Note: * Values valid for external housing / front plate

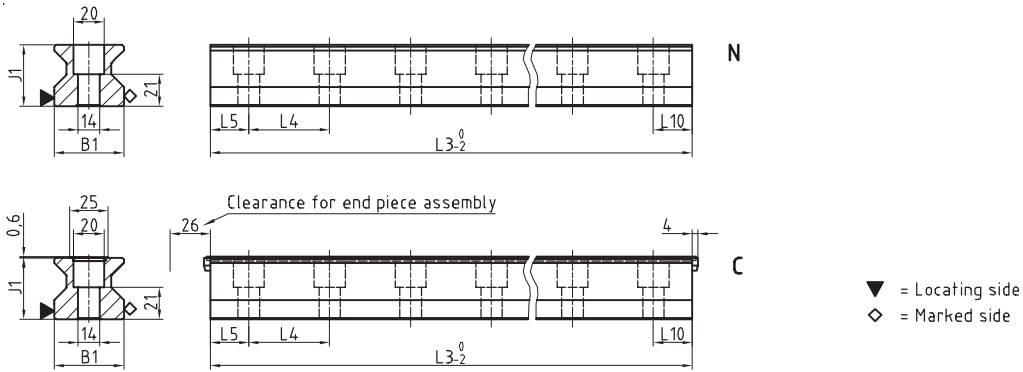
Available options for AMSD 3A W 35



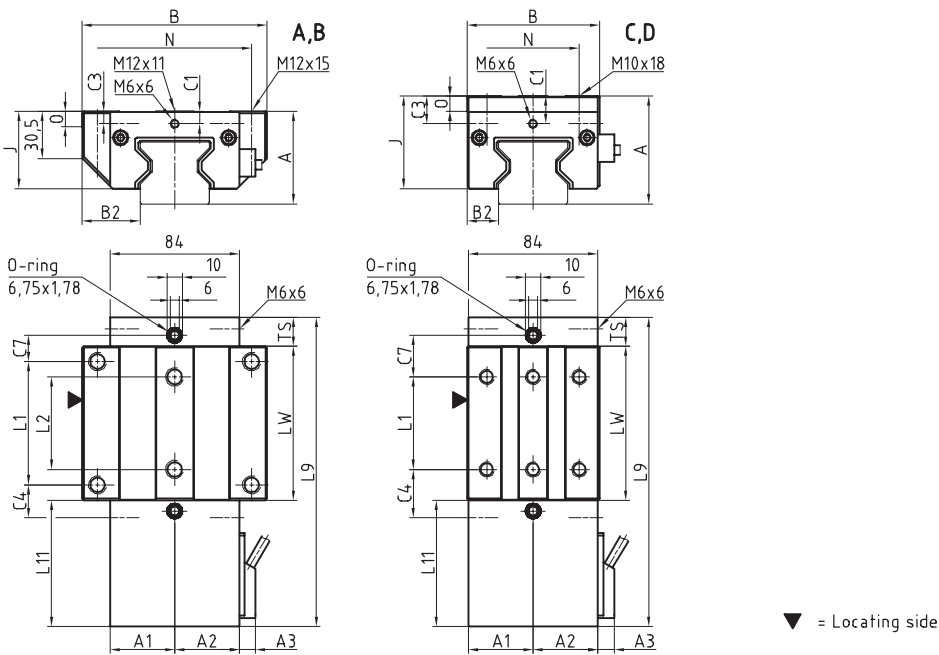
7.2

MONORAIL AMSD 3A AMSD 3A 45 Technical Data

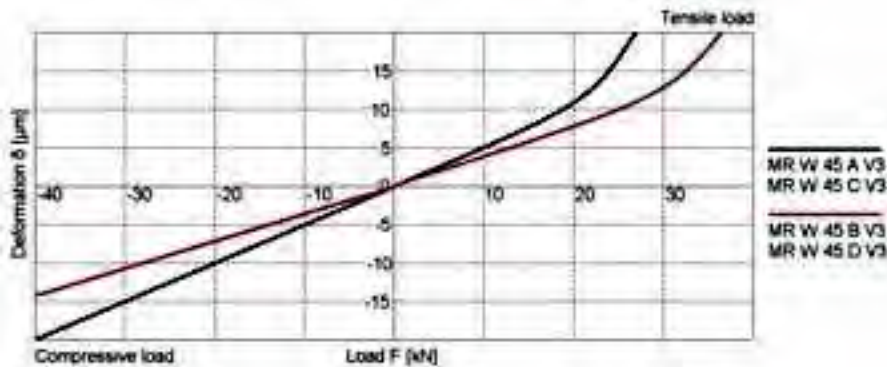
AMSD 3A 45 Rail Drawings



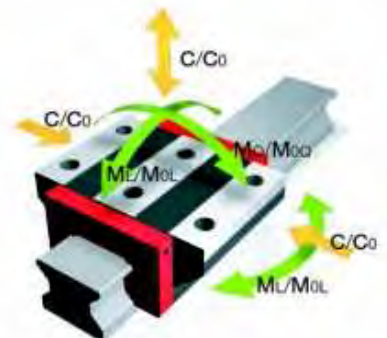
AMSD 3A 45 Carriage Drawings



AMSD 3A 45 Rigidity diagram



AMSD 3A 45 load rating



AMSD 3A S 45 Dimensions



| | AMSD 3A S 45-N | AMSD 3A S 45-C | | | |
|--|----------------|----------------|--|--|--|
| B1: Rail width | 45 | 45 | | | |
| J1: Rail height | 40 | 40 | | | |
| L3: Rail length max. | 6 000 | 6 000 | | | |
| L4: Spacing of fixing holes | 52.5 | 52.5 | | | |
| L5/L10: Position of first/last fixing hole | 25 | 25 | | | |
| Gew: Rail weight, specific (kg/m) | 10.8 | 10.6 | | | |

Available options for AMSD 3A S 45



AMSD 3A W 45 Dimensions and capacities



| | AMSD 3A W 45-A | AMSD 3A W 45-B | AMSD 3A W 45-C | AMSD 3A W 45-D | | |
|--|----------------|----------------|----------------|----------------|--|--|
| A: System height | 60 | 60 | 70 | 70 | | |
| A1: Half width of housing on opposite side | 42 | 42 | 42 | 42 | | |
| A2: Half width of housing on reading head side | 42 | 42 | 42 | 42 | | |
| A3: Projection of reading head | 10.5 | 10.5 | 10.5 | 10.5 | | |
| B: Carriage width | 120 | 120 | 86 | 86 | | |
| B2: Distance between locating faces | 37.5 | 37.5 | 20.5 | 20.5 | | |
| C1: Position of center front lube hole | 8 | 8 | 18 | 18 | | |
| C3: Position of lateral lube hole | 8 | 8 | 18 | 18 | | |
| C4: Position of lateral lube hole | 21.25 | 38.75 | 31.25 | 38.75 | | |
| C7: Position of top lube hole | 17 | 34.5 | 27 | 34.5 | | |
| J: Carriage height | 50 | 50 | 60 | 60 | | |
| L1: Exterior fixing hole spacing | 80 | 80 | 60 | 80 | | |
| L2: Interior fixing hole spacing | 60 | 60 | - | - | | |
| L9: Carriage length with housing | 200.7 | 235.7 | 200.7 | 235.7 | | |
| L11: Housing length | 81.9 | 81.9 | 81.9 | 81.9 | | |
| Lw: Inner carriage body length | 100 | 135 | 100 | 135 | | |
| N: Lateral fixing hole spacing | 100 | 100 | 60 | 60 | | |
| O: Reference face height | 10 | 10 | 10 | 10 | | |
| Ts: Front plate thickness | 18.8 | 18.8 | 18.8 | 18.8 | | |

Capacities and weights

| | | | | | | |
|---|---------|---------|---------|---------|--|--|
| C0: Static load capacity (N) | 167 500 | 229 500 | 167 500 | 229 500 | | |
| C100: Dynamic load capacity (N) | 93 400 | 127 800 | 93 400 | 127 800 | | |
| MOQ: Static cross moment capacity (Nm) | 4 621 | 6 333 | 4 621 | 6 333 | | |
| MOL: Static longitudinal moment capacity (Nm) | 2 790 | 5 161 | 2 790 | 5 161 | | |
| MQ: Dynamic cross moment capacity (Nm) | 2 577 | 3 527 | 2 577 | 3 527 | | |
| ML: Dynamic longitudinal moment capacity (Nm) | 1 556 | 2 874 | 1 556 | 2 874 | | |
| Gew: Carriage weight (kg) | 4.0 | 5.1 | 3.8 | 4.8 | | |

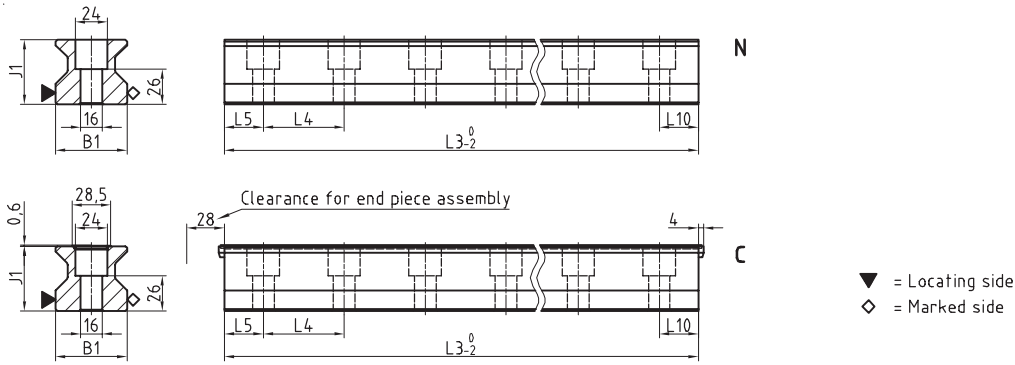
Available options for AMSD 3A W 45



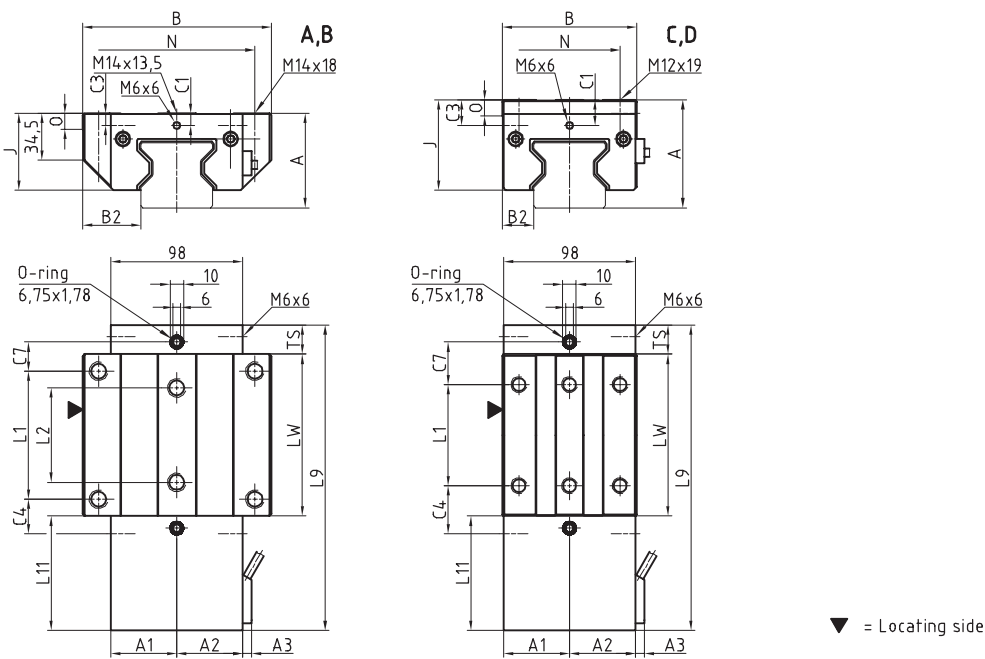
7.2

MONORAIL AMSD 3A AMSD 3A 55 Technical Data

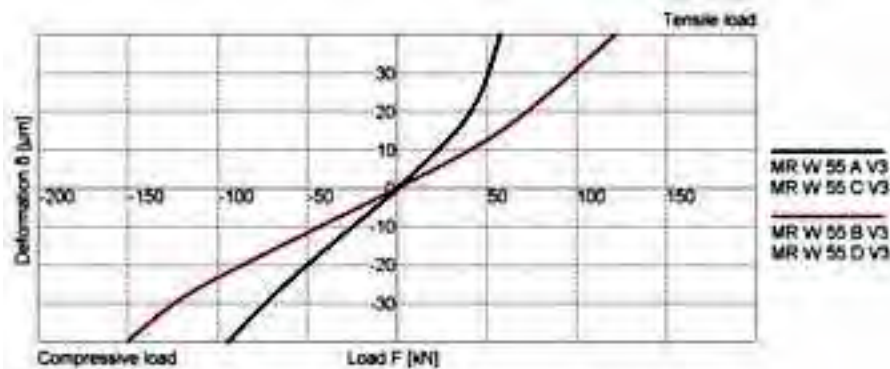
AMSD 3A 55 Rail Drawings



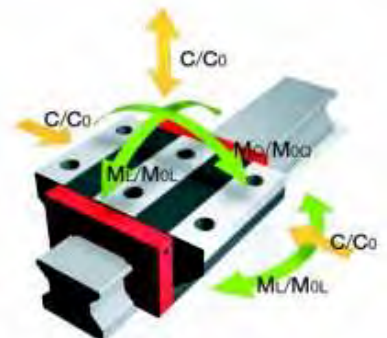
AMSD 3A 55 Carriage Drawings



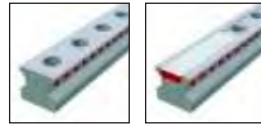
AMSD 3A 55 Rigidity diagram



AMSD 3A 55 load rating



AMSD 3A S 55 Dimensions



| | AMSD 3A S 55-N | AMSD 3A S 55-C | | | |
|--|----------------|----------------|--|--|--|
| B1: Rail width | 53 | 53 | | | |
| J1: Rail height | 48 | 48 | | | |
| L3: Rail length max. | 6 000 | 6 000 | | | |
| L4: Spacing of fixing holes | 60 | 60 | | | |
| L5/L10: Position of first/last fixing hole | 28.5 | 28.5 | | | |
| Gew: Rail weight, specific (kg/m) | 15.2 | 14.9 | | | |

Available options for AMSD 3A S 55



AMSD 3A W 55 Dimensions and capacities



| | AMSD 3A W 55-A | AMSD 3A W 55-B | AMSD 3A W 55-C | AMSD 3A W 55-D | | |
|--|----------------|----------------|----------------|----------------|--|--|
| A: System height | 70 | 70 | 80 | 80 | | |
| A1: Half width of housing on opposite side | 49 | 49 | 49 | 49 | | |
| A2: Half width of housing on reading head side | 49 | 49 | 49 | 49 | | |
| A3: Projection of reading head | 6.5 | 6.5 | 6.5 | 6.5 | | |
| B: Carriage width | 140 | 140 | 100 | 100 | | |
| B2: Distance between locating faces | 43.5 | 43.5 | 23.5 | 23.5 | | |
| C1: Position of center front lube hole | 9 | 9 | 19 | 19 | | |
| C3: Position of lateral lube hole | 9 | 9 | 19 | 19 | | |
| C4: Position of lateral lube hole | 25.75 | 46.75 | 35.75 | 46.75 | | |
| C7: Position of top lube hole | 21.5 | 42.5 | 31.5 | 42.5 | | |
| J: Carriage height | 57 | 57 | 67 | 67 | | |
| L1: Exterior fixing hole spacing | 95 | 95 | 75 | 95 | | |
| L2: Interior fixing hole spacing | 70 | 70 | - | - | | |
| L9: Carriage length with housing | 226.7 | 268.7 | 226.7 | 268.7 | | |
| L11: Housing length | 84.9 | 84.9 | 84.9 | 84.9 | | |
| Lw: Inner carriage body length | 120 | 162 | 120 | 162 | | |
| N: Lateral fixing hole spacing | 116 | 116 | 75 | 75 | | |
| O: Reference face height | 12 | 12 | 12 | 12 | | |
| Ts: Front plate thickness | 21.8 | 21.8 | 21.8 | 21.8 | | |

Capacities and weights

| | | | | | | |
|---|---------|---------|---------|---------|--|--|
| C0: Static load capacity (N) | 237 000 | 324 000 | 237 000 | 324 000 | | |
| C100: Dynamic load capacity (N) | 131 900 | 180 500 | 131 900 | 180 500 | | |
| MOQ: Static cross moment capacity (Nm) | 7 771 | 10 624 | 7 771 | 10 624 | | |
| MOL: Static longitudinal moment capacity (Nm) | 4 738 | 8 745 | 4 738 | 8 745 | | |
| MQ: Dynamic cross moment capacity (Nm) | 4 325 | 5 919 | 4 325 | 5 919 | | |
| ML: Dynamic longitudinal moment capacity (Nm) | 2 637 | 4 872 | 2 637 | 4 872 | | |
| Gew: Carriage weight (kg) | 5.9 | 7.7 | 5.5 | 7.0 | | |

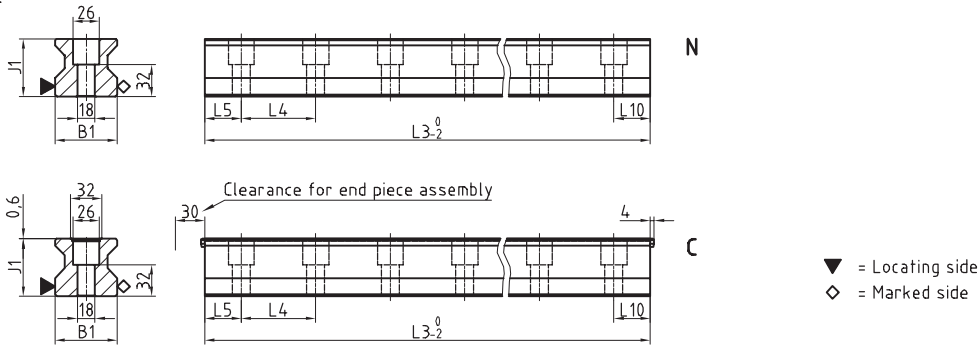
Available options for AMSD 3A W 55



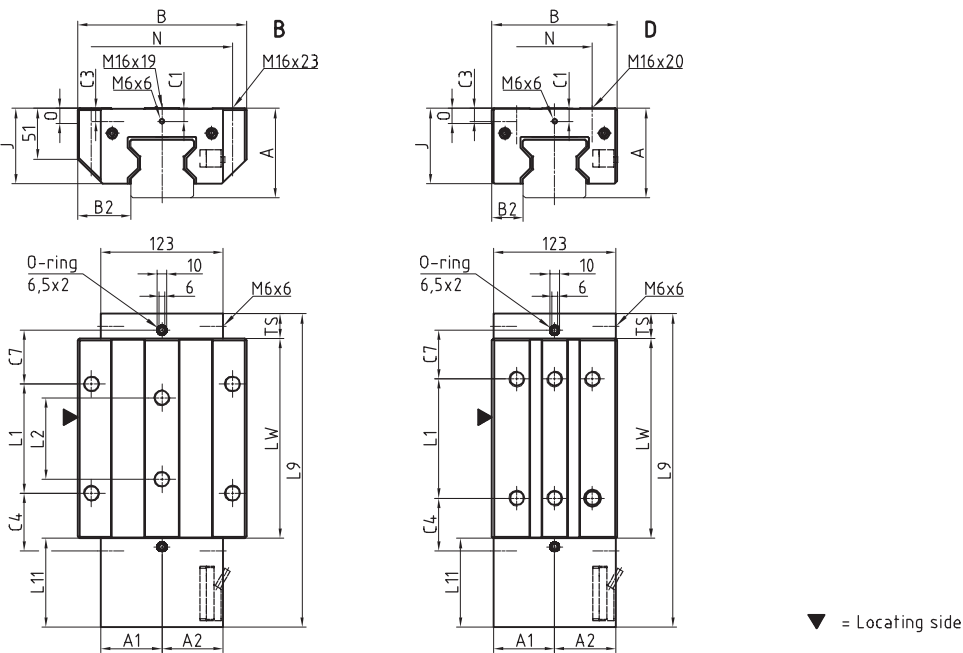
7.2

MONORAIL AMSD 3A AMSD 3A 65 Technical Data

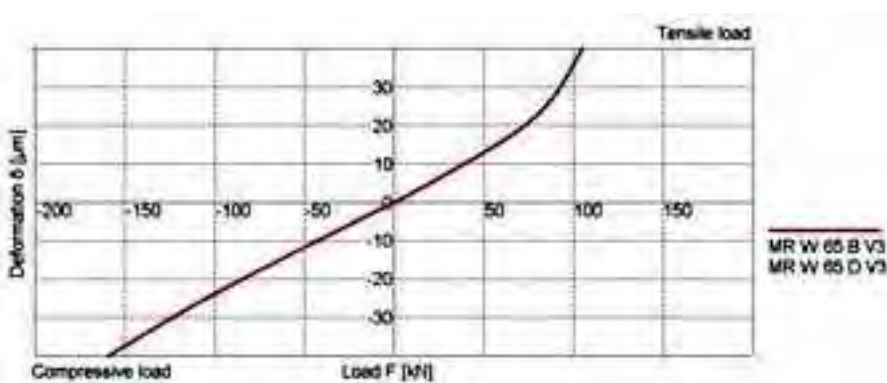
AMSD 3A 65 Rail Drawings



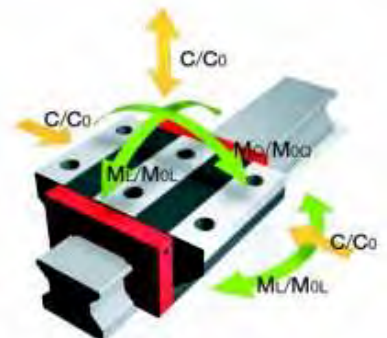
AMSD 3A 65 Carriage Drawings



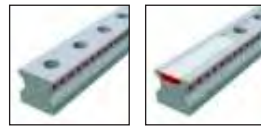
AMSD 3A 65 Rigidity diagram



AMSD 3A 65 load rating



AMSD 3A S 65 Dimensions



| | AMSD 3A S 65-N | AMSD 3A S 65-C | | | |
|--|----------------|----------------|--|--|--|
| B1: Rail width | 63 | 63 | | | |
| J1: Rail height | 58 | 58 | | | |
| L3: Rail length max. | 6 000 | 6 000 | | | |
| L4: Spacing of fixing holes | 75 | 75 | | | |
| L5/L10: Position of first/last fixing hole | 36 | 36 | | | |
| Gew: Rail weight, specific (kg/m) | 22.8 | 22.5 | | | |

