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EWELLIX

MAKERS IN MOTION

Profile rail guides - LLR catalogue



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Heritage of innovation for technology leadership

Ewellix is a global innovator and manufacturer of linear motion and actuation solutions. Today, our state-of-the-art linear solutions are designed to increase machine performance, maximise uptime, reduce maintenance, improve safety and save energy.

Technology leadership

Our journey began **over 50 years** ago as part of the SKF Group, and our history with SKF provided us with the **expertise to continuously develop new technologies** and use them to create cutting edge products that offer our customers a competitive advantage.

In 2019, we became independent from SKF and changed our name to Ewellix. **We are proud of our heritage.** This gives us a unique foundation on which to build an agile business with engineering excellence and innovation as our core strengths.

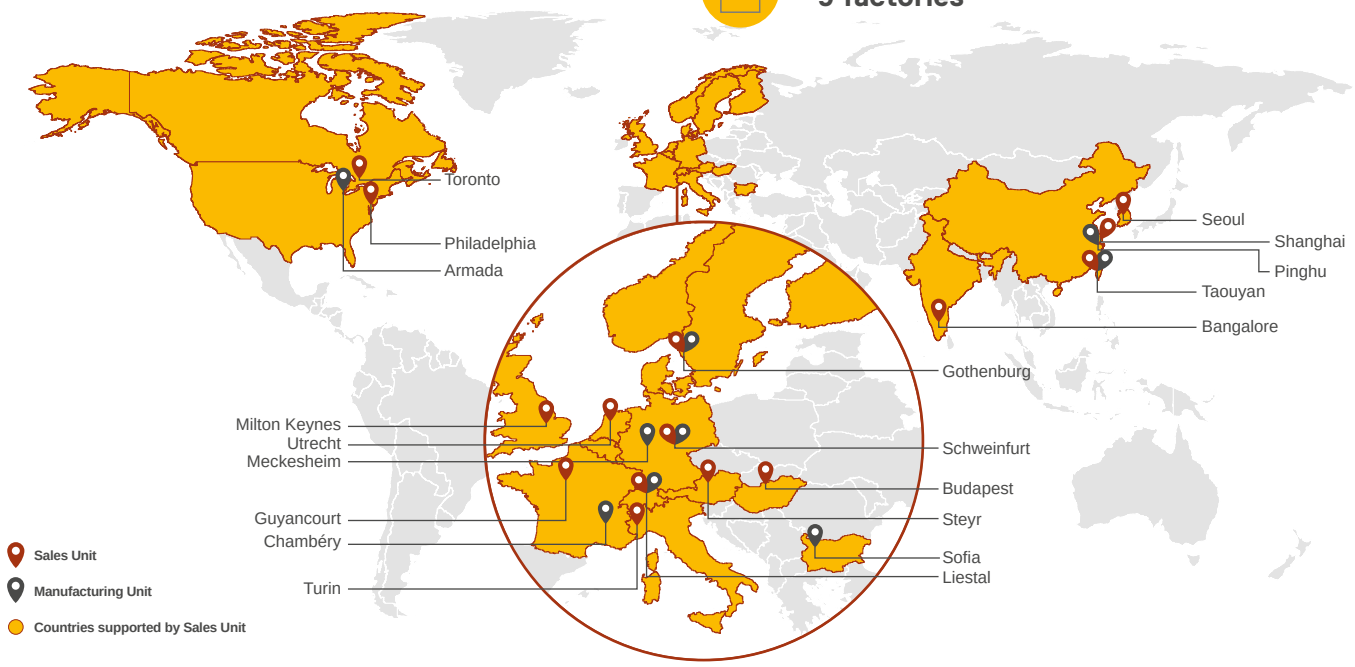
Global presence and local support

With our **global presence**, we are uniquely positioned to deliver **standard components and custom-engineered solutions**, with full technical and applications support around the world. Long standing relationships with our distributor partners allow us to support customers in a variety of different industries. At Ewellix, we don't just provide products; **we engineer integrated solutions** that help customers realise their ambitions.

1 200 employees

16 sales units

9 factories



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EWELLIX

Trusted engineering expertise

Our industry is in motion; pushing towards solutions that reduce environmental impact and leverage new technology. We provide technical and manufacturing expertise to overcome our customers' challenges.

Engineering for the future

We work in a **wide range of industries**, where our solutions provide key functionality for business critical applications.

For the **medical industry**, we provide precision components for use in core medical equipment.
Our unparalleled understanding of **industrial automation** systems is based on decades of research into advanced automation components and techniques.

Our deep knowledge of **mobile machinery** provides powerful and reliable electromechanical solutions for the harshest conditions. In an **industrial distribution** setting, we supply linear expertise to our partners, empowering them to serve customers with greater efficiency.

We offer excellence

We have a **unique understanding of linear equipment** and how it's integrated in customers' applications to provide the best performance and machine efficiency.

We assist our customers by creating equipment that runs faster, longer and safer and that is sustainable.
We provide a wide variety of **linear motion components** and electromechanical actuators for equipping any automation application, helping our customers **reduce its footprint, energy use and maintenance**.

We push for lower energy consumption that **increases productivity and reduces the environmental impact**.

Actuation systems



Linear guides and systems



Ball and roller screws



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1

Introduction

1.1 Product description

As the world's leading manufacturer of rolling bearings, Ewellix supplies practically every type of rolling bearing for rotary and linear movements. The standard profile rail guides pro- duced by Ewellix are brought together in this catalogue. Ewellix profile rail guides are accuracy rolling bearings for linear movements and are there- fore suitable for use in most types of machinery. With these profile rail guides it is possible for Ewellix to offer a guide system which achieves a good price/performance ratio.

Profile rail guides from Ewellix are available in many designs and sizes, and thanks to their unlimited stroke they can be adapted to any linear movement. They consist of a rail guide with ground raceways on which one or several guide carriages can be moved with an unlimited stroke. The guide carriages are made of tempered bearing steel into which the hardened raceways of the ball circuits are inserted. Fixing holes in the attachment surfaces enable machine parts to be directly mounted onto the carriages. Fundamentally, profile rail guides constitute a coupled angular ball bearing in back-to- back arrangement and, depending on the application, are available in different preload classes.

The race- ways of the profile rail and of the carriage are arranged at an angle of 45°. As a result, the system has the same load capacity in the four main load directions as well as a high moment load capacity.

Depending on the load conditions and the required service life, a selection can also be made between two design versions. In addition to the standard carriage length, a series with extended carriages is available which exhibits higher load rating. To meet the requirements of operating practice, a range of different guide systems is offered. Their main features are load capacity, screw connections to provide the fastening points on the carriage and the sectional height.

Thanks to the modular design of the systems, subsequent changes are not a problem. This catalogue brings together all the data which we feel is relevant.

If you require additional information please get in touch with one of our sales companies.



1.2 Design

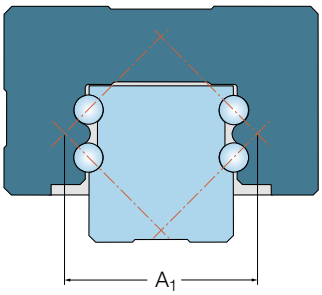
Just as with rotary bearings, the raceways of profile rail guides can be arranged in an X- or O-arrangement. The load carrying capacity of these two arrangements are essentially the same. Therefore, there are no basic differences in behavior in the vast majority of load situations, except when they are subjected to moment loads around the X-axis.

The LLR profile rail guides from Ewellix feature an O-arrangement, based on the contact angle of the rolling elements (↳ **fig. 1**). The advantage of this arrangement is that especially in one-axis systems, the moment-related rigidity is higher than comparable systems with an X-arrangement.

Due to the design-related bigger lever arm, the O-arrangement provides better rigidity and thus higher accuracy.

Fig. 1

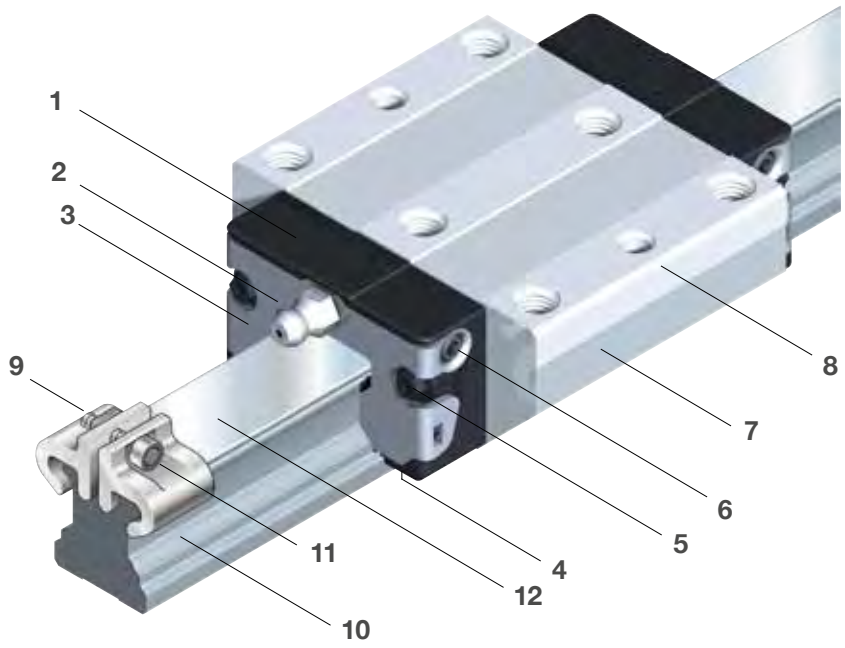
Schematic illustration of ball-arrangement



O-arrangement

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1.2.1 Components and material specifications



Material specifications

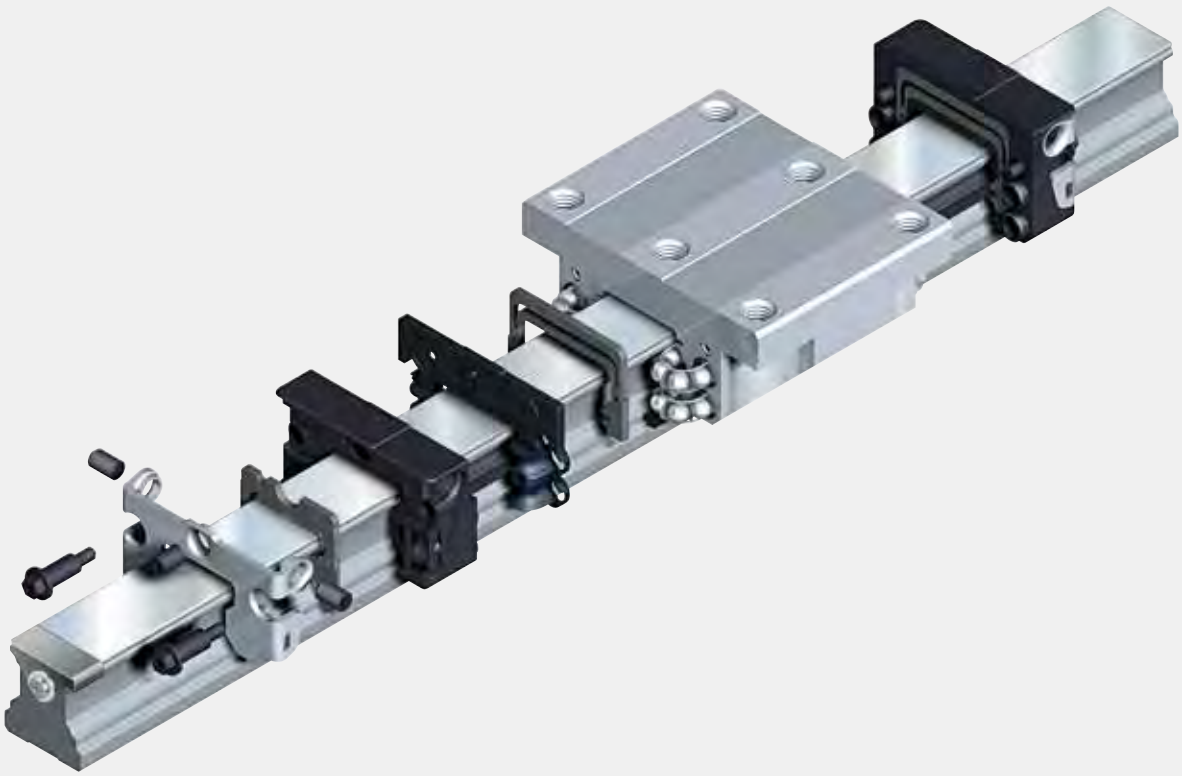
1. Recirculation parts: POM (PA6.6)
2. Lubrication nipple: carbon steel
3. Metal front plates: 1.4301
4. Seals: TEE-E
5. Flange screws: carbon steel
6. Thread pins: 1.4301
7. Balls: bearing steel
8. Housing: tempered steel
9. Cover strip retaining clamps: aluminium
10. Clamping screw and nut: 1.4301
11. Rail: tempered steel
12. Cover strip: 1.4301

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1.3 Features and benefits

- Carriages with and without ball chain
- High load capacities in all main directions and high moment load capacities
- High dynamic performances: v = 5 m/s; a_{max} = 500 m/s^2
- Low noise and smooth, light running due to optimised ball recirculation and ideal ball chain geometry
- Long term lubrication system
- Lube ports with metal threads on all sides.
- Full interchangeability due to standardised rail, with or without rail seal cover strip, for all carriage versions
- Various accuracy and preload classes
- Carriages can be screwed from above or below, depending on type.
- Improved stiffness under lift off and side loading conditions when additional mounting screws are used for the holes in the centre of the carriage
- Integrated all-round sealing through front and longitudinal seals
- Wide range of accessories
- Both grease and oil lubrication possible despite initial grease application
- Wide range of accessories
- Worldwide Ewellix service network
- Both sides of the guide rail can be used as reference edges



1.4 Product range

LLRHC ... SA

Flange short
Standard height
Further information **see page 22**



LLRHC ... A

Flange normal
Standard height
Further information **see page 24**



LLRHC ... LA

Flange long
Standard height
Further information **see page 26**



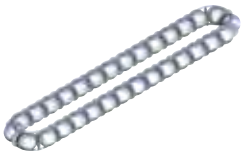
LLRHC ... R

Slim line normal
High
Further information **see page 34**



Ball chain

Optimises noise level and running behaviour



LLRHC ... LR

Slim line long
High
Further information **see page 36**



LLRHC ... SU

Slim line short
Standard height
Further information **see page 28**



LLRHC ... U

Slim line normal
Standard height
Further information **see page 30**



LLRHC ... LU

Slim line long
Standard height
Further information **see page 32**



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2

Selection guide

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2.1 Technical data

2.1.1 General information

The general technical data applies to all rail guides (all carriages and rails). Special technical data is listed separately for the individual designs.

Preload classes

In view of the different user require- ments, the ball rail guides can be supplied in four different preload classes.

So as not to reduce the service life, the preload should not amount to more than 1/3 of the bearing load F.

In general, the stiffness of the carriage increases according to the preload increase.

Guide systems with parallel rails

- In connection with the selected preload class the permissible deviation in parallelism of the rails must also be taken into account (see tables for the various designs).
- For the installation of rail guides in the accuracy class P5 we recommend the version with clearance T0 or the preload class T1 in order to avoid stresses owing to the tolerances.

Speed

v_{max}: 5 m/s

Acceleration

a_{max}: 500 m/s^2

Only in the case of preloaded systems. In the case of non-preloaded systems: a_{max} = 50 m/s^2

Temperature resistance

t_{max}: 100 °C

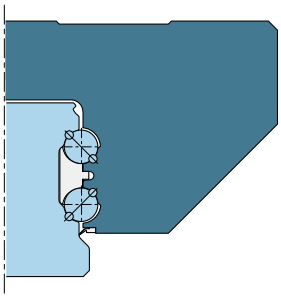
This is a maximum value which is only permissible for a short time. In continuous operation a maximum temperature of 80 °C must not be exceeded.

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Friction

The friction coefficient μ of the ball rail guide is approx. 0,002 to 0,003 (not including the friction of the seal). As a result of the design with 4 ball rows a 2-point contact exists for all load directions. This reduces fric- tion to a minimum (↳ **fig. 1**).

Fig. 1



Seals

Seals should prevent the penetration of dirt and chips into the interior of the carriage in order to avoid pre- mature failure.

Universal seal

Universal seals are installed as stan- dard in Ewellix carriages.

They have a constant sealing effect on rails with and without cover strip. In addition to efficient sealing, the design also provides for low friction. For applications where low friction is required light-contact seals are available on request.

Front seal

Front seals can be ordered as acces- sories and are attached by the customer. They are suitable for use in environments with fine dust or metal particles, as well as coolants or cutting fluids.

NOTE: For extreme duty in environments with coarse dirt or metal particles, or where there is massive use of coolants or cutting fluids, Viton seals are available on request. Viton seals have to be attached by the customer.

Scraper plates

Scraper plates can be ordered as accessories (have to be attached by the customer). They are suitable for use in most environments where coarse dirt or chips are encountered.

2.1.2 Load rating

Definition of the basic dynamic load rating C

The radial load, constant in magnitude and direction, which a linear rolling bearing can in theory accommodate for a basic rating life represented by a travelled distance of 105 m (to DIN 636 Part 1). The basic dynamic load ratings in the tables are generally 30 % higher than the values to DIN. They have been verified in tests.

Definition of the basic static load rating C_0

The static load in the direction of loading which corresponds to a cal-culated load in the centre of the most highly loaded contact point between the rolling element and both raceways (rail) at an osculation of ≤ 0,52, 4 200 MPa.

NOTE: At this load on the contact point a permanent total deformation of the rolling element and raceway occurs which corresponds to about 0,0001 times the rolling element diameter (to DIN 636 Part 2).

Definition and calculation of the basic rating life

The calculated life achievable with 90 % reliability for a single rolling bearing or a group of evidently identical rolling bearings running under identical conditions given the material generally used today of normal manufacturer's quality and usual operating conditions (to DIN 636 Part 1).

Basic rating life at constant speed

The basic rating life L or Lh can be calculated applying the formula 1, 2 or 3:

1) $L_{10} = \left(\frac{C}{P}\right)^3 10^5$

2) $L_{10h} = \frac{L_{10}}{2 \times s \times n \times 60}$

Basic rating life at changing speed

3) $L_{10h} = \frac{L_{10}}{60 \times v_m}$

4) $v_m = \frac{t_1 \times v_1 + t_2 \times v_2 + \ldots + t_n \times v_n}{100}$

L_{10} = basic rating life (m)
L_{10h} = basic rating life (h)
C = basic dynamic load rating (N)
P = equivalent load (N)
s = stroke length (m)
n = stroke frequency (double strokes/min)

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v_m = mean speed (m/min)
$v_1, v_2 ... v_n$ = travel speeds (m/min)
$t_1, t_2 ... t_n$ = time proportions for v1, v_2...vn (%)

The formulae for calculating the service life of profile rail guides apply to a stroke length of S ≥ 2 times the carriage length. At lower values the load rating is reduced. Please consult Ewellix.

Dynamic equivalent bearing load for calculation of the service life

For a fluctuating bearing load the dynamic equivalent loading F is calculated according to **formula 5**:

$$5)\quad F_m = \sqrt[3]{\frac{F_1^{\,3} \times s_1 + F_2^{\,3} \times s_2 + \ldots + F_n^{\,3} \times s_n}{s}}$$

F_m = constant mean load (N)

$F_1, F_2 \ldots F_n$ = constant loads during stroke lengths s_1, $+ s_2 +, \ldots s_n$ (N)

s = total stroke length ($s = s_1 + s_2 +, \ldots + s_n$), during which loads $F_1, F_2 \ldots F_n$ have an effect (mm)

*** given a combined bearing load**

Note on dynamic load capacities and moments

Determination of dynamic load capacities and moments is based on a travel life of 100 000 m. However, frequently this is determined on the basis of only 50 000 m. In this case for comparison: multiply values C, MC and MA by 1.26 in accordance with Ewellix tables. For carriages with ball chain the permissible moments are reduced in accordance with the load ratings.

2.1.3 Preload classes

For perfect operating behaviour under various operating conditions in an extremely wide range of applications it is necessary to establish the suitable preload. In general, a slight to medium preload is enough for the majority of applications. For special applications in which high shock loads and vibration can occur it is advisable to use a higher preloading. The preload classes offered by Ewellix are categorised in **table 4**.

Selection of the preload class

In the designs with clearance no preloading is achieved. Instead, there is clearance of between 1 and 10 µm between the carriage and rail. If two rails and more than one carriage per rail are used this clearance is in most cases equalised by parallelism tolerances.

Preload force referred to the basic dynamic load rating Cdyn of the respective carriage.

Example:

Carriage LLRHC 35 A
C = 41 900 N
Preload 0,02 x C = 838 N
This carriage is preloaded with a basic load of approx. 838N.