Available options for AMSD 3A S 65



AMSD 3A W 65 Dimensions and capacities



| | AMSD 3A W 65-B | AMSD 3A W 65-D | | | |
|--|----------------|----------------|--|--|--|
| A: System height | 90 | 90 | | | |
| A1: Half width of housing on opposite side | 61.5 | 61.5 | | | |
| A2: Half width of housing on reading head side | 61.5 | 61.5 | | | |
| A3: Projection of reading head | 0 | 0 | | | |
| B: Carriage width | 170 | 126 | | | |
| B2: Distance between locating faces | 53.5 | 31.5 | | | |
| C1: Position of center front lube hole | 13 | 13 | | | |
| C3: Position of lateral lube hole | 13 | 13 | | | |
| C4: Position of lateral lube hole | 58 | 53 | | | |
| C7: Position of top lube hole | 54 | 49 | | | |
| J: Carriage height | 76 | 76 | | | |
| L1: Exterior fixing hole spacing | 110 | 120 | | | |
| L2: Interior fixing hole spacing | 82 | - | | | |
| L9: Carriage length with housing | 315 | 315 | | | |
| L11: Housing length | 89 | 89 | | | |
| Lw: Inner carriage body length | 201 | 201 | | | |
| N: Lateral fixing hole spacing | 142 | 76 | | | |
| O: Reference face height | 15 | 15 | | | |
| Ts: Front plate thickness | 25 | 25 | | | |

Capacities and weights

| | | | | | |
|---|---------|---------|--|--|--|
| C0: Static load capacity (N) | 530 000 | 530 000 | | | |
| C100: Dynamic load capacity (N) | 295 000 | 295 000 | | | |
| MOQ: Static cross moment capacity (Nm) | 20 912 | 20 912 | | | |
| MOL: Static longitudinal moment capacity (Nm) | 17 930 | 17 930 | | | |
| MQ: Dynamic cross moment capacity (Nm) | 11 640 | 11 640 | | | |
| ML: Dynamic longitudinal moment capacity (Nm) | 9 980 | 9 980 | | | |
| Gew: Carriage weight (kg) | 14.9 | 11.8 | | | |

Available options for AMSD 3A W 65



7.3

MONORAIL AMSD 3A

Accessories

AMSD 3A Rails accessories overview

| Accessories | AMSD 3A S 25 | AMSD 3A S 35 | AMSD 3A S 45 | AMSD 3A S 55 | AMSD 3A S 65 |
|--|--------------|--------------|--------------|--------------|--------------|
| Plugs: | | | | | |
| Plastic plugs | MRK 25 | MRK 35 | MRK 45 | MRK 55 | MRK 65 |
| Brass plugs | MRS 25 | MRS 35 | MRS 45 | MRS 55 | MRS 65 |
| Steel plugs | MRZ 25 | MRZ 35 | MRZ 45 | MRZ 55 | MRZ 65 |
| Cover strips: | | | | | |
| Cover strip (spare part) | MAC 25 | MAC 35 | MAC 45 | MAC 55 | MAC 65 |
| End piece for cover strip (spare part) | EST 25-MAC | EST 35-MAC | EST 45-MAC | EST 55-MAC | EST 65-MAC |
| Assembly tools: | | | | | |
| Installation tool for steel plugs | MWH 25 | MWH 35 | MWH 45 | MWH 55 | MWH 65 |
| Hydraulic cylinder for MWH | MZH | MZH | MZH | MZH | MZH |
| Installation tool for cover strip | MWC 25 | MWC 35 | MWC 45 | MWC 55 | MWC 65 |

AMSD 3A Carriages accessories overview

| Accessories | AMSD 3A W 25 | AMSD 3A W 35 | AMSD 3A W 45 | AMSD 3A W 55 | AMSD 3A W 65 |
|---|--------------|---------------|---------------|---------------|---------------|
| Additional wipers: | | | | | |
| Additional wiper NBR | ZCN 25 | ZCN 35 | ZCN 45 | ZCN 55 | ZCN 65 |
| Additional wiper Viton | ZCV 25 | ZCV 35 | ZCV 45 | ZCV 55 | ZCV 65 |
| Metal wiper | ASM 25 | ASM 35 | ASM 45 | ASM 55 | ASM 65 |
| Bellows: | | | | | |
| Bellows | FBM 25 | FBM 35 | FBM 45 | FBM 55 | FBM 65 |
| Adapter plate for bellows (spare part) | ZPL 25 | ZPL 35 | ZPL 45 | ZPL 55 | ZPL 65 |
| End plate for bellows (spare part) | EPL 25 | EPL 35 | EPL 45 | EPL 55 | EPL 65 |
| Assembly rails: | | | | | |
| Assembly rail | MRM 25 | MRM 35 | MRM 45 | MRM 55 | MRM 65 |
| Lubrication plates: | | | | | |
| Lubrication plate | SPL 25-MR | SPL 35-MR | SPL 45-MR | SPL 55-MR | SPL 65-MR |
| Front plates: | | | | | |
| Front plate (spare part) | STP 25-EK | STP 35-EK | STP 45-EK | STP 55-EK | STP 65-EK |
| Lube nipples: | | | | | |
| Hydraulic-type grease nipple straight | SN 6 | SN 6 | SN 6 | SN 6 | SN 6 |
| Hydraulic-type grease nipple 45° | SN 6-45 | SN 6-45 | SN 6-45 | SN 6-45 | SN 6-45 |
| Hydraulic-type grease nipple 90° | SN 6-90 | SN 6-90 | SN 6-90 | SN 6-90 | SN 6-90 |
| Flush type grease nipple M3 | SN 3-T | - | - | - | - |
| Flush type grease nipple M6 | SN 6-T | SN 6-T | SN 6-T | SN 6-T | SN 6-T |
| Grease gun for SN 3-T and SN 6-T | SFP-T3 | SFP-T3 | SFP-T3 | SFP-T3 | SFP-T3 |
| Lube adapters: | | | | | |
| Straight screw-in connection M3 | SA 3-D3 | - | - | - | - |
| Lubrication adapter M8 round-head | SA 6-RD-M8 | SA 6-RD-M8 | SA 6-RD-M8 | SA 6-RD-M8 | SA 6-RD-M8 |
| Lubrication adapter M8 hexagon head | - | SA 6-6KT-M8 | SA 6-6KT-M8 | SA 6-6KT-M8 | SA 6-6KT-M8 |
| Lubrication adapter G1/8 hexagon head | - | SA 6-6KT-G1/8 | SA 6-6KT-G1/8 | SA 6-6KT-G1/8 | SA 6-6KT-G1/8 |
| Swivel screw connection for pipe d=4 mm | SV 6-D4 | SV 6-D4 | SV 6-D4 | SV 6-D4 | SV 6-D4 |
| Swivel screw connection M6 | SV 6-M6 | SV 6-M6 | SV 6-M6 | SV 6-M6 | SV 6-M6 |
| Swivel screw connection M6 long | SV 6-M6-L | SV 6-M6-L | SV 6-M6-L | SV 6-M6-L | SV 6-M6-L |
| Swivel screw connection M8 | SV 6-M8 | SV 6-M8 | SV 6-M8 | SV 6-M8 | SV 6-M8 |
| Swivel screw connection M8 long | SV 6-M8-L | SV 6-M8-L | SV 6-M8-L | SV 6-M8-L | SV 6-M8-L |
| Cables: | | | | | |
| Connecting cable, 12-pole | KAO 12-X | KAO 12-X | KAO 12-X | KAO 12-X | KAO 12-X |
| Connecting cable, 12-pole | KAO 13-X | KAO 13-X | KAO 13-X | KAO 13-X | KAO 13-X |
| Extension cable, 12-pole | KAO 14-X | KAO 14-X | KAO 14-X | KAO 14-X | KAO 14-X |
| Connecting cable, 12-pole | KAO 16-X | KAO 16-X | KAO 16-X | KAO 16-X | KAO 16-X |

7.4

MONORAIL AMSD 3A

Order code

Individual guide rails and carriages are ordered in accordance with the order codes described below.

AMSD 3A carriages consist of guide carriage, casing and reading head.

All MONORAIL MR carriages can also be used with AMSD 3A rails.

Q.v. chapter 2 and chapter 3.3 for the order key for accessories.

Separate order codes are used in each case for rails, carriages and accessories. This also applies to different versions of rails and carriages.

All guide components are supplied individually as standard, i.e. unassembled.

If required, SCHNEEBERGER can also supply rails and carriages assembled incl. accessories as complete systems. Please note the ordering instructions in chapter 2.4 if this applies.

Order code for AMSD 3A rails

| | 1x | AMSD 3A S | -35 | -N | -G1 | -KC | -R12 | -918 | -19 | -19 | -CN | -TR50 |
|----------------------------------|----|-----------|-----|----|-----|-----|------|------|-----|-----|-----|-------|
| Quantity | | | | | | | | | | | | |
| Rail | | | | | | | | | | | | |
| Size | | | | | | | | | | | | |
| Type | | | | | | | | | | | | |
| Accuracy | | | | | | | | | | | | |
| Straightness | | | | | | | | | | | | |
| Reference side | | | | | | | | | | | | |
| Rail length L3 | | | | | | | | | | | | |
| Position of first fixing hole L5 | | | | | | | | | | | | |
| Position of last fixing hole L10 | | | | | | | | | | | | |
| Coating | | | | | | | | | | | | |
| Magnetization | | | | | | | | | | | | |

NB

Q.v. chapter 7.1 to 7.3 for an overview of types, details of shapes, available options and accessories.

Q.v. chapter 2 for a description of the options.

If possible, standard lengths are preferred for L3 rail length.

These are calculated with the table values in chapter 7.2 using the following formula: $L3 = n \times L4 + L5 + L10 \leq L3_{max}$.

Order code for AMSD 3A carriages

| | 1x | AMSD 3A W | -35 | -A | -P1 | -G1 | -V3 | -R1 | -CN | -S10 | -LN | -TSD | -050 | -80 | ZN |
|------------------------------------|----|-----------|-----|----|-----|-----|-----|-----|-----|------|-----|------|------|-----|----|
| Quantity | | | | | | | | | | | | | | | |
| Carriage | | | | | | | | | | | | | | | |
| Size | | | | | | | | | | | | | | | |
| Type | | | | | | | | | | | | | | | |
| Reading head position | | | | | | | | | | | | | | | |
| Accuracy | | | | | | | | | | | | | | | |
| Preload | | | | | | | | | | | | | | | |
| Reference side | | | | | | | | | | | | | | | |
| Coating | | | | | | | | | | | | | | | |
| Lube connection | | | | | | | | | | | | | | | |
| Lubrication as delivered condition | | | | | | | | | | | | | | | |
| Interface | | | | | | | | | | | | | | | |
| Interpolation | | | | | | | | | | | | | | | |
| Frequency | | | | | | | | | | | | | | | |
| Reference pulse | | | | | | | | | | | | | | | |

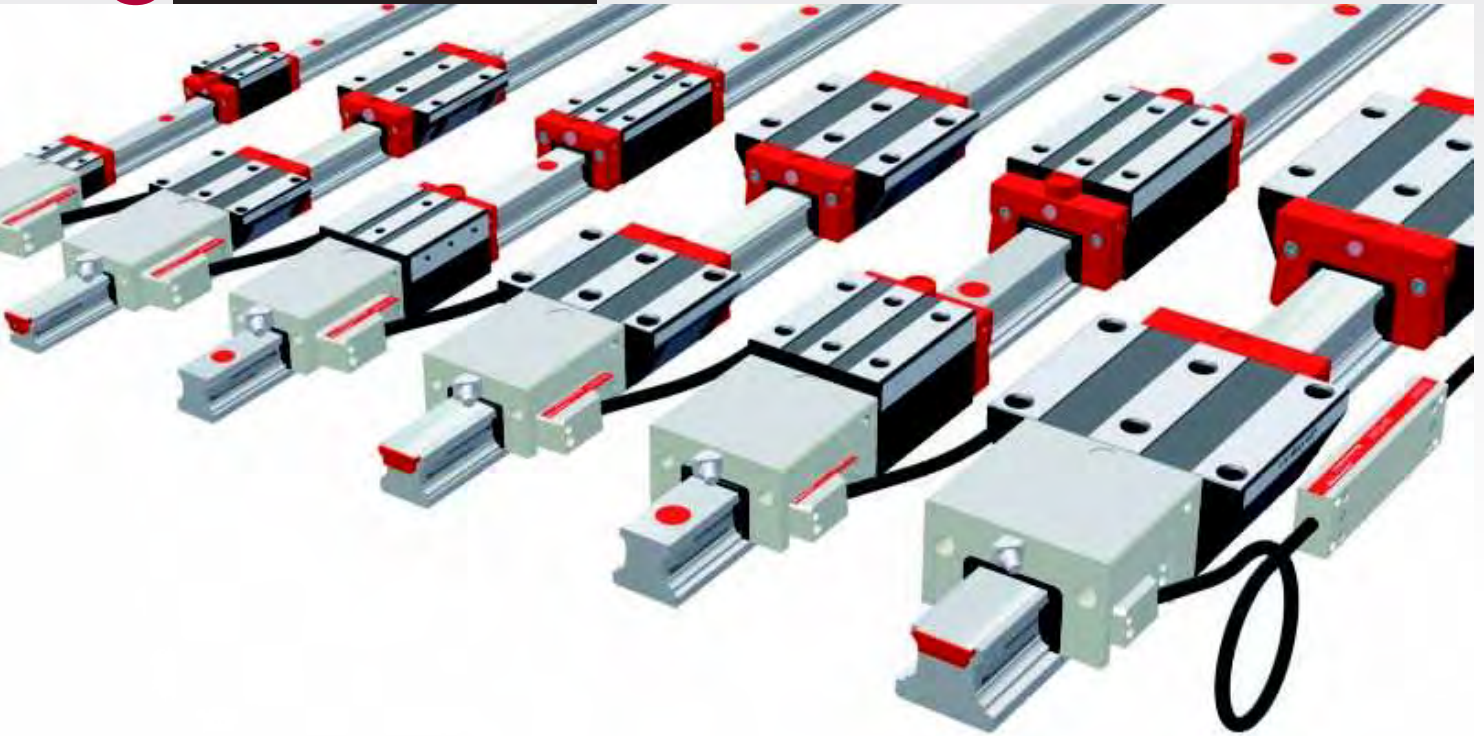
NB

Q.v. chapter 7.1 to 7.3 for an overview of types, details of shapes, available options and accessories.

Q.v. chapter 2 for a description of the options.

SCHNEEBERGER
 LINEAR TECHNOLOGY

8 **MONORAIL AMSA 4A**

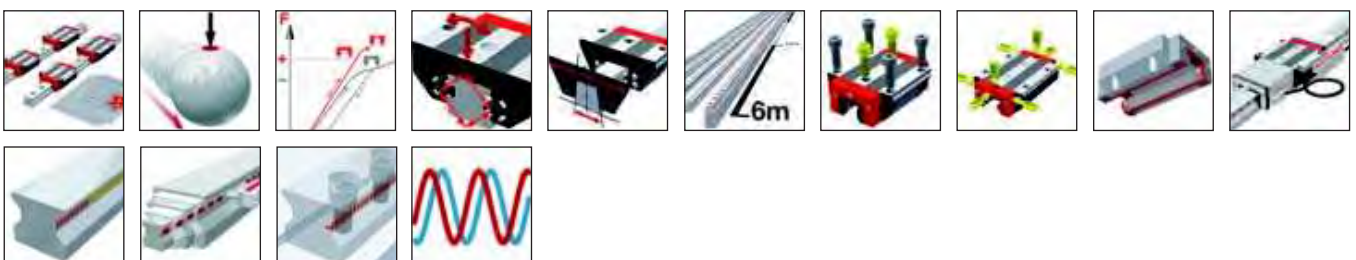


SCHNEEBERGER's AMSA 4A MONORAIL is an integrated linear encoder system for use on all protected machine tool axes with lower machining forces and high demands on system precision. Mechanically the AMSA 4A is based on SCHNEEBERGER's BM MONORAIL ball guide with lengths up to 6 metres. The integration of the measurement system allows very compact axes to be put together.

An analog 1Vss (200 µm signal period) interface with different cable lengths is available as the interface with the control system. Combined with SCHNEEBERGER's SMEa interpolation electronics, very high-resolution and fast digital signals can be provided. Reference marks can be set at 50mm intervals or distance coded.. Different options for carriage lubrication and sealing permit the best possible degree of adaptation to application requirements. The easily interchangeable reading head is identical for all sizes.

Features of System MONORAIL AMSA 4A

Details see chapter 1

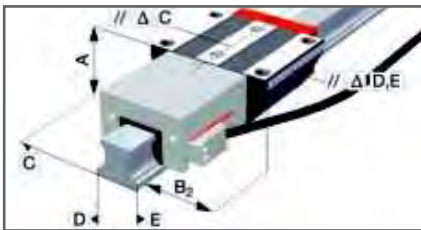


8.1 Overview of Types, Sizes and available Options



| | |
|--------------------------------------|--------|
| > Product overview AMSA 4A Rails | p. 134 |
| > Product overview AMSA 4A Carriages | p. 135 |

8.2 Technical data and Options



| | |
|--------------|--------|
| > AMSA 4A 15 | p. 136 |
| > AMSA 4A 20 | p. 138 |
| > AMSA 4A 25 | p. 140 |
| > AMSA 4A 30 | p. 142 |
| > AMSA 4A 35 | p. 144 |
| > AMSA 4A 45 | p. 146 |

8.3 Accessories MONORAIL AMSA 4A



| | |
|---------------------------------------|--------|
| > Accessories overview | p. 148 |
| > AMSA 4A Rails accessory details | p. 148 |
| > AMSA 4A Carriages accessory details | p. 148 |

8.4 Order key



| | |
|-------------------------------|--------|
| > Order key AMSA 4A Rails | p. 149 |
| > Order key AMSA 4A Carriages | p. 149 |

8.1

MONORAIL AMSA 4A

Overview of Types, Sizes and available Options

Product overview AMSA 4A Rails







| | N standard | ND standard, through hardened | C for cover strip | CD for cover strip, through hardened | | |
|--------------------------------------|----------------|--|----------------------|---|--|--|
| Buildsizes / Rail build forms | | | | | | |
| Size 15 | | AMSA 4A S 15-ND | | AMSA 4A S 15-CD | | |
| Size 20 | AMSA 4A S 20-N | | AMSA 4A S 20-C | | | |
| Size 25 | AMSA 4A S 25-N | | AMSA 4A S 25-C | | | |
| Size 30 | AMSA 4A S 30-N | | AMSA 4A S 30-C | | | |
| Size 35 | AMSA 4A S 35-N | | AMSA 4A S 35-C | | | |
| Size 45 | AMSA 4A S 45-N | | AMSA 4A S 45-C | | | |
| Features | | | | | | |
| Screwable from above | • | • | • | • | | |
| Small assembly effort | | | • | • | | |
| Great single-part system length | • | | • | | | |
| For the support of metal covers | | • | | | | |

Available options for AMSA 4A Rails

Details see chapter 2



Accuracy

-  G0 Highly accurate
-  G1 Very accurate
-  G2 Accurate
-  G3 Standard





Straightness

-  KC Standard




Coating

-  CN None
-  CH Hard chromium

Locating sides

-  R11 Ref.bottom, scale bottom
-  R12 Ref.bottom, scale top
-  R21 Ref.top, scale bottom
-  R22 Ref.top, scale top

Magnetization

-  TR50 50mm pattern
-  TD20 20mm code
-  TD50 50mm code

Available accessories for AMSA 4A Rails

Details see chapter 4.3

- Plugs
- Cover strips
- Assembly tools

Product overview AMSA 4A Carriages



| | A standard | B standard, long | C compact, high | D compact, high, long | E compact, high, for lateral fixing | F compact | G compact, long |
|--|---------------|---------------------|--------------------|--------------------------|--|--------------|--------------------|
|--|---------------|---------------------|--------------------|--------------------------|--|--------------|--------------------|

Buildsizes / Carriage build forms

| | | | | | | | |
|---------|----------------|----------------|----------------|----------------|----------------|----------------|----------------|
| Size 15 | AMSA 4A W 15-A | | AMSA 4A W 15-C | | | AMSA 4A W 15-F | |
| Size 20 | AMSA 4A W 20-A | AMSA 4A W 20-B | AMSA 4A W 20-C | AMSA 4A W 20-D | | | |
| Size 25 | AMSA 4A W 25-A | AMSA 4A W 25-B | AMSA 4A W 25-C | AMSA 4A W 25-D | AMSA 4A W 25-E | AMSA 4A W 25-F | AMSA 4A W 25-G |
| Size 30 | AMSA 4A W 30-A | AMSA 4A W 30-B | AMSA 4A W 30-C | AMSA 4A W 30-D | AMSA 4A W 30-E | AMSA 4A W 30-F | AMSA 4A W 30-G |
| Size 35 | AMSA 4A W 35-A | AMSA 4A W 35-B | AMSA 4A W 35-C | AMSA 4A W 35-D | AMSA 4A W 35-E | AMSA 4A W 35-F | AMSA 4A W 35-G |
| Size 45 | AMSA 4A W 45-A | AMSA 4A W 45-B | AMSA 4A W 45-C | AMSA 4A W 45-D | | | |

Features

| | | | | | | | |
|------------------------------|---|---|---|---|---|---|---|
| Screwable from above | • | • | • | • | | • | • |
| Screwable from below | • | • | | | | | |
| Screwable from the side | | | | | • | | |
| For high loads and moments | | • | | • | | | • |
| For medium loads and moments | • | | • | | • | • | • |
| For limited space conditions | | | | | | • | • |

Available options for AMSA 4A Carriages

Details see chapter 2

Accuracy

| | |
|----|-----------------|
| G0 | Highly accurate |
| G1 | Very accurate |
| G2 | Accurate |
| G3 | Standard |

Preload

| | |
|----|----------|
| V0 | Very low |
| V1 | Low |
| V2 | Medium |
| V3 | High |

Reference side

| | |
|----|----------------|
| R1 | Ref. at bottom |
| R2 | Ref. on top |

Coating

| | |
|----|---------------|
| CN | None |
| CH | Hard chromium |

Lube connections

| | |
|-----|------------------|
| S10 | Left center |
| S20 | Right center |
| S11 | Top left |
| S21 | Top right |
| S12 | Lower left side |
| S22 | Lower right side |

| | |
|-----|------------------|
| S13 | Upper left side |
| S23 | Upper right side |
| S32 | Left side |
| S42 | Right side |

Lubrication

| | |
|----|----------------|
| LN | Oil protect |
| LG | Grease protect |
| LV | Full greasing |

Interface

| | |
|-----|-------------------|
| TMU | TMU, analog, 0,3m |
| TRU | TRU, analog, 3m |
| TSU | TSU, analog, 3m |