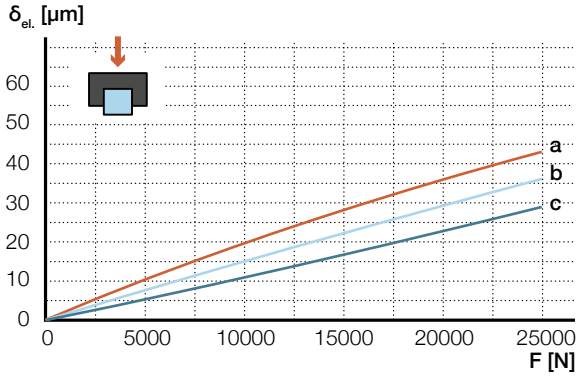
Table 4

Versions and area of applications

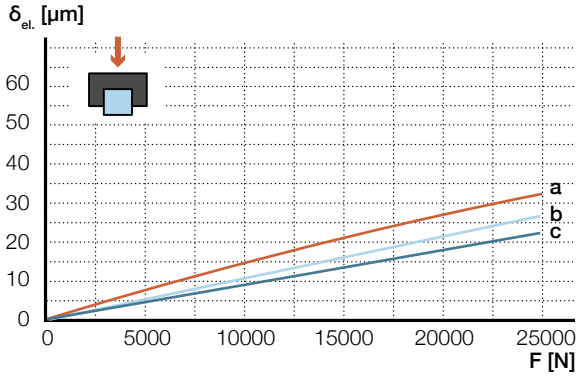
Preload class	Preload force F_{Pr}
T0 – Clearance	For particularly smooth-running guide systems with low friction and low external influences. Designs with clearance are only available in the accuracy classes P5 and P3.
T1 - Preload 0,02 C	For precise guide systems with low external load and high requirements in respect of overall stiffness.
T2 - Preload 0,08 C	For precise guide systems with high external load and high requirements in respect of overall stiffness; also recommended for single-rail systems. Above-average moment loads are absorbed without any significant elastic deformation. At only medium moment loads the overall stiffness is further improved.
T3 - Preload 0,13 C	For highly rigid guide systems such as precision machine tools or injection mould clamping units. Above-average loads and moments are absorbed with lowest-possible elastic deformation. Version with preload T3 only available in accuracy classes P1, P01 and P001.

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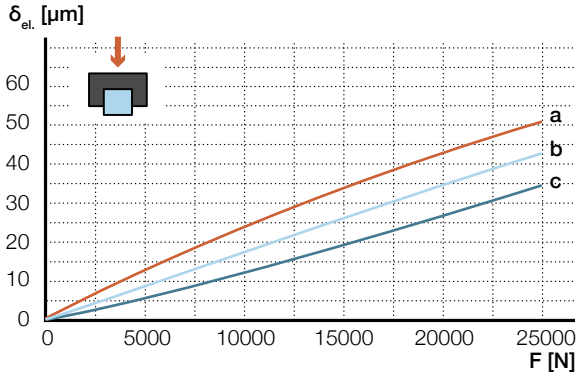
Deflection as a function of preload class and carriage



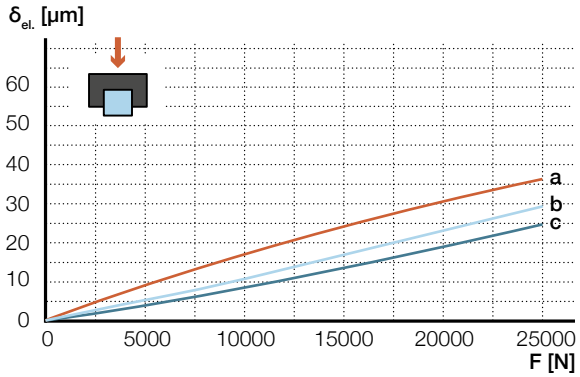
Example:
Carriage LLRHC 35 A,
- **a = Preload 0,02 C (T1)**
- **b = Preload 0,08 C (T2)**
- **c = Preload 0,13 C (T3)**



Example:
Carriage LLRHC 35 LA,
- **a = Preload 0,02 C (T1)**
- **b = Preload 0,08 C (T2)**
- **c = Preload 0,13 C (T3)**



Example:
Carriage LLRHC 35 U,
- **a = Preload 0,02 C (T1)**
- **b = Preload 0,08 C (T2)**
- **c = Preload 0,13 C (T3)**



Example:
Carriage LLRHC 35 LU,
- **a = Preload 0,02 C (T1)**
- **b = Preload 0,08 C (T2)**
- **c = Preload 0,13 C (T3)**

Legend
$\delta_{el.}$ = elastic deformation
F = load

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2.1.4 Accuracy

Accuracy classes and their tolerances

Ewellix profile rail guides are available in five accuracy classes. As shown in the adjacent illustration, the tolerances are defined for each accuracy class. The stated accuracy classes are available for almost all types of profile rail guides. For the designs which can be supplied please refer to the respective table on **page 11**.

Dimensional tolerance in height “H”

The dimensional tolerance in height “H” is the maximum deviation of the height “H” for the carriages on a profile rail (**Table 1**).

Dimensional tolerance in width “N”

The dimensional tolerance in width “N” is the maximum deviation of the “N” dimension for the carriages on a profile rail (**Table 1**).

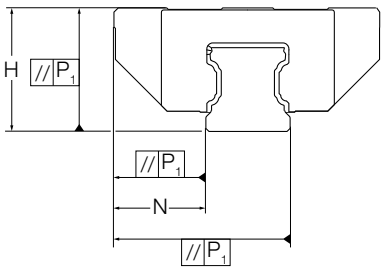
- The “N” dimension designates the distance of the mounting surface of the profile rail from the ground side surface of the carriage.
- The accuracies stated are mean values and relate to the centre of the carriage.

The tolerances should be checked again after the profile rail guide has been mounted on the machine bed.

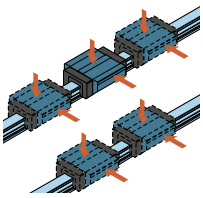
Problem-free interchangeability through precision manufacture

The rail and carriage are produced so precisely by Ewellix, especially in the ball raceway area, that each individ- ual element can be exchanged at any time. For example, a carriage can be used without any problems on dif- ferent rails of the same size. Conversely, various carriages can be used on one rail.

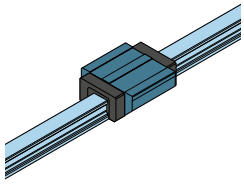
Table 1



Precision class [1]	Tolerances		Differences in dimension H and N on one rail	
	H	N	ΔH max.	ΔN max.
–	µm		µm	
P5	±100	±40	30	30
P3	±40	±20	15	15
P1	±20	±10	7	7
P01	±10	±7	5	5
P001	±5	±5	3	3



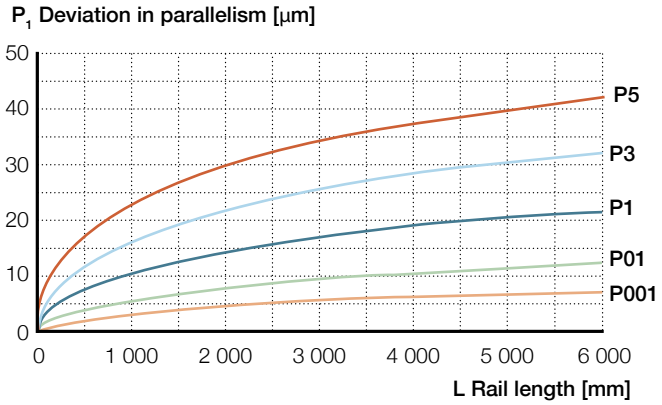
For any combination of carriages and rails over the entire rail length



For different carriages on the same rail position

[1] Measured at the centre of the carriage

Diagram 1



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2.1.5 Selection criteria for combination of accuracy classes

Recommendations for the combination of accuracy classes

Recommended for short strokes and small distances between the carriages: Carriage in higher accuracy class than guide rail. Recommended for long strokes and larger distances between the carriages:

Guide rail in higher accuracy class than carriage.

Running accuracy as selection criterion

By means of perfected ball entry and exit zones in the carriages of accuracy classes P1 and P001, a hitherto unattained running accuracy accompanied by extremely low pul- sation is achieved.

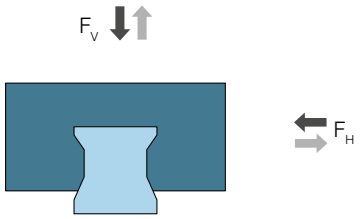
This is particularly suitable for ultra-fine metal cutting operations, metrology, high-precision scanners, erosion techniques etc.

Carriage	Rails	P5	P3	P1	P01	P001
		µm	µm	µm	µm	µm
P5	Tolerance dimension H (µm)	± 100	± 48	± 32	± 23	± 19
	Tolerance dimension N (µm)	± 40	± 28	± 22	± 20	± 19
	Max. difference of dimensions H and N on a rail (µm)	30	30	30	30	30
P3	Tolerance dimension H (µm)	± 88	± 40	± 23	± 23	± 19
	Tolerance dimension N (µm)	± 33	± 20	± 14	± 20	± 19
	Max. difference of dimensions H and N on a rail (µm)	15	15	15	15	15
P1	Tolerance dimension H (µm)	± 84	± 34	± 21	± 11	± 7
	Tolerance dimension N (µm)	± 28	± 16	± 10	± 8	± 7
	Max. difference of dimensions H and N on a rail (µm)	7	7	7	7	7
P01	Tolerance dimension H (µm)	± 83	± 33	± 19	± 10	± 6
	Tolerance dimension N (µm)	± 27	± 15	± 9	± 7	± 6
	Max. difference of dimensions H and N on a rail (µm)	5	5	5	5	5
P001	Tolerance dimension H (µm)	± 82	± 32	± 18	± 9	± 5
	Tolerance dimension N (µm)	± 26	± 14	± 8	± 6	± 5
	Max. difference of dimensions H and N on a rail (µm)	3	3	3	3	3

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2.2 Calculation of bearing loads

Fig. 1



Dynamic equivalent bearing load

For a combined external load – vertical and horizontal – the dynamic equivalent load F is calculated by means of
formula 6. (↳ **fig. 1**)

6) $F = |F_V| + |F_H|$

dynamic equivalent load (N)

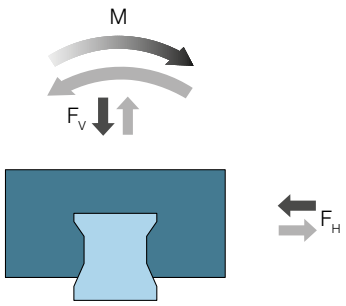
F_V = dynamic external load, vertical (N)

F_H = dynamic external load, horizontal (N)

NOTE: The design of the ball rail guide permits this simplified calculation.

NOTE: If different load stages exist for FV and FH, FV and FH must be calculated individually using **formula 5**. An external load applied at any angle to the carriage must be divided into the proportions F_V and F_H. The amounts are then used in **formula 6.**

Fig. 2



Dynamic equivalent bearing load

For a combined external load – vertical and horizontal – in combination with a torsional moment the dynamic equivalent load F can be calculated using **formula 7.** (↳ **fig. 2**)

7) $F = |F_v| + |F_H| + C \times \frac{|M|}{M_t}$

F = dynamic equivalent load (N)

F_V, F_H = dynamic external loads (N)

M = dynamic torsional moment (Nm)

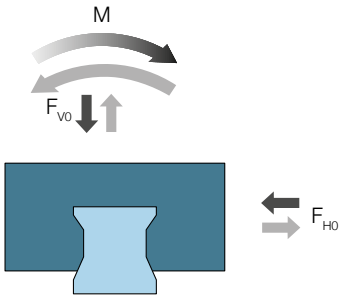
C = basic dynamic load rating (N)

M_t = dynamic permissible moment (Nm)

Formula 7 only applies if a single rail is used.

NOTE: If different load stages exist for F_V and F_H, F_V and F_H must be calculated individually using **formula 5**. An external load applied at any angle to the carriage must be divided into the proportions F_V and F_H The amounts are then used in **formula 7**.

Fig. 3



Static equivalent bearing load

For a combined external static load – vertical and horizontal – in connection with a static torsional moment the static equivalent load F_0 can be calculated using **formula 8**. The static equivalent load F_0 must not exceed the static load rating C_0.

Formula 8 only applies if a single rail is used. (↳ **fig. 3**)

8) $F_0 = |F_{v0}| + |F_{H0}| + C_0 \times \frac{|M_0|}{M_{t0}}$

F_0 = static equivalent load (N)
F_{V0}, F_{H0} = static external loads (N)
M_0 = static torsional moment (Nm)
C_0 = basic static load rating (N)
M_{t0} = static permissible

NOTE: An external load applied at any angle to the carriage must be divided into the proportions F_{V0} and F_{H0}. The amounts are then used in **formula 8**.

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3

Product range



3.1 Carriage data

LLRHC ... SA

Flange short. Standard height



Size design	Ball chain C (N)	No ball chain C (N)	Ball chain C_0 (N)	No ball chain C_0 (N)
15	5 900	6 800	6 700	8 100
20	12 400	12 400	13 600	13 600
25	14 000	15 800	15 200	18 200
30	22 100	22 100	24 800	24 800
35	29 300	29 300	32 400	32 400
45	–	–	–	–

LLRHC ... A

Flange normal. Standard height.



Size design	Ball chain C (N)	No ball chain C (N)	Ball chain C_0 (N)	No ball chain C_0 (N)
15	7 280	7 800	12 100	13 500
20	17 400	18 800	21 700	24 400
25	21 300	22 800	27 300	30 400
30	29 300	31 700	37 200	41 300
35	41 900	41 900	54 000	54 000
45	63 300	68 100	77 100	85 700

LLRHC ... LA

Flange long. Standard height.



Size design	Ball chain C (N)	No ball chain C (N)	Ball chain C_0 (N)	No ball chain C_0 (N)
15	5 900	6 800	6 700	8 100
20	12 400	12 400	13 600	13 600
25	14 000	15 800	15 200	18 200
30	22 100	22 100	24 800	24 800
35	29 300	29 300	32 400	32 400
45	–	–	–	–

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LLRHC ... SU

Slim line short. Standard height.



Size design	Ball chain C (N)	No ball chain C (N)	Ball chain C_0 (N)	No ball chain C_0 (N)
15	5 900	6 800	6 700	8 100
20	12 400	12 400	13 600	13 600
25	14 000	15 800	15 200	18 200
30	22 100	22 100	24 800	24 800
35	29 300	29 300	32 400	32 400
45	–	–	–	–

LLRHC ... U

Slim line normal. Standard height



Size design	Ball chain C (N)	No ball chain C (N)	Ball chain C0 (N)	No ball chain C0 (N)
15	7 280	7 800	12 100	13 500
20	17 400	18 800	21 700	24 400
25	21 300	22 800	27 300	30 400
30	29 300	31 700	37 200	41 300
35	41 900	41 900	54 000	54 000
45	63 300	68 100	77 100	85 700

LLRHC ... LU

Slim line long. Standard height.



Size design	Ball chain C (N)	No ball chain C (N)	Ball chain C_0 (N)	No ball chain C_0 (N)
15	9 000	10 000	17 500	20 200
20	23 100	24 400	32 500	35 200
25	27 500	30 400	39 500	45 500
30	38 000	40 000	53 700	57 800
35	53 000	55 600	75 600	81 000
45	81 900	90 400	111 400	128 500

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LLRHC ... R

Slim line normal. High.



Size design	Ball chain C (N)	No ball chain C (N)	Ball chain C_0 (N)	No ball chain C_0 (N)
15	7 280	7 800	12 100	13 500
25	21 300	22 800	27 300	30 400
30	29 300	31 700	37 200	41 300
35	41 900	41 900	54 000	54 000
45	63 300	68 100	77 100	85 700

LLRHC ... LR

Slim line long. High.



Size design	Ball chain C (N)	No ball chain C (N)	Ball chain C_0 (N)	No ball chain C_0 (N)
25	27 500	30 400	39 50	45 500
30	38 000	40 000	53 700	57 800
35	53 000	55 600	75 600	81 000
45	81 900	90 400	111 400	128 500

Note on dynamic load capacities and moments
Determination of dynamic load capacities and moments is based on a travel life of 100 000 m. However, frequently this is determined on the basis of only 50 000 m. In this case for comparison: multiply values C, M_C and M_A by 1.26 in accordance with Ewellix tables. For carriages with ball chain the permissible moments are reduced in accordance with the load ratings.

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3.1.1 Carriage LLRHC ... SA

Flange short. Standard height.

For type designation see designation system



Dynamic values

Speed v_{max} = 5 m/s

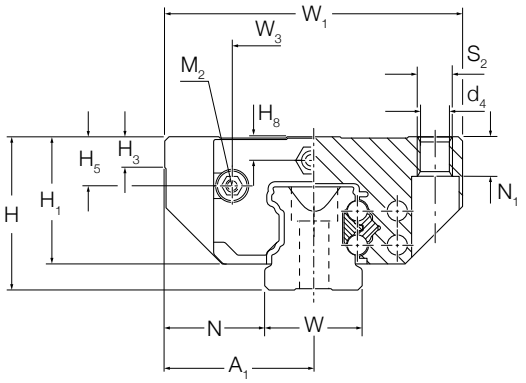
Acceleration a_{max} = 500 m/s^2

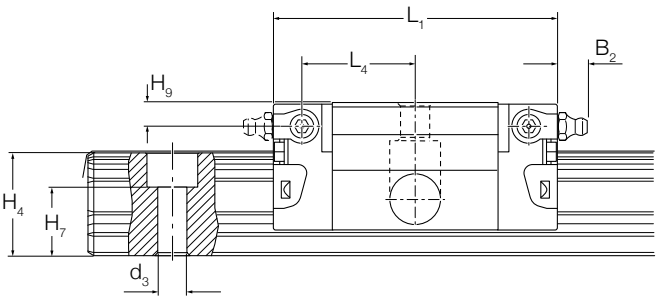
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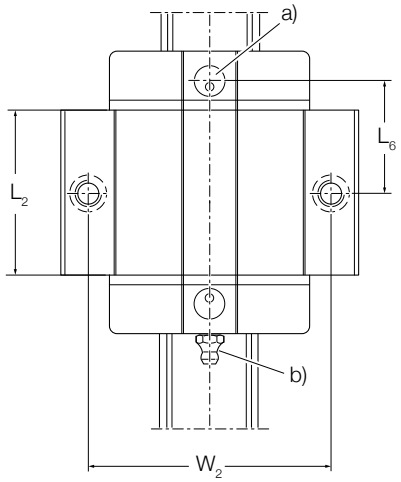
Size	Accuracy class		
		T0	T1
15	P5	LLRHC 15 SA T0 P5	LLRHC 15 SA T1 P5
	P3	LLRHC 15 SA T0 P3	LLRHC 15 SA T1 P3
20	P5	LLRHC 20 SA T0 P5	LLRHC 20 SA T1 P5
	P3	LLRHC 20 SA T0 P3	LLRHC 20 SA T1 P3
25	P5	LLRHC 25 SA T0 P5	LLRHC 25 SA T1 P5
	P3	LLRHC 25 SA T0 P3	LLRHC 25 SA T1 P3
30	P5	LLRHC 30 SA T0 P5	LLRHC 30 SA T1 P5
	P3	LLRHC 30 SA T0 P3	LLRHC 30 SA T1 P3
35	P5	LLRHC 35 SA T0 P5	LLRHC 35 SA T1 P5
	P3	LLRHC 35 SA T0 P3	LLRHC 35 SA T1 P3

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Dimensional drawing







a) For O-ring
Size 15: Ø 4 x 1,0 (mm)
Size 20-35: Ø 5 x 1,0 (mm)
Open lubrication hole as required.
See additional elements:
Mounting of lubrication adapter.

b) Lubrication nipple size 15 and 20: Funnel-type nipple
Type A – Thread size M3 x 5, DIN 3405
B2 = 1,6 mm
When using other nipples, the max. permissible screw depth of 5 mm must be observed!
Size 25 to 35: M6 x 8, DIN 71412
B2 = 9,5 mm
When using other nipples, the max. permissible screw depth of 8 mm must be observed!
Lubrication nipple supplied along with the rail guide (unmounted).
Connection possible at all sides.
If pin holes are needed, please refer to section "Mounting instructions".

Size	Dimensions (mm)																	
	W_1	A_1	W	N	L_1	L_2	H	H_1	H_4 [1]	H_4 [2]	H_3	W_2	W_3	H_5	L_6	L_4	H_8	H_9
15	47	23,5	15	16,0	44,7	25,7	24	19,90	16,30	16,20	5,0	38	24,55	6,70	16,25	17,85	3,20	3,20
20	63	31,5	20	21,5	57,3	31,9	30	25,35	20,75	20,55	6,0	53	32,50	7,30	22,95	22,95	3,35	3,35
25	70	35,0	23	23,5	67,0	38,6	36	29,90	24,45	24,25	7,5	57	38,30	11,50	25,35	26,50	5,50	5,50
30	90	45,0	28	31,0	75,3	45,0	42	35,35	28,55	28,35	7,0	72	48,40	14,60	28,80	30,50	6,05	6,05
35	100	50,0	34	33,0	84,9	51,4	48	40,40	32,15	31,85	8,0	82	58,00	17,35	32,70	34,20	6,90	6,90[1]

[1] Dimension H_4 with cover strip
[2] Dimension H_4 without cover strip

Size	Dimensions (mm)						Weight	Load ratings (N)		Moments (Nm)			
	N_1	H_7 $^{\pm 0,5}$	d_4	S_2	d_3	M_2	(kg)	C dynamic	C_0 static	M_C dynamic	M_{C0} static	M_A dynamic	M_B static
15	5,2	10,3	4,3	M5	4,4	M2,5-3,5 depth	0,15	5 400	8 100	52	80	19	28
20	7,7	13,2	5,3	M6	6,0	M3-5 depth	0,3	12 400	13 600	150	170	52	58
25	9,3	15,2	6,7	M8	7,0	M3-5 depth	0,5	15 900	18 200	230	260	82	94
30	11,0	17,0	8,5	M10	9,0	M3-5 depth	0,8	22 100	24 800	380	430	133	150
35	12,0	20,5	8,5	M10	9,0	M3-5 depth	1,2	29 300	32 400	640	700	200	220

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3.1.2 Carriage LLRHC ... A

Flange normal. Standard height.