Reading head position

| | |
|----|-------------|
| P1 | Right top |
| P3 | Left bottom |

Available accessories for AMSA 4A Carriages

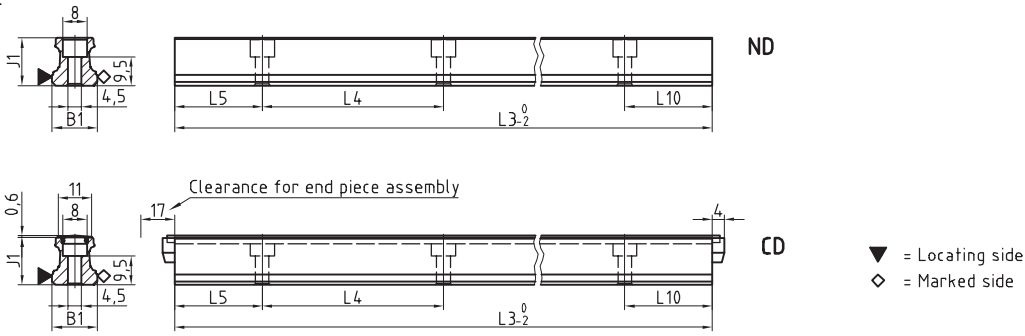
Details see chapter 2.1 and 4.3

| | | | |
|-------------------|--------------|----------------|--------------------|
| Additional wipers | Bellows | Assembly rails | Lubrication plates |
| Front plates | Lube nipples | Lube adapters | Cables |

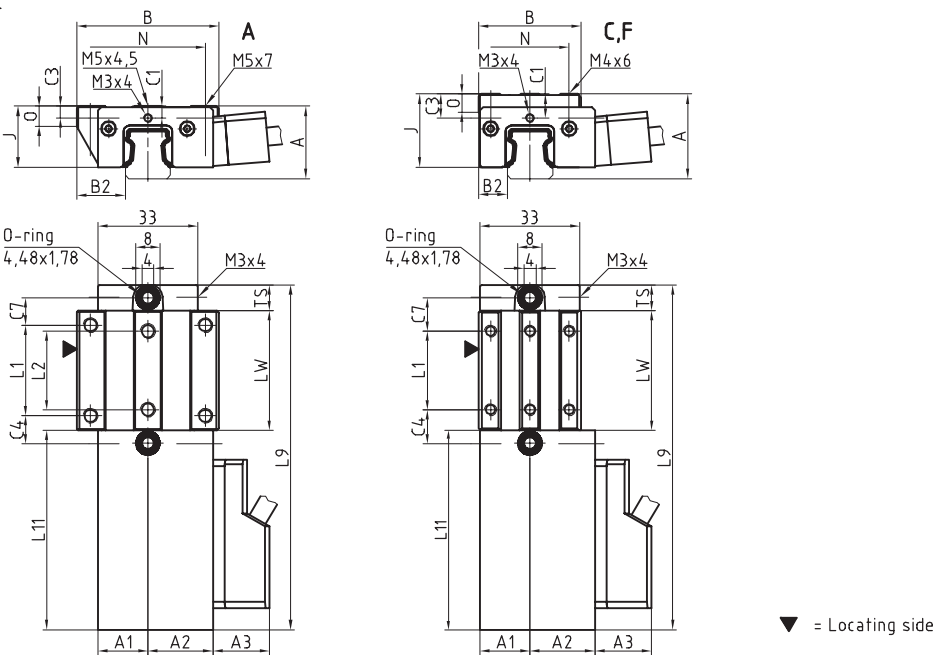
8.2

MONORAIL AMSA 4A AMSA 4A 15 Technical Data

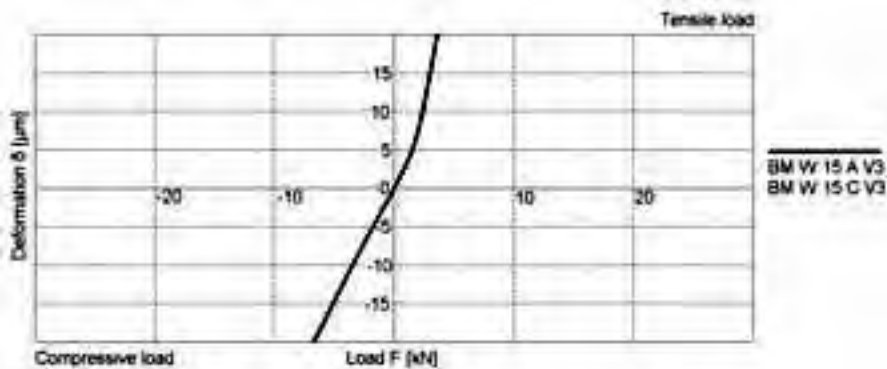
AMSA 4A 15 Rail Drawings



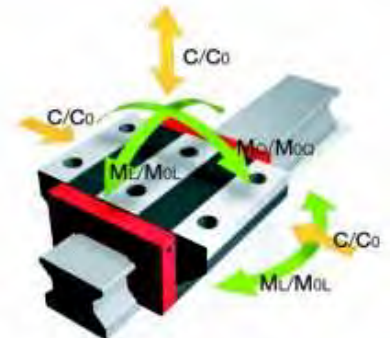
AMSA 4A 15 Carriage Drawings



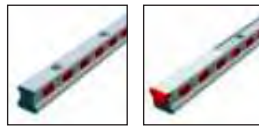
AMSA 4A 15 Rigidity diagram



AMSA 4A 15 load rating



AMSA 4A S 15 Dimensions



| | AMSA 4A S 15-ND | AMSA 4A S 15-CD | | | |
|--|-----------------|-----------------|--|--|--|
| B1: Rail width | 15 | 15 | | | |
| J1: Rail height | 15.7 | 15.7 | | | |
| L3: Rail length max. | 1 500 | 1 500 | | | |
| L4: Spacing of fixing holes | 60 | 60 | | | |
| L5/L10: Position of first/last fixing hole | 28.5 | 28.5 | | | |
| Gew: Rail weight, specific (kg/m) | 1.4 | 1.3 | | | |

Available options for AMSA 4A S 15



AMSA 4A W 15 Dimensions and capacities



| | AMSA 4A W 15-A | AMSA 4A W 15-C | AMSA 4A W 15-F | | |
|--|----------------|----------------|----------------|--|--|
| A: System height | 24 | 28 | 24 | | |
| A1: Half width of housing on opposite side | 16.5 | 16.5 | 16.5 | | |
| A2: Half width of housing on reading head side | 21.5 | 21.5 | 21.5 | | |
| A3: Projection of reading head | 18.7 | 18.7 | 18.7 | | |
| B: Carriage width | 47 | 34 | 34 | | |
| B2: Distance between locating faces | 16 | 9.5 | 9.5 | | |
| C1: Position of center front lube hole | 4 | 8 | 4 | | |
| C3: Position of lateral lube hole | 4 | 8 | 4 | | |
| C4: Position of lateral lube hole | 9.3 | 11.3 | 11.3 | | |
| C7: Position of top lube hole | 9.05 | 11.05 | 11.05 | | |
| J: Carriage height | 20.2 | 24.2 | 20.2 | | |
| L1: Exterior fixing hole spacing | 30 | 26 | 26 | | |
| L2: Interior fixing hole spacing | 26 | - | - | | |
| L9: Carriage length with housing | 114.1 | 114.1 | 114.1 | | |
| L11: Housing length | 66 | 66 | 66 | | |
| Lw: Inner carriage body length | 39.6 | 39.6 | 39.6 | | |
| N: Lateral fixing hole spacing | 38 | 26 | 26 | | |
| O: Reference face height | 7 | 6 | 5.5 | | |
| Ts: Front plate thickness | 8.5 | 8.5 | 8.5 | | |

Capacities and weights

| | | | | | |
|---|--------|--------|--------|--|--|
| C0: Static load capacity (N) | 19 600 | 19 600 | 19 600 | | |
| C100: Dynamic load capacity (N) | 9 000 | 9 000 | 9 000 | | |
| MOQ: Static cross moment capacity (Nm) | 181 | 181 | 181 | | |
| MOL: Static longitudinal moment capacity (Nm) | 146 | 146 | 146 | | |
| MQ: Dynamic cross moment capacity (Nm) | 83 | 83 | 83 | | |
| ML: Dynamic longitudinal moment capacity (Nm) | 67 | 67 | 67 | | |
| Gew: Carriage weight (kg) | 0.8 | 0.8 | 0.7 | | |

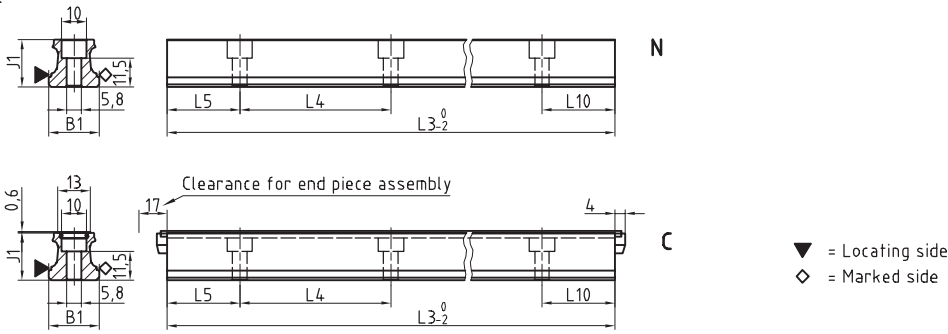
Available options for AMSA 4A W 15



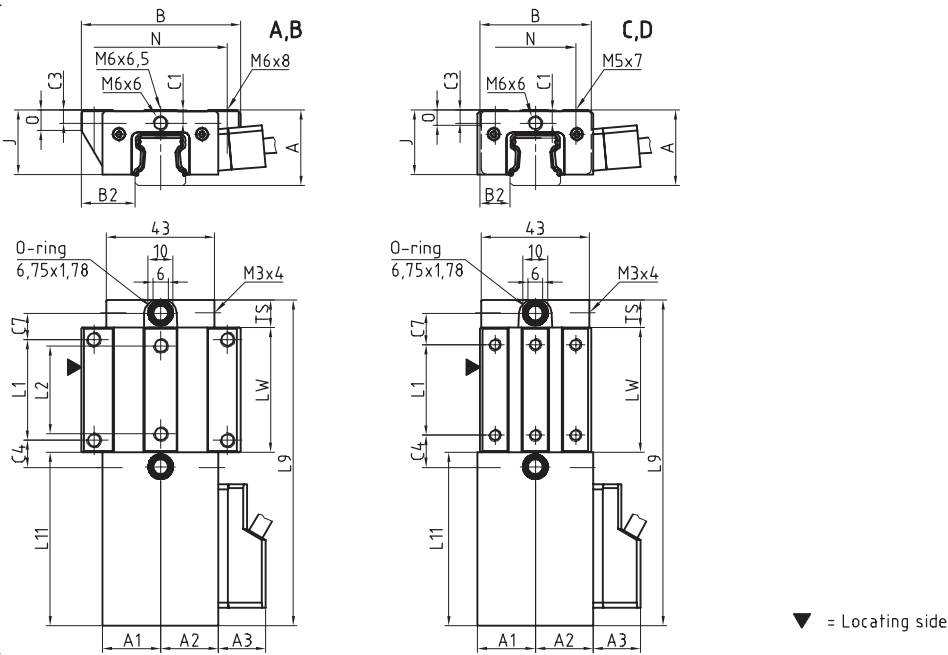
8.2

MONORAIL AMSA 4A AMSA 4A 20 Technical Data

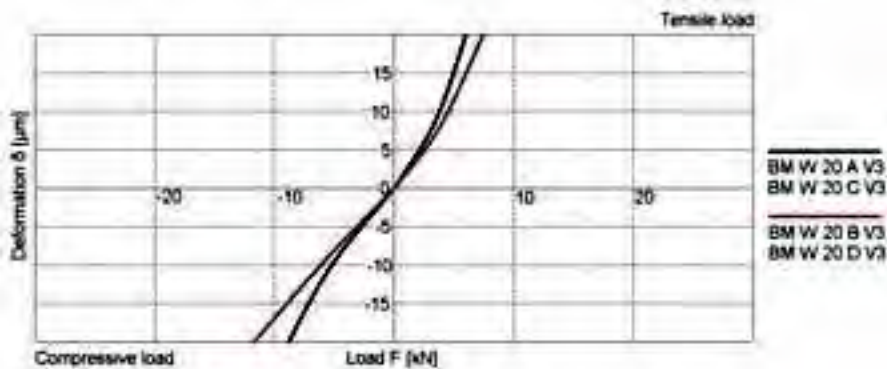
AMSA 4A 20 Rail Drawings



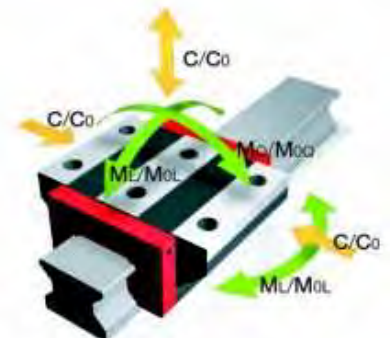
AMSA 4A 20 Carriage Drawings



AMSA 4A 20 Rigidity diagram



AMSA 4A 20 load rating



AMSA 4A S 20 Dimensions



| | AMSA 4A S 20-N | AMSA 4A S 20-C | | | |
|--|----------------|----------------|--|--|--|
| B1: Rail width | 20 | 20 | | | |
| J1: Rail height | 19 | 19 | | | |
| L3: Rail length max. | 3 000 | 3 000 | | | |
| L4: Spacing of fixing holes | 60 | 60 | | | |
| L5/L10: Position of first/last fixing hole | 28.5 | 28.5 | | | |
| Gew: Rail weight, specific (kg/m) | 2.2 | 2.1 | | | |

Available options for AMSA 4A S 20



AMSA 4A W 20 Dimensions and capacities



| | AMSA 4A W 20-A | AMSA 4A W 20-B | AMSA 4A W 20-C | AMSA 4A W 20-D | | |
|--|----------------|----------------|----------------|----------------|--|--|
| A: System height | 30 | 30 | 30 | 30 | | |
| A1: Half width of housing on opposite side | 23 | 23 | 23 | 23 | | |
| A2: Half width of housing on reading head side | 23 | 23 | 23 | 23 | | |
| A3: Projection of reading head | 18.7 | 18.7 | 18.7 | 18.7 | | |
| B: Carriage width | 63 | 63 | 44 | 44 | | |
| B2: Distance between locating faces | 21.5 | 21.5 | 12 | 12 | | |
| C1: Position of center front lube hole | 5.2 | 5.2 | 5.2 | 5.2 | | |
| C3: Position of lateral lube hole | 5.2 | 5.2 | 5.2 | 5.2 | | |
| C4: Position of lateral lube hole | 10.75 | 18.75 | 12.75 | 13.75 | | |
| C7: Position of top lube hole | 10.25 | 18.25 | 12.25 | 13.25 | | |
| J: Carriage height | 25.5 | 25.5 | 25.5 | 25.5 | | |
| L1: Exterior fixing hole spacing | 40 | 40 | 36 | 50 | | |
| L2: Interior fixing hole spacing | 35 | 35 | - | - | | |
| L9: Carriage length with housing | 129.5 | 145.5 | 129.5 | 145.5 | | |
| L11: Housing length | 69 | 69 | 69 | 69 | | |
| Lw: Inner carriage body length | 49.5 | 65.5 | 49.5 | 65.5 | | |
| N: Lateral fixing hole spacing | 53 | 53 | 32 | 32 | | |
| O: Reference face height | 8 | 8 | 6 | 6 | | |
| Ts: Front plate thickness | 11 | 11 | 11 | 11 | | |

Capacities and weights

| | | | | | | |
|---|--------|--------|--------|--------|--|--|
| C0: Static load capacity (N) | 31 400 | 41 100 | 31 400 | 41 100 | | |
| C100: Dynamic load capacity (N) | 14 400 | 17 400 | 14 400 | 17 400 | | |
| MOQ: Static cross moment capacity (Nm) | 373 | 490 | 373 | 490 | | |
| MOL: Static longitudinal moment capacity (Nm) | 292 | 495 | 292 | 495 | | |
| MQ: Dynamic cross moment capacity (Nm) | 171 | 206 | 171 | 206 | | |
| ML: Dynamic longitudinal moment capacity (Nm) | 134 | 208 | 134 | 208 | | |
| Gew: Carriage weight (kg) | 1.0 | 1.2 | 0.9 | 1.0 | | |

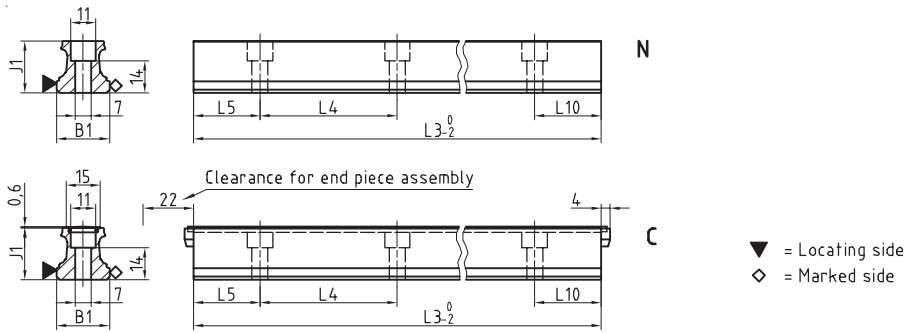
Available options for AMSA 4A W 20



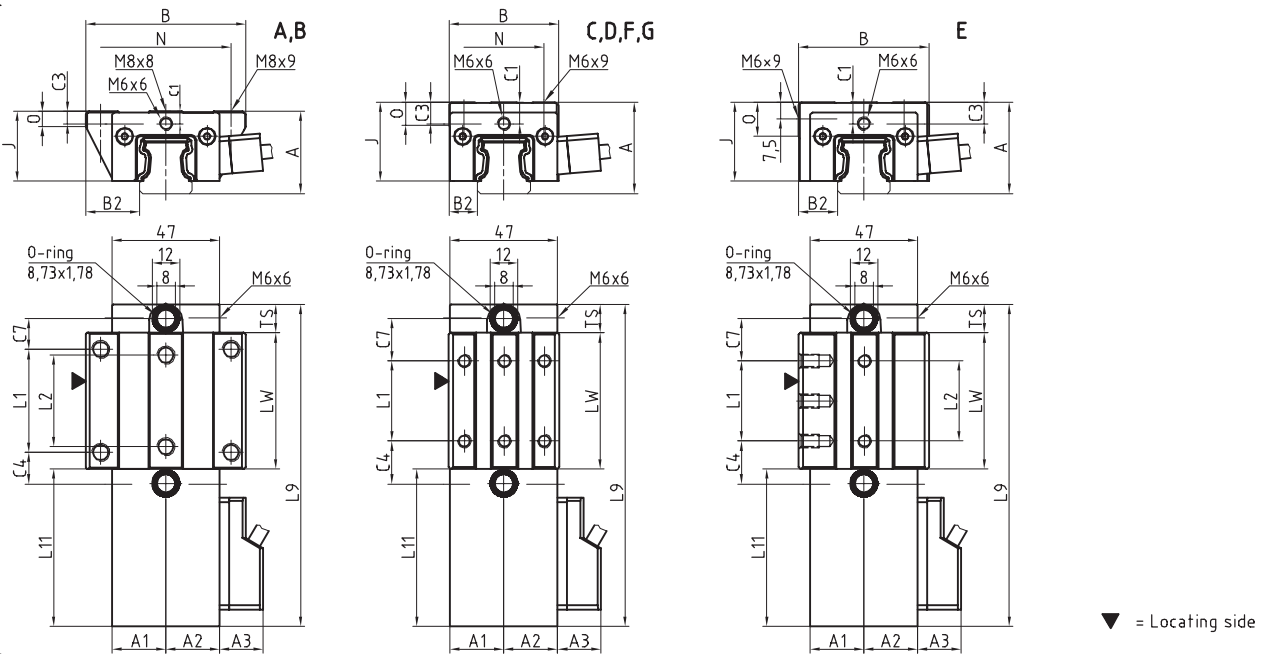
8.2

MONORAIL AMSA 4A AMSA 4A 25 Technical Data

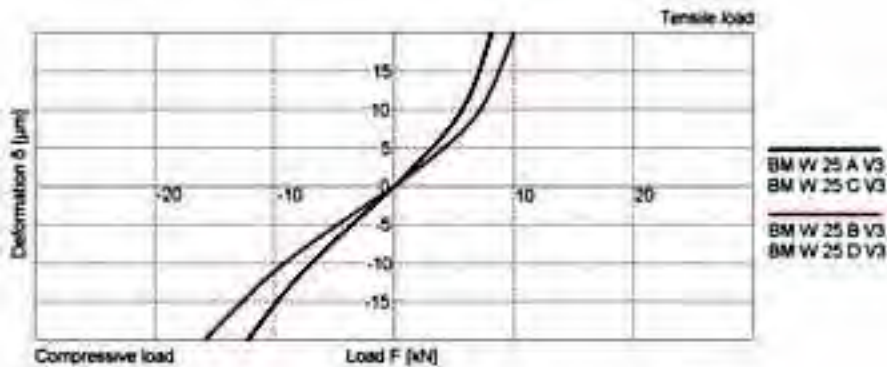
AMSA 4A 25 Rail Drawings



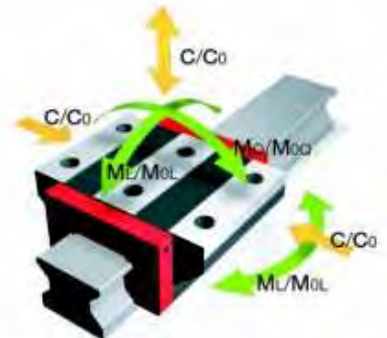
AMSA 4A 25 Carriage Drawings



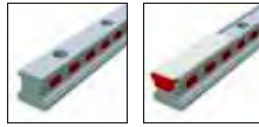
AMSA 4A 25 Rigidity diagram



AMSA 4A 25 load rating



AMSA 4A S 25 Dimensions



| | AMSA 4A S 25-N | AMSA 4A S 25-C | | | | |
|--|----------------|----------------|--|--|--|--|
| B1: Rail width | 23 | 23 | | | | |
| J1: Rail height | 22.7 | 22.7 | | | | |
| L3: Rail length max. | 6 000 | 3 000 | | | | |
| L4: Spacing of fixing holes | 60 | 60 | | | | |
| L5/L10: Position of first/last fixing hole | 28.5 | 28.5 | | | | |
| Gew: Rail weight, specific (kg/m) | 3.0 | 2.8 | | | | |

Available options for AMSA 4A S 25



AMSA 4A W 25 Dimensions and capacities



| | AMSA 4A W 25-A | AMSA 4A W 25-B | AMSA 4A W 25-C | AMSA 4A W 25-D | AMSA 4A W 25-E | AMSA 4A W 25-F | AMSA 4A W 25-G |
|--|----------------|----------------|----------------|----------------|----------------|----------------|----------------|
| A: System height | 36 | 36 | 40 | 40 | 40 | 36 | 36 |
| A1: Half width of housing on opposite side | 23.5 | 23.5 | 23.5 | 23.5 | 23.5 | 23.5 | 23.5 |
| A2: Half width of housing on reading head side | 23.5 | 23.5 | 23.5 | 23.5 | 23.5 | 23.5 | 23.5 |
| A3: Projection of reading head | 18.9 | 18.9 | 18.9 | 18.9 | 18.9 | 18.9 | 18.9 |
| B: Carriage width | 70 | 70 | 48 | 48 | 57 | 48 | 48 |
| B2: Distance between locating faces | 23.5 | 23.5 | 12.5 | 12.5 | 17 | 12.5 | 12.5 |
| C1: Position of center front lube hole | 5.5 | 5.5 | 9.5 | 9.5 | 9.5 | 5.5 | 5.5 |
| C3: Position of lateral lube hole | 5.5 | 5.5 | 9.5 | 9.5 | 9.5 | 5.5 | 5.5 |
| C4: Position of lateral lube hole | 13.75 | 23.25 | 18.75 | 20.75 | 18.75 | 18.75 | 20.75 |
| C7: Position of top lube hole | 13.5 | 23 | 18.5 | 20.5 | 18.5 | 18.5 | 20.5 |
| J: Carriage height | 30.5 | 30.5 | 34.5 | 34.5 | 34.5 | 30.5 | 30.5 |
| L1: Exterior fixing hole spacing | 45 | 45 | 35 | 50 | 35 | 35 | 50 |
| L2: Interior fixing hole spacing | 40 | 40 | - | - | 35 | - | - |
| L9: Carriage length with housing | 140.7 | 159.7 | 140.7 | 159.7 | 140.7 | 140.7 | 159.7 |
| L11: Housing length | 68.7 | 68.7 | 68.7 | 68.7 | 68.7 | 68.7 | 68.7 |
| Lw: Inner carriage body length | 59.5 | 78.5 | 59.5 | 78.5 | 59.5 | 59.5 | 78.5 |
| N: Lateral fixing hole spacing | 57 | 57 | 35 | 35 | - | 35 | 35 |
| O: Reference face height | 7 | 7 | 11 | 11 | 15 | 7.1 | 7.1 |
| Ts: Front plate thickness | 12.5 | 12.5 | 12.5 | 12.5 | 12.5 | 12.5 | 12.5 |

Capacities and weights

| | | | | | | | |
|---|--------|--------|--------|--------|--------|--------|--------|
| C0: Static load capacity (N) | 46 100 | 60 300 | 46 100 | 60 300 | 46 100 | 46 100 | 60 300 |
| C100: Dynamic load capacity (N) | 21 100 | 25 500 | 21 100 | 25 500 | 21 100 | 21 100 | 25 500 |
| MOQ: Static cross moment capacity (Nm) | 631 | 825 | 631 | 825 | 631 | 631 | 825 |
| MOL: Static longitudinal moment capacity (Nm) | 513 | 863 | 513 | 863 | 513 | 513 | 863 |
| MQ: Dynamic cross moment capacity (Nm) | 289 | 349 | 289 | 349 | 289 | 289 | 349 |
| ML: Dynamic longitudinal moment capacity (Nm) | 235 | 365 | 235 | 365 | 235 | 235 | 365 |
| Gew: Carriage weight (kg) | 1.3 | 1.5 | 1.2 | 1.4 | 1.3 | 1.1 | 1.3 |

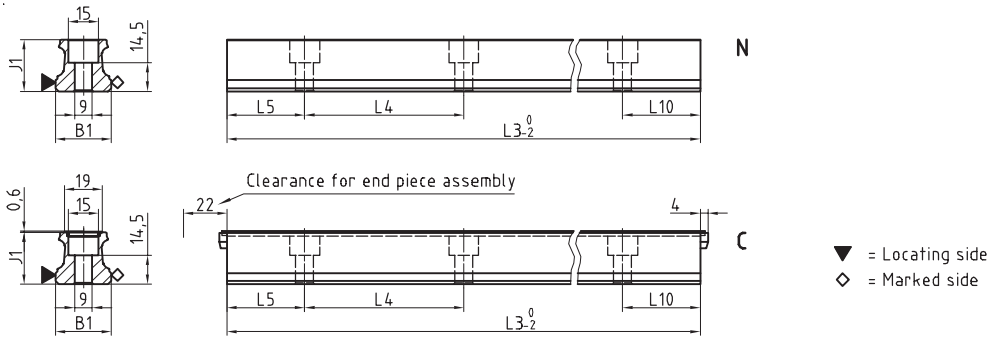
Available options for AMSA 4A W 25



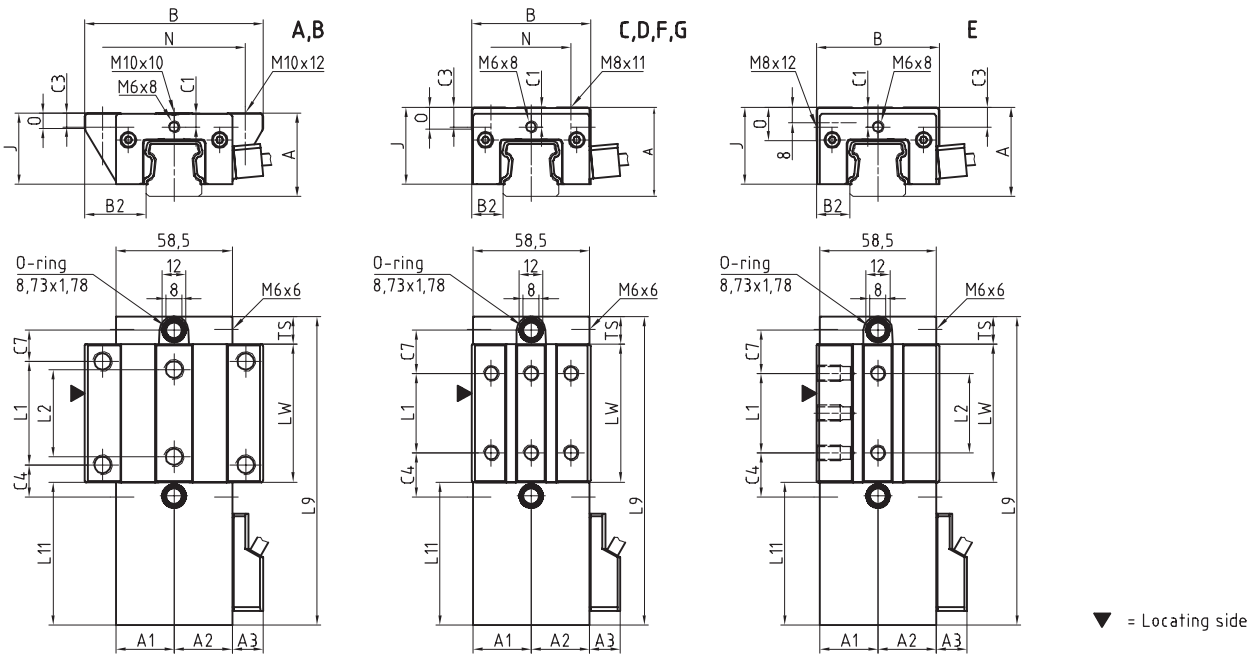
8.2

MONORAIL AMSA 4A AMSA 4A 30 Technical Data

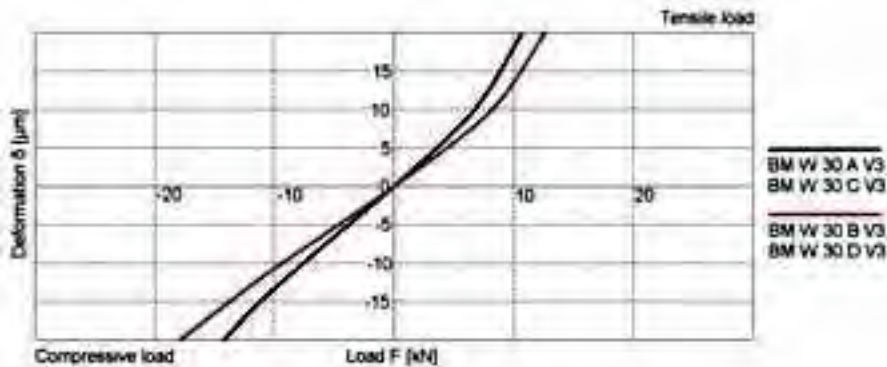
AMSA 4A 30 Rail Drawings



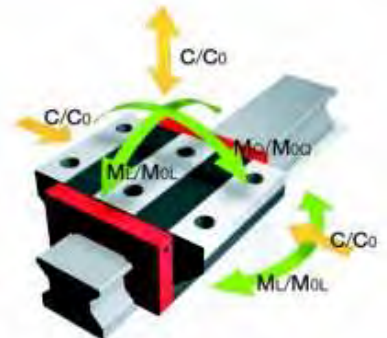
AMSA 4A 30 Carriage Drawings



AMSA 4A 30 Rigidity diagram



AMSA 4A 30 load rating



AMSA 4A S 30 Dimensions



| | AMSA 4A S 30-N | AMSA 4A S 30-C | | | | |
|--|----------------|----------------|--|--|--|--|
| B1: Rail width | 28 | 28 | | | | |
| J1: Rail height | 26 | 26 | | | | |
| L3: Rail length max. | 6 000 | 6 000 | | | | |
| L4: Spacing of fixing holes | 80 | 80 | | | | |
| L5/L10: Position of first/last fixing hole | 38.5 | 38.5 | | | | |
| Gew: Rail weight, specific (kg/m) | 4.3 | 4.1 | | | | |

Available options for AMSA 4A S 30



AMSA 4A W 30 Dimensions and capacities



| | AMSA 4A W 30-A | AMSA 4A W 30-B | AMSA 4A W 30-C | AMSA 4A W 30-D | AMSA 4A W 30-E | AMSA 4A W 30-F | AMSA 4A W 30-G |
|--|----------------|----------------|----------------|----------------|----------------|----------------|----------------|
| A: System height | 42 | 42 | 45 | 45 | 45 | 42 | 42 |
| A1: Half width of housing on opposite side | 29.3 | 29.3 | 29.3 | 29.3 | 29.3 | 29.3 | 29.3 |
| A2: Half width of housing on reading head side | 29.3 | 29.3 | 29.3 | 29.3 | 29.3 | 29.3 | 29.3 |
| A3: Projection of reading head | 15.6 | 15.6 | 15.6 | 15.6 | 15.6 | 15.6 | 15.6 |
| B: Carriage width | 90 | 90 | 60 | 60 | 62 | 60 | 60 |
| B2: Distance between locating faces | 31 | 31 | 16 | 16 | 17 | 16 | 16 |
| C1: Position of center front lube hole | 7 | 7 | 10 | 10 | 10 | 7 | 7 |
| C3: Position of lateral lube hole | 7 | 7 | 10 | 10 | 10 | 7 | 7 |
| C4: Position of lateral lube hole | 16.2 | 27.2 | 22.2 | 23.2 | 22.2 | 22.2 | 23.2 |
| C7: Position of top lube hole | 15.7 | 26.7 | 21.7 | 22.7 | 21.7 | 21.7 | 22.7 |
| J: Carriage height | 35.9 | 35.9 | 38.9 | 38.9 | 38.9 | 35.9 | 35.9 |
| L1: Exterior fixing hole spacing | 52 | 52 | 40 | 60 | 40 | 40 | 60 |
| L2: Interior fixing hole spacing | 44 | 44 | - | - | 40 | - | - |
| L9: Carriage length with housing | 155.4 | 177.4 | 155.4 | 177.4 | 155.4 | 155.4 | 177.4 |
| L11: Housing length | 72 | 72 | 72 | 72 | 72 | 72 | 72 |
| Lw: Inner carriage body length | 69.4 | 91.4 | 69.4 | 91.4 | 69.4 | 69.4 | 91.4 |
| N: Lateral fixing hole spacing | 72 | 72 | 40 | 40 | - | 40 | 40 |
| O: Reference face height | 7.8 | 7.8 | 11 | 11 | 17 | 8 | 8 |
| Ts: Front plate thickness | 14 | 14 | 14 | 14 | 14 | 14 | 14 |

Capacities and weights

| | | | | | | | |
|---|--------|--------|--------|--------|--------|--------|--------|
| C0: Static load capacity (N) | 63 700 | 83 300 | 63 700 | 83 300 | 63 700 | 63 700 | 83 300 |
| C100: Dynamic load capacity (N) | 29 200 | 35 300 | 29 200 | 35 300 | 29 200 | 29 200 | 35 300 |
| MOQ: Static cross moment capacity (Nm) | 1 084 | 1 414 | 1 084 | 1 414 | 1 084 | 1 084 | 1 414 |
| MOL: Static longitudinal moment capacity (Nm) | 829 | 1 390 | 829 | 1 390 | 829 | 829 | 1 390 |
| MQ: Dynamic cross moment capacity (Nm) | 497 | 599 | 497 | 599 | 497 | 497 | 599 |
| ML: Dynamic longitudinal moment capacity (Nm) | 380 | 589 | 380 | 589 | 380 | 380 | 589 |
| Gew: Carriage weight (kg) | 1.8 | 2.2 | 1.7 | 1.9 | 1.7 | 1.6 | 1.8 |

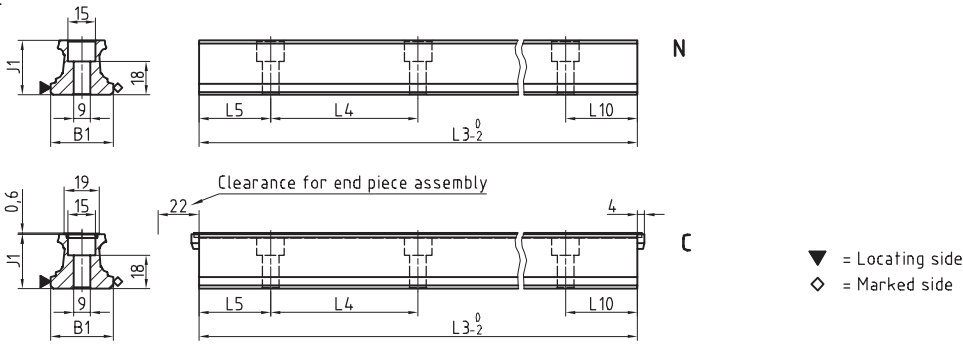
Available options for AMSA 4A W 30



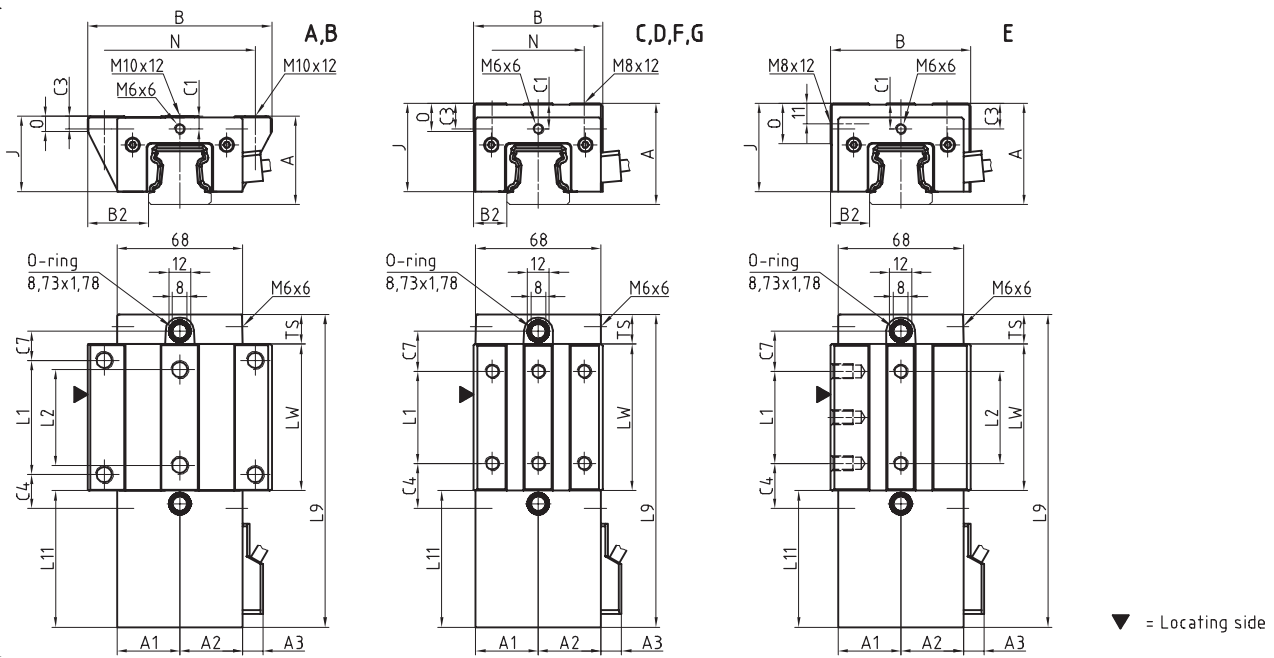
8.2

MONORAIL AMSA 4A AMSA 4A 35 Technical Data

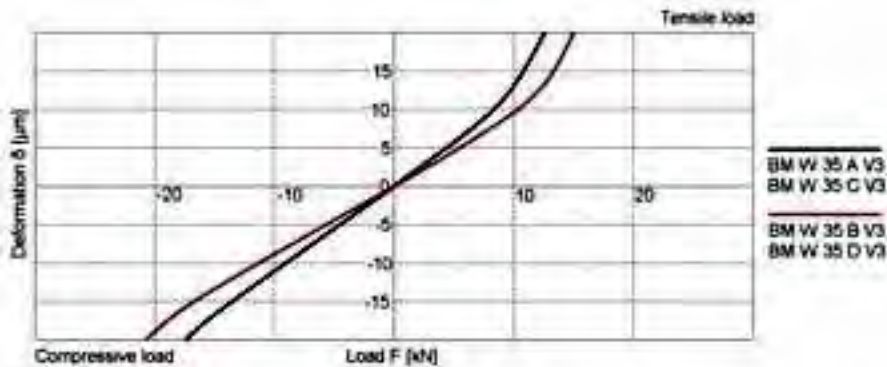
AMSA 4A 35 Rail Drawings



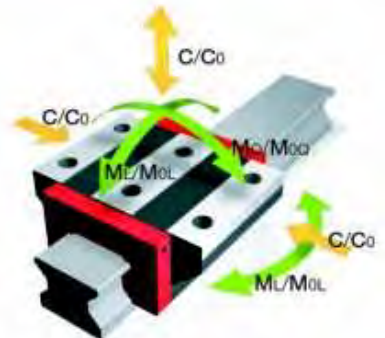
AMSA 4A 35 Carriage Drawings



AMSA 4A 35 Rigidity diagram



AMSA 4A 35 load rating



AMSA 4A S 35 Dimensions



| | AMSA 4A S 35-N | AMSA 4A S 35-C | | | | |
|--|----------------|----------------|--|--|--|--|
| B1: Rail width | 34 | 34 | | | | |
| J1: Rail height | 29.5 | 29.5 | | | | |
| L3: Rail length max. | 6 000 | 6 000 | | | | |
| L4: Spacing of fixing holes | 80 | 80 | | | | |
| L5/L10: Position of first/last fixing hole | 38.5 | 38.5 | | | | |
| Gew: Rail weight, specific (kg/m) | 5.4 | 5.2 | | | | |

Available options for AMSA 4A S 35



AMSA 4A W 35 Dimensions and capacities



| | AMSA 4A W 35-A | AMSA 4A W 35-B | AMSA 4A W 35-C | AMSA 4A W 35-D | AMSA 4A W 35-E | AMSA 4A W 35-F | AMSA 4A W 35-G |
|--|----------------|----------------|----------------|----------------|----------------|----------------|----------------|
| A: System height | 48 | 48 | 55 | 55 | 55 | 48 | 48 |
| A1: Half width of housing on opposite side | 34 | 34 | 34 | 34 | 34 | 34 | 34 |
| A2: Half width of housing on reading head side | 34 | 34 | 34 | 34 | 34 | 34 | 34 |
| A3: Projection of reading head | 11.2 | 11.2 | 11.2 | 11.2 | 11.2 | 11.2 | 11.2 |
| B: Carriage width | 100 | 100 | 70 | 70 | 76 | 70 | 70 |
| B2: Distance between locating faces | 33 | 33 | 18 | 18 | 21 | 18 | 18 |
| C1: Position of center front lube hole | 7 | 7 | 14 | 14 | 14 | 7 | 7 |
| C3: Position of lateral lube hole | 7 | 7 | 14 | 14 | 14 | 7 | 7 |
| C4: Position of lateral lube hole | 18.3 | 31.05 | 24.3 | 26.05 | 24.3 | 24.3 | 26.05 |
| C7: Position of top lube hole | 15.8 | 28.55 | 21.8 | 23.55 | 21.8 | 21.8 | 23.55 |
| J: Carriage height | 41 | 41 | 48 | 48 | 48 | 41 | 41 |
| L1: Exterior fixing hole spacing | 62 | 62 | 50 | 72 | 50 | 50 | 72 |
| L2: Interior fixing hole spacing | 52 | 52 | - | - | 50 | - | - |
| L9: Carriage length with housing | 169.6 | 195.1 | 169.6 | 195.1 | 169.6 | 169.6 | 195.1 |
| L11: Housing length | 74 | 74 | 74 | 74 | 74 | 74 | 74 |
| Lw: Inner carriage body length | 79.6 | 105.1 | 79.6 | 105.1 | 79.6 | 79.6 | 105.1 |
| N: Lateral fixing hole spacing | 82 | 82 | 50 | 50 | - | 50 | 50 |
| O: Reference face height | 8 | 8 | 15 | 15 | 22 | 8 | 8 |
| Ts: Front plate thickness | 16 | 16 | 16 | 16 | 16 | 16 | 16 |

Capacities and weights

| | | | | | | | |
|---|--------|---------|--------|---------|--------|--------|---------|
| C0: Static load capacity (N) | 84 400 | 110 300 | 84 400 | 110 300 | 84 400 | 84 400 | 110 300 |
| C100: Dynamic load capacity (N) | 38 700 | 46 700 | 38 700 | 46 700 | 38 700 | 38 700 | 46 700 |
| MOQ: Static cross moment capacity (Nm) | 1 566 | 2 048 | 1 566 | 2 048 | 1 566 | 1 566 | 2 048 |
| MOL: Static longitudinal moment capacity (Nm) | 1 252 | 2 104 | 1 252 | 2 104 | 1 252 | 1 252 | 2 104 |
| MQ: Dynamic cross moment capacity (Nm) | 718 | 867 | 718 | 867 | 718 | 718 | 867 |
| ML: Dynamic longitudinal moment capacity (Nm) | 574 | 891 | 574 | 891 | 574 | 574 | 891 |
| Gew: Carriage weight (kg) | 2.5 | 3.0 | 2.5 | 3.0 | 2.6 | 2.2 | 2.6 |