For type designation see designation system

Dynamic values
Speed v_{max} = 5 m/s
Acceleration a_{max} = 500 m/s²



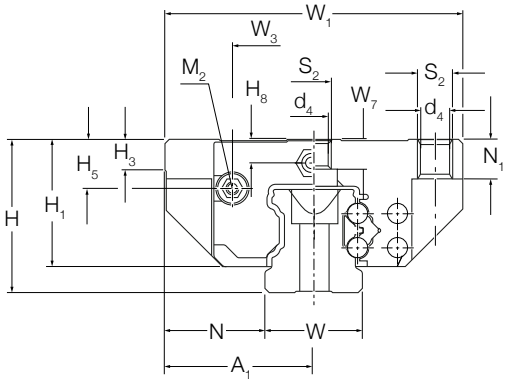
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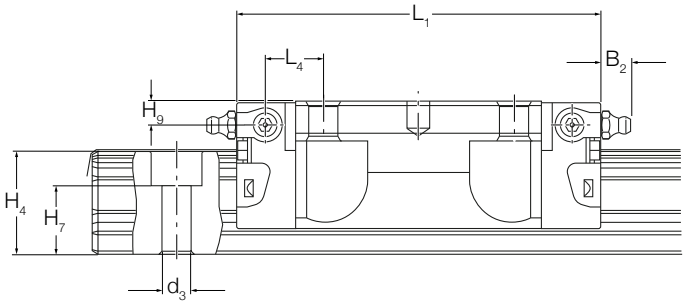
Size	Accuracy class				
		T0	T1	T2	T3
15	P5	**LLRHC 15 A T0 P5**	**LLRHC 15 A T1 P5**	LLRHC 15 A T2 P5	
	P3	**LLRHC 15 A T0 P3**	**LLRHC 15 A T1 P3**	LLRHC 15 A T2 P3	
	P1		LLRHC 15 A T1 P1	LLRHC 15 A T2 P1	LLRHC 15 A T3 P1
	P01		LLRHC 15 A T1 P01	LLRHC 15 A T2 P01	LLRHC 15 A T3 P01
	P001		LLRHC 15 A T1 P001	LLRHC 15 A T2 P001	LLRHC 15 A T3 P001
20	P5	**LLRHC 20 A T0 P5**	**LLRHC 20 A T1 P5**	LLRHC 20 A T2 P5	
	P3	**LLRHC 20 A T0 P3**	**LLRHC 20 A T1 P3**	LLRHC 20 A T2 P3	
	P1		LLRHC 20 A T1 P1	LLRHC 20 A T2 P1	LLRHC 20 A T3 P1
	P01		LLRHC 20 A T1 P01	LLRHC 20 A T2 P01	LLRHC 20 A T3 P01
	P001		LLRHC 20 A T1 P001	LLRHC 20 A T2 P001	LLRHC 20 A T3 P001
25	P5	**LLRHC 25 A T0 P5**	**LLRHC 25 A T1 P5**	LLRHC 25 A T2 P5	
	P3	**LLRHC 25 A T0 P3**	**LLRHC 25 A T1 P3**	LLRHC 25 A T2 P3	
	P1		LLRHC 25 A T1 P1	LLRHC 25 A T2 P1	LLRHC 25 A T3 P1
	P01		LLRHC 25 A T1 P01	LLRHC 25 A T2 P01	LLRHC 25 A T3 P01
	P001		LLRHC 25 A T1 P001	LLRHC 25 A T2 P001	LLRHC 25 A T3 P001
30	P5	**LLRHC 30 A T0 P5**	**LLRHC 30 A T1 P5**	LLRHC 30 A T2 P5	
	P3	**LLRHC 30 A T0 P3**	**LLRHC 30 A T1 P3**	LLRHC 30 A T2 P3	
	P1		LLRHC 30 A T1 P1	LLRHC 30 A T2 P1	LLRHC 30 A T3 P1
	P01		LLRHC 30 A T1 P01	LLRHC 30 A T2 P01	LLRHC 30 A T3 P01
	P001		LLRHC 30 A T1 P001	LLRHC 30 A T2 P001	LLRHC 30 A T3 P001
35	P5	**LLRHC 35 A T0 P5**	LLRHC 35 A T1 P5	LLRHC 35 A T2 P5	
	P3	**LLRHC 35 A T0 P3**	LLRHC 35 A T1 P3	LLRHC 35 A T2 P3	
	P1		LLRHC 35 A T1 P1	LLRHC 35 A T2 P1	LLRHC 35 A T3 P1
	P01		LLRHC 35 A T1 P01	LLRHC 35 A T2 P01	LLRHC 35 A T3 P01
	P001		LLRHC 35 A T1 P001	LLRHC 35 A T2 P001	LLRHC 35 A T3 P001
45	P5	**LLRHC 45 A T0 P5**	**LLRHC 45 A T1 P5**	LLRHC 45 A T2 P5	
	P3	**LLRHC 45 A T0 P3**	**LLRHC 45 A T1 P3**	LLRHC 45 A T2 P3	
	P1		LLRHC 45 A T1 P1	LLRHC 45 A T2 P1	LLRHC 45 A T3 P1
	P01		LLRHC 45 A T1 P01	LLRHC 45 A T2 P01	LLRHC 45 A T3 P01
	P001		LLRHC 45 A T1 P001	LLRHC 45 A T2 P001	LLRHC 45 A T3 P001

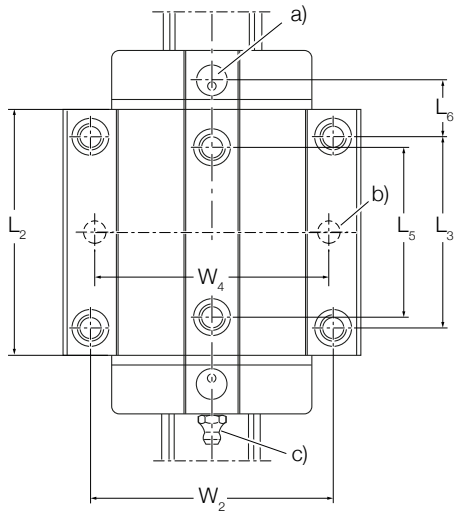
Standard range

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Dimensional drawing







a) For O-ring
Size 15: Ø 4 x 1,0 (mm)
Size 20-35: Ø 5 x 1,0 (mm)
Open lubrication hole as required.
See additional elements: Mounting of lubrication adapter.

b) Recommended position for pin holes (dimensions W4, see “Mounting instructions”)
NB: For production-related reasons there may be pilot drill holes in the middle of the carriage. They are suitable for drilling.

c) Lubrication nipple size 15 and 20: Funnel-type nipple
Type A – Thread size M3 x 5, DIN 3405
B2 = 1,6 mm
When using other nipples, the max. permissible screw depth of 5 mm must be observed!

Size 25 to 45: M6 x 8, DIN 71412
B2 = 9,5 mm
When using other lubrication nipples, the max. permissible screw depth of 8 mm must be observed!
Lubrication nipple supplied with the rail guide (unmounted).
Connection possible at all sides.

Size	Dimensions (mm)																			
	W_1	A_1	W	N	L_1	L_2	H	H_1	H_4 [1]	H_4 [2]	H_3	W_2	L_3	L_5	W_3	H_5	L_6	L_4	H_8	H_9
15	47	23,5	15	16	58	39	24	19,90	16,30	16,20	5,0	38	30	26	24,55	6,70	8,00	9,60	8,00	9,60
20	63	31,5	20	22	75	50	30	25,35	20,75	20,55	6,0	53	40	35	32,50	7,30	11,80	11,80	11,80	11,80
25	70	35,0	23	24	86	58	36	29,90	24,45	24,25	7,5	57	45	40	38,30	11,50	12,45	13,60	12,45	13,60
30	90	45,0	28	31	98	67	42	35,35	28,55	28,35	7,0	72	52	44	48,40	14,60	14,00	15,70	14,00	15,70
35	100	50,0	34	33	111	77	48	40,40	32,15	31,85	8,0	82	62	52	58,00	17,35	14,50	16,00	14,50	16,00
45	120	60,0	45	38	138	97	60	50,30	40,15	39,85	10,0	100	80	60	69,80	20,90	17,30	19,30	17,30	19,30

[1] Dimension H_4 with cover strip
[2] Dimension H_4 without cover strip

Size	Dimensions (mm)							Weight	Load ratings (N)		Moments (Nm)			
	N_1	W_7 ±0,5	H_7 ±0,5	d_4	S_2	d_3	M_2	(kg)	C dynamic	C_0 static	M_C dynamic	M_{C0} static	M_A dynamic	M_B static
15	5,2	4,4	10,3	4,3	M5	4,4	M2,5-3,5 depth	0,20	7 800	13 500	74	130	40	71
20	7,7	5,2	13,2	5,3	M6	6	M3-5 depth	0,45	18 800	24 400	240	310	130	165
25	9,3	7,0	15,2	6,7	M8	7	M3-5 depth	0,65	22 800	30 400	320	430	180	240
30	11,0	7,9	17,0	8,5	M10	9	M3-5 depth	1,10	31 700	41 300	540	720	290	380
35	12,0	10,2	20,5	8,5	M10	9	M3-5 depth	1,60	41 900	54 000	890	1 160	440	565
45	15,0	14,4	23,5	10,4	M12	14	M4-7 depth	3,00	68 100	85 700	1 830	2 310	890	1 130

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3.1.3 Carriage LLRHC ... LA

Flange long. Standard height.

For type designation see designation system

Dynamic values
Speed v_{max} = 5 m/s
Acceleration a_{max} = 500 m/s²



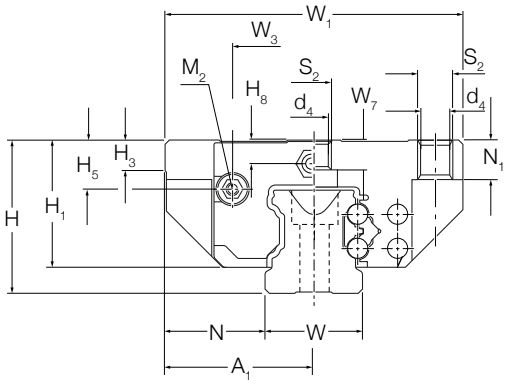
Technical data

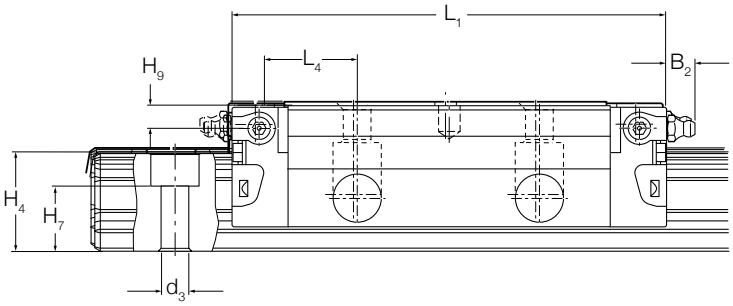
Size	Accuracy class				
		T0	T1	T2	T3
15	P5	**LLRHC 15 LA T0 P5**	**LLRHC 15 LA T1 P5**	LLRHC 15 LA T2 P5	
	P3	**LLRHC 15 LA T0 P3**	**LLRHC 15 LA T1 P3**	LLRHC 15 LA T2 P3	
	P1		LLRHC 15 LA T1 P1	LLRHC 15 LA T2 P1	LLRHC 15 LA T3 P1
	P01		LLRHC 15 LA T1 P01	LLRHC 15 LA T2 P01	LLRHC 15 LA T3 P01
	P001		LLRHC 15 LA T1 P001	LLRHC 15 LA T2 P001	LLRHC 15 LA T3 P001
20	P5	**LLRHC 20 LA T0 P5**	**LLRHC 20 LA T1 P5**	LLRHC 20 LA T2 P5	
	P3	**LLRHC 20 LA T0 P3**	**LLRHC 20 LA T1 P3**	LLRHC 20 LA T2 P3	
	P1		LLRHC 20 LA T1 P1	LLRHC 20 LA T2 P1	LLRHC 20 LA T3 P1
	P01		LLRHC 20 LA T1 P01	LLRHC 20 LA T2 P01	LLRHC 20 LA T3 P01
	P001		LLRHC 20 LA T1 P001	LLRHC 20 LA T2 P001	LLRHC 20 LA T3 P001
25	P5	**LLRHC 25 LA T0 P5**	**LLRHC 25 LA T1 P5**	LLRHC 25 LA T2 P5	
	P3	**LLRHC 25 LA T0 P3**	**LLRHC 25 LA T1 P3**	LLRHC 25 LA T2 P3	
	P1		LLRHC 25 LA T1 P1	LLRHC 25 LA T2 P1	LLRHC 25 LA T3 P1
	P01		LLRHC 25 LA T1 P01	LLRHC 25 LA T2 P01	LLRHC 25 LA T3 P01
	P001		LLRHC 25 LA T1 P001	LLRHC 25 LA T2 P001	LLRHC 25 LA T3 P001
30	P5	**LLRHC 30 LA T0 P5**	**LLRHC 30 LA T1 P5**	LLRHC 30 LA T2 P5	
	P3	**LLRHC 30 LA T0 P3**	**LLRHC 30 LA T1 P3**	LLRHC 30 LA T2 P3	
	P1		LLRHC 30 LA T1 P1	LLRHC 30 LA T2 P1	LLRHC 30 LA T3 P1
	P01		LLRHC 30 LA T1 P01	LLRHC 30 LA T2 P01	LLRHC 30 LA T3 P01
	P001		LLRHC 30 LA T1 P001	LLRHC 30 LA T2 P001	LLRHC 30 LA T3 P001
35	P5	**LLRHC 35 LA T0 P5**	LLRHC 35 LA T1 P5	LLRHC 35 LA T2 P5	
	P3	**LLRHC 35 LA T0 P3**	LLRHC 35 LA T1 P3	LLRHC 35 LA T2 P3	
	P1		LLRHC 35 LA T1 P1	LLRHC 35 LA T2 P1	LLRHC 35 LA T3 P1
	P01		LLRHC 35 LA T1 P01	LLRHC 35 LA T2 P01	LLRHC 35 LA T3 P01
	P001		LLRHC 35 LA T1 P001	LLRHC 35 LA T2 P001	LLRHC 35 LA T3 P001
45	P5	**LLRHC 45 LA T0 P5**	**LLRHC 45 LA T1 P5**	LLRHC 45 LA T2 P5	
	P3	**LLRHC 45 LA T0 P3**	**LLRHC 45 LA T1 P3**	LLRHC 45 LA T2 P3	
	P1		LLRHC 45 LA T1 P1	LLRHC 45 LA T2 P1	LLRHC 45 LA T3 P1
	P01		LLRHC 45 LA T1 P01	LLRHC 45 LA T2 P01	LLRHC 45 LA T3 P01
	P001		LLRHC 45 LA T1 P001	LLRHC 45 LA T2 P001	LLRHC 45 LA T3 P001

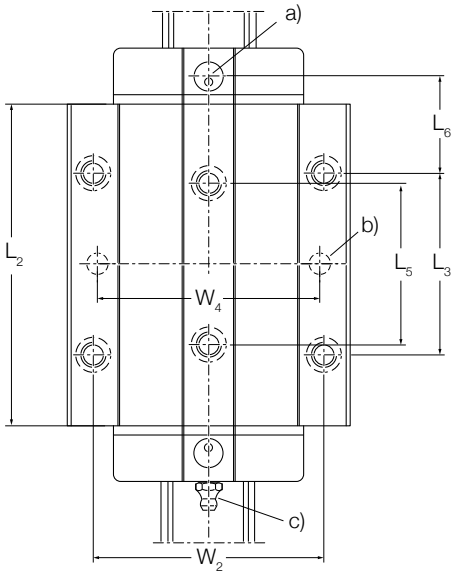
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Dimensional drawing







a) For O-ring
Size 15: Ø 4 x 1,0 (mm)
Size 20-45: Ø 5 x 1,0 (mm)
Open lubrication hole as required.

b) Recommended position for pin holes (dimensions W4, see “Mounting instructions”)
NB: For production-related reasons there may be pilot drill holes in the middle of the carriage. They are suitable for drilling.

c) Lubrication nipple size 15 and 20: Funnel-type nipple Type A – Thread size M3 x 5, DIN 3405 B2 = 1.6 mm
When using other nipples, the max. permissible screw depth of 5 mm must be observed!

Size 25 to 45: M6 x 8, DIN 71412
B_2 = 9.5 mm
When using other lubrication nipples, the max. permissible screw depth of 8 mm must be observed!
Lubrication nipple supplied with the rail guide (unmounted).
Connection possible at all sides.

Size	Dimensions (mm)																		
	W_1	A_1	W	N	L_1	L_2	H	H_1	H_4 [1]	H_4 [2]	H_3	W_2	L_3	L_5	W_3	H_5	L_6	L_4	H_8	H_9
15	47	23,5	15	16,0	72,6	53,6	24	19,90	16,30	16,20	5,0	38	30	26	24,55	6,70	15,20	16,80	3,20	3,20
20	63	31,5	20	21,5	91,0	65,6	30	25,35	20,75	20,55	6,0	53	40	35	32,50	7,30	19,80	19,80	3,35	3,35
25	70	35,0	23	23,5	107,9	79,5	36	29,90	24,45	24,25	7,5	57	45	40	38,30	11,50	23,30	24,45	5,50	5,50
30	90	45,0	28	31,0	119,7	89,4	42	35,35	28,55	28,35	7,0	72	52	44	48,40	14,60	25,00	26,70	6,05	6,05
35	100	50,0	34	33,0	139,0	105,5	48	40,40	32,15	31,85	8,0	82	62	52	58,00	17,35	28,75	30,25	6,90	6,90
45	120	60,0	45	37,5	174,1	133,5	60	50,30	40,15	39,85	10,0	100	80	60	69,80	20,90	35,50	37,50	8,20	8,20

[1] Dimension H_4 with cover strip
[2] Dimension H_4 without cover strip

Size	Dimensions (mm)							Weight	Load ratings (N)		Moments (Nm)			
	N_1	W_7 ±0,5	H_7 ±0,5	d_4	S_2	d_3	M_2	(kg)	C dynamic	C_0 static	M_C dynamic	M_{C0} static	M_A dynamic	M_B static
15	5,2	4,4	10,3	4,3	M5	4,4	M2,5-3,5 depth	0,30	10 000	20 200	130	190	98	150
20	7,7	5,2	13,2	5,3	M6	6	M3-5 depth	0,55	24 400	35 200	310	450	225	330
25	9,3	7,0	15,2	6,7	M8	7	M3-5 depth	0,90	30 400	45 500	430	650	345	510
30	11,0	7,9	17,0	8,5	M10	9	M3-5 depth	1,50	40 000	57 800	690	1 000	495	715
35	12,0	10,2	20,5	8,5	M10	9	M3-5 depth	2,25	55 600	81 000	1 200	1 740	830	1 215
45	15,0	12,4	23,5	10,4	M12	14	M4-7 depth	4,30	90 400	128 500	2 440	3 470	1 700	2 425

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3.1.4 Carriage LLRHC ... SU

Slim line short. Standard height.

For type designation see designation system

Dynamic values
Speed v_{max} = 5 m/s
Acceleration a_{max} = 500 m/s^2



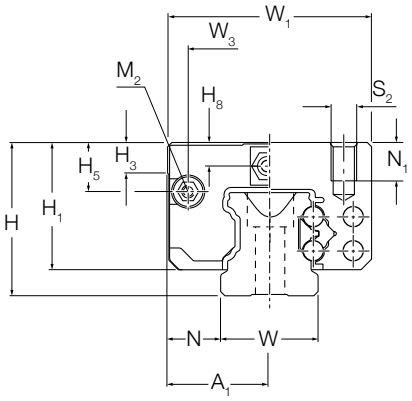
Technical data

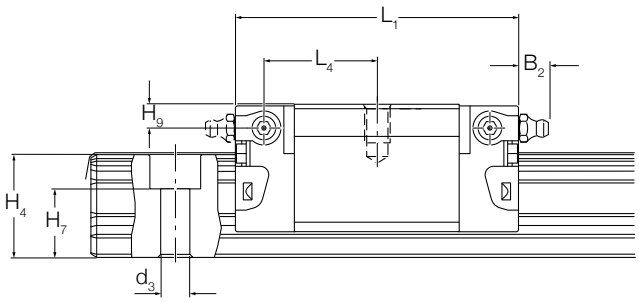
Size	Accuracy class		
		T0	T1
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	P3	**LLRHC 15 SU T0 P3**	**LLRHC 15 SU T1 P3**
	P1	**LLRHC 15 SU T0 P1**	**LLRHC 15 SU T1 P1**
20	P5	**LLRHC 20 SU T0 P5**	**LLRHC 20 SU T1 P5**
	P3	**LLRHC 20 SU T0 P3**	**LLRHC 20 SU T1 P3**
	P1	**LLRHC 20 SU T0 P1**	**LLRHC 20 SU T1 P1**
25	P5	**LLRHC 25 SU T0 P5**	**LLRHC 25 SU T1 P5**
	P3	**LLRHC 25 SU T0 P3**	**LLRHC 25 SU T1 P3**
	P1	**LLRHC 25 SU T0 P1**	**LLRHC 25 SU T1 P1**
30	P5	**LLRHC 30 SU T0 P5**	**LLRHC 30 SU T1 P5**
	P3	**LLRHC 30 SU T0 P3**	**LLRHC 30 SU T1 P3**
	P1	**LLRHC 30 SU T0 P1**	**LLRHC 30 SU T1 P1**
35	P5	**LLRHC 35 SU T0 P5**	**LLRHC 35 SU T1 P5**
	P3	**LLRHC 35 SU T0 P3**	**LLRHC 35 SU T1 P3**
	P1	**LLRHC 35 SU T0 P1**	**LLRHC 35 SU T1 P1**

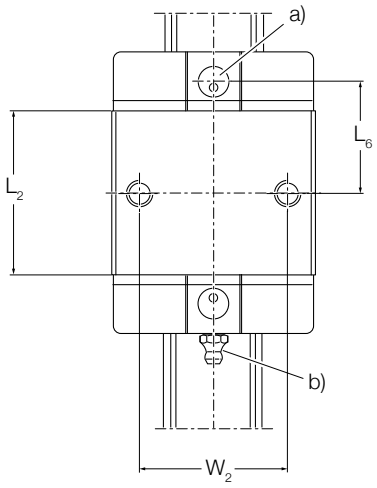
Standard range

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Dimensional drawing







a) For O-ring
Size 15: Ø 4 x 1,0 (mm)
Size 20-35: Ø 5 x 1,0 (mm)
Open lubrication hole as required.

b) Lubrication nipple size 15 and 20: Funnel-type nipple
Type A – Thread size M3 x 5, DIN 3405
B2 = 1,6 mm
When using other nipples, the max. permissible screw depth of 5 mm must be observed!