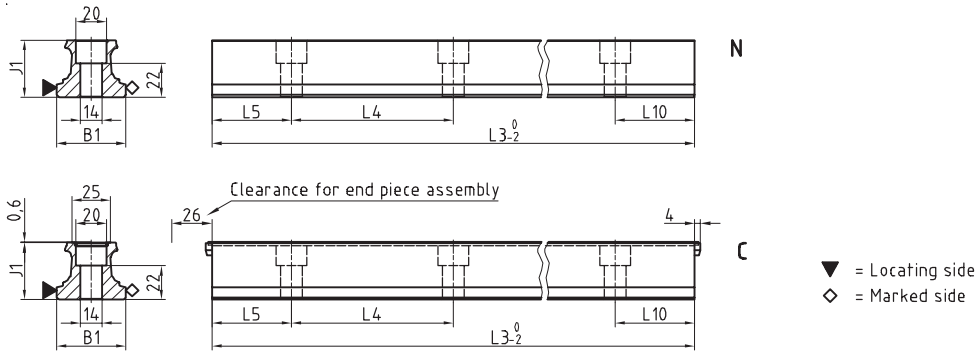
Available options for AMSA 4A W 35



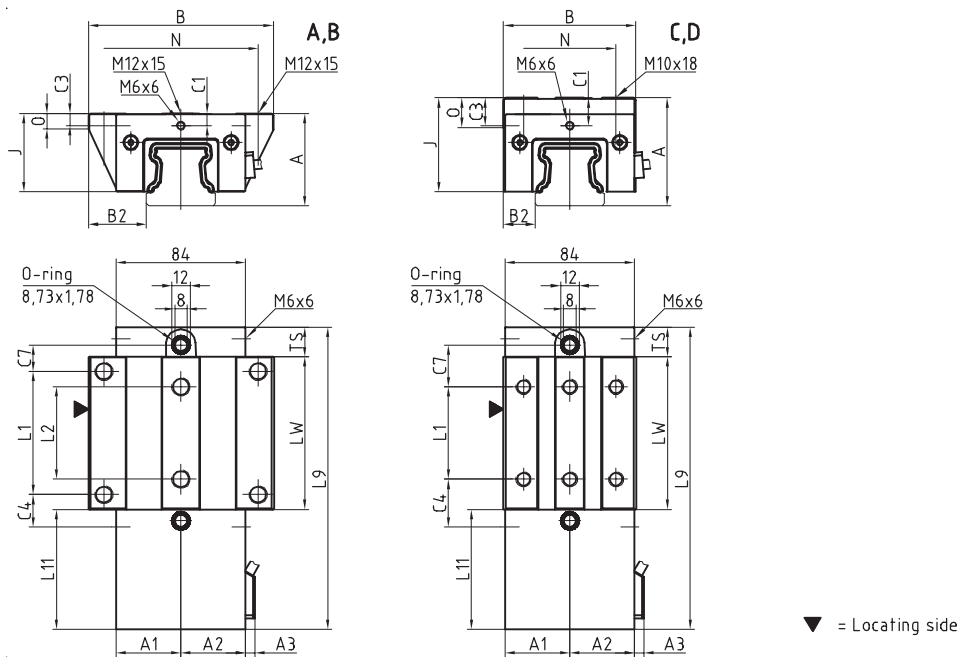
8.2

MONORAIL AMSA 4A AMSA 4A 45 Technical Data

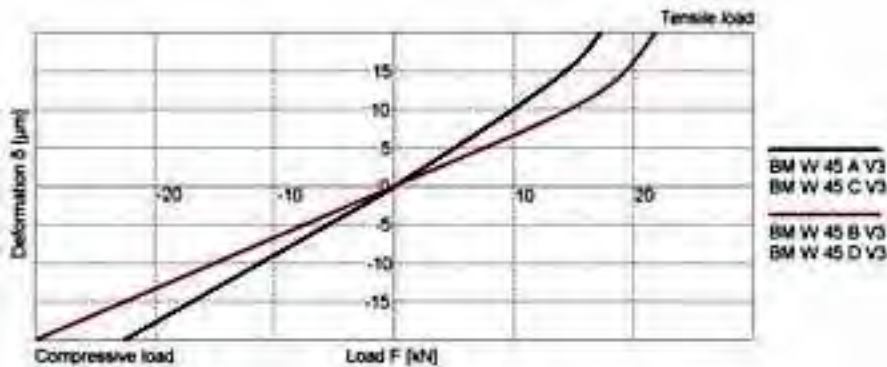
AMSA 4A 45 Rail Drawings



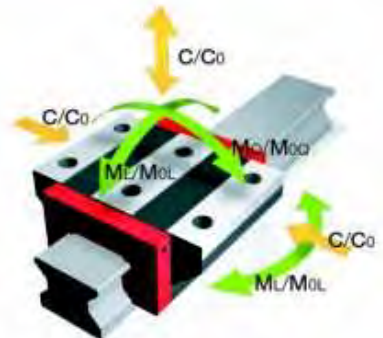
AMSA 4A 45 Carriage Drawings



AMSA 4A 45 Rigidity diagram



AMSA 4A 45 load rating



AMSA 4A S 45 Dimensions



| | AMSA 4A S 45-N | AMSA 4A S 45-C | | | |
|--|----------------|----------------|--|--|--|
| B1: Rail width | 45 | 45 | | | |
| J1: Rail height | 37 | 37 | | | |
| L3: Rail length max. | 6 000 | 6 000 | | | |
| L4: Spacing of fixing holes | 105 | 105 | | | |
| L5/L10: Position of first/last fixing hole | 51 | 51 | | | |
| Gew: Rail weight, specific (kg/m) | 8.8 | 8.6 | | | |

Available options for AMSA 4A S 45



AMSA 4A W 45 Dimensions and capacities



| | AMSA 4A W 45-A | AMSA 4A W 45-B | AMSA 4A W 45-C | AMSA 4A W 45-D | | |
|--|----------------|----------------|----------------|----------------|--|--|
| A: System height | 60 | 60 | 70 | 70 | | |
| A1: Half width of housing on opposite side | 42 | 42 | 42 | 42 | | |
| A2: Half width of housing on reading head side | 42 | 42 | 42 | 42 | | |
| A3: Projection of reading head | 6.1 | 6.1 | 6.1 | 6.1 | | |
| B: Carriage width | 120 | 120 | 86 | 86 | | |
| B2: Distance between locating faces | 37.5 | 37.5 | 20.5 | 20.5 | | |
| C1: Position of center front lube hole | 8 | 8 | 18 | 18 | | |
| C3: Position of lateral lube hole | 8 | 8 | 18 | 18 | | |
| C4: Position of lateral lube hole | 21.05 | 36.8 | 31.05 | 36.8 | | |
| C7: Position of top lube hole | 17.05 | 32.8 | 27.05 | 32.8 | | |
| J: Carriage height | 50.8 | 50.8 | 60.8 | 60.8 | | |
| L1: Exterior fixing hole spacing | 80 | 80 | 60 | 80 | | |
| L2: Interior fixing hole spacing | 60 | 60 | - | - | | |
| L9: Carriage length with housing | 196.1 | 227.6 | 196.1 | 227.6 | | |
| L11: Housing length | 78 | 78 | 78 | 78 | | |
| Lw: Inner carriage body length | 99.1 | 130.6 | 99.1 | 130.6 | | |
| N: Lateral fixing hole spacing | 100 | 100 | 60 | 60 | | |
| O: Reference face height | 10 | 10 | 19 | 19 | | |
| Ts: Front plate thickness | 19 | 19 | 19 | 19 | | |

Capacities and weights

| | | | | | | |
|---|---------|---------|---------|---------|--|--|
| C0: Static load capacity (N) | 134 800 | 176 300 | 134 800 | 176 300 | | |
| C100: Dynamic load capacity (N) | 61 900 | 74 700 | 61 900 | 74 700 | | |
| MOQ: Static cross moment capacity (Nm) | 3 193 | 4 175 | 3 193 | 4 175 | | |
| MOL: Static longitudinal moment capacity (Nm) | 2 498 | 4 199 | 2 498 | 4 199 | | |
| MQ: Dynamic cross moment capacity (Nm) | 1 466 | 1 769 | 1 466 | 1 769 | | |
| ML: Dynamic longitudinal moment capacity (Nm) | 1 147 | 1 779 | 1 147 | 1 779 | | |
| Gew: Carriage weight (kg) | 4.1 | 5.1 | 4.2 | 5.2 | | |

Available options for AMSA 4A W 45



8.3

MONORAIL AMSA 4A

Accessories

AMSA 4A Rails accessories overview

| Accessories | AMSA 4A S 15 | AMSA 4A S 20 | AMSA 4A S 25 | AMSA 4A S 30 | AMSA 4A S 35 | AMSA 4A S 45 |
|--|--------------|--------------|--------------|--------------|--------------|--------------|
| Plugs: | | | | | | |
| Plastic plugs | BRK 15 | BRK 20 | BRK 25 | BRK 30 | BRK 35 | BRK 45 |
| Cover strips: | | | | | | |
| Cover strip (spare part) | BAC 15 | BAC 20 | BAC 25 | BAC 30 | BAC 35 | BAC 45 |
| End piece for cover strip (spare part) | EST 15-BAC | EST 20-BAC | EST 25-BAC | EST 30-BAC | EST 35-BAC | EST 45-BAC |
| Assembly tools: | | | | | | |
| Installation tool for cover strip | BWC 15 | BWC 20 | BWC 25 | BWC 30 | BWC 35 | BWC 45 |

AMSA 4A Carriages accessories overview

| Accessories | AMSA 4A W 15 | AMSA 4A W 20 | AMSA 4A W 25 | AMSA 4A W 30 | AMSA 4A W 35 | AMSA 4A W 45 |
|--|--------------|--------------|--------------|---------------|---------------|---------------|
| Additional wipers: | | | | | | |
| Additional wiper NBR | ZBN 15-U | ZBN 20-U | ZBN 25-U | ZBN 30-U | ZBN 35-U | ZBN 45-U |
| Additional wiper Viton | ZBV 15-U | ZBV 20-U | ZBV 25-U | ZBV 30-U | ZBV 35-U | ZBV 45-U |
| Metal wiper | ABM 15 | ABM 20 | ABM 25 | ABM 30 | ABM 35 | ABM 45 |
| Bellows: | | | | | | |
| Bellows | - | FBB 20 | FBB 25 | FBB 30 | FBB 35 | FBB 45 |
| Adapter plate for bellows (spare part) | - | ZPB 20 | ZPB 25 | ZPB 30 | ZPB 35 | ZPB 45 |
| End plate for bellows (spare part) | - | EPB 20 | EPB 25 | EPB 30 | EPB 35 | EPB 45 |
| Assembly rails: | | | | | | |
| Assembly rail | MBM 15 | MBM 20 | MBM 25 | MBM 30 | MBM 35 | MBM 45 |
| Lubrication plates: | | | | | | |
| Lubrication plate | SPL 15-BM | SPL 20-BM | SPL 25-BM | SPL 30-BM | SPL 35-BM | SPL 45-BM |
| Front plates: | | | | | | |
| Cross wiper for front plate (spare part) | QAS 15-STB | QAS 20-STB | QAS 25-STB | QAS 30-STB | QAS 35-STB | QAS 45-STB |
| Lube nipples: | | | | | | |
| Hydraulic-type grease nipple straight | - | SN 6 | SN 6 | SN 6 | SN 6 | SN 6 |
| Hydraulic-type grease nipple 45° | - | SN 6-45 | SN 6-45 | SN 6-45 | SN 6-45 | SN 6-45 |
| Hydraulic-type grease nipple 90° | - | SN 6-90 | SN 6-90 | SN 6-90 | SN 6-90 | SN 6-90 |
| Flush type grease nipple M3 | SN 3-T | SN 3-T | - | - | - | - |
| Flush type grease nipple M6 | - | SN 6-T | SN 6-T | SN 6-T | SN 6-T | SN 6-T |
| Grease gun for SN 3-T and SN 6-T | SFP-T3 | SFP-T3 | SFP-T3 | SFP-T3 | SFP-T3 | SFP-T3 |
| Lube adapters: | | | | | | |
| Straight screw-in connection M3 | SA 3-D3 | SA 3-D3 | - | - | - | - |
| Lubrication adapter M8 round-head | - | SA 6-RD-M8 | SA 6-RD-M8 | SA 6-RD-M8 | SA 6-RD-M8 | SA 6-RD-M8 |
| Lubrication adapter M8 hexagon head | - | - | - | SA 6-6KT-M8 | SA 6-6KT-M8 | SA 6-6KT-M8 |
| Lubrication adapter G1/8 hexagon head | - | - | - | SA 6-6KT-G1/8 | SA 6-6KT-G1/8 | SA 6-6KT-G1/8 |
| Swivel screw connection for pipe d=4 mm | - | SV 6-D4 | SV 6-D4 | SV 6-D4 | SV 6-D4 | SV 6-D4 |
| Swivel screw connection M6 | - | SV 6-M6 | SV 6-M6 | SV 6-M6 | SV 6-M6 | SV 6-M6 |
| Swivel screw connection M6 long | - | SV 6-M6-L | SV 6-M6-L | SV 6-M6-L | SV 6-M6-L | SV 6-M6-L |
| Swivel screw connection M8 | - | SV 6-M8 | SV 6-M8 | SV 6-M8 | SV 6-M8 | SV 6-M8 |
| Swivel screw connection M8 long | - | SV 6-M8-L | SV 6-M8-L | SV 6-M8-L | SV 6-M8-L | SV 6-M8-L |
| Cables: | | | | | | |
| Connecting cable, 12-pole | KAO 12-X | KAO 12-X | KAO 12-X | KAO 12-X | KAO 12-X | KAO 12-X |
| Connecting cable, 12-pole | KAO 13-X | KAO 13-X | KAO 13-X | KAO 13-X | KAO 13-X | KAO 13-X |
| Extension cable, 12-pole | KAO 14-X | KAO 14-X | KAO 14-X | KAO 14-X | KAO 14-X | KAO 14-X |
| Connecting cable, 12-pole | KAO 16-X | KAO 16-X | KAO 16-X | KAO 16-X | KAO 16-X | KAO 16-X |

8.4

MONORAIL AMSA 4A

Order code

Individual guide rails and carriages are ordered in accordance with the order codes described below.

AMSA 4A carriages consist of guide carriage, casing and reading head.

All MONORAIL BM carriages can also be used with AMSA 4A rails.

Q.v. chapter 2 and chapter 4.3 for the order key for accessories.

Separate order codes are used in each case for rails, carriages and accessories. This also applies to different versions of rails and carriages.

All guide components are supplied individually as standard, i.e. unassembled.

If required, SCHNEEBERGER can also supply rails and carriages assembled incl. accessories as complete systems. Please note the ordering instructions in chapter 2.4 if this applies.

Order code for AMSA 4A rails

| | 1x | AMSA 4A S | 25 | -N | -G3 | -KC | -R12 | -958 | -29 | -29 | -CN | -TR50 |
|----------------------------------|----|-----------|----|----|-----|-----|------|------|-----|-----|-----|-------|
| Quantity | | | | | | | | | | | | |
| Rail | | | | | | | | | | | | |
| Size | | | | | | | | | | | | |
| Type | | | | | | | | | | | | |
| Accuracy | | | | | | | | | | | | |
| Straightness | | | | | | | | | | | | |
| Reference sides | | | | | | | | | | | | |
| Rail length L3 | | | | | | | | | | | | |
| Position of first fixing hole L5 | | | | | | | | | | | | |
| Position of last fixing hole L10 | | | | | | | | | | | | |
| Coating | | | | | | | | | | | | |
| Magnetization | | | | | | | | | | | | |

NB

Q.v. chapter 8.1 to 8.3 for an overview of types, details of shapes, available options and accessories.

Q.v. chapter 2 for a description of the options.

If possible, standard lengths are preferred for L3 rail length.

These are calculated with the table values in chapter 8.2 using the following formula: $L3 = n \times L4 + L5 + L10 \leq L3_{max}$.

Order code for AMSA 4A carriages

| | 1x | AMSA 4A W | 25 | -A | -P1 | -G3 | -V1 | -R1 | -CN | -S10 | -LN | -TSU |
|------------------------------------|----|-----------|----|----|-----|-----|-----|-----|-----|------|-----|------|
| Quantity | | | | | | | | | | | | |
| Carriage | | | | | | | | | | | | |
| Size | | | | | | | | | | | | |
| Type | | | | | | | | | | | | |
| Reading head position | | | | | | | | | | | | |
| Accuracy | | | | | | | | | | | | |
| Preload | | | | | | | | | | | | |
| Reference side | | | | | | | | | | | | |
| Coating | | | | | | | | | | | | |
| Lube connection | | | | | | | | | | | | |
| Lubrication as delivered condition | | | | | | | | | | | | |
| Interface | | | | | | | | | | | | |

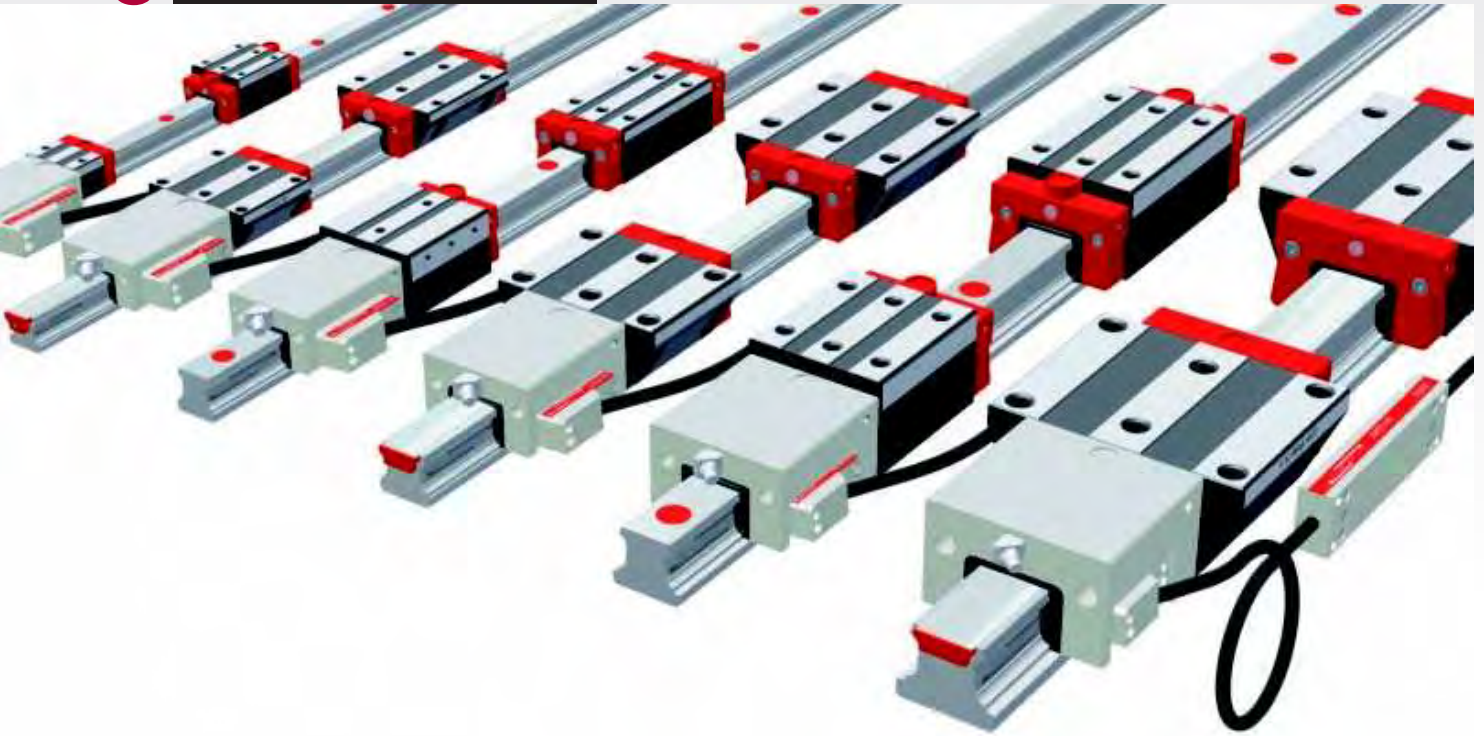
NB

Q.v. chapter 8.1 to 8.3 for an overview of types, details of shapes, available options and accessories.

Q.v. chapter 2 for a description of the options.

SCHNEEBERGER
 LINEAR TECHNOLOGY

9 **MONORAIL AMSD 4A**



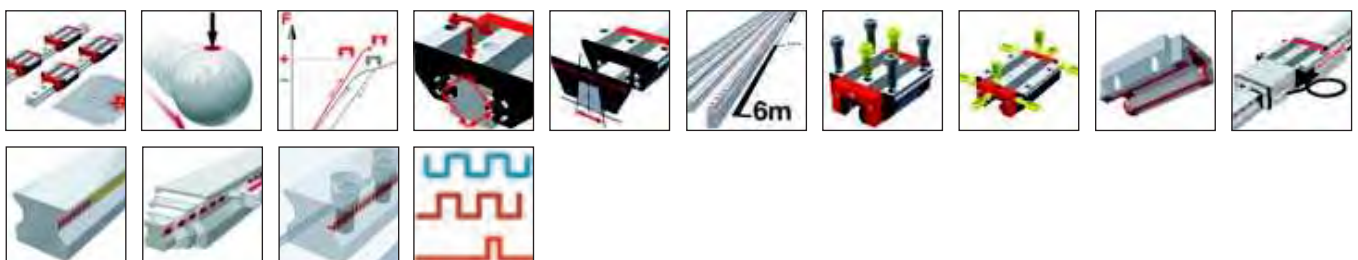
SCHNEEBERGER's AMSD 4A MONORAIL is an integrated linear encoder system for use in automation and handling technology as well as in machine tool design where high forces and precise measurement are required in compact spaces. Mechanically the AMSD 4A is based on SCHNEEBERGER's BM MONORAIL ball guide with lengths up to 6 metres. The integration of the measurement system allows very compact axes to be put together.

Different resolutions with various digital interface speeds are available as control system interfaces. Reference marks can be set at 50mm intervals or distance coded. Different options for carriage lubrication and sealing permit the best possible degree of adaptation to application requirements.

The easily interchangeable reading head is identical for all sizes.