Size 25 to 35:
M6 x 8, DIN 71412
B2 = 9,5 mm
When using other lubrication nipples, the max. permissible screw depth of 8 mm must be observed!
Lubrication nipple supplied with the rail guide (unmounted).
Connection possible at all sides.
If pin holes are needed, please refer to section "Mounting instructions".

Size	Dimensions (mm)																	
	W_1	A_1	W	N	L_1	L_2	H	H_1	H_4 [1)]	H_4 [2)]	H_3	W_2	W_3	H_5	L_6	L_4	H_8	H_9
15	34	17	15	9,5	44,7	25,7	24	19,90	16,30	16,20	5,0	26	24,55	6,70	16,25	17,85	3,20	3,20
20	44	22	20	12,0	57,3	31,9	30	25,35	20,75	20,55	6,0	32	32,50	7,30	22,95	22,95	3,35	3,35
25	48	24	23	12,5	67,0	38,6	36	29,90	24,45	24,25	7,5	35	38,30	11,50	25,35	26,50	5,50	5,50
30	60	30	28	16,0	75,3	45,0	42	35,35	28,55	28,35	7,0	40	48,40	14,60	28,80	30,50	6,05	6,05
35	70	35	34	18,0	84,9	51,4	48	40,40	32,15	31,85	8,0	50	58,00	17,35	32,70	34,20	6,90	6,90[1)]

[1)] Dimension H_4 with cover strip
[2)] Dimension H_4 without cover strip

Size	Dimensions (mm)					Weight	Load ratings (N)		Moments (Nm)			
	N_1	H_7 ±0,5	S_2	d_3	M_2	(kg)	C dynamic	C_0 static	M_C dynamic	M_{C0} static	M_A dynamic	M_B static
15	6,0	10,3	M4	4,4	M2,5-3,5 depth	0,10	5 400	8 100	52	80	19	28
20	7,5	13,2	M5	6,0	M3-5 depth	0,25	12 400	13 600	150	170	52	58
25	9,0	15,2	M6	7,0	M3-5 depth	0,35	15 900	18 200	230	260	82	94
30	12,0	17,0	M8	9,0	M3-5 depth	0,60	22 100	24 800	380	430	133	150
35	13,0	20,5	M8	9,0	M3-5 depth	0,90	29 300	32 400	640	700	200	220

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3.1.5 Carriage LLRHC ... U

Slim line normal. Standard height.

For type designation see designation system

Dynamic values
Speed v_{max} = 5 m/s
Acceleration a_{max} = 500 m/s^2



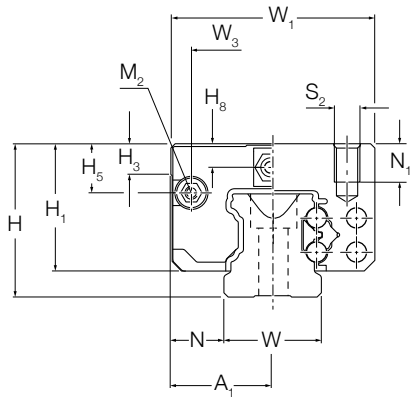
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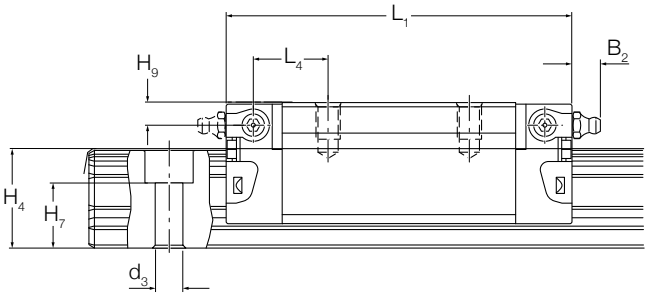
Size	Accuracy class			
		T0	T1	T2
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	P3	**LLRHC 15 U T0 P3**	**LLRHC 15 U T1 P3**	LLRHC 15 U T2 P3
	P1	LLRHC 15 U T0 P1	LLRHC 15 U T1 P1	LLRHC 15 U T2 P1
20	P5	**LLRHC 20 U T0 P5**	**LLRHC 20 U T1 P5**	LLRHC 20 U T2 P5
	P3	**LLRHC 20 U T0 P3**	**LLRHC 20 U T1 P3**	LLRHC 20 U T2 P3
	P1	LLRHC 20 U T0 P1	LLRHC 20 U T1 P1	LLRHC 20 U T2 P1
25	P5	**LLRHC 25 U T0 P5**	**LLRHC 25 U T1 P5**	LLRHC 25 U T2 P5
	P3	**LLRHC 25 U T0 P3**	**LLRHC 25 U T1 P3**	LLRHC 25 U T2 P3
	P1	LLRHC 25 U T0 P1	LLRHC 25 U T1 P1	LLRHC 25 U T2 P1
30	P5	**LLRHC 30 U T0 P5**	**LLRHC 30 U T1 P5**	LLRHC 30 U T2 P5
	P3	**LLRHC 30 U T0 P3**	**LLRHC 30 U T1 P3**	LLRHC 30 U T2 P3
	P1	LLRHC 30 U T0 P1	LLRHC 30 U T1 P1	LLRHC 30 U T2 P1
35	P5	**LLRHC 35 U T0 P5**	**LLRHC 35 U T1 P5**	LLRHC 35 U T2 P5
	P3	**LLRHC 35 U T0 P3**	**LLRHC 35 U T1 P3**	LLRHC 35 U T2 P3
	P1	LLRHC 35 U T0 P1	LLRHC 35 U T1 P1	LLRHC 35 U T2 P1
45	P5	**LLRHC 45 U T0 P5**	**LLRHC 45 U T1 P5**	LLRHC 45 U T2 P5
	P3	**LLRHC 45 U T0 P3**	**LLRHC 45 U T1 P3**	LLRHC 45 U T2 P3
	P1	LLRHC 45 U T0 P1	LLRHC 45 U T1 P1	LLRHC 45 U T2 P1

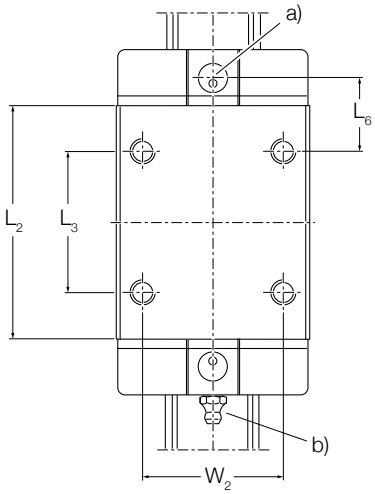
Standard range

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Dimensional drawing







a) For O-ring
Size 15: Ø 4 x 1,0 (mm)
Size 20-45: Ø 5 x 1,0 (mm)
Open lubrication hole as required.

b) Lubrication nipple size 15 and 20: Funnel-type nipple
Type A – Thread size M3 x 5, DIN 3405
B2 = 1,6 mm
When using other nipples, the max. permissible screw depth of 5 mm must be observed!

Size 25 to 45:
M6 x 8, DIN 71412
B2 = 9,5 mm
When using other lubrication nipples, the max. permissible screw depth of 8 mm must be observed!
Lubrication nipple supplied with the rail guide (unmounted).
Connection possible at all sides.
If pin holes are needed, please refer to section "Mounting instructions".

Size	Dimensions (mm)																		
	W_1	A_1	W	N	L_1	L_2	H	H_1	H_4 [1]	H_4 [2]	H_3	W_2	L_3	W_3	H_5	L_6	L_4	H_8	H_9
15	34	17	15	9,5	58,2	39,2	24	19,90	16,30	16,20	5,0	26	26	24,55	6,70	10,00	11,60	3,20	3,20
20	44	22	20	12,0	75,0	49,6	30	25,35	20,75	20,55	6,0	32	36	32,50	7,30	13,80	13,80	3,35	3,35
25	48	24	23	12,5	86,2	57,8	36	29,90	24,45	24,25	7,5	35	35	38,30	11,50	17,45	18,60	5,50	5,50
30	60	30	28	16,0	97,7	67,4	42	35,35	28,55	28,35	7,0	40	40	48,40	14,60	20,00	21,70	6,05	6,05
35	70	35	34	18,0	110,5	77,0	48	40,40	32,15	31,85	8,0	50	50	58,00	17,35	20,50	22,00	6,90	6,90
45	86	43	45	20,5	137,6	97,0	60	50,30	40,15	39,85	10,0	60	60	69,80	20,90	27,30	29,30	8,20	8,20

[1] Dimension H_4 with cover strip
[2] Dimension H_4 without cover strip

Size	Dimensions (mm)					Weight	Load ratings (N)		Moments (Nm)			
	N1	H_7 ±0,5	S_2	d_3	M_2	(kg)	C dynamic	C_0 static	M_C dynamic	M_{C0} static	M_A dynamic	M_B static
15	6,0	10,3	M4	4,4	M2,5-3,5 depth	0,15	7 800	13 500	74	130	40	71
20	7,5	13,2	M5	6,0	M3-5 depth	0,35	18 800	24 400	240	310	130	165
25	9,0	15,2	M6	7,0	M3-5 depth	0,50	22 800	30 400	320	430	180	240
30	12,0	17,0	M8	9,0	M3-5 depth	0,85	31 700	41 300	540	720	290	380
35	13,0	20,5	M8	9,0	M3-5 depth	1,25	41 900	54 000	890	1 160	440	565
45	18,0	23,5	M10	14,0	M4-7 depth	2,40	68 100	85 700	1 830	2 310	890	1 130

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3.1.6 Carriage LLRHC ... LU

Slim line normal. Standard height.

For type designation see designation system

Dynamic values
Speed v_{max} = 5 m/s
Acceleration a_{max} = 500 m/s^2



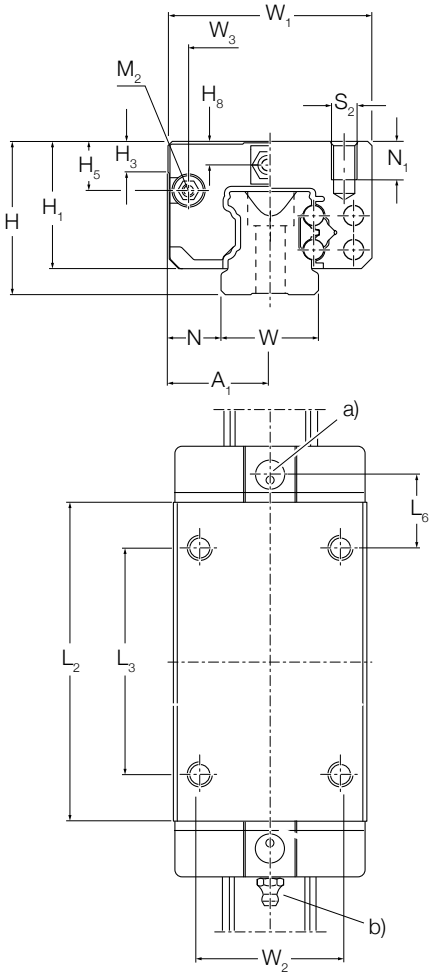
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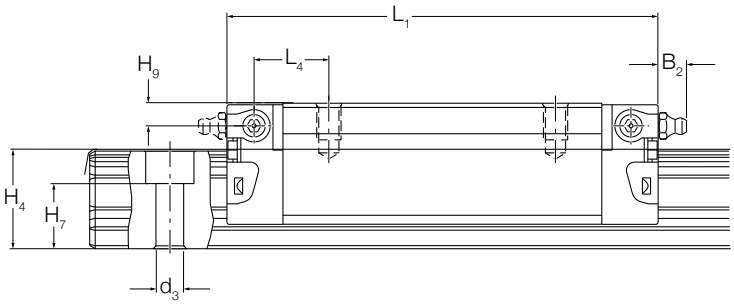
Size	Accuracy class			
		T0	T1	T2
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	P3	**LLRHC 15 LU T0 P3**	**LLRHC 15 LU T1 P3**	LLRHC 15 LU T2 P3
	P1		LLRHC 15 LU T1 P1	LLRHC 15 LU T2 P1
20	P5	**LLRHC 20 LU T0 P5**	**LLRHC 20 LU T1 P5**	LLRHC 20 LU T2 P5
	P3	**LLRHC 20 LU T0 P3**	**LLRHC 20 LU T1 P3**	LLRHC 20 LU T2 P3
	P1		LLRHC 20 LU T1 P1	LLRHC 20 LU T2 P1
25	P5	**LLRHC 25 LU T0 P5**	**LLRHC 25 LU T1 P5**	LLRHC 25 LU T2 P5
	P3	**LLRHC 25 LU T0 P3**	**LLRHC 25 LU T1 P3**	LLRHC 25 LU T2 P3
	P1		LLRHC 25 LU T1 P1	LLRHC 25 LU T2 P1
30	P5	**LLRHC 30 LU T0 P5**	**LLRHC 30 LU T1 P5**	LLRHC 30 LU T2 P5
	P3	**LLRHC 30 LU T0 P3**	**LLRHC 30 LU T1 P3**	LLRHC 30 LU T2 P3
	P1		LLRHC 30 LU T1 P1	LLRHC 30 LU T2 P1
35	P5	**LLRHC 35 LU T0 P5**	**LLRHC 35 LU T1 P5**	LLRHC 35 LU T2 P5
	P3	**LLRHC 35 LU T0 P3**	**LLRHC 35 LU T1 P3**	LLRHC 35 LU T2 P3
	P1		LLRHC 35 LU T1 P1	LLRHC 35 LU T2 P1
45	P5	**LLRHC 45 LU T0 P5**	**LLRHC 45 LU T1 P5**	LLRHC 45 LU T2 P5
	P3	**LLRHC 45 LU T0 P3**	**LLRHC 45 LU T1 P3**	LLRHC 45 LU T2 P3
	P1		LLRHC 45 LU T1 P1	LLRHC 45 LU T2 P1

Standard range

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Dimensional drawing





a) For O-ring
Size 15: Ø 4 x 1,0 (mm)
Size 20-45: Ø 5 x 1,0 (mm)
Open lubrication hole as required.

b) Lubrication nipple size 15 and 20: Funnel-type nipple
Type A – Thread size M3 x 5, DIN 3405
B2 = 1,6 mm
When using other nipples, the max. permissible screw depth of 5 mm must be observed!

Size 25 to 45:
M6 x 8, DIN 71412
B2 = 9,5 mm
When using other lubrication nipples, the max. permissible screw depth of 8 mm must be observed!
Lubrication nipple supplied with the rail guide (unmounted).
Connection possible at all sides.
If pin holes are needed, please refer to section "Mounting instructions".

Size	Dimensions (mm)																		
	W_1	A_1	W	N	L_1	L_2	H	H_1	H_4 [1]	H_4 [2]	H_3	W_2	L_3	W_3	H_5	L_6	L_4	H_8	H_9
15	34	17	15	9,5	72,6	53,6	24	19,90	16,30	16,20	5,0	26	26	24,55	6,70	17,20	18,80	3,20	3,20
20	44	22	20	12,0	91,0	65,6	30	25,35	20,75	20,55	6,0	32	50	32,50	7,30	14,80	14,80	3,35	3,35
25	48	24	23	12,5	107,9	79,5	36	29,90	24,45	24,25	7,5	35	50	38,30	11,50	20,80	21,95	5,50	5,50
30	60	30	28	16,0	119,7	89,4	42	35,35	28,55	28,35	7,0	40	60	48,40	14,60	21,00	22,70	6,05	6,05
35	70	35	34	18,0	139,0	105,5	48	40,40	32,15	31,85	8,0	50	72	58,00	17,35	23,75	25,25	6,90	6,90
45	86	43	45	20,5	174,1	133,5	60	50,30	40,15	39,85	10,0	60	80	69,80	20,90	35,50	37,50	8,20	8,20

[1] Dimension H_4 with cover strip
[2] Dimension H_4 without cover strip

Size	Dimensions (mm)					Weight	Load ratings (N)		Moments (Nm)			
	N1	H_7 ±0,5	S_2	d_3	M_2	(kg)	C dynamic	C_0 static	M_C dynamic	M_{C0} static	M_A dynamic	M_B static
15	6,0	10,3	M4	4,4	M2,5-3,5 depth	0,15	7 800	13 500	74	130	40	71
20	7,5	13,2	M5	6,0	M3-5 depth	0,35	18 800	24 400	240	310	130	165
25	9,0	15,2	M6	7,0	M3-5 depth	0,50	22 800	30 400	320	430	180	240
30	12,0	17,0	M8	9,0	M3-5 depth	0,85	31 700	41 300	540	720	290	380
35	13,0	20,5	M8	9,0	M3-5 depth	1,25	41 900	54 000	890	1 160	440	565
45	18,0	23,5	M10	14,0	M4-7 depth	2,40	68 100	85 700	1 830	2 310	890	1 130

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3.1.7 Carriage LLRHC ... R

Slim line normal. High.

For type designation see designation system

Dynamic values
Speed v_{max} = 5 m/s
Acceleration a_{max} = 500 m/s^2



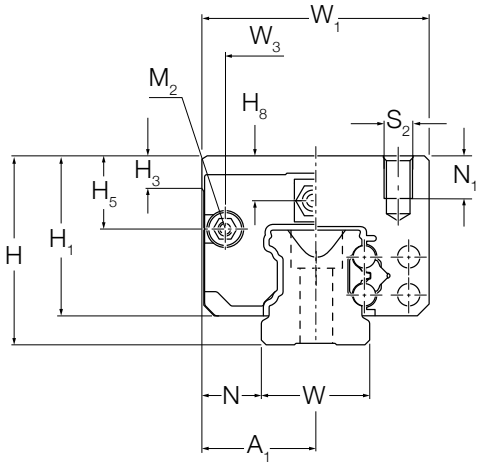
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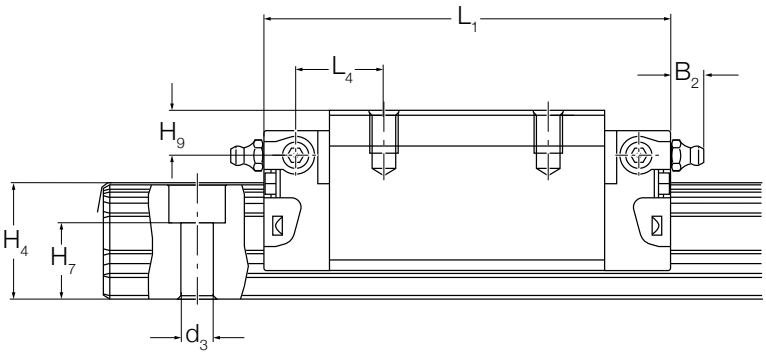
Size	Accuracy class			
		T0	T1	T2
15	P5	**LLRHC 15 R T0 P5**	**LLRHC 15 R T1 P5**	LLRHC 15 R T2 P5
	P3	**LLRHC 15 R T0 P3**	**LLRHC 15 R T1 P3**	LLRHC 15 R T2 P3
	P1		LLRHC 15 R T1 P1	LLRHC 15 R T2 P1
25	P5	**LLRHC 25 R T0 P5**	**LLRHC 25 R T1 P5**	LLRHC 25 R T2 P5
	P3	**LLRHC 25 R T0 P3**	**LLRHC 25 R T1 P3**	LLRHC 25 R T2 P3
	P1		LLRHC 25 R T1 P1	LLRHC 25 R T2 P1
30	P5	**LLRHC 30 R T0 P5**	**LLRHC 30 R T1 P5**	LLRHC 30 R T2 P5
	P3	**LLRHC 30 R T0 P3**	**LLRHC 30 R T1 P3**	LLRHC 30 R T2 P3
	P1		LLRHC 30 R T1 P1	LLRHC 30 R T2 P1
35	P5	**LLRHC 35 R T0 P5**	**LLRHC 35 R T1 P5**	LLRHC 35 R T2 P5
	P3	**LLRHC 35 R T0 P3**	**LLRHC 35 R T1 P3**	LLRHC 35 R T2 P3
	P1		LLRHC 35 R T1 P1	LLRHC 35 R T2 P1
45	P5	**LLRHC 45 R T0 P5**	**LLRHC 45 R T1 P5**	LLRHC 45 R T2 P5
	P3	**LLRHC 45 R T0 P3**	**LLRHC 45 R T1 P3**	LLRHC 45 R T2 P3
	P1		LLRHC 45 R T1 P1	LLRHC 45 R T2 P1

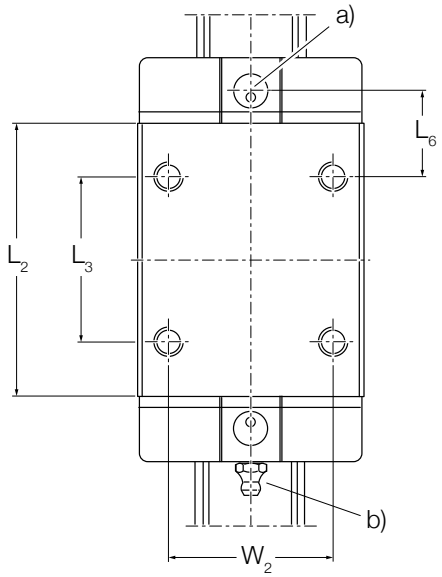
Standard range

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Dimensional drawing







a) For O-ring
Size 15: Ø 4 x 1,0 (mm)
Size 20-45: Ø 5 x 1,0 (mm)
Open lubrication hole as required.

b) Lubrication nipple size 15 and 20: Funnel-type nipple
Type A – Thread size M3 x 5, DIN 3405
B2 = 1,6 mm
When using other nipples, the max. permissible screw depth of 5 mm must be observed!