Features of System MONORAIL AMSD 4A

Details see chapter 1

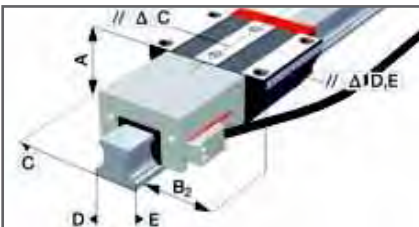


9.1 Overview of Types, Sizes and available Options



| | |
|--------------------------------------|--------|
| > Product overview AMSD 4A Rails | p. 154 |
| > Product overview AMSD 4A Carriages | p. 155 |

9.2 Technical data and Options



| | |
|--------------|--------|
| > AMSD 4A 15 | p. 156 |
| > AMSD 4A 20 | p. 158 |
| > AMSD 4A 25 | p. 160 |
| > AMSD 4A 30 | p. 162 |
| > AMSD 4A 35 | p. 164 |
| > AMSD 4A 45 | p. 166 |

9.3 Accessories MONORAIL AMSD 4A



| | |
|---------------------------------------|--------|
| > Accessories overview | p. 168 |
| > AMSD 4A Rails accessory details | p. 168 |
| > AMSD 4A Carriages accessory details | p. 168 |

9.4 Order key



| | |
|-------------------------------|--------|
| > Order key AMSD 4A Rails | p. 169 |
| > Order key AMSD 4A Carriages | p. 169 |

9.1

MONORAIL AMSD 4A

Overview of Types, Sizes and available Options

Product overview AMSD 4A Rails







| | N standard | ND standard, through hardened | C for cover strip | CD for cover strip, through hardened | | |
|--------------------------------------|----------------|--|----------------------|---|--|--|
| Buildsizes / Rail build forms | | | | | | |
| Size 15 | | AMSD 4A S 15ND | | AMSD 4A S 15CD | | |
| Size 20 | AMSD 4A S 20-N | | AMSD 4A S 20-C | | | |
| Size 25 | AMSD 4A S 25-N | | AMSD 4A S 25-C | | | |
| Size 30 | AMSD 4A S 30-N | | AMSD 4A S 30-C | | | |
| Size 35 | AMSD 4A S 35-N | | AMSD 4A S 35-C | | | |
| Size 45 | AMSD 4A S 45-N | | AMSD 4A S 45-C | | | |
| Features | | | | | | |
| Screwable from above | • | • | • | • | | |
| Small assembly effort | | | • | • | | |
| Great single-part system length | • | | • | | | |
| For the support of metal covers | | • | | | | |

Available options for AMSD 4A Rails

Details see chapter 2



Accuracy

-  G0 Highly accurate
-  G1 Very accurate
-  G2 Accurate
-  G3 Standard





Straightness

-  KC Standard




Coating

-  CN None
-  CH Hard chromium

Locating sides

-  R11 Ref.bottom, scale bottom
-  R12 Ref.bottom, scale top
-  R21 Ref.top, scale bottom
-  R22 Ref.top, scale top

Magnetization

-  TR50 50mm pattern
-  TD20 20mm code
-  TD50 50mm code

Available accessories for AMSD 4A Rails

Details see chapter 4.3

- Plugs
- Cover strips
- Assembly tools

Product overview AMSD 4A Carriages



| | | | | | | |
|----------------------|----------------------------|---------------------------|---------------------------------|---|---------------------|---------------------------|
| A standard | B standard, long | C compact, high | D compact, high, long | E compact, high, for lateral fixing | F compact | G compact, long |
|----------------------|----------------------------|---------------------------|---------------------------------|---|---------------------|---------------------------|

Buildsizes / Carriage build forms

| | | | | | | | |
|---------|----------------|----------------|----------------|----------------|----------------|----------------|----------------|
| Size 15 | AMSD 4A W 15-A | | AMSD 4A W 15-C | | | AMSD 4A W 15-F | |
| Size 20 | AMSD 4A W 20-A | AMSD 4A W 20-B | AMSD 4A W 20-C | AMSD 4A W 20-D | | | |
| Size 25 | AMSD 4A W 25-A | AMSD 4A W 25-B | AMSD 4A W 25-C | AMSD 4A W 25-D | AMSD 4A W 25-E | AMSD 4A W 25-F | AMSD 4A W 25-G |
| Size 30 | AMSD 4A W 30-A | AMSD 4A W 30-B | AMSD 4A W 30-C | AMSD 4A W 30-D | AMSD 4A W 30-E | AMSD 4A W 30-F | AMSD 4A W 30-G |
| Size 35 | AMSD 4A W 35-A | AMSD 4A W 35-B | AMSD 4A W 35-C | AMSD 4A W 35-D | AMSD 4A W 35-E | AMSD 4A W 35-F | AMSD 4A W 35-G |
| Size 45 | AMSD 4A W 45-A | AMSD 4A W 45-B | AMSD 4A W 45-C | AMSD 4A W 45-D | | | |

Features

| | | | | | | | |
|------------------------------|---|---|---|---|---|---|---|
| Screwable from above | • | • | • | • | | • | • |
| Screwable from below | • | • | | | | | |
| Screwable from the side | | | | | • | | |
| For high loads and moments | | • | | • | | | • |
| For medium loads and moments | • | | • | | • | • | • |
| For limited space conditions | | | | | | • | • |

Available options for AMSD 4A Carriages

Details see chapter 2

Accuracy

- G0** Highly accurate
- G1** Very accurate
- G2** Accurate
- G3** Standard

Preload

- V0** Very low
- V1** Low
- V2** Medium
- V3** High

Reference side

- R1** Ref. at bottom
- R2** Ref. on top

Coating

- CN** None
- CH** Hard chromium

Lube connections

- S10** Left center
- S20** Right center
- S11** Top left
- S21** Top right
- S12** Lower left side
- S22** Lower right side

- S13** Upper left side
- S23** Upper right side
- S32** Left side
- S42** Right side

Lubrication

- LN** Oil protect
- LG** Grease protect
- LV** Full greasing

Interface

- TMD** TMD, digital, 0,3m
- TRD** TRD, digital, 3m
- TSD** TSD, digital, 3m

Reading head position

- P1** Right top
- P3** Left bottom

Interpolation

Frequency

Reference pulse

Available accessories for AMSD 4A Carriages

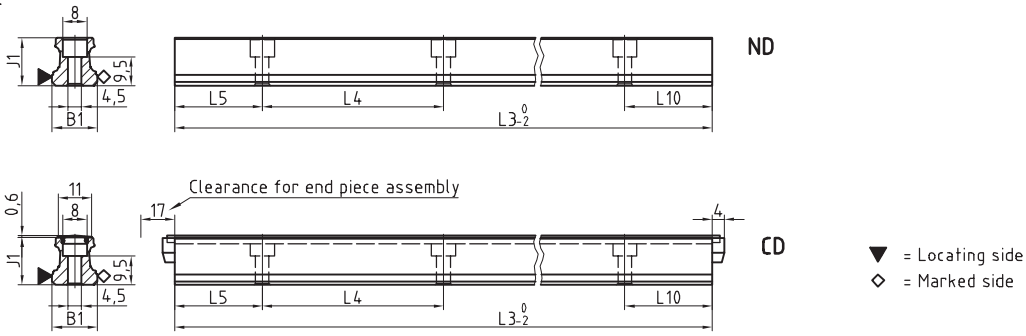
Details see chapter 2.1 and 4.3

- Additional wipers
- Front plates
- Bellows
- Lube nipples
- Assembly rails
- Lube adapters
- Lubrication plates
- Cables

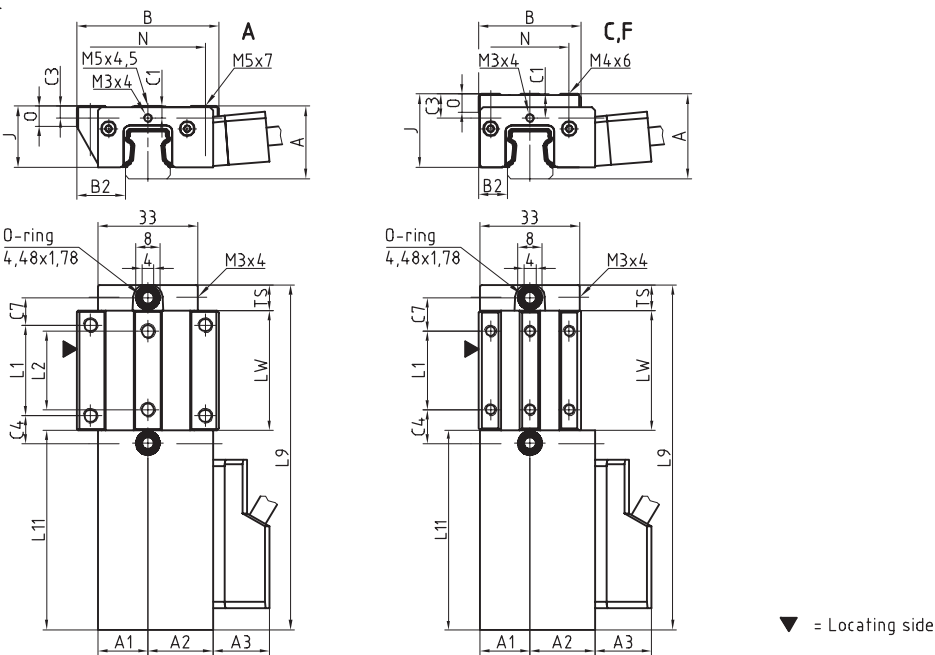
9.2

MONORAIL AMSD 4A AMSD 4A 15 Technical Data

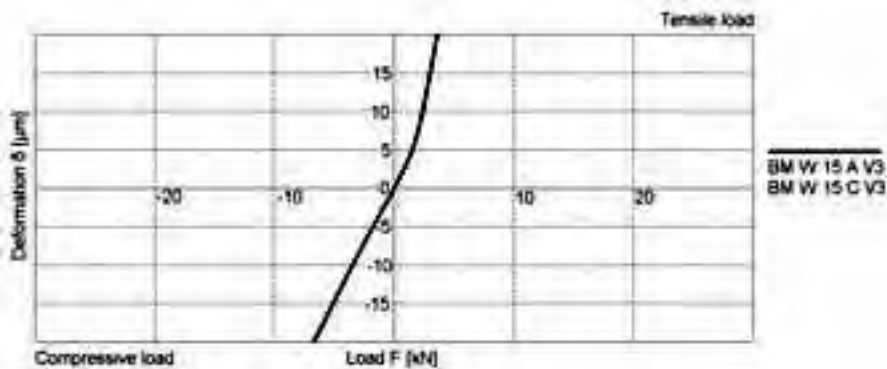
AMSD 4A 15 Rail Drawings



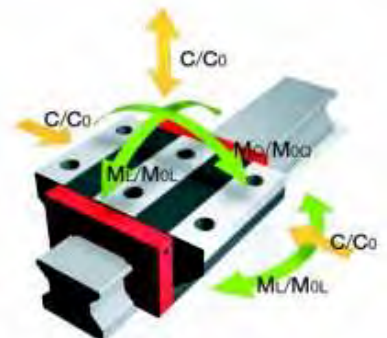
AMSD 4A 15 Carriage Drawings



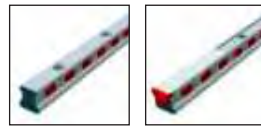
AMSD 4A 15 Rigidity diagram



AMSD 4A 15 load rating



AMSD 4A S 15 Dimensions



| | AMSD 4A S 15ND | AMSD 4A S 15CD | | | |
|--|----------------|----------------|--|--|--|
| B1: Rail width | 15 | 15 | | | |
| J1: Rail height | 15.7 | 15.7 | | | |
| L3: Rail length max. | 1 500 | 1 500 | | | |
| L4: Spacing of fixing holes | 60 | 60 | | | |
| L5/L10: Position of first/last fixing hole | 28.5 | 28.5 | | | |
| Gew: Rail weight, specific (kg/m) | 1.4 | 1.3 | | | |

Available options for AMSD 4A S 15



AMSD 4A W 15 Dimensions and capacities



| | AMSD 4A W 15-A | AMSD 4A W 15-C | AMSD 4A W 15-F | | |
|--|----------------|----------------|----------------|--|--|
| A: System height | 24 | 28 | 24 | | |
| A1: Half width of housing on opposite side | 16.5 | 16.5 | 16.5 | | |
| A2: Half width of housing on reading head side | 21.5 | 21.5 | 21.5 | | |
| A3: Projection of reading head | 18.7 | 18.7 | 18.7 | | |
| B: Carriage width | 47 | 34 | 34 | | |
| B2: Distance between locating faces | 16 | 9.5 | 9.5 | | |
| C1: Position of center front lube hole | 4 | 8 | 4 | | |
| C3: Position of lateral lube hole | 4 | 8 | 4 | | |
| C4: Position of lateral lube hole | 9.3 | 11.3 | 11.3 | | |
| C7: Position of top lube hole | 9.05 | 11.05 | 11.05 | | |
| J: Carriage height | 20.2 | 24.2 | 20.2 | | |
| L1: Exterior fixing hole spacing | 30 | 26 | 26 | | |
| L2: Interior fixing hole spacing | 26 | - | - | | |
| L9: Carriage length with housing | 114.1 | 114.1 | 114.1 | | |
| L11: Housing length | 66 | 66 | 66 | | |
| Lw: Inner carriage body length | 39.6 | 39.6 | 39.6 | | |
| N: Lateral fixing hole spacing | 38 | 26 | 26 | | |
| O: Reference face height | 7 | 6 | 5.5 | | |
| Ts: Front plate thickness | 8.5 | 8.5 | 8.5 | | |

Capacities and weights

| | | | | | |
|---|--------|--------|--------|--|--|
| C0: Static load capacity (N) | 19 600 | 19 600 | 19 600 | | |
| C100: Dynamic load capacity (N) | 9 000 | 9 000 | 9 000 | | |
| MOQ: Static cross moment capacity (Nm) | 181 | 181 | 181 | | |
| MOL: Static longitudinal moment capacity (Nm) | 146 | 146 | 146 | | |
| MQ: Dynamic cross moment capacity (Nm) | 83 | 83 | 83 | | |
| ML: Dynamic longitudinal moment capacity (Nm) | 67 | 67 | 67 | | |
| Gew: Carriage weight (kg) | 0.8 | 0.8 | 0.7 | | |

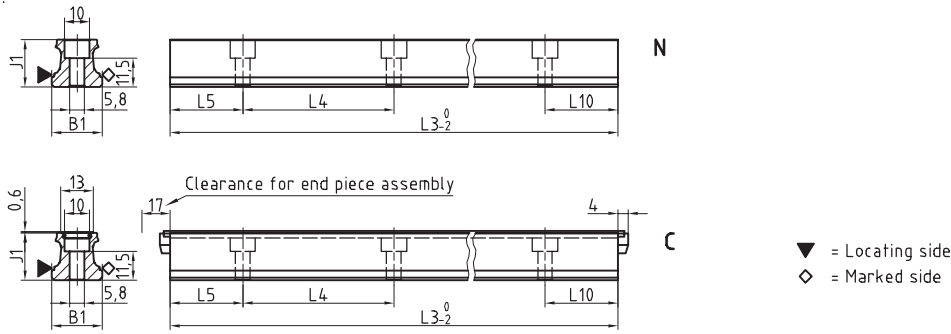
Available options for AMSD 4A W 15



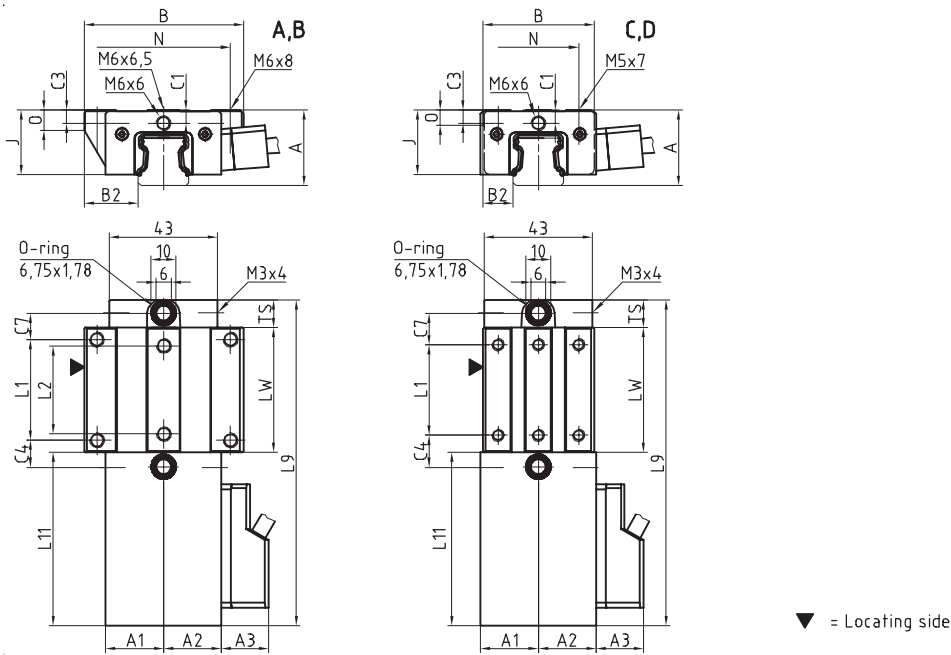
9.2

MONORAIL AMSD 4A AMSD 4A 20 Technical Data

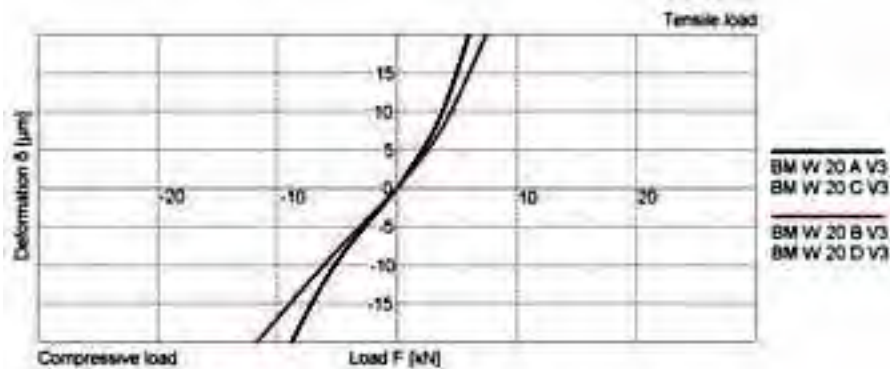
AMSD 4A 20 Rail Drawings



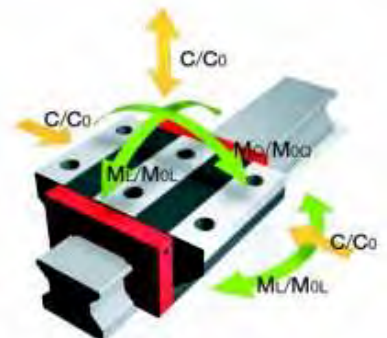
AMSD 4A 20 Carriage Drawings



AMSD 4A 20 Rigidity diagram



AMSD 4A 20 load rating



AMSD 4A S 20 Dimensions



| | AMSD 4A S 20-N | AMSD 4A S 20-C | | | |
|--|----------------|----------------|--|--|--|
| B1: Rail width | 20 | 20 | | | |
| J1: Rail height | 19 | 19 | | | |
| L3: Rail length max. | 3 000 | 3 000 | | | |
| L4: Spacing of fixing holes | 60 | 60 | | | |
| L5/L10: Position of first/last fixing hole | 28.5 | 28.5 | | | |
| Gew: Rail weight, specific (kg/m) | 2.2 | 2.1 | | | |

Available options for AMSD 4A S 20



AMSD 4A W 20 Dimensions and capacities



| | AMSD 4A W 20-A | AMSD 4A W 20-B | AMSD 4A W 20-C | AMSD 4A W 20-D | | |
|--|----------------|----------------|----------------|----------------|--|--|
| A: System height | 30 | 30 | 30 | 30 | | |
| A1: Half width of housing on opposite side | 23 | 23 | 23 | 23 | | |
| A2: Half width of housing on reading head side | 23 | 23 | 23 | 23 | | |
| A3: Projection of reading head | 18.7 | 18.7 | 18.7 | 18.7 | | |
| B: Carriage width | 63 | 63 | 44 | 44 | | |
| B2: Distance between locating faces | 21.5 | 21.5 | 12 | 12 | | |
| C1: Position of center front lube hole | 5.2 | 5.2 | 5.2 | 5.2 | | |
| C3: Position of lateral lube hole | 5.2 | 5.2 | 5.2 | 5.2 | | |
| C4: Position of lateral lube hole | 10.75 | 18.75 | 12.75 | 13.75 | | |
| C7: Position of top lube hole | 10.25 | 18.25 | 12.25 | 13.25 | | |
| J: Carriage height | 25.5 | 25.5 | 25.5 | 25.5 | | |
| L1: Exterior fixing hole spacing | 40 | 40 | 36 | 50 | | |
| L2: Interior fixing hole spacing | 35 | 35 | - | - | | |
| L9: Carriage length with housing | 129.5 | 145.5 | 129.5 | 145.5 | | |
| L11: Housing length | 69 | 69 | 69 | 69 | | |
| Lw: Inner carriage body length | 49.5 | 65.5 | 49.5 | 65.5 | | |
| N: Lateral fixing hole spacing | 53 | 53 | 32 | 32 | | |
| O: Reference face height | 8 | 8 | 6 | 6 | | |
| Ts: Front plate thickness | 11 | 11 | 11 | 11 | | |

Capacities and weights

| | | | | | | |
|---|--------|--------|--------|--------|--|--|
| C0: Static load capacity (N) | 31 400 | 41 100 | 31 400 | 41 100 | | |
| C100: Dynamic load capacity (N) | 14 400 | 17 400 | 14 400 | 17 400 | | |
| MOQ: Static cross moment capacity (Nm) | 373 | 490 | 373 | 490 | | |
| MOL: Static longitudinal moment capacity (Nm) | 292 | 495 | 292 | 495 | | |
| MQ: Dynamic cross moment capacity (Nm) | 171 | 206 | 171 | 206 | | |
| ML: Dynamic longitudinal moment capacity (Nm) | 134 | 208 | 134 | 208 | | |
| Gew: Carriage weight (kg) | 1.0 | 1.2 | 0.9 | 1.0 | | |

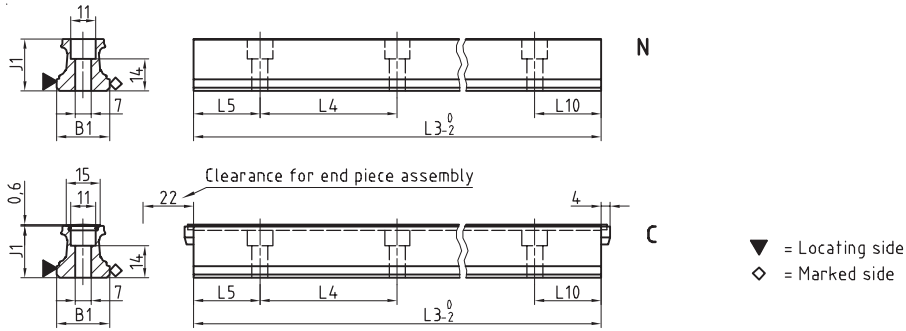
Available options for AMSD 4A W 20



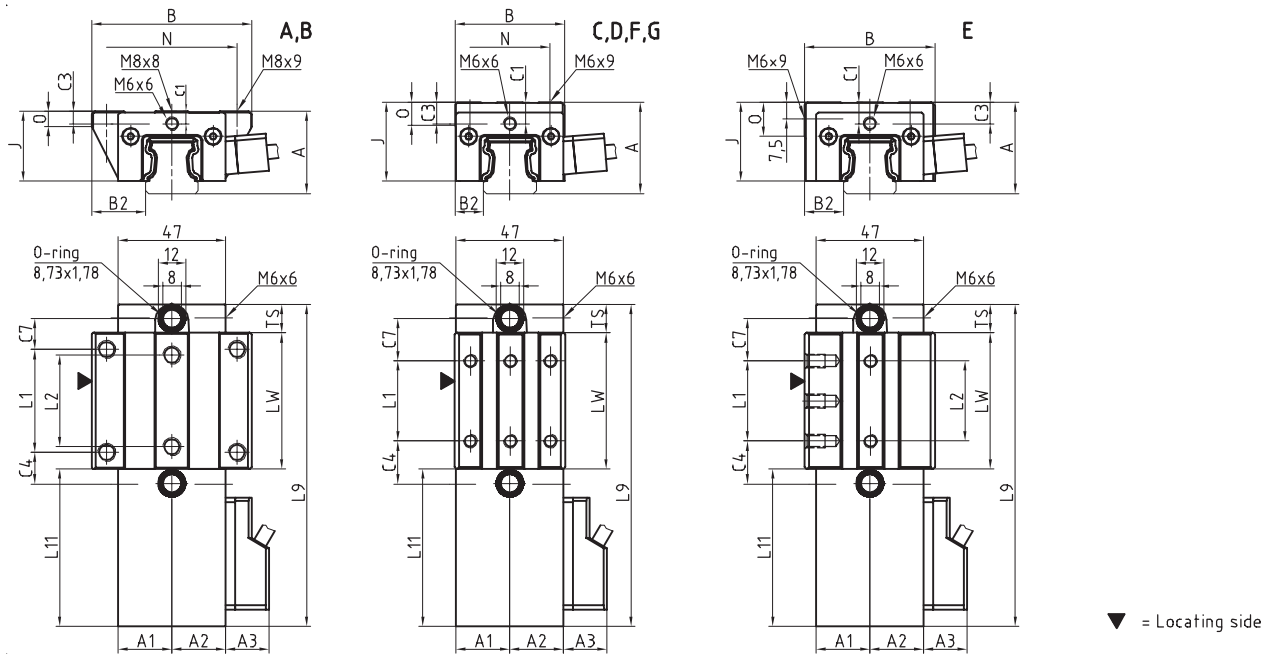
9.2

MONORAIL AMSD 4A AMSD 4A 25 Technical Data

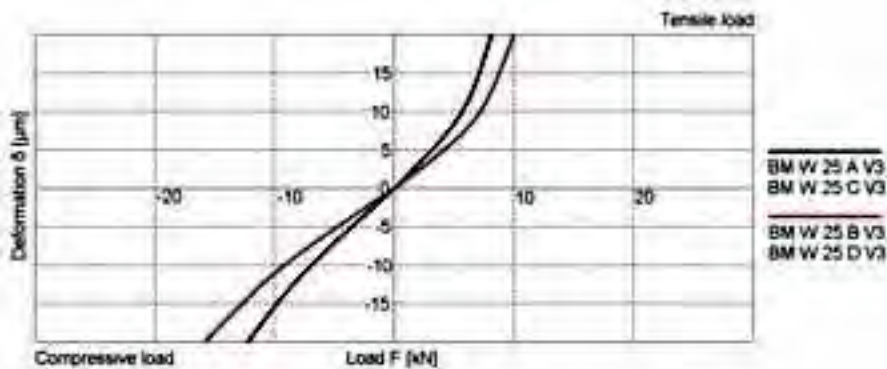
AMSD 4A 25 Rail Drawings



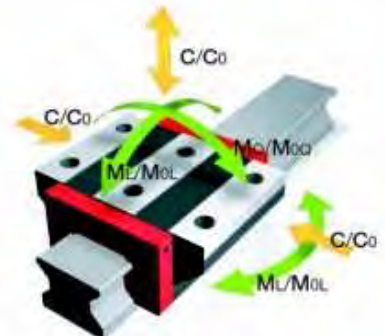
AMSD 4A 25 Carriage Drawings



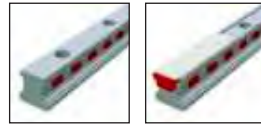
AMSD 4A 25 Rigidity diagram



AMSD 4A 25 load rating



AMSD 4A S 25 Dimensions



| | AMSD 4A S 25-N | AMSD 4A S 25-C | | | | |
|--|----------------|----------------|--|--|--|--|
| B1: Rail width | 23 | 23 | | | | |
| J1: Rail height | 22.7 | 22.7 | | | | |
| L3: Rail length max. | 6 000 | 3 000 | | | | |
| L4: Spacing of fixing holes | 60 | 60 | | | | |
| L5/L10: Position of first/last fixing hole | 28.5 | 28.5 | | | | |
| Gew: Rail weight, specific (kg/m) | 3.0 | 2.8 | | | | |

Available options for AMSD 4A S 25



AMSD 4A W 25 Dimensions and capacities



| | AMSD 4A W 25-A | AMSD 4A W 25-B | AMSD 4A W 25-C | AMSD 4A W 25-D | AMSD 4A W 25-E | AMSD 4A W 25-F | AMSD 4A W 25-G |
|--|----------------|----------------|----------------|----------------|----------------|----------------|----------------|
| A: System height | 36 | 36 | 40 | 40 | 40 | 36 | 36 |
| A1: Half width of housing on opposite side | 23.5 | 23.5 | 23.5 | 23.5 | 23.5 | 23.5 | 23.5 |
| A2: Half width of housing on reading head side | 23.5 | 23.5 | 23.5 | 23.5 | 23.5 | 23.5 | 23.5 |
| A3: Projection of reading head | 18.9 | 18.9 | 18.9 | 18.9 | 18.9 | 18.9 | 18.9 |
| B: Carriage width | 70 | 70 | 48 | 48 | 57 | 48 | 48 |
| B2: Distance between locating faces | 23.5 | 23.5 | 12.5 | 12.5 | 17 | 12.5 | 12.5 |
| C1: Position of center front lube hole | 5.5 | 5.5 | 9.5 | 9.5 | 9.5 | 5.5 | 5.5 |
| C3: Position of lateral lube hole | 5.5 | 5.5 | 9.5 | 9.5 | 9.5 | 5.5 | 5.5 |
| C4: Position of lateral lube hole | 13.75 | 23.25 | 18.75 | 20.75 | 18.75 | 18.75 | 20.75 |
| C7: Position of top lube hole | 13.5 | 23 | 18.5 | 20.5 | 18.5 | 18.5 | 20.5 |
| J: Carriage height | 30.5 | 30.5 | 34.5 | 34.5 | 34.5 | 30.5 | 30.5 |
| L1: Exterior fixing hole spacing | 45 | 45 | 35 | 50 | 35 | 35 | 50 |
| L2: Interior fixing hole spacing | 40 | 40 | - | - | 35 | - | - |
| L9: Carriage length with housing | 140.7 | 159.7 | 140.7 | 159.7 | 140.7 | 140.7 | 159.7 |
| L11: Housing length | 68.7 | 68.7 | 68.7 | 68.7 | 68.7 | 68.7 | 68.7 |
| Lw: Inner carriage body length | 59.5 | 78.5 | 59.5 | 78.5 | 59.5 | 59.5 | 78.5 |
| N: Lateral fixing hole spacing | 57 | 57 | 35 | 35 | - | 35 | 35 |
| O: Reference face height | 7 | 7 | 11 | 11 | 15 | 7.1 | 7.1 |
| Ts: Front plate thickness | 12.5 | 12.5 | 12.5 | 12.5 | 12.5 | 12.5 | 12.5 |

Capacities and weights

| | | | | | | | |
|---|--------|--------|--------|--------|--------|--------|--------|
| C0: Static load capacity (N) | 46 100 | 60 300 | 46 100 | 60 300 | 46 100 | 46 100 | 60 300 |
| C100: Dynamic load capacity (N) | 21 100 | 25 500 | 21 100 | 25 500 | 21 100 | 21 100 | 25 500 |
| MOQ: Static cross moment capacity (Nm) | 631 | 825 | 631 | 825 | 631 | 631 | 825 |
| MOL: Static longitudinal moment capacity (Nm) | 513 | 863 | 513 | 863 | 513 | 513 | 863 |
| MQ: Dynamic cross moment capacity (Nm) | 289 | 349 | 289 | 349 | 289 | 289 | 349 |
| ML: Dynamic longitudinal moment capacity (Nm) | 235 | 365 | 235 | 365 | 235 | 235 | 365 |
| Gew: Carriage weight (kg) | 1.3 | 1.5 | 1.2 | 1.4 | 1.3 | 1.1 | 1.3 |

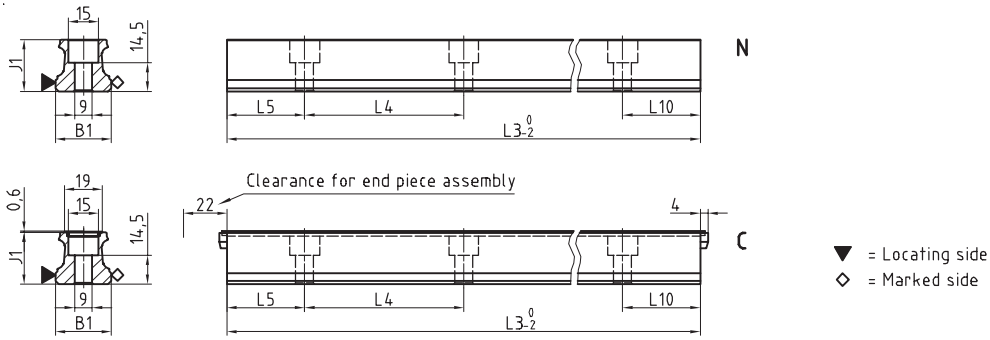
Available options for AMSD 4A W 25



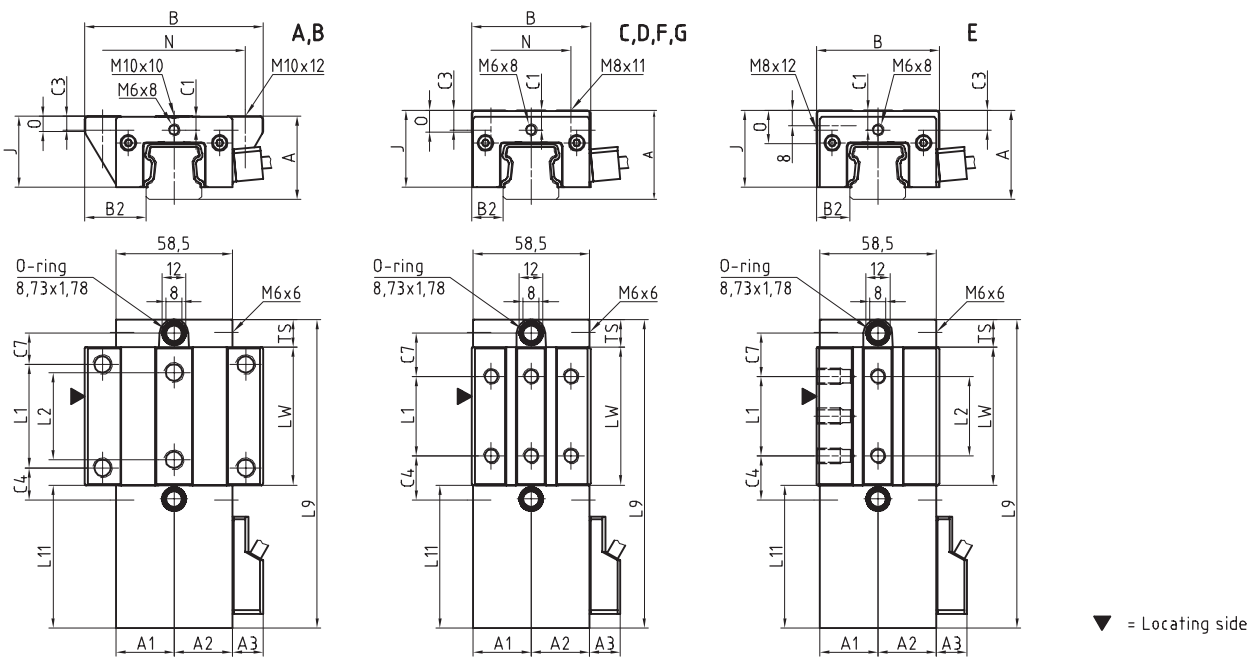
9.2

MONORAIL AMSD 4A AMSD 4A 30 Technical Data

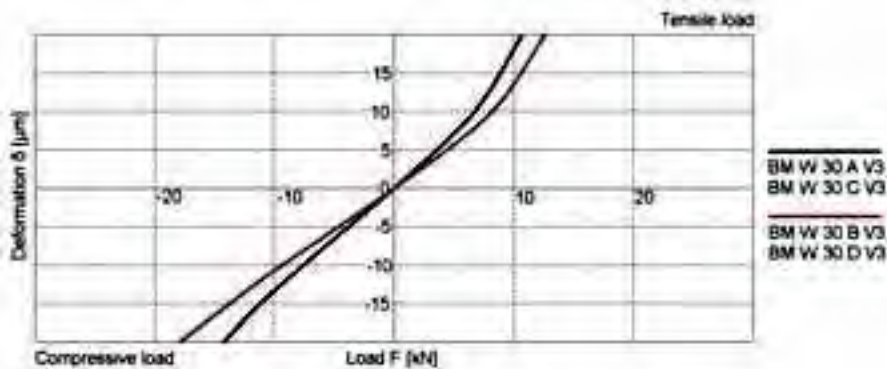
AMSD 4A 30 Rail Drawings



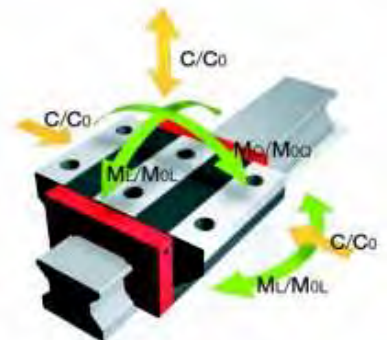
AMSD 4A 30 Carriage Drawings



AMSD 4A 30 Rigidity diagram



AMSD 4A 30 load rating



AMSD 4A S 30 Dimensions



| | AMSD 4A S 30-N | AMSD 4A S 30-C | | | | |
|--|----------------|----------------|--|--|--|--|
| B1: Rail width | 28 | 28 | | | | |
| J1: Rail height | 26 | 26 | | | | |
| L3: Rail length max. | 6 000 | 6 000 | | | | |
| L4: Spacing of fixing holes | 80 | 80 | | | | |
| L5/L10: Position of first/last fixing hole | 38..5 | 38.5 | | | | |
| Gew: Rail weight, specific (kg/m) | 4.3 | 4.1 | | | | |

Available options for AMSD 4A S 30



AMSD 4A W 30 Dimensions and capacities



| | AMSD 4A W 30-A | AMSD 4A W 30-B | AMSD 4A W 30-C | AMSD 4A W 30-D | AMSD 4A W 30-E | AMSD 4A W 30-F | AMSD 4A W 30-G |
|--|----------------|----------------|----------------|----------------|----------------|----------------|----------------|
| A: System height | 42 | 42 | 45 | 45 | 45 | 42 | 42 |
| A1: Half width of housing on opposite side | 29.3 | 29.3 | 29.3 | 29.3 | 29.3 | 29.3 | 29.3 |
| A2: Half width of housing on reading head side | 29.3 | 29.3 | 29.3 | 29.3 | 29.3 | 29.3 | 29.3 |
| A3: Projection of reading head | 15.6 | 15.6 | 15.6 | 15.6 | 15.6 | 15.6 | 15.6 |
| B: Carriage width | 90 | 90 | 60 | 60 | 62 | 60 | 60 |
| B2: Distance between locating faces | 31 | 31 | 16 | 16 | 17 | 16 | 16 |
| C1: Position of center front lube hole | 7 | 7 | 10 | 10 | 10 | 7 | 7 |
| C3: Position of lateral lube hole | 7 | 7 | 10 | 10 | 10 | 7 | 7 |
| C4: Position of lateral lube hole | 16.2 | 27.2 | 22.2 | 23.2 | 22.2 | 22.2 | 23.2 |
| C7: Position of top lube hole | 15.7 | 26.7 | 21.7 | 22.7 | 21.7 | 21.7 | 22.7 |
| J: Carriage height | 35.9 | 35.9 | 38.9 | 38.9 | 38.9 | 35.9 | 35.9 |
| L1: Exterior fixing hole spacing | 52 | 52 | 40 | 60 | 40 | 40 | 60 |
| L2: Interior fixing hole spacing | 44 | 44 | - | - | 40 | - | - |
| L9: Carriage length with housing | 155.4 | 177.4 | 155.4 | 177.4 | 155.4 | 155.4 | 177.4 |
| L11: Housing length | 72 | 72 | 72 | 72 | 72 | 72 | 72 |
| Lw: Inner carriage body length | 69.4 | 91.4 | 69.4 | 91.4 | 69.4 | 69.4 | 91.4 |
| N: Lateral fixing hole spacing | 72 | 72 | 40 | 40 | - | 40 | 40 |
| O: Reference face height | 7.8 | 7.8 | 11 | 11 | 17 | 8 | 8 |
| Ts: Front plate thickness | 14 | 14 | 14 | 14 | 14 | 14 | 14 |

Capacities and weights

| | | | | | | | |
|---|--------|--------|--------|--------|--------|--------|--------|
| C0: Static load capacity (N) | 63 700 | 83 300 | 63 700 | 83 300 | 63 700 | 63 700 | 83 300 |
| C100: Dynamic load capacity (N) | 29 200 | 35 300 | 29 200 | 35 300 | 29 200 | 29 200 | 35 300 |
| MOQ: Static cross moment capacity (Nm) | 1 084 | 1 414 | 1 084 | 1 414 | 1 084 | 1 084 | 1 414 |
| MOL: Static longitudinal moment capacity (Nm) | 829 | 1 390 | 829 | 1 390 | 829 | 829 | 1 390 |
| MQ: Dynamic cross moment capacity (Nm) | 497 | 599 | 497 | 599 | 497 | 497 | 599 |
| ML: Dynamic longitudinal moment capacity (Nm) | 380 | 589 | 380 | 589 | 380 | 380 | 589 |
| Gew: Carriage weight (kg) | 1.8 | 2.2 | 1.7 | 1.9 | 1.7 | 1.6 | 1.8 |

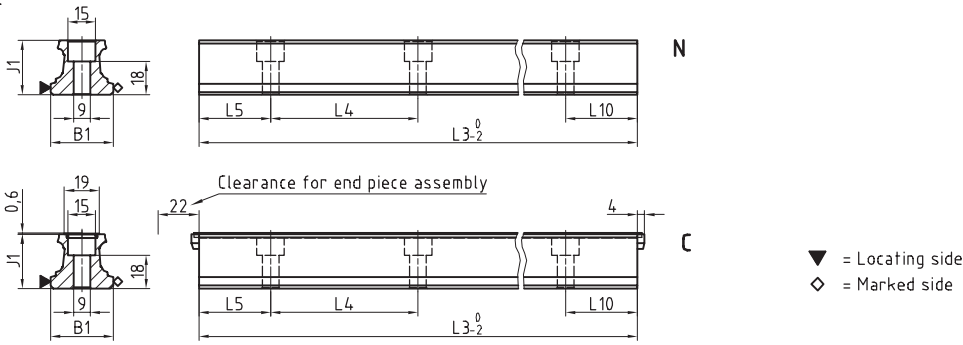
Available options for AMSD 4A W 30



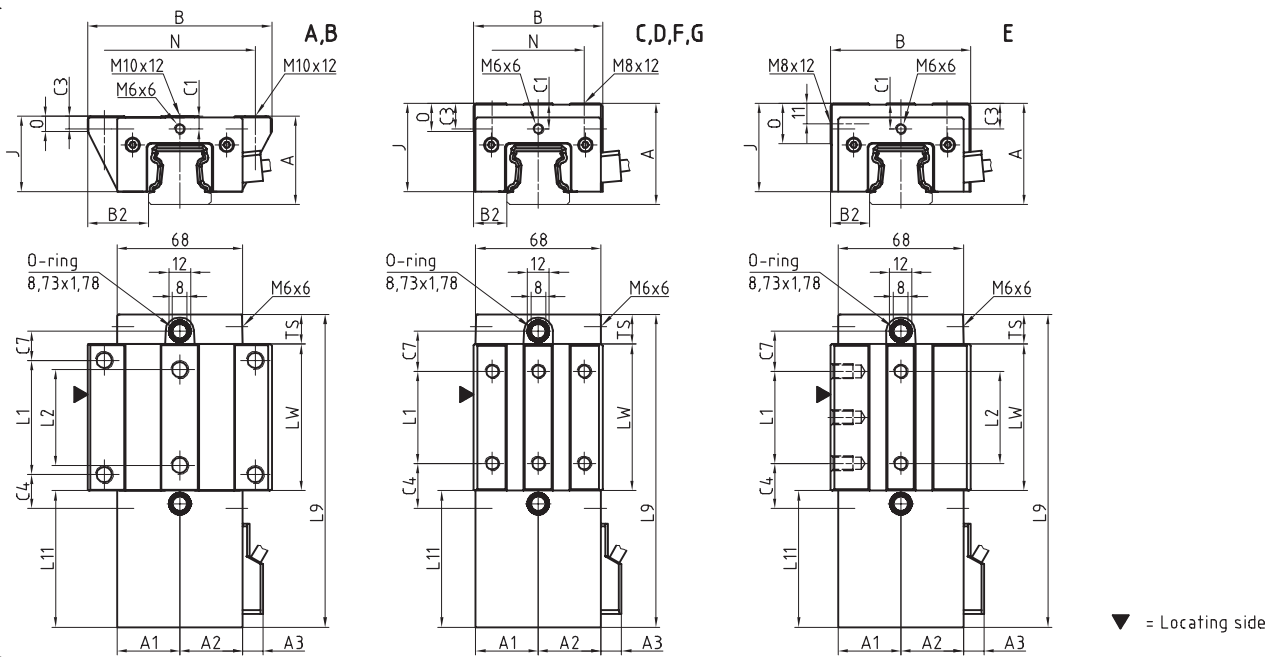
9.2

MONORAIL AMSD 4A AMSD 4A 35 Technical Data

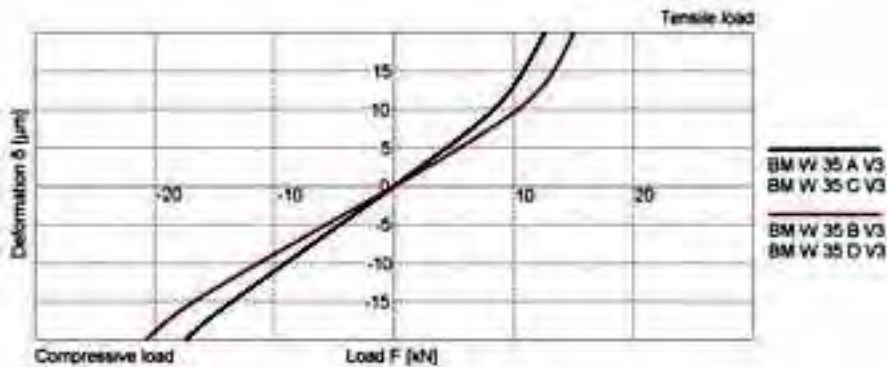
AMSD 4A 35 Rail Drawings



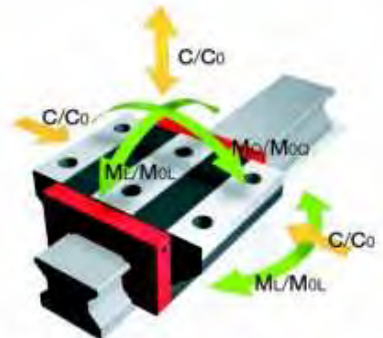
AMSD 4A 35 Carriage Drawings



AMSD 4A 35 Rigidity diagram



AMSD 4A 35 load rating



AMSD 4A S 35 Dimensions



| | AMSD 4A S 35-N | AMSD 4A S 35-C | | | | |
|--|----------------|----------------|--|--|--|--|
| B1: Rail width | 34 | 34 | | | | |
| J1: Rail height | 29.5 | 29.5 | | | | |
| L3: Rail length max. | 6 000 | 6 000 | | | | |
| L4: Spacing of fixing holes | 80 | 80 | | | | |
| L5/L10: Position of first/last fixing hole | 38.5 | 38.5 | | | | |
| Gew: Rail weight, specific (kg/m) | 5.4 | 5.2 | | | | |