Size 25 to 45:
M6 x 8, DIN 71412
B2 = 9,5 mm
When using other lubrication nipples, the max. permissible screw depth of 8 mm must be observed!
Lubrication nipple supplied with the rail guide (unmounted).
Connection possible at all sides.
If pin holes are needed, please refer to section "Mounting instructions".

Size	Dimensions (mm)																		
	W_1	A_1	W	N	L_1	L_2	H	H_1	H_4 [1]	H_4 [2]	H_3	W_2	L_3	W_3	H_5	L_6	L_4	H_8	H_9
15	34	17	15	9,5	58,2	39,2	28	23,90	16,30	16,20	5,0	26	26	24,55	10,70	10,00	11,6	7,20	7,20
25	48	24	23	12,5	86,2	57,8	40	33,90	24,45	24,25	7,5	35	35	38,30	15,50	17,45	18,6	9,50	9,50
30	60	30	28	16,0	97,7	67,4	45	38,35	28,55	28,35	7,0	40	40	48,40	17,60	20,00	21,7	9,05	9,05
35	70	35	34	18,0	110,5	77,0	55	47,40	32,15	31,85	8,0	50	50	58,00	24,35	20,50	22,0	13,90	13,90
45	86	43	45	20,5	137,6	97,0	70	60,30	40,15	39,85	10,0	60	60	69,80	30,90	27,30	29,3	18,20	18,20

[1] Dimension H_4 with cover strip
[2] Dimension H_4 without cover strip

Size	Dimensions (mm)					Weight	Load ratings (N)		Moments (Nm)			
	N1	H_7 ±0,5	S_2	d_3	M_2	(kg)	C dynamic	C_0 static	M_C dynamic	M_{C0} static	M_A dynamic	M_B static
15	6	10,3	M4	4,4	M2,5-3,5 depth	0,2	7 800	13 500	74	130	40	71
25	9	15,2	M6	7,0	M3-5 depth	0,6	22 800	30 400	320	430	180	240
30	12	17,0	M8	9,0	M3-5 depth	0,95	31 700	41 300	540	720	290	380
35	13	20,5	M8	9,0	M3-5 depth	1,55	41 900	54 000	890	1 160	440	565
45	18	23,5	M10	14,0	M4-7 depth	3	68 100	85 700	1 830	2 310	890	1 130

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3.1.8 Carriage LLRHC ... LR

Slim line long. High.

For type designation see designation system

Dynamic values
Speed v_{max} = 5 m/s
Acceleration a_{max} = 500 m/s²



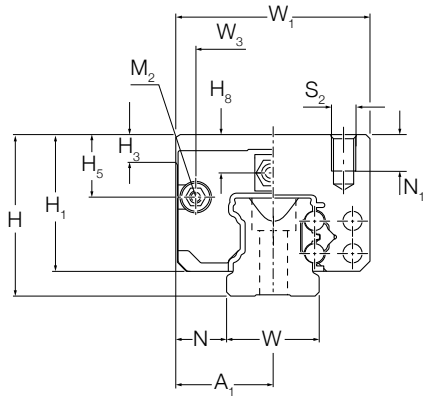
Technical data

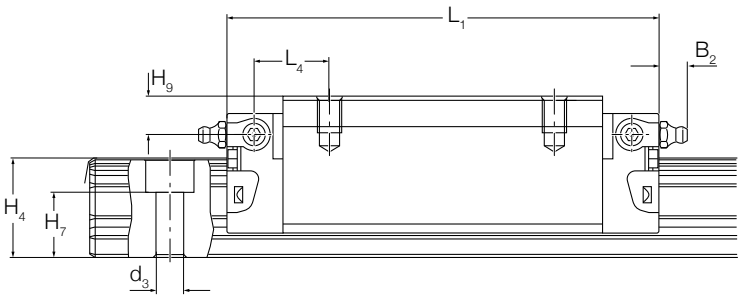
Size	Accuracy class			
		T0	T1	T2
25	P5	**LLRHC 25 LR T0 P5**	**LLRHC 25 LR T1 P5**	LLRHC 25 LR T2 P5
	P3	**LLRHC 25 LR T0 P3**	**LLRHC 25 LR T1 P3**	LLRHC 25 LR T2 P3
	P1		LLRHC 25 LR T1 P1	LLRHC 25 LR T2 P1
30	P5	**LLRHC 30 LR T0 P5**	**LLRHC 30 LR T1 P5**	LLRHC 30 LR T2 P5
	P3	**LLRHC 30 LR T0 P3**	**LLRHC 30 LR T1 P3**	LLRHC 30 LR T2 P3
	P1		LLRHC 30 LR T1 P1	LLRHC 30 LR T2 P1
35	P5	**LLRHC 35 LR T0 P5**	**LLRHC 35 LR T1 P5**	LLRHC 35 LR T2 P5
	P3	**LLRHC 35 LR T0 P3**	**LLRHC 35 LR T1 P3**	LLRHC 35 LR T2 P3
	P1		LLRHC 35 LR T1 P1	LLRHC 35 LR T2 P1
45	P5	**LLRHC 45 LR T0 P5**	**LLRHC 45 LR T1 P5**	LLRHC 45 LR T2 P5
	P3	**LLRHC 45 LR T0 P3**	**LLRHC 45 LR T1 P3**	LLRHC 45 LR T2 P3
	P1		LLRHC 45 LR T1 P1	LLRHC 45 LR T2 P1

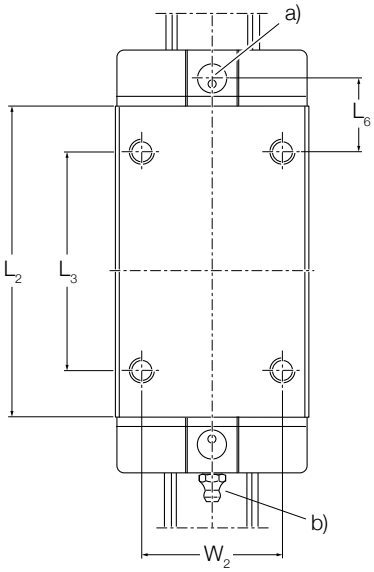
Standard range

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Dimensional drawing







a) For O-ring
Size 15: Ø 4 x 1,0 (mm)
Size 20-45: Ø 5 x 1,0 (mm)
Open lubrication hole as required.

b) Lubrication nipple size 25 to 45: M6 x 8, DIN 71412
B2 = 9,5 mm
When using other lubrication nipples, the max. permissible screw depth of 8 mm must be observed!
Lubrication nipple supplied with the rail guide (unmounted).
Connection possible at all sides.
If pin holes are needed, please refer to section "Mounting instructions".

Size	Dimensions (mm)																		
	W_1	A_1	W	N	L_1	L_2	H	H_1	H_4 [1]	H_4 [2]	H_3	W_2	L_3	W_3	H_5	L_6	L_4	H_8	H_9
25	48	24	23	12,5	107,9	79,5	40	33,90	24,45	24,25	7,5	35	50	38,3	15,50	20,80	21,95	9,50	9,50
30	60	30	28	16	119,7	89,4	45	38,35	28,55	28,35	7,0	40	60	48,4	17,60	21,00	22,70	9,05	9,05
35	70	35	34	18	139,0	105,5	55	47,40	32,15	31,85	8,0	50	72	58,0	24,35	23,75	25,25	13,90	13,90
45	86	43	45	20,5	174,1	133,5	70	60,30	40,15	39,85	10,0	60	80	69,8	30,90	35,50	37,50	18,20	18,20

[1] Dimension H_4 with cover strip
[2] Dimension H_4 without cover strip

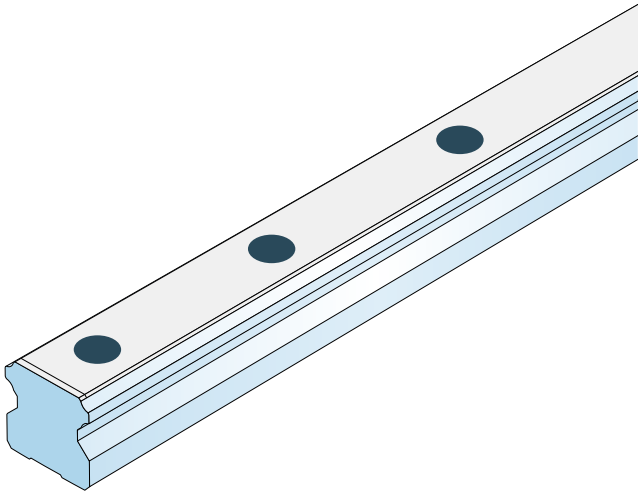
Size	Dimensions (mm)					Weight	Load ratings (N)		Moments (Nm)			
	N1	H_7 ±0,5	S_2	d_3	M_2	(kg)	C dynamic	C_0 static	M_C dynamic	M_{C0} static	M_A dynamic	M_B static
25	9	15,2	M6	7	M3-5 depth	0,8	30 400	45 500	430	650	345	510
30	12	17,0	M8	9	M3-5 depth	1,2	40 000	57 800	690	1 000	495	715
35	13	20,5	M8	9	M3-5 depth	2,1	55 600	81 000	1 200	1 740	830	1 215
45	18	23,5	M10	14	M4-7 depth	4,1	90 400	128 500	2 440	3 470	1 700	2 425

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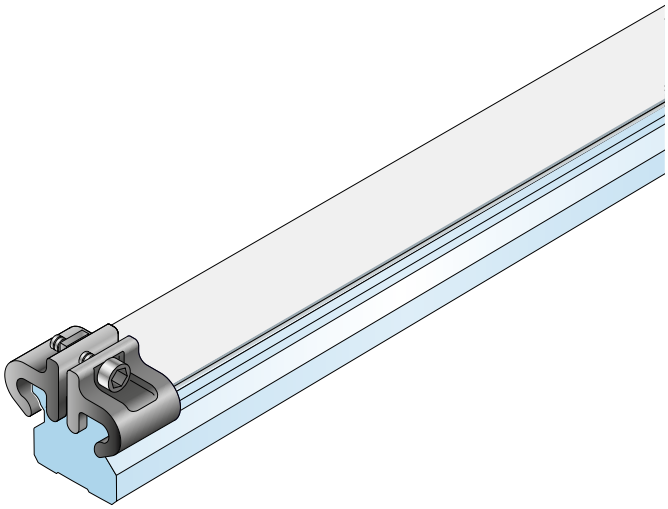
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3.2 Rail data



Rails with protective caps made of plastics

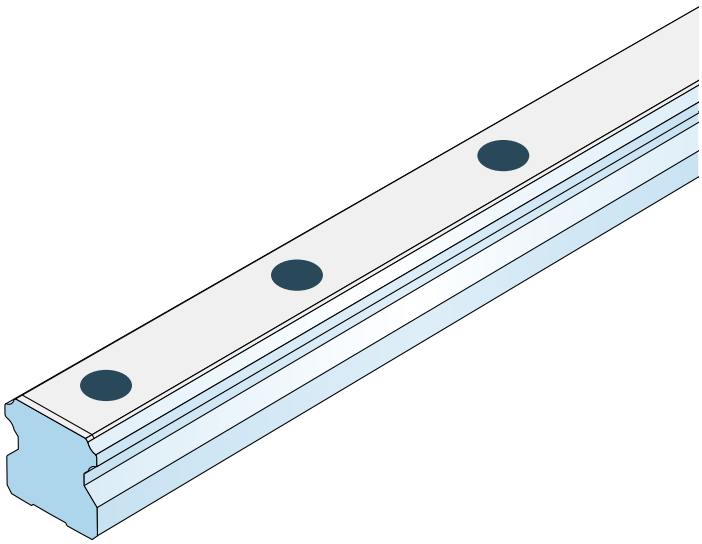


Rails with cover strip and cover strip retaining clamps made of aluminium - without end face threaded holes (not required)

3.2.1 LLRHR rails

For mounting from above with plastic mounting caps (supplied).

NOTE: The rails can also be supplied in several parts.



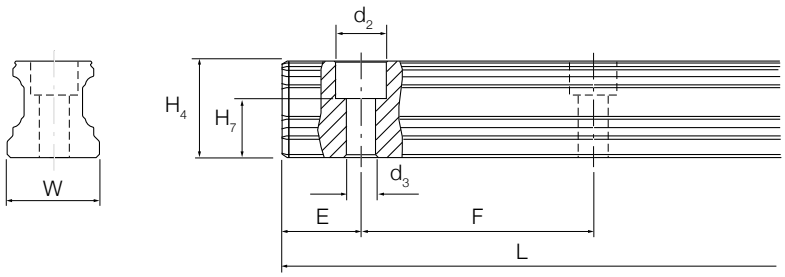
Technical data

Standard rail		Rail one-piece	Rail multi-piece	Pitch T
Size	Accuracy	Designation	Designation	[mm]
15	**P5**	**LLRHR 15 - xxxx P5**	**LLRHR 15 - xxxx P5 A**	60
	P3	**LLRHR 15 - xxxx P3**	**LLRHR 15 - xxxx P3 A**	
	P1	LLRHR 15 - xxxx P1	LLRHR 15 - xxxx P1 A	
	P01	LLRHR 15 - xxxx P01	LLRHR 15 - xxxx P01 A	
	P001	LLRHR 15 - xxxx P001	LLRHR 15 - xxxx P001 A	
20	**P5**	**LLRHR 20 - xxxx P5**	**LLRHR 20 - xxxx P5 A**	60
	P3	**LLRHR 20 - xxxx P3**	**LLRHR 20 - xxxx P3 A**	
	P1	LLRHR 20 - xxxx P1	LLRHR 20 - xxxx P1 A	
	P01	LLRHR 20 - xxxx P01	LLRHR 20 - xxxx P01 A	
	P001	LLRHR 20 - xxxx P001	LLRHR 20 - xxxx P001 A	
25	**P5**	**LLRHR 25 - xxxx P5**	**LLRHR 25 - xxxx P5 A**	60
	P3	**LLRHR 25 - xxxx P3**	**LLRHR 25 - xxxx P3 A**	
	P1	LLRHR 25 - xxxx P1	LLRHR 25 - xxxx P1 A	
	P01	LLRHR 25 - xxxx P01	LLRHR 25 - xxxx P01 A	
	P001	LLRHR 25 - xxxx P001	LLRHR 25 - xxxx P001 A	
30	**P5**	**LLRHR 30 - xxxx P5**	**LLRHR 30 - xxxx P5 A**	80
	P3	**LLRHR 30 - xxxx P3**	**LLRHR 30 - xxxx P3 A**	
	P1	LLRHR 30 - xxxx P1	LLRHR 30 - xxxx P1 A	
	P01	LLRHR 30 - xxxx P01	LLRHR 30 - xxxx P01 A	
	P001	LLRHR 30 - xxxx P001	LLRHR 30 - xxxx P001 A	
35	**P5**	**LLRHR 35 - xxxx P5**	**LLRHR 35 - xxxx P5 A**	80
	P3	**LLRHR 35 - xxxx P3**	**LLRHR 35 - xxxx P3 A**	
	P1	LLRHR 35 - xxxx P1	LLRHR 35 - xxxx P1 A	
	P01	LLRHR 35 - xxxx P01	LLRHR 35 - xxxx P01 A	
	P001	LLRHR 35 - xxxx P001	LLRHR 35 - xxxx P001 A	
45	P5	LLRHR 45 - xxxx P5	LLRHR 45 - xxxx P5 A	105
	P3	LLRHR 45 - xxxx P3	LLRHR 45 - xxxx P3 A	
	P1	LLRHR 45 - xxxx P1	LLRHR 45 - xxxx P1 A	
	P01	LLRHR 45 - xxxx P01	LLRHR 45 - xxxx P01 A	
	P001	LLRHR 45 - xxxx P001	LLRHR 45 - xxxx P001 A	

Standard range
xxxx = rail length

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Dimensional drawing



Size	Dimensions (mm)								Weight
	W_1	H_4	H_7 ±0,5	d_2	d_3	$E_{1\ min}$	F	L_{max}	kg/m
15	15	16,2	10,3	7,4	4,4	10	60	4 000	1,4
20	20	20,55	13,2	9,4	6,0	10	60	4 000	2,4
25	23	24,25	15,2	11,0	7,0	10	60	4 000	3,2
30	28	28,35	17,0	15,0	9,0	12	80	4 000	5,0
35	34	31,85	20,5	15,0	9,0	12	80	4 000	6,8
45	45	39,85	23,5	20,0	14,0	16	105	4 000	10,5

[1] Dimension H_4 with cover strip
[2] Dimension H_4 without cover strip

The “E” dimension designates the distance from the rail end to the centre of the first attachment hole.

If no customer-specific “E” dimension is provided with the order, the rails are produced according to the following formula: The distance of the first and last attachment holes is mediated.

If several possibilities arise, the shorter “E” dimension will be produced!

$$E = \frac{L - (z - 1) \times F}{2}$$

E = Rail end dimension
F = Distance of attachment holes
L = Rail length
z = Number of attachment holes

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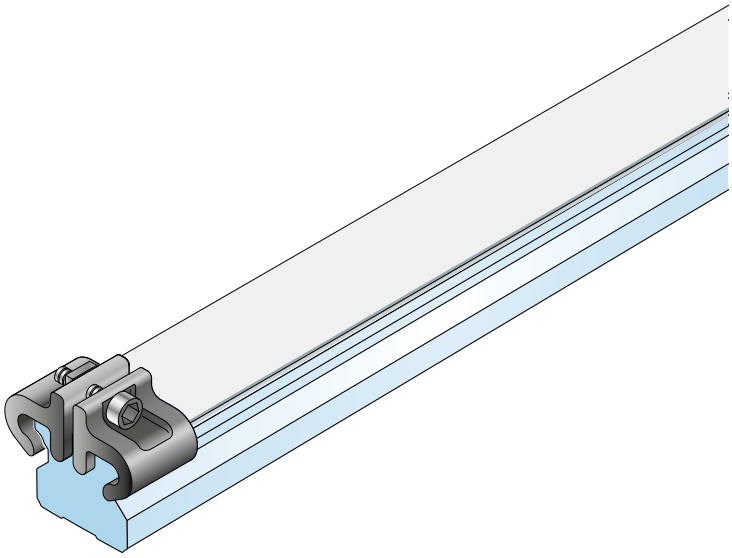
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3.2.2 LLRHR D2 rails

For mounting from above with cover strip and strip retaining clamps.

- Robust cover strip retaining clamps made of aluminium
- Rail without end face threaded holes (not required for cover strip retaining clamps)

NOTE: The rails can also be supplied in several parts.