Available options for AMSD 4A S 35



AMSD 4A W 35 Dimensions and capacities

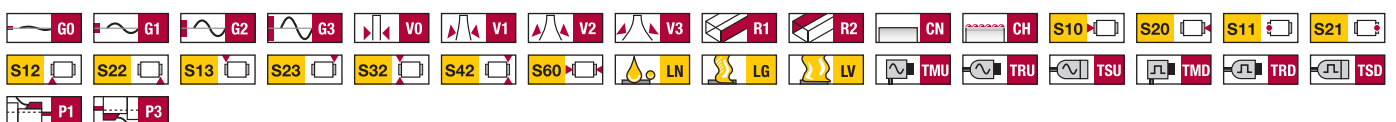


| | AMSD 4A W 35-A | AMSD 4A W 35-B | AMSD 4A W 35-C | AMSD 4A W 35-D | AMSD 4A W 35-E | AMSD 4A W 35-F | AMSD 4A W 35-G |
|--|----------------|----------------|----------------|----------------|----------------|----------------|----------------|
| A: System height | 48 | 48 | 55 | 55 | 55 | 48 | 48 |
| A1: Half width of housing on opposite side | 34 | 34 | 34 | 34 | 34 | 34 | 34 |
| A2: Half width of housing on reading head side | 34 | 34 | 34 | 34 | 34 | 34 | 34 |
| A3: Projection of reading head | 11.2 | 11.2 | 11.2 | 11.2 | 11.2 | 11.2 | 11.2 |
| B: Carriage width | 100 | 100 | 70 | 70 | 76 | 70 | 70 |
| B2: Distance between locating faces | 33 | 33 | 18 | 18 | 21 | 18 | 18 |
| C1: Position of center front lube hole | 7 | 7 | 14 | 14 | 14 | 7 | 7 |
| C3: Position of lateral lube hole | 7 | 7 | 14 | 14 | 14 | 7 | 7 |
| C4: Position of lateral lube hole | 18.3 | 31.05 | 24.3 | 26.05 | 24.3 | 24.3 | 26.05 |
| C7: Position of top lube hole | 15.8 | 28.55 | 21.8 | 23.55 | 21.8 | 21.8 | 23.55 |
| J: Carriage height | 41 | 41 | 48 | 48 | 48 | 41 | 41 |
| L1: Exterior fixing hole spacing | 62 | 62 | 50 | 72 | 50 | 50 | 72 |
| L2: Interior fixing hole spacing | 52 | 52 | - | - | 50 | - | - |
| L9: Carriage length with housing | 169.6 | 195.1 | 169.6 | 195.1 | 169.6 | 169.6 | 195.1 |
| L11: Housing length | 74 | 74 | 74 | 74 | 74 | 74 | 74 |
| Lw: Inner carriage body length | 79.6 | 105.1 | 79.6 | 105.1 | 79.6 | 79.6 | 105.1 |
| N: Lateral fixing hole spacing | 82 | 82 | 50 | 50 | - | 50 | 50 |
| O: Reference face height | 8 | 8 | 15 | 15 | 22 | 8 | 8 |
| Ts: Front plate thickness | 16 | 16 | 16 | 16 | 16 | 16 | 16 |

Capacities and weights

| | | | | | | | |
|---|--------|---------|--------|---------|--------|--------|---------|
| C0: Static load capacity (N) | 84 400 | 110 300 | 84 400 | 110 300 | 84 400 | 84 400 | 110 300 |
| C100: Dynamic load capacity (N) | 38 700 | 46 700 | 38 700 | 46 700 | 38 700 | 38 700 | 46 700 |
| MOQ: Static cross moment capacity (Nm) | 1 566 | 2 048 | 1 566 | 2 048 | 1 566 | 1 566 | 2 048 |
| MOL: Static longitudinal moment capacity (Nm) | 1 252 | 2 104 | 1 252 | 2 104 | 1 252 | 1 252 | 2 104 |
| MQ: Dynamic cross moment capacity (Nm) | 718 | 867 | 718 | 867 | 718 | 718 | 867 |
| ML: Dynamic longitudinal moment capacity (Nm) | 574 | 891 | 574 | 891 | 574 | 574 | 891 |
| Gew: Carriage weight (kg) | 2.5 | 3.0 | 2.5 | 3.0 | 2.6 | 2.2 | 2.6 |

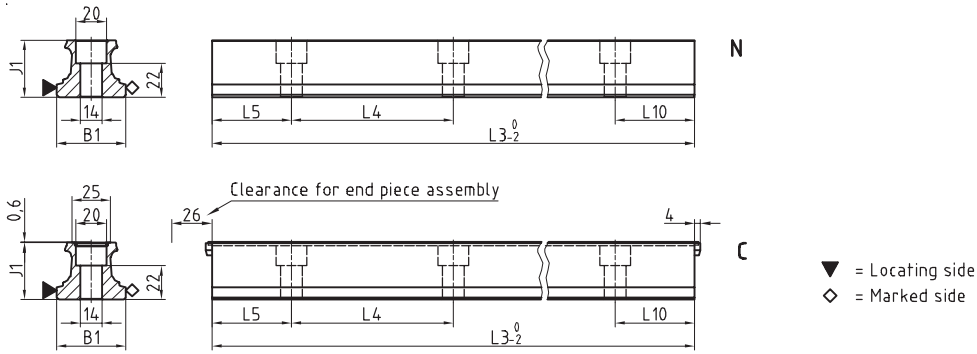
Available options for AMSD 4A W 35



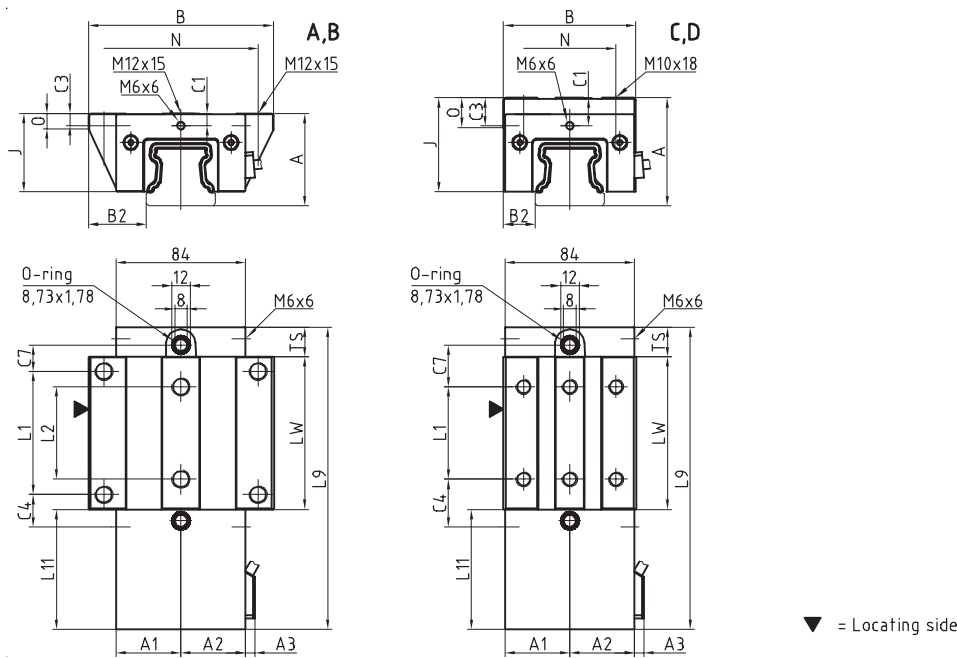
9.2

MONORAIL AMSD 4A AMSD 4A 45 Technical Data

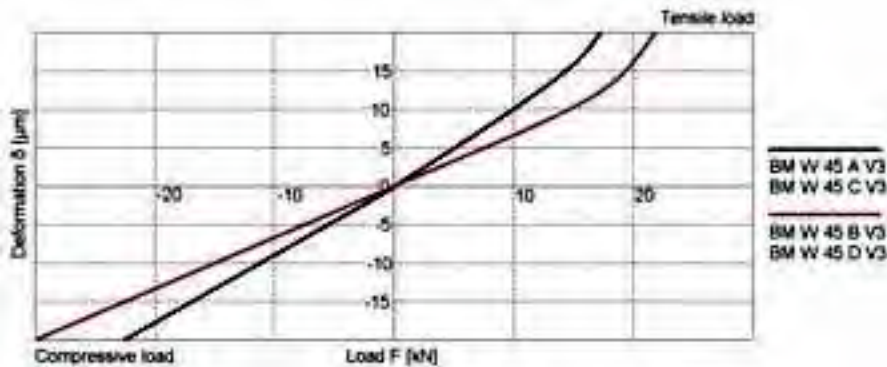
AMSD 4A 45 Rail Drawings



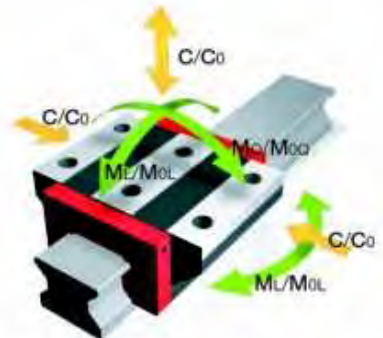
AMSD 4A 45 Carriage Drawings



AMSD 4A 45 Rigidity diagram



AMSD 4A 45 load rating



AMSD 4A S 45 Dimensions



| | AMSD 4A S 45-N | AMSD 4A S 45-C | | | |
|--|----------------|----------------|--|--|--|
| B1: Rail width | 45 | 45 | | | |
| J1: Rail height | 37 | 37 | | | |
| L3: Rail length max. | 6 000 | 6 000 | | | |
| L4: Spacing of fixing holes | 105 | 105 | | | |
| L5/L10: Position of first/last fixing hole | 51 | 51 | | | |
| Gew: Rail weight, specific (kg/m) | 8.8 | 8.6 | | | |

Available options for AMSD 4A S 45



AMSD 4A W 45 Dimensions and capacities



| | AMSD 4A W 45-A | AMSD 4A W 45-B | AMSD 4A W 45-C | AMSD 4A W 45-D | | |
|--|----------------|----------------|----------------|----------------|--|--|
| A: System height | 60 | 60 | 70 | 70 | | |
| A1: Half width of housing on opposite side | 42 | 42 | 42 | 42 | | |
| A2: Half width of housing on reading head side | 42 | 42 | 42 | 42 | | |
| A3: Projection of reading head | 6.1 | 6.1 | 6.1 | 6.1 | | |
| B: Carriage width | 120 | 120 | 86 | 86 | | |
| B2: Distance between locating faces | 37.5 | 37.5 | 20.5 | 20.5 | | |
| C1: Position of center front lube hole | 8 | 8 | 18 | 18 | | |
| C3: Position of lateral lube hole | 8 | 8 | 18 | 18 | | |
| C4: Position of lateral lube hole | 21.05 | 36.8 | 31.05 | 36.8 | | |
| C7: Position of top lube hole | 17.05 | 32.8 | 27.05 | 32.8 | | |
| J: Carriage height | 50.8 | 50.8 | 60.8 | 60.8 | | |
| L1: Exterior fixing hole spacing | 80 | 80 | 60 | 80 | | |
| L2: Interior fixing hole spacing | 60 | 60 | - | - | | |
| L9: Carriage length with housing | 196.1 | 227.6 | 196.1 | 227.6 | | |
| L11: Housing length | 78 | 78 | 78 | 78 | | |
| Lw: Inner carriage body length | 99.1 | 130.6 | 99.1 | 130.6 | | |
| N: Lateral fixing hole spacing | 100 | 100 | 60 | 60 | | |
| O: Reference face height | 10 | 10 | 19 | 19 | | |
| Ts: Front plate thickness | 19 | 19 | 19 | 19 | | |

Capacities and weights

| | | | | | | |
|---|---------|---------|---------|---------|--|--|
| C0: Static load capacity (N) | 134 800 | 176 300 | 134 800 | 176 300 | | |
| C100: Dynamic load capacity (N) | 61 900 | 74 700 | 61 900 | 74 700 | | |
| MOQ: Static cross moment capacity (Nm) | 3 193 | 4 175 | 3 193 | 4 175 | | |
| MOL: Static longitudinal moment capacity (Nm) | 2 498 | 4 199 | 2 498 | 4 199 | | |
| MQ: Dynamic cross moment capacity (Nm) | 1 466 | 1 769 | 1 466 | 1 769 | | |
| ML: Dynamic longitudinal moment capacity (Nm) | 1 147 | 1 779 | 1 147 | 1 779 | | |
| Gew: Carriage weight (kg) | 4.1 | 5.1 | 4.2 | 5.2 | | |

Available options for AMSD 4A W 45



9.3

MONORAIL AMSD 4A

Accessories

AMSD 4A Rails accessories overview

| Accessories | AMSD 4A S 15 | AMSD 4A S 20 | AMSD 4A S 25 | AMSD 4A S 30 | AMSD 4A S 35 | AMSD 4A S 45 |
|--|--------------|--------------|--------------|--------------|--------------|--------------|
| Plugs: | | | | | | |
| Plastic plugs | BRK 15 | BRK 20 | BRK 25 | BRK 30 | BRK 35 | BRK 45 |
| Cover strips: | | | | | | |
| Cover strip (spare part) | BAC 15 | BAC 20 | BAC 25 | BAC 30 | BAC 35 | BAC 45 |
| End piece for cover strip (spare part) | EST 15-BAC | EST 20-BAC | EST 25-BAC | EST 30-BAC | EST 35-BAC | EST 45-BAC |
| Assembly tools: | | | | | | |
| Installation tool for cover strip | BWC 15 | BWC 20 | BWC 25 | BWC 30 | BWC 35 | BWC 45 |

AMSD 4A Carriages accessories overview

| Accessories | AMSD 4A W 15 | AMSD 4A W 20 | AMSD 4A W 25 | AMSD 4A W 30 | AMSD 4A W 35 | AMSD 4A W 45 |
|--|--------------|--------------|--------------|---------------|---------------|---------------|
| Additional wipers: | | | | | | |
| Additional wiper NBR | ZBN 15-U | ZBN 20-U | ZBN 25-U | ZBN 30-U | ZBN 35-U | ZBN 45-U |
| Additional wiper Viton | ZBV 15-U | ZBV 20-U | ZBV 25-U | ZBV 30-U | ZBV 35-U | ZBV 45-U |
| Metal wiper | ABM 15 | ABM 20 | ABM 25 | ABM 30 | ABM 35 | ABM 45 |
| Bellows: | | | | | | |
| Bellows | - | FBB 20 | FBB 25 | FBB 30 | FBB 35 | FBB 45 |
| Adapter plate for bellows (spare part) | - | ZPB 20 | ZPB 25 | ZPB 30 | ZPB 35 | ZPB 45 |
| End plate for bellows (spare part) | - | EPB 20 | EPB 25 | EPB 30 | EPB 35 | EPB 45 |
| Assembly rails: | | | | | | |
| Assembly rail | MBM 15 | MBM 20 | MBM 25 | MBM 30 | MBM 35 | MBM 45 |
| Lubrication plates: | | | | | | |
| Lubrication plate | SPL 15-BM | SPL 20-BM | SPL 25-BM | SPL 30-BM | SPL 35-BM | SPL 45-BM |
| Front plates: | | | | | | |
| Cross wiper for front plate (spare part) | QAS 15-STB | QAS 20-STB | QAS 25-STB | QAS 30-STB | QAS 35-STB | QAS 45-STB |
| Lube nipples: | | | | | | |
| Hydraulic-type grease nipple straight | - | SN 6 | SN 6 | SN 6 | SN 6 | SN 6 |
| Hydraulic-type grease nipple 45° | - | SN 6-45 | SN 6-45 | SN 6-45 | SN 6-45 | SN 6-45 |
| Hydraulic-type grease nipple 90° | - | SN 6-90 | SN 6-90 | SN 6-90 | SN 6-90 | SN 6-90 |
| Flush type grease nipple M3 | SN 3-T | SN 3-T | - | - | - | - |
| Flush type grease nipple M6 | - | SN 6-T | SN 6-T | SN 6-T | SN 6-T | SN 6-T |
| Grease gun for SN 3-T and SN 6-T | SFP-T3 | SFP-T3 | SFP-T3 | SFP-T3 | SFP-T3 | SFP-T3 |
| Lube adapters: | | | | | | |
| Straight screw-in connection M3 | SA 3-D3 | SA 3-D3 | - | - | - | - |
| Lubrication adapter M8 round-head | - | SA 6-RD-M8 | SA 6-RD-M8 | SA 6-RD-M8 | SA 6-RD-M8 | SA 6-RD-M8 |
| Lubrication adapter M8 hexagon head | - | - | - | SA 6-6KT-M8 | SA 6-6KT-M8 | SA 6-6KT-M8 |
| Lubrication adapter G1/8 hexagon head | - | - | - | SA 6-6KT-G1/8 | SA 6-6KT-G1/8 | SA 6-6KT-G1/8 |
| Swivel screw connection for pipe d=4 mm | - | SV 6-D4 | SV 6-D4 | SV 6-D4 | SV 6-D4 | SV 6-D4 |
| Swivel screw connection M6 | - | SV 6-M6 | SV 6-M6 | SV 6-M6 | SV 6-M6 | SV 6-M6 |
| Swivel screw connection M6 long | - | SV 6-M6-L | SV 6-M6-L | SV 6-M6-L | SV 6-M6-L | SV 6-M6-L |
| Swivel screw connection M8 | - | SV 6-M8 | SV 6-M8 | SV 6-M8 | SV 6-M8 | SV 6-M8 |
| Swivel screw connection M8 long | - | SV 6-M8-L | SV 6-M8-L | SV 6-M8-L | SV 6-M8-L | SV 6-M8-L |
| Cables: | | | | | | |
| Connecting cable, 12-pole | KAO 12-X | KAO 12-X | KAO 12-X | KAO 12-X | KAO 12-X | KAO 12-X |
| Connecting cable, 12-pole | KAO 13-X | KAO 13-X | KAO 13-X | KAO 13-X | KAO 13-X | KAO 13-X |
| Extension cable, 12-pole | KAO 14-X | KAO 14-X | KAO 14-X | KAO 14-X | KAO 14-X | KAO 14-X |
| Connecting cable, 12-pole | KAO 16-X | KAO 16-X | KAO 16-X | KAO 16-X | KAO 16-X | KAO 16-X |

9.4

MONORAIL AMSD 4A

Order code

Individual guide rails and carriages are ordered in accordance with the order codes described below.

AMSD 4A carriages consist of guide carriage, casing and reading head.

All MONORAIL BM carriages can also be used with AMSD 4A rails.

Q.v. chapter 2 and chapter 4.3 for the order key for accessories.

Separate order codes are used in each case for rails, carriages and accessories. This also applies to different versions of rails and carriages.

All guide components are supplied individually as standard, i.e. unassembled.

If required, SCHNEEBERGER can also supply rails and carriages assembled incl. accessories as complete systems. Please note the ordering instructions in chapter 2.4 if this applies.

Order code for AMSD 4A rails

| | 1x | AMSD 4A S | 25 | -N | -G3 | -KC | -R12 | -958 | -29 | -29 | -CN | -TR50 |
|----------------------------------|----|-----------|----|----|-----|-----|------|------|-----|-----|-----|-------|
| Quantity | | | | | | | | | | | | |
| Rail | | | | | | | | | | | | |
| Size | | | | | | | | | | | | |
| Type | | | | | | | | | | | | |
| Accuracy | | | | | | | | | | | | |
| Straightness | | | | | | | | | | | | |
| Reference sides | | | | | | | | | | | | |
| Rail length L3 | | | | | | | | | | | | |
| Position of first fixing hole L5 | | | | | | | | | | | | |
| Position of last fixing hole L10 | | | | | | | | | | | | |
| Coating | | | | | | | | | | | | |
| Magnetization | | | | | | | | | | | | |

NB

Q.v. chapter 9.1 to 9.3 for an overview of types, details of shapes, available options and accessories.

Q.v. chapter 2 for a description of the options.

If possible, standard lengths are preferred for L3 rail length.

These are calculated with the table values in chapter 9.2 using the following formula: $L3 = n \times L4 + L5 + L10 \leq L3max$.

Order code for AMSD 4A carriages

| | 1x | AMSD 4A W | 25 | -A | -P1 | -G3 | -V1 | -R1 | -CN | -S10 | -LN | -TSD | -050 | -80 | ZN |
|------------------------------------|----|-----------|----|----|-----|-----|-----|-----|-----|------|-----|------|------|-----|----|
| Quantity | | | | | | | | | | | | | | | |
| Carriage | | | | | | | | | | | | | | | |
| Size | | | | | | | | | | | | | | | |
| Type | | | | | | | | | | | | | | | |
| Reading head position | | | | | | | | | | | | | | | |
| Accuracy | | | | | | | | | | | | | | | |
| Preload | | | | | | | | | | | | | | | |
| Reference side | | | | | | | | | | | | | | | |
| Coating | | | | | | | | | | | | | | | |
| Lube connection | | | | | | | | | | | | | | | |
| Lubrication as delivered condition | | | | | | | | | | | | | | | |
| Interface | | | | | | | | | | | | | | | |
| Interpolation | | | | | | | | | | | | | | | |
| Frequency | | | | | | | | | | | | | | | |
| Reference pulse | | | | | | | | | | | | | | | |

NB

Q.v. chapter 9.1 to 9.3 for an overview of types, details of shapes, available options and accessories.

Q.v. chapter 2 for a description of the options.