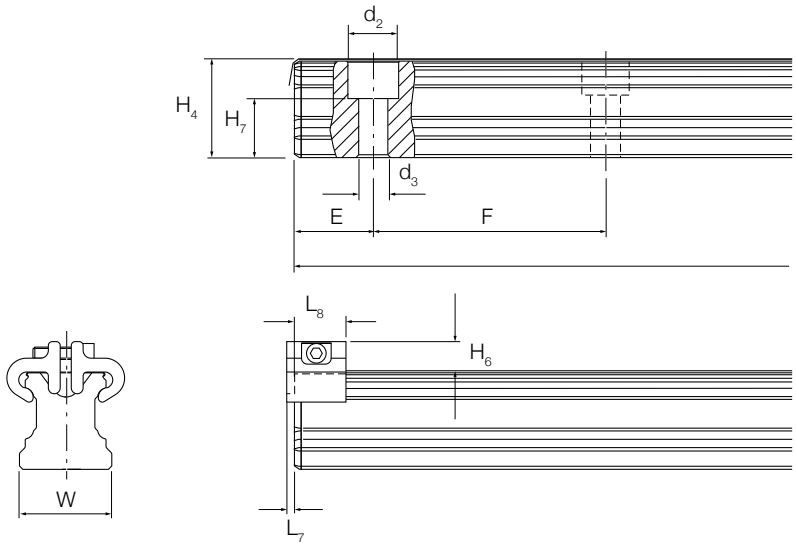
Technical data

Standard rail		Rail one-piece	Rail multi-piece	Pitch
Size	Accuracy	Designation	Designation	[mm]
15	**P5 D2**	**LLRHR 15 - xxxx P5 D2**	**LLRHR 15 - xxxx P5 A D2**	60
	P3 D2	**LLRHR 15 - xxxx P3 D2**	**LLRHR 15 - xxxx P3 A D2**	
	P1 D2	LLRHR 15 - xxxx P1 D2	LLRHR 15 - xxxx P1 A D2	
	P01 D2	LLRHR 15 - xxxx P01 D2	LLRHR 15 - xxxx P01 A D2	
	P001 D2	LLRHR 15 - xxxx P001 D2	LLRHR 15 - xxxx P001 A D2	
20	**P5 D2**	**LLRHR 20 - xxxx P5 D2**	**LLRHR 20 - xxxx P5 A D2**	60
	P3 D2	**LLRHR 20 - xxxx P3 D2**	**LLRHR 20 - xxxx P3 A D2**	
	P1 D2	LLRHR 20 - xxxx P1 D2	LLRHR 20 - xxxx P1 A D2	
	P01 D2	LLRHR 20 - xxxx P01 D2	LLRHR 20 - xxxx P01 A D2	
	P001 D2	LLRHR 20 - xxxx P001 D2	LLRHR 20 - xxxx P001 A D2	
25	**P5 D2**	**LLRHR 25 - xxxx P5 D2**	**LLRHR 25 - xxxx P5 A D2**	60
	P3 D2	**LLRHR 25 - xxxx P3 D2**	**LLRHR 25 - xxxx P3 A D2**	
	P1 D2	LLRHR 25 - xxxx P1 D2	LLRHR 25 - xxxx P1 A D2	
	P01 D2	LLRHR 25 - xxxx P01 D2	LLRHR 25 - xxxx P01 A D2	
	P001	LLRHR 25 - xxxx P001 D2	LLRHR 25 - xxxx P001 A D2	
30	**P5 D2**	**LLRHR 30 - xxxx P5 D2**	**LLRHR 30 - xxxx P5 A D2**	80
	P3 D2	**LLRHR 30 - xxxx P3 D2**	**LLRHR 30 - xxxx P3 A D2**	
	P1 D2	LLRHR 30 - xxxx P1 D2	LLRHR 30 - xxxx P1 A D2	
	P01 D2	LLRHR 30 - xxxx P01 D2	LLRHR 30 - xxxx P01 A D2	
	P001 D2	LLRHR 30 - xxxx P001 D2	LLRHR 30 - xxxx P001 A D2	
35	**P5 D2**	**LLRHR 35 - xxxx P5 D2**	**LLRHR 35 - xxxx P5 A D2**	80
	P3 D2	**LLRHR 35 - xxxx P3 D2**	**LLRHR 35 - xxxx P3 A D2**	
	P1 D2	LLRHR 35 - xxxx P1 D2	LLRHR 35 - xxxx P1 A D2	
	P01 D2	LLRHR 35 - xxxx P01 D2	LLRHR 35 - xxxx P01 A D2	
	P001 D2	LLRHR 35 - xxxx P001 D2	LLRHR 35 - xxxx P001 A D2	
45	**P5 D2**	**LLRHR 45 - xxxx P5 D2**	**LLRHR 45 - xxxx P5 A D2**	105
	P3 D2	**LLRHR 45 - xxxx P3 D2**	**LLRHR 45 - xxxx P3 A D2**	
	P1 D2	LLRHR 45 - xxxx P1 D2	LLRHR 45 - xxxx P1 A D2	
	P01 D2	LLRHR 45 - xxxx P01 D2	LLRHR 45 - xxxx P01 A D2	
	P001 D2	LLRHR 45 - xxxx P001 D2	LLRHR 45 - xxxx P001 A D2	

Standard range
xxxx = rail length

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Dimensional drawing



Size	Dimensions (mm)											Weight
	W_1	H_4	H_7	H_6	L_8	L_7	d_2	d_3	$E_{1\ min}$	F	L_{max}	kg/m
15	15	16,30	10,3	7,3	12	2,0	7,4	4,4	10	60	3 000	1,4
20	20	20,75	13,2	7,1	12	2,0	9,4	6,0	10	60	4 000	2,4
25	23	24,45	15,2	8,2	13	2,0	11,0	7,0	10	60	4 000	3,2
30	28	28,50	17,0	8,7	13	2,0	15,0	9,0	12	80	4 000	5,0
35	34	32,15	20,5	11,7	16	2,2	15,0	9,0	12	80	4 000	6,8
45	45	40,15	23,5	12,5	18	2,2	20,0	14,0	16	105	4 000	10,5

[1] Dimension H_4 with cover strip
[2] Dimension H_4 without cover strip

The “E” dimension designates the distance from the rail end to the centre of the first attachment hole.

If no customer-specific “E” dimension is provided with the order, the rails are produced according to the following formula: The distance of the first and last attachment holes is mediated.

If several possibilities arise, the shorter “E” dimension will be produced!

$$E = \frac{L - (z - 1) \times F}{2}$$

E = Rail end dimension
F = Distance of attachment holes
L = Rail length
z = Number of attachment holes

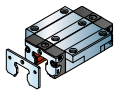
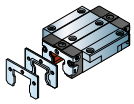
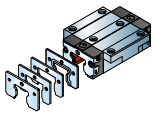
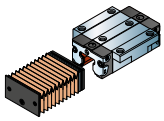
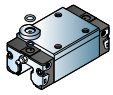
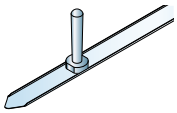
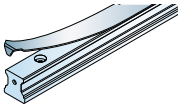
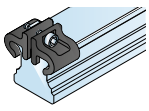
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3.3 Accessories

Accessories Item name	Illustration [1]	Purpose
Scraper plate		Scraper plates are spring-steel, non-contact components. They protect the front seal from coarse contaminants or hot metal chips.
Two-piece front seal		Additional front seals are contact seals that can be attached to the carriage end faces. They are singlelip seals consisting of special heavy-duty material and offer additional protection against liquids and smaller contaminants.
Sealing kit		The seal kit consists of a metal scraper and an additional front seal. It is intended for applications involving exposure to coarse and fine dirt as well as liquids.
Bellows		Bellows protect the entire system against solid and liquid contaminants from above. They are suitable for highly contaminated environments like machining centres in the woodworking and metals industries.
Lubrication adapter		
Expanding mandrel		
Loose cover strip		
Cover strip retaining clamps made of aluminium		

[1] Appearance can vary slightly depending on the size

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3.3.1 Scraper plate

Material:

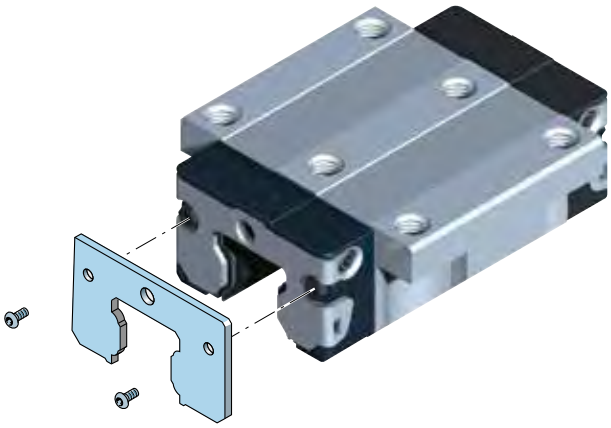
stainless spring steel to DIN EN 10088

- Condition: bright
- Precision design with 0,2 to 0,3 mm maximum gap measurement

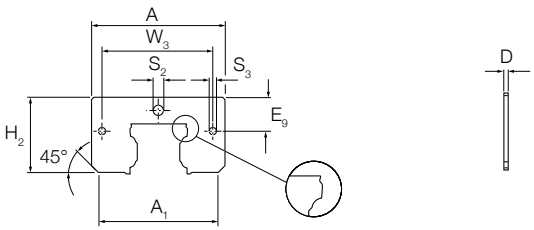
Mounting:

Fastening screws are supplied. During mounting please ensure an even gap between the rail and scraper plate. Scraper plate for rails with and without cover strip

NOTE: Use in combination with two-piece front seal kit LLRHZxxS3.



Dimensional drawing



Technical data

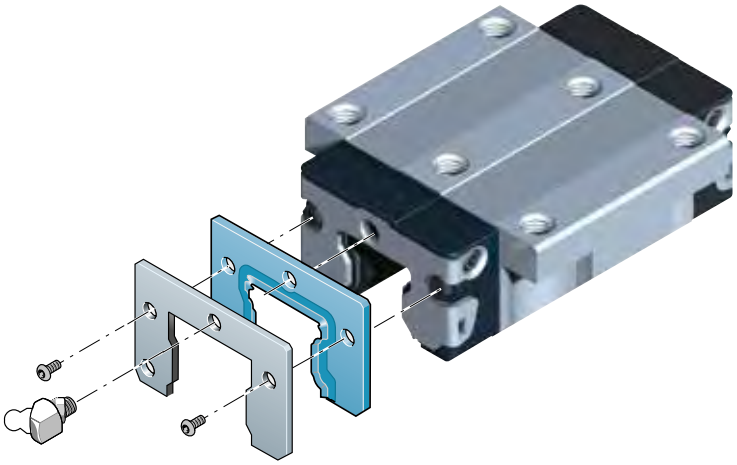
Size	Part numbers	Dimensions (mm)								Weight (g)
		A	A_1	H_2	W_3	E_9	S_2	S_3	D	
15	LLRHZ 15 S1	33	26,4	19,2	24,6	6,3	4,6	3,5	1,0	4
20	LLRHZ 20 S1	42	40,0	24,8	32,4	6,8	5,1	4,0	1,0	6
25	LLRHZ 25 S1	47	41,6	29,5	38,3	11,0	7,0	4,0	1,0	8
30	LLRHZ 30 S1	59	52,8	34,7	48,4	14,1	7,0	4,0	1,0	12
35	LLRHZ 35 S1	69	60,9	40,1	58,0	17,0	7,0	4,0	1,0	16
35*	LLRHZ 35 S1 CS	69	60,9	40,1	58,0	17,0	7,0	4,0	1,0	16
45	LLRHZ 45 S1	85	76,7	50,0	69,8	20,5	7,0	5,0	2,0	50
45*	LLRHZ 45 S1 CS	85	76,7	50,0	69,8	20,5	7,0	5,0	2,0	50

* Scraper plates in combination with cover strip

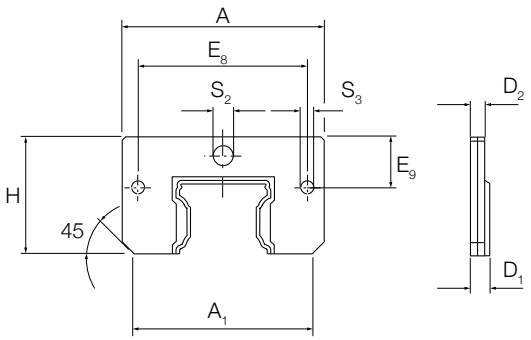
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3.3.2 Two-piece front seal

Additional front seals are contact seals that can be attached to the carriage end faces. They are singlelip seals consisting of special heavy-duty material and offer additional protection against liquids and smaller contaminants.



Dimensional drawing



Technical data

Size	Part numbers	Dimensions (mm)										Weight (g)
		A	A_1	H_2	W_3	E_9	S_2	S_3	D_1	D_2		
15	LLRHZ	15 S2	32	27	19,0	24,55	6,3	3,5	3,5	3,0	2,2	6
20	LLRHZ	20 S2	42	39	24,3	32,40	6,8	5,1	4,0	3,3	2,5	8
25	LLRHZ	25 S2	47	42	29,0	38,30	11,0	7,0	4,0	3,3	2,5	10
30	LLRHZ	30 S2	59	53	34,5	48,40	14,1	7,0	4,0	4,5	3,3	18
35	LLRHZ	35 S2	69	61	39,5	58,00	17,0	7,0	4,0	4,5	3,3	25
45	LLRHZ	45 S2	85	77	49,5	69,80	20,5	7,0	5,0	5,5	4,0	55

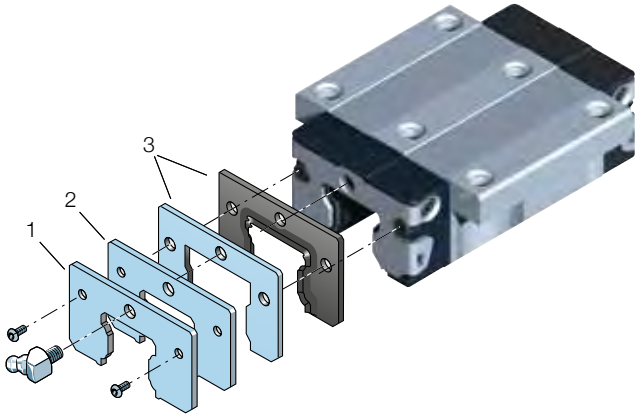
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3.3.3 Seal kit

The seal kit consists of the following components:

1. Scraper plate
2. Support plate
3. Two-piece front seal



Technical data

Size	Seal kit Designation
15	LLRHZ 15 S3
20	LLRHZ 20 S3
25	LLRHZ 25 S3
30	LLRHZ 30 S3
35	LLRHZ 35 S3
35 CS*	LLRHZ 35 S3 CS
45	LLRHZ 45 S3
45 CS*	LLRHZ 45 S3 CS

* Seal kit in combination with cover strip

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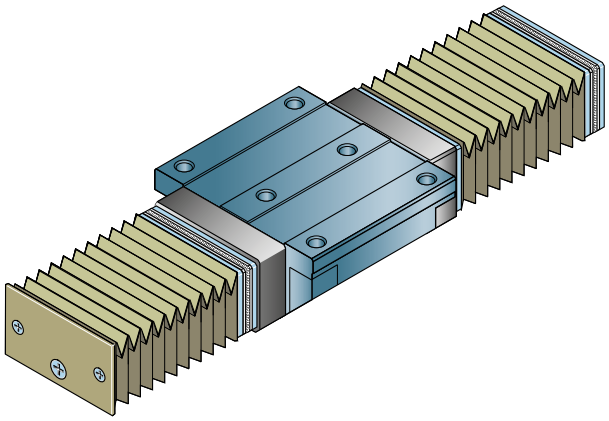
3.3.4 Bellows

Material:

Bellows are made out of polyester fabric with polyurethane coating

Adapter plates are made out of aluminium.

The lubrication nipple on the carriage can be used.



Technical data

Size	Type 2  with fastening plate for the carriage and end plate for the rail	Type 4  with two fastening plates for the carriages	Type 9  loose bellows (spare part)
15	LLRHB 15 B2 xx	LLRHB 15 B4 xx	LLRHB 15 xx
20	LLRHB 20 B2 xx	LLRHB 20 B4 xx	LLRHB 20 xx
25	LLRHB 25 B2 xx	LLRHB 25 B4 xx	LLRHB 25 xx
30	LLRHB 30 B2 xx	LLRHB 30 B4 xx	LLRHB 30 xx
35	LLRHB 35 B2 xx	LLRHB 35 B4 xx	LLRHB 35 xx
45	LLRHB 45 B2 xx	LLRHB 45 B4 xx	LLRHB 45 xx

xx = Number of folds

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3.3.5 Lubrication adapter

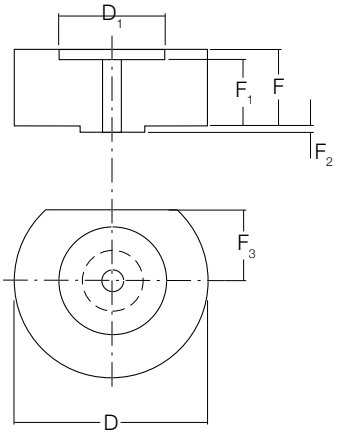
For high carriages: LLRHC_R LLRHC_LR

- Material: plastic
- Contents: 1 piece

Mounting: O-rings are supplied.



Dimensional drawing



Technical data

Size	Part numbers	Dimensions (mm)						
		D	D_1	D_2	F	F_1	F_2	F_3
15	LLRHZ 15 0	12	6,2	3,4	3,7	3,1	0,5	3,20
25	LLRHZ 25 0	15	7,2	4,4	3,8	3,2	0,5	5,85
30	LLRHZ 30 0	16	7,2	4,4	2,8	2,2	0,5	6,10
35	LLRHZ 35 0	18	7,2	4,4	6,8	6,2	0,5	6,80
45	LLRHZ 45 0	20	7,2	4,4	9,8	9,2	0,5	8,30

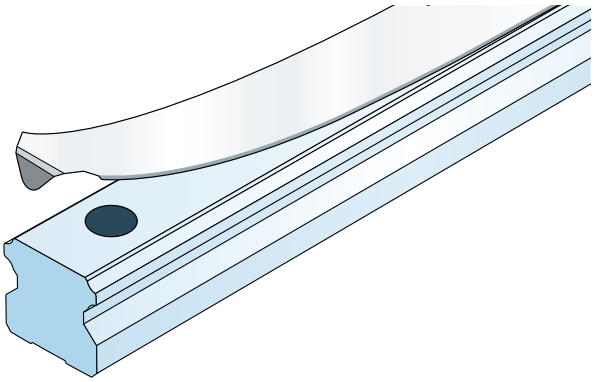
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3.3.6 Cover strip

Advantages of the cover strip

The cover strip can be simply clipped on and pulled off.

- This considerably simplifies and quickens mounting:
  - It is not necessary to close every single drill hole
  - It is not necessary to wait for the adhesive to set on adhesive strips.
- Multiple mounting and removal is possible (up to 4 times)



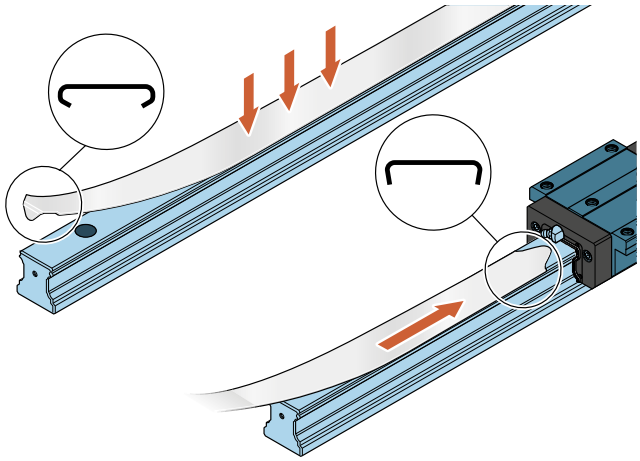
Cover strip with fixed seat (standard)

- The cover strip is clipped on before the carriages are mounted and stays firmly in place.

With an optionally available expanding mandrel for 0,15 mm cover strips or a special expanding tool for 0,3 mm cover strips a slide can also be retroactively created in order to remove a cover strip.

In particular, however, the slide length X can be optimally adapted to the specific application.

Please observe the precise mounting instructions!



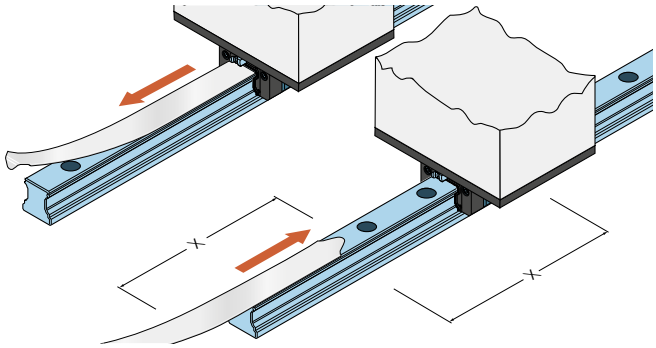
Cover strip for initial mounting/ stock/ replacement

For each guide rail length a matching cover strip with fixed seat can be supplied.

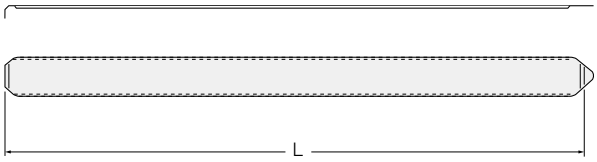
Ordering a standard cover strip with fixed seat

Example:
Rail Size 35,
Rail length L = 2 696 mm
LLRHZ 15 – 2 969 CS

(For order designation see product table)



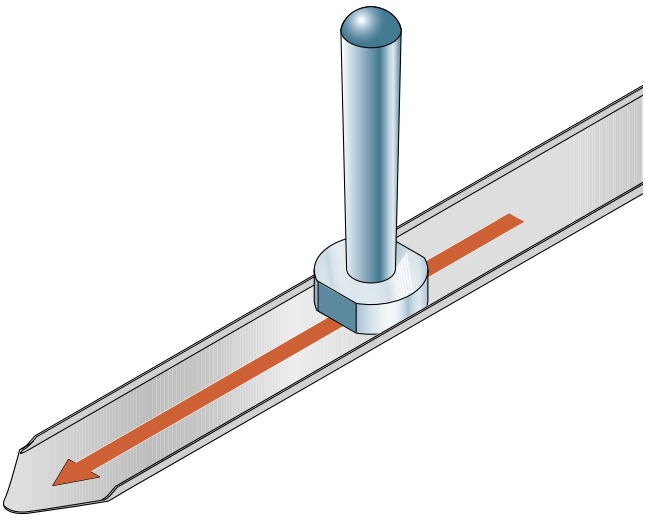
Size	Standard cover strips Order designation, length (mm)
15	LLRHZ 15 - xxx CS
20	LLRHZ 20 - xxx CS
25	LLRHZ 25 - xxx CS
30	LLRHZ 30 - xxx CS
35	LLRHZ 35 - xxx CS
45	LLRHZ 45 - xxx CS



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3.3.7 Expanding mandrel to create a slide on the cover strip

Size	Expanding mandrel Order designation
15	LLRHZ 15 W
20	LLRHZ 20 W
25	LLRHZ 25 W
30	LLRHZ 30 W
35	LLRHZ 35 W
45	LLRHZ 45 W



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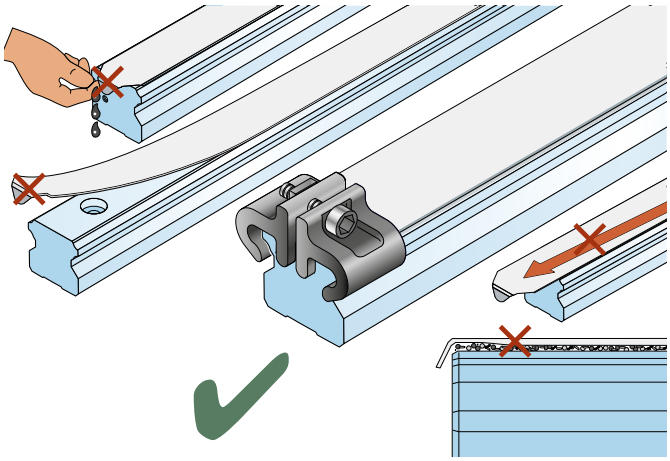
3.3.8 Cover strip retaining clamps

For guide rails without end-face threaded holes.

Ewellix recommends the use of cover strip retaining clamps.

These can:

- prevent unintentional removal of the strip and incursion of dirt
- fix the cover strip in place

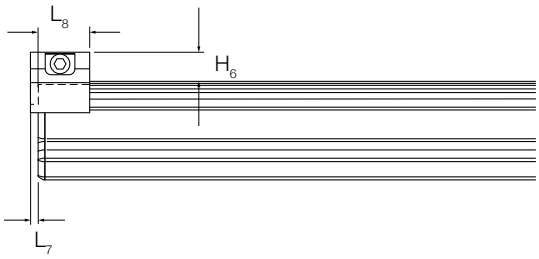


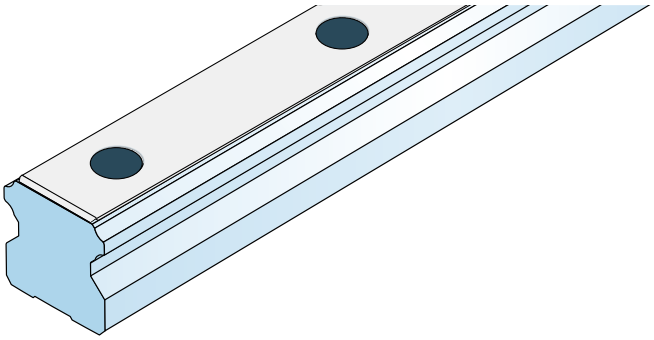
Materials:

Retaining clamps made of aluminium, black anodised. Clamping screw and nut made of corrosion-resistant steel.

Order designations for cover strip retaining clamps

Dimensional drawing





Plastic caps are supplied as standard if a cover strip has not been ordered.

Technical data

Size	Retaining clamps (2 pieces per unit) Order designation		Dimensions (mm)		
			H_6	L_7	L_8
15	LLR 15 CSG		7,3	2,0	12
20	LLR 20 CSG		7,1	2,0	12
25	LLR 25 CSG		8,2	2,0	13
30	LLR 30 CSG		8,7	2,0	13
35	LLR 35 CSG		11,7	2,2	16
45	LLR 45 CSG		12,5	2,2	18

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Mounting instruction and maintenance

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4.1 Design rules

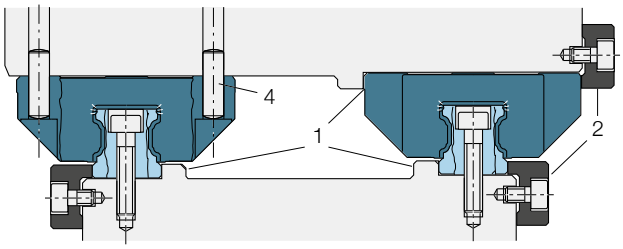
4.1.1 General instructions

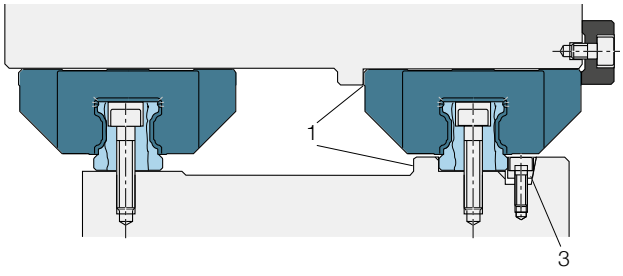
The following mounting instructions apply to all profile rail guides.

Please note, however, that differ-ing specifications exist concerning the parallelism of the rails as well as the screwing and pinning of the car-riages. These are therefore assigned to the individual versions.

Ball profile rail guides. are high-quality products. Greatest possible care should be taken during trans-port and subsequent assembly. All steel parts have been oil-protected. The protection materials do not need to be removed if the recom-mended lubricants are used.

Detailed mounting instructions are available through your normal Ewellix contact.





4.1.2 Assembly examples

Rails

Each rail has ground reference edges on both sides.

Options for lateral fixing:

1. Stop edges
2. Clamp strips
3. Wedge strips

NOTE: The rail must have a chamfer to prevent the seal from being dam-aged. This is not the case for joint rail tracks

Rails without lateral fixing must be aligned straight and parallel during assembly, preferably using an auxil-iary strip.

(Guide values for the permissible lateral force without additional later-al fixing can be obtained from the information for the individual ver-sions).

Carriage

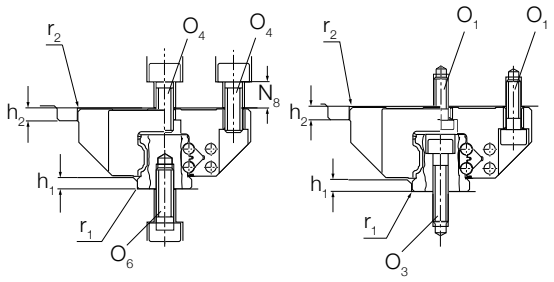
Each carriage has a ground refer-ence edge on one side (<dimension H3 in the dimensional drawings). Additional fixing options:

1. Reference edges
2. Retaining strips
3. Clamp strips
4. Pinning

NOTE: After being successfully mounted the carriage should move easily when pushed.

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4.1.3 Stop edges, corner radii, screw sizes and tightening torques



Carriages made of steel, type A, LA

- Standard width

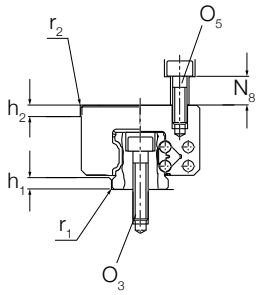
Rails

- Can be screwed from above

Carriages made of steel, type U, LU, R, LR

Rails

- Can be screwed from above



The combinations shown are examples. In principle all carriages can be combined with all rails.

Technical data

Size	Dimensions					Screw						
	h_1 min	max	r_1 max	h_2	r_2 max	O_1 DIN 912 4 Pieces	O_2 [2] DIN 6912 2 Pieces	O_4 [1][2] DIN 912 6 Pieces	O_5 DIN 912 4 Pieces	O_3 DIN 912	O_6 DIN 912	N_8
–	mm											mm
15	2,5	3,5	0,4	4	0,6	M4x12	M4x10	M5x12	M4x12	M4x20	M5x12	6
20	2,5	4,0	0,6	5	0,6	M5x16	M5x12	M6x16	M5x16	M5x25	M6x16	9
25	3,0	5,0	0,8	5	0,8	M6x20	M6x16	M8x20	M6x18	M6x30	M6x20	10
30	3,0	5,0	0,8	6	0,8	M8x25	M8x16	M10x20	M8x20	M8x30	M8x20	10
35	3,5	6,0	0,8	6	0,8	M8x25	M8x20	M10x25	M8x25	M8x35	M8x25	13
45	4,5	8,0	0,8	8	0,8	M10x30	M10x25	M12x30	M10x30	M12x45	M12x30	14

Dimensions and guide values for permissible lateral force without additional lateral fixing

	Screw strength class	Carriages			Rails		
Carriages A, U, R	8.8	0,11 C	0,15 C[3]	0,23 C	0,11 C	0,06 C	0,06 C
	12.9	0,18 C	0,22 C[3]	0,35 C	0,18 C	0,10 C	0,10 C
Carriages LA, LU, LR	8.8	0,08	C 0,13 C[3]	0,18 C	0,08 C	0,04 C	0,04 C
	12.9	0,14 C	0,18 C[3]	0,26 C	0,14 C	0,07 C	0,07 C

[1] If the carriage is fastened from above with only four O_4 screws:
- permissible lateral force 1/3 lower
- lower stiffness

[2] If the carriage is fastened with 6 screws:
Tighten the middle screws with a tightening torque for strength class 8.8

[3] If fastened with two O_2 screws and four O_1 screws

Tightening torques of the fixing screws in Nm

	M4	M5	M6	M8	M10	M12	M14	M16
8.8	2,7	5,5	9,5	23	46	80	125	195
12.9	4,6	9,5	16	39	77	135	215	340

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Carriages SA

- Standard width, short

Rails

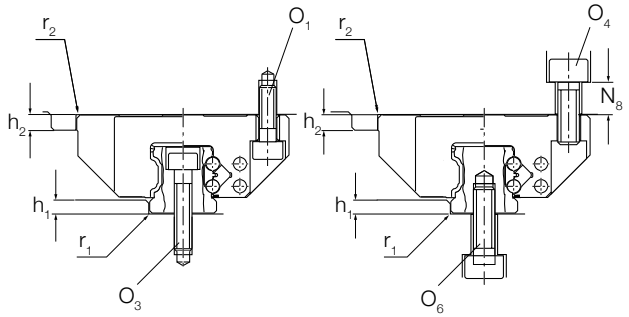
- Can be screwed from above

Carriages SU

- Slim line short

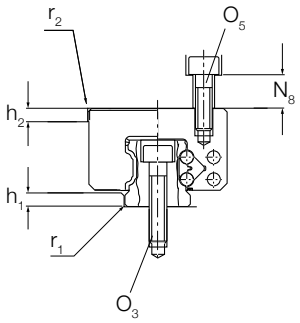
Rails

- Can be screwed from above



NOTE: The combinations shown are examples. In principle all carriages can be combined with all rails.

The screw connection for the carriages using 2 screws is completely adequate to withstand the maximum load. (See maximum load ability and moment loadability for the individual versions.)



Technical data

Size	Dimensions						Screw				
	h_1 min	max	r_1 max	h_2	r_2 max	O_1 DIN 912	O_4 DIN 912	O_5 DIN 912	O_3 DIN 912	O_6 DIN 912	N_8
–	mm					2 Pieces	2 Pieces	2 Pieces	Rail	Rail	mm
15	2,5	3,5	0,4	4	0,6	M4x12	M5x12	M4x12	M4x20	M5x12	6
20	2,5	4,0	0,6	5	0,6	M5x16	M6x16	M5x16	M5x25	M6x16	9
25	3,0	5,0	0,8	5	0,8	M6x20	M8x20	M6x18	M6x30	M6x20	10
30	3,0	5,0	0,8	6	0,8	M8x25	M10x20	M8x20	M8x30	M8x20	10
35	3,5	6,0	0,8	6	0,8	M8x25	M10x25	M8x25	M8x35	M8x25	13

Dimensions and guide values for permissible lateral force without additional lateral fixing

Screw strength class	Carriages			Rails		
8.8	0,08 C	0,12 C	0,08 C	0,09 C	0,09 C	0,04 C
12.9	0,13 C	0,21 C	0,13 C	0,15 C	0,15 C	0,07 C

Tightening torques of the fixing screws in Nm

		M4	M5	M6	M8	M10	M12	M14	M16
	8.8	2,7	5,5	9,5	23	46	80	125	195
	12.9	4,6	9,5	16	39	77	135	215	340

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4.1.4 Pinning

Carriage standard width A, LA,slim line U, LU, slim line high R, LR

If the guide values for the permissible lateral force are exceeded (see table) the carriage must be additionally fixed by means of pinning or stop edges.

The recommended dimensions for the pin holes can be obtained from the drawings and table.

Usable pins:

- tapered pin (hardened) or
- straight pin DIN ISO 8734

Instructions

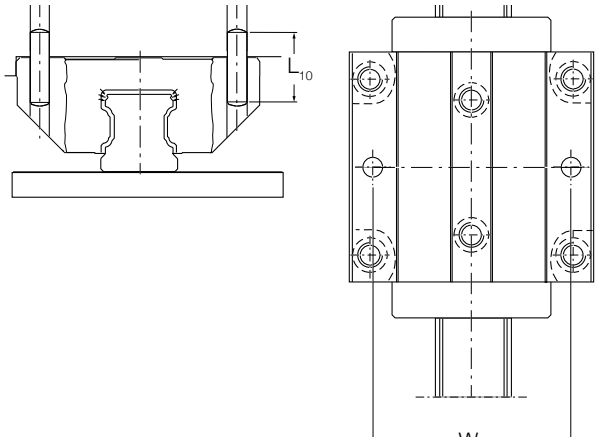
For production-related reasons there may be pilot drill holes in the middle of the carriage at the recommended positions for pin holes (Ø < S_{10}). They are suitable for drilling.

If necessary, the pinning must be carried out in a different position (e.g. middle lube port), but must not exceed the dimension L_3 in longitudinal direction (L_3 can be obtained from the dimension tables for the individual versions).

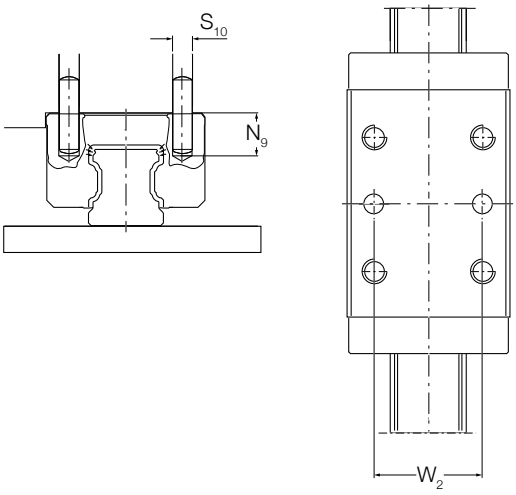
Keep to dimensions W_2 and W_4!

Do not complete the pin holes until after mounting (see also general mounting instructions - available through your normal contact).

Standard width A, LA



Slim line U, LU, Slim line high R, LR



Technical data

Size	Dimensions Tapered pin (hardened) or straight pin (DIN 6325)	Dimensions (mm)			
	S_{10} mm	L_{10}	W_2	W_4	N_9 (max)
15	4	18	26	38	6,0
20	5	24	32	53	7,5
25	6	32	35	55	9,0
30	8	36	40	70	12,0
35	8	40	50	80	13,0
45	10	50	60	98	18,0

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Carriage flange short, SA, slim line, SU

If the guide values for the permissible lateral force are exceeded (see table) the carriage must be additionally fixed by means of pinning or stop edges.

The recommended dimensions for the pin holes can be obtained from the drawings and table.

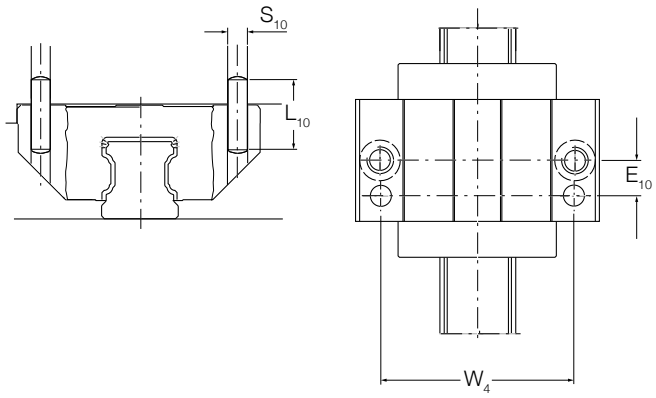
Usable pins:

- tapered pin (hardened) or
- straight pin DIN ISO 8734

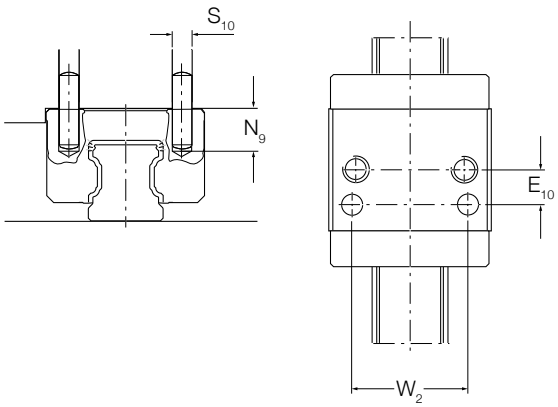
Instructions

For production-related reasons there may be pilot drill holes in the middle of the carriage at the recommended positions for pin holes (Ø < S_{10}). They are suitable for drilling.

Flange short, SA



Slim line, SU



Technical data

Size	Dimensions	Dimensions (mm)				
	S_{10} mm	L_{10}	W_4	W_2	E_{10}	N_9 (max)
15	4	18	38	26	9	3,0
20	5	24	53	32	10	3,5
25	6	32	55	35	11	7,0
30	8	36	70	40	14	10,0
35	8	40	80	50	15	12,0

Tapered pin (hardened), straight pin (DIN 6325)

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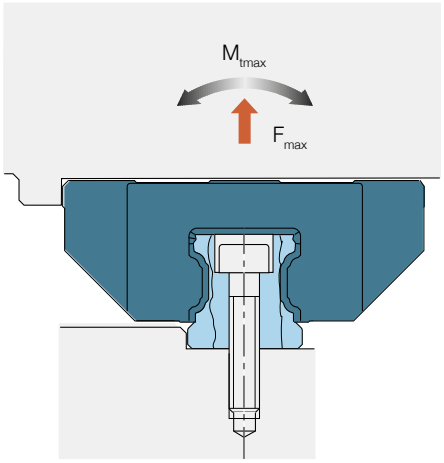
4.1.5 Loading of the screw connections between rail and substructure

The screw connections specified in the DIN 645-1 standard can become excessively loaded owing to the high performance capacity of the profile rail guides.

The screw connection between the guide rail and the substructure is critical. If the lift-off loads (F) or moments (Mt) are higher than the respective load values in the table, the screw connection must be recalculated separately.

The figures apply to the following conditions:

- Grade 12.9 fixings screws
- Screws tightened using a torque wrench
- Slightly oiled screws (for grade 8.8 screws approximately a reduction factor of 0,6 can be applied)



Lift-off loads and moment
Rail screwed from above

Technical data

Carriage	LLRH--SA, LLRH--SU		LLRH--A, LLRH--U, LLRH--R		LLRH--LA, LLRH--LU, LLRH--LR	
Size	F_{max} N	$M_{t\,max.}$ Nm	F_{max} N	$M_{t\,max.}$ Nm	F_{max} N	$M_{t\,max.}$ Nm
15	6 040	41	7 050	47	8 060	54
20	10 000	90	11 700	106	13 400	121
25	14 600	154	17 100	180	19 500	205
30	-	360	32 400	420	37 100	480
35	27 500	440	32 100	510	36 700	580
45	-	-	78 100	1 680	89 300	1 920

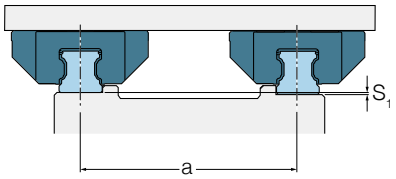
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4.1.6 Height deviation

The values for height deviation apply to all carriages.

Approximately 20 % higher values are permissible for the SA (standard width short) and SU (slim line short) carriages.

Given adherence to the permissible height deviation S1 and S2, the influence on the service life is generally negligible.



Permissible height deviation in lateral direction

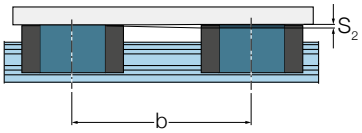
In the permissible height deviation S_1, the tolerance for dimension H according to the table is already taken into account in “Technical Data”.

S_1 = a × Y

S_1 = Permissible height deviation (mm)

a = Distance between the rails (mm)

Y = Calculation factor



Permissible height deviation in longitudinal direction

For carriages

In the permissible height deviation S2 the tolerance “maximum difference of dimension H on a rail” according to the table is already taken into account in “Technical Data”.

Approximately 40 % higher values are permissible for SA and SU carriages.

On A-type carriages (standard width long), LU and LR approx. 30 % lower values are permissible.

Permissible height deviation S_2 on carriages

S_2 = b × 4,3 × 10^{-5}

S_2 = Permissible height deviation (mm)

b = Distance between the carriages (mm)

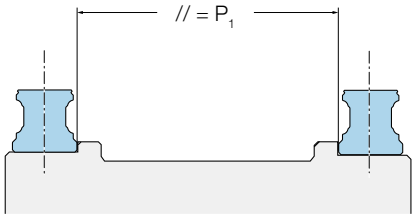
Calculation factor Y for carriages

Calculation factor	Preload class			
	T0 up to approx. 10 µm clearance	T1 Preload 0,02 C	T2 Preload 0,08 C	T3 Preload 0,13 C
Y	4,3 × 10^{-4}	2,8 × 10^{-4}	1,7 × 10^{-4}	1,2 × 10^{-4}

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4.1.7 Parallelism of mounted rails measured on the rails and the carriages



The values for the deviation in parallelism P_1 apply to all carriages.

Approximately 20 % higher values are permissible for the SA and SU carriages.

Deviation in parallelism P_1 for carriages

Through the deviation in parallelism P_1 the preload is increased somewhat on one side.

If the table values are adhered to, the influence on the service life is generally negligible.

The values shown in the following table apply to applications in which highest precision is required.

For all other uses and for general mechanical engineering doubled values can be applied.

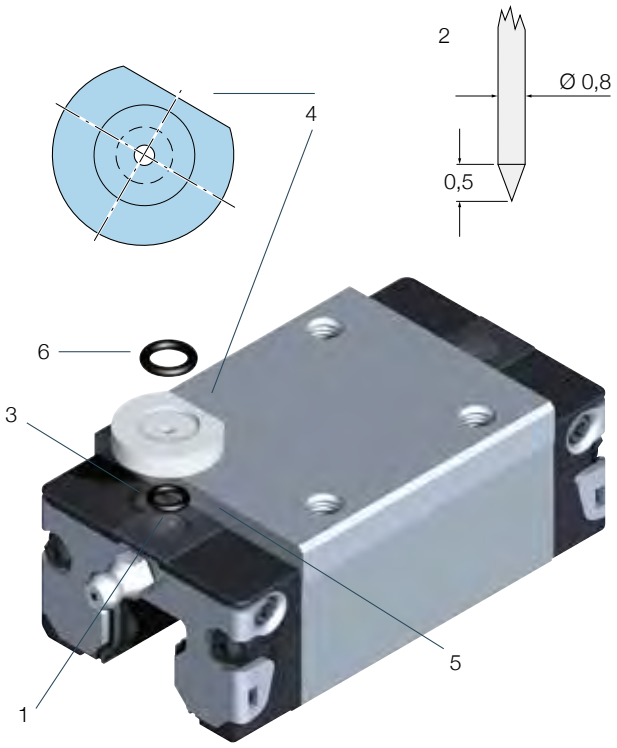
Technical data

Size	Deviation in parallelism P1 (mm) for high precision demands			
	T0 up to approx. 10 µm clearance	T1 Preload 0,02 C	T2 Preload 0,08 C	T3 Preload 0,13 C
15	0,015	0,009	0,005	0,004
20	0,018	0,011	0,006	0,004
25	0,019	0,012	0,007	0,005
30	0,021	0,014	0,009	0,006
35	0,023	0,015	0,01	0,007
45	0,028	0,019	0,012	0,009

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4.1.8 Mounting of lubrication adapter

A lubrication adapter is necessary on high carriages if lubrication is to take place from the table part.



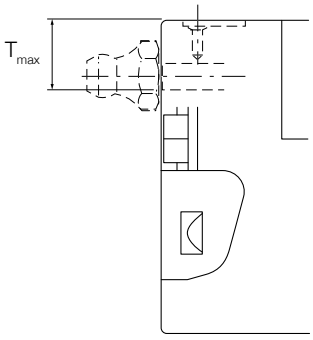
⚠ **In the recess for the O-ring seal a further small recess (1) has been preformed. Do not drill this open. Risk of dirt incursion!**

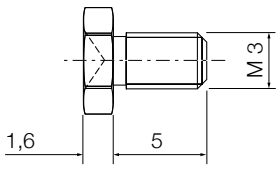
- Heat up metal tip (2) with a diameter of 0,8 mm.
- Carefully open the recess (1) with the metal tip and push through.
  Observe maximum permissible depth T_{max} stated in the table!
- Insert O-ring seal (3) in the recess.
- Insert lubrication adapter at an angle in the recess and press the flattened side (4) onto the steel part (5). Use grease for fixing.
- Insert O-ring seal (6) in the lubrication adapter.

Size

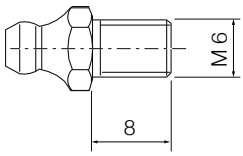
Top lubrication opening: maximum permissible depth for penetration T_{max} (mm)

Dimensional drawing





DIN 3405, funnel-type nipple for carriage size 15 and 20



DIN 71412, cone-type nipple for carriage size 25, 30, 35 and 45

Technical data

Size	Top lubrication opening: maximum permissible depth for penetration T_{max} (mm)
15	3,6
20	3,9
25	3,3
30	6,6
35	7,5
45	8,8

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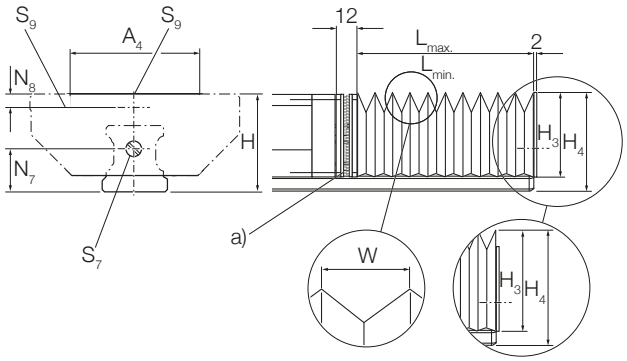
4.1.9 Mounting bellow

The bellows are pre-mounted.
The fixing screws are supplied.

On type 2 in each case one thread M4-10 deep, 2 x 45° countersunk, must be inserted in the end face of the rail.

Size 25 - 45:
The lubrication nipple on the carriage can be used.

Size 15 and 20:
A drive-type lubrication nipple is supplied.



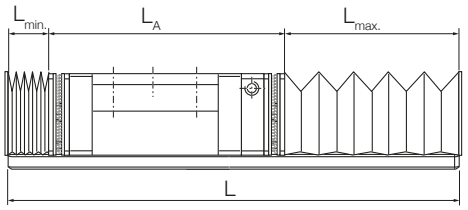
Calculation of the bellows

$L_{min} = L_{max}$ - Stroke
$L_{max} = (Stroke + 30) \cdot U$

$$\text{Number of folds} = \frac{L_{max}}{W} + 2$$

L_A = Carriage length L_1 plus 2x12 mm for the fastening plates.
L_{max} = Bellows stretched
L_{min} = Bellows pushed together
Stroke = Stroke (mm)
U = Calculation factor
W = Maximum extension of folds

Calculation of the rail length



$L = L_{min} + L_{max} + L_A$

L = Rail lenght (mm)

Technical data

Size	Dimensions (mm)											Factor
	A_4	B_3	H	H_3	H_4	N_7	N_8	S_7	S_8	S_9	W	U
15	45	11	24	26,5	31,5	11	3,4	M4	ø3	M3	19,9	1,18
20	42	12	30	24,0	29,2	13	3,5	M4	ø3	M3	10,3	1,33
25	45	12	36	28,5	35,0	15	6,0	M4	M6	M3	12,9	1,32
30	55	12	42	34,0	41,0	18	8,0	M4	M6	M6	15,4	1,25
35	64	12	48	39,0	47,0	22	8,0	M4	M6	M6	19,9	1,18
45	83	12	60	49,0	59,0	30	8,0	M4	M6	M6	26,9	1,13

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4.2 Maintenance and repairs

As a function of the stroke length

Stroke > 2 × length of the carriage

1 lube port needs to be provided per carriage (↳ **fig. 1**).

- Oil lubrication in accordance with ISO VG 220.

For lubrication quantities please refer to the next page.

Stroke < 2 × length of the carriage

- 2 lube ports need to be provided per carriage (↳ **fig. 2**).
- Apply the prescribed lubricant quantity per lube port.
- Oil lubrication in accordance with ISO VG 220.

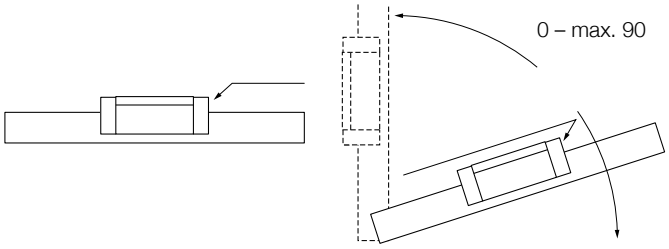
For lubrication quantities please refer to the next page.

Installation in inclined or side position (wall mounting)

Stroke > 2 × length of the carriage

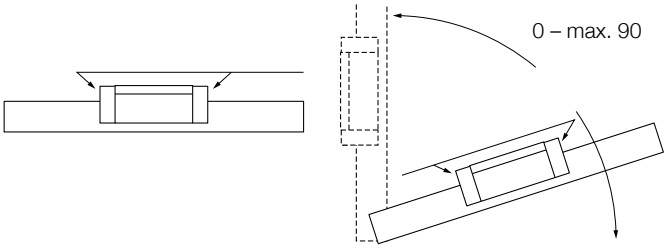
- 1 lube port needs to be provided per carriage (↳ **fig. 3**).
- Apply the lubricant quantity stated in the table with an impulse.
- If the lubricant quantity cannot be applied with an impulse, please consult Ewellix.

Fig. 1



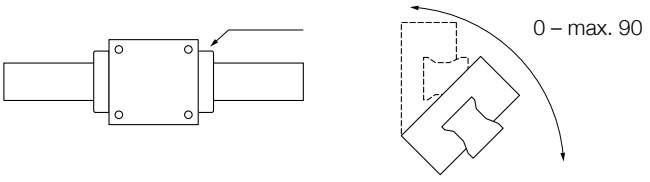
1 Lube port *1 Lube port*

Fig. 2

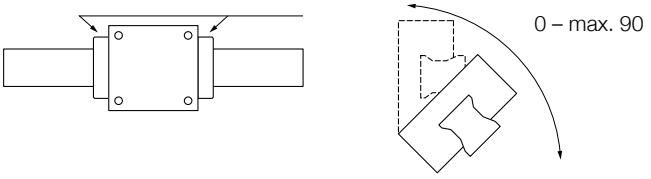


2 Lube ports *2 Lube ports*

Fig. 3



1 Lube port *For 1 Lube port*



2 Lube ports *For 2 Lube ports*

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Maintenance

Dirt can drop and settle on exposed rails in particular. To maintain the function of seals and cover strips, such dirt must be regularly removed.

For this purpose a “cleaning stroke” should be carried out over the entire length of travel at least twice a day, and at the latest after eight hours.

Carry out a cleaning stroke each time before switching off the machine.

Lubrication

Grease lubrication

Initial lubrication of the carriage (basic lubrication)

No initial lubrication is required if the carriage has been greased at the factory.

The initial lubrication takes place with three times the part quantity stated in **Table 1**:

1. Grease the carriage with the first part quantity stated in **table 1**.
2. Move the carriage backwards and forwards with three double strokes along at least three times the carriage length.
3. Repeat step 1 and 2 twice.
4. Check whether a lubricating film is visible on the rail.

Ball rail guides are supplied in protected form. With basic greasing at the factory, both grease and oil lubrication is possible.

For lubrication we recommend lubricating grease to DIN 51825: – KP2K-20, consistency class NLGI 2 to DIN 51818. This can be obtained from Ewellix, see recommendation for lubricating greases.

Never start to use carriages without basic lubrication.

Observe the manufacturer’s instructions, in particular instructions concerning incompatibilities.

⚠ **Greases with a proportion of solid lubricant (such as graphite) should not be used!**

Re-lubricating the carriage

When the re-lubrication interval according to **Table 2** has been reached, the carriage must be lubricated with the lubricant quantity as stated in **Table 1**. Where such environmental influences as dirt, the use of coolants, vibration, shock loads etc. are encountered, we recommend that the re-lubrication intervals be shortened accordingly.

Longer re-lubrication intervals apply in the case of smaller loads.

Short stroke

Stroke < 2 × carriage length

- 2 lube ports need to be provided per carriage and lubricated in each case!

Stroke < 0,5 × carriage length

- 2 lube ports need to be provided per carriage and lubricated in each case!
- For each lubrication cycle move the carriage 2 × the carriage length. If this is not possible, please consult Ewellix.

Lubricant quantities as stated in **Table 1** (re-lubrication). Apply the stated quantity for each lube port.

* NLGI 00 greases reduce the relubrication intervals to 75 % of the values stated in **Table 2**.

Table 1

Size	Grease lubrication Initial lubrication by customer Part quantity (cm^3)	Re-lubrication Part quantity (cm^3)
15	0,4 (x 3)	0,4 (x 2)
20	0,7 (x 3)	0,7 (x 2)
25	1,4 (x 3)	1,4 (x 2)
30	2,2 (x 3)	2,2 (x 2)
35	2,2 (x 3)	2,2 (x 2)
45	4,7 (x 3)	4,7 (x 2)

Table 2

Size	Grease lubrication Relubrication intervals under normal operating conditions, v ≤ 1 m/s	
	Travel (km) under load ≤ 0,15 C	≤ 0,3 C
15	5 000	1 200
20	5 000	1 200
25	10 000	2 400
30	10 000	2 400
35	10 000	2 400

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Oil lubrication

Oil quantities for initial lubrication and re-lubrication

⚠ **Apply the entire quantity of oil with a single lubrication impulse!**

Carriages initially greased at the factory can also be re-lubricated with oil.

In the case of carriages which have not been initially greased at the factory, carry out the initial lubrication in accordance with **Table 3**.

If environmental influences such as dirt, use of coolants, vibration, shock loads etc. are encountered, we recommend that the re-lubrication intervals be shortened accordingly.

Refer to **Table 4**.

Central oil lubrication

Oil quantities and lubrication impulses for central oil lubrication

NOTE: Recommended waiting time between the impulses: 10 seconds.

For example size 45:
4 impulses with in each case 0,6 cm^3 in 30 seconds.
Refer to **Table 5**.

Table 3

Size	Oil lubrication Initial lubrication by customer Part quantity (cm^3)	Re-lubrication Part quantity (cm^3)
15	0,4 (x 2)	0,4
20	0,7 (x 2)	0,7
25	1,0 (x 2)	1,0
30	1,1 (x 2)	1,1
35	1,2 (x 2)	1,2
45	2,2 (x 2)	2,2

Table 4

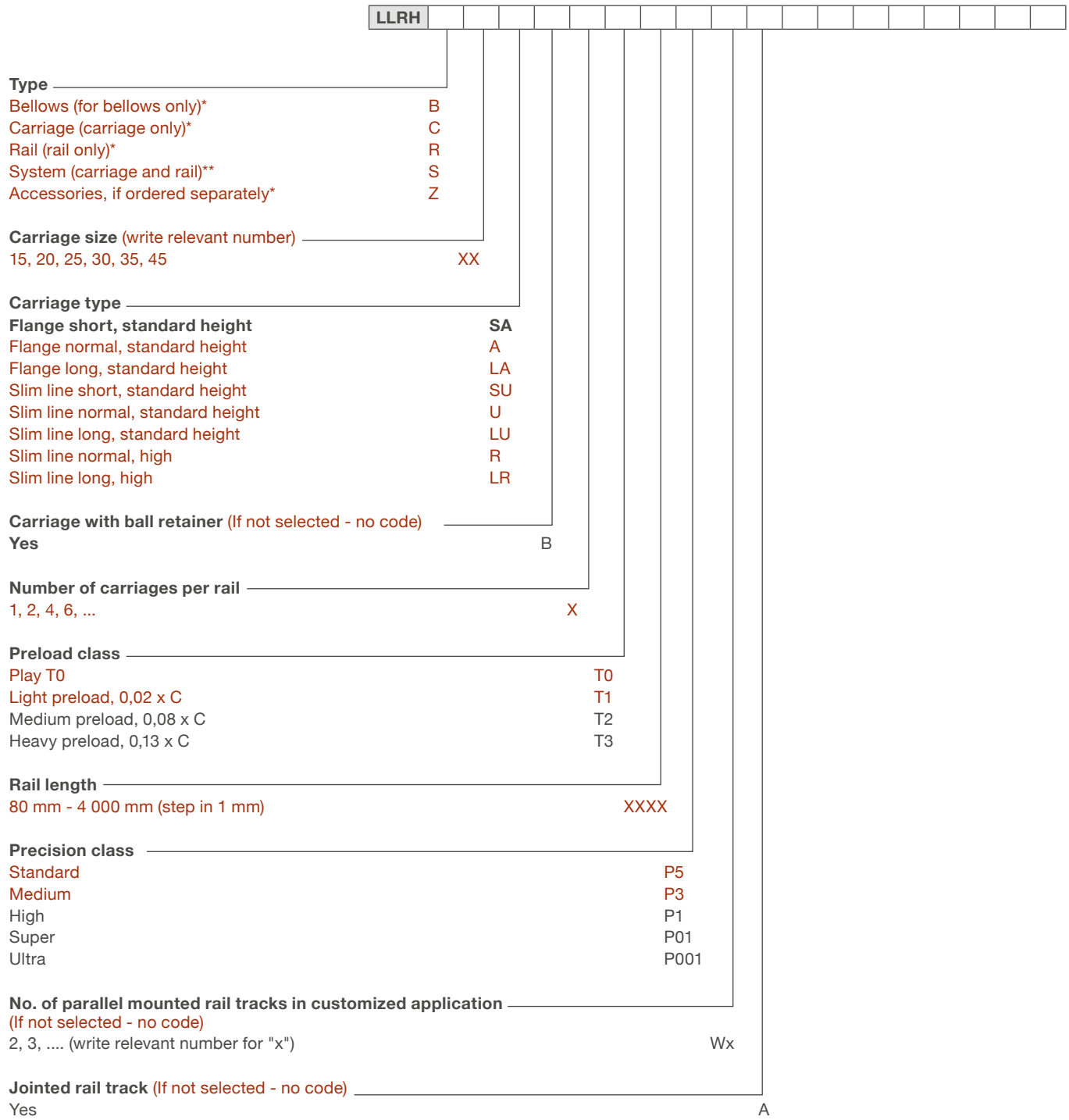
Size	Oil lubrication Re-lubrication intervals under normal operating conditions, v ≤ 1 m/s	
	Travel (km) under load ≤ 0,15 C	≤ 0,3 C
15	2 500	600
20	2 500	600
25	5 000	1 200
30	5 000	1 200
35	5 000	1 200

Table 4

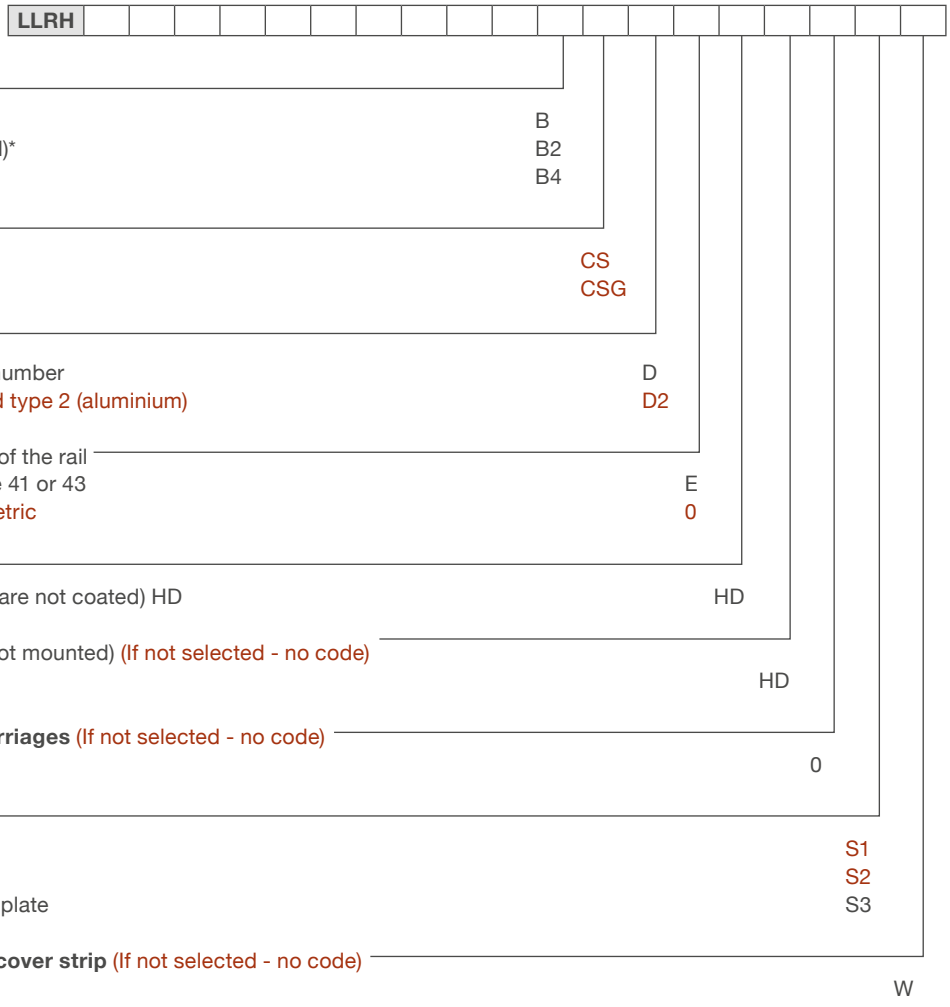
Size	Central oil lubrication	
	Oil quantities Impulse (cm^3)	Impulses per lubrication cycle Number of impulses
15	0,6	1
20	0,6	1
25	0,6	2
30	0,6	2
35	0,6	2
45	0,6	4

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4.3 Ordering key



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* When ordered separately (not in a system).
** System consisting of carriage and rail
An key with all positions in red fonts qualifies the product for the easy range concept (quick delivery).

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PUB NUM IL-06016-EN-May 2020

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