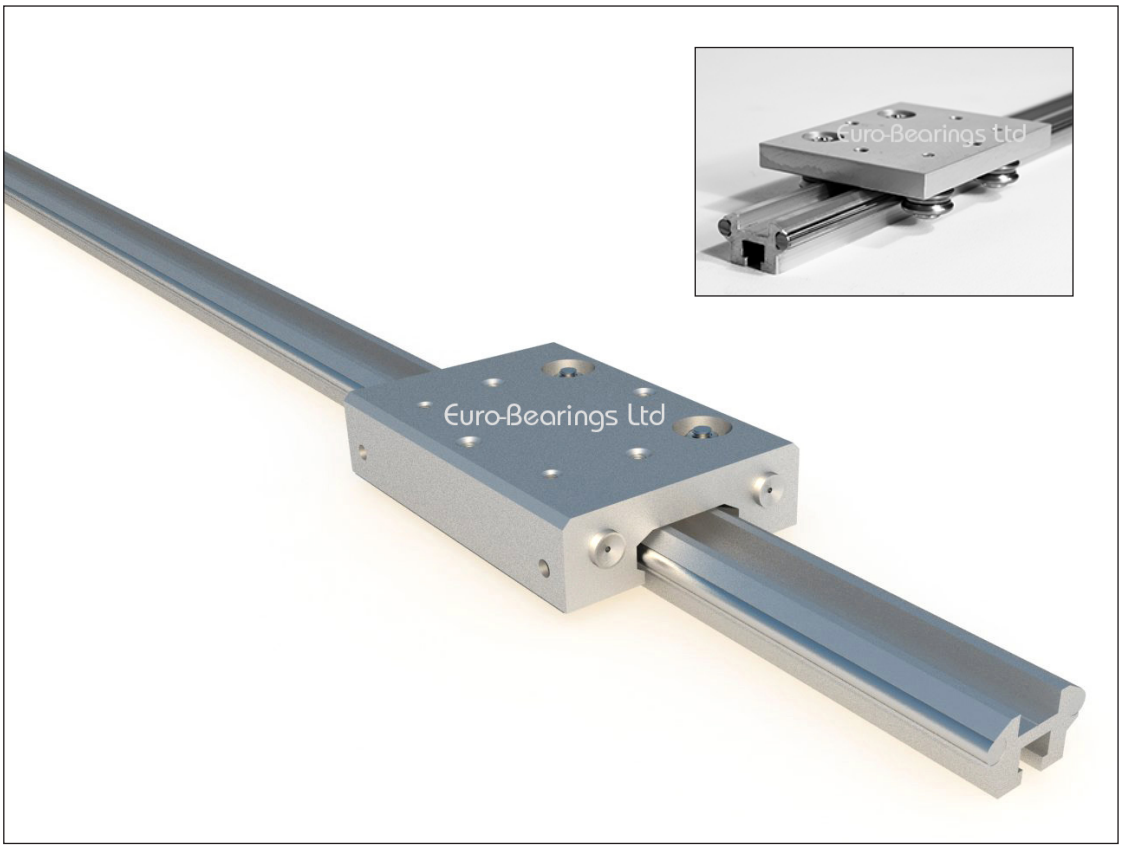
EURO-BEARINGS LTD

TRACK GUIDANCE SYSTEMS



www.euro-bearings.com

Tel. 01908 511733

email: sales@euro-bearings.com

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INTRODUCTION

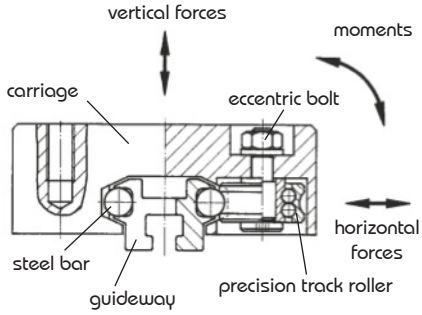
This linear guidance system consists of a carriage assembly complete with four precision track bearings running on an accurate guideway. The accuracy of the guideway unit is achieved by mounting precision hardened steel bars into a high quality aluminium support rail. This is done using our specially developed process.

The optimised double row angular contact ball bearings have outer rings with a precise profile ensuring accurate rolling combined with high radial and axial load capacities.

Two of the track rollers are fitted to the carriage using eccentric bolts, enabling adjustment for pre-loading the bearing onto the rail or setting for clearance free travel.

Advantages:

- High speeds and accelerations are possible due to the low mass and minimal friction
- Highly accurate guidance combined with smooth running and quiet operation
- High load carrying capacity allowing forces from all directions and moments about all axes.
- Extremely reliable operaton even in contaminated environments
- The nearly unlimited stroke and mounting positions offer a variety of applications
- Very simple installation
- Long life
- Optional wiping and lubrcation components available
- Corrosion resistant model has same load capacities



Application Range:

Velocity	v_{max}	=	10 m/s
Acceleration	a_{max}	=	50 m/sec^2
Temperature	T	=	-20ºC to +80ºC

Accuracy:

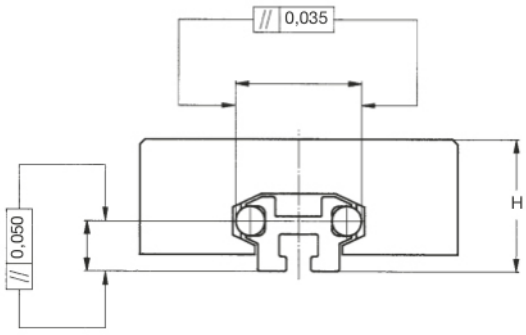
The accuracy of this system has the following high precision characteristics:

Guidance Accuracy	0.05mm/m

Assembly height (H) tolerances:

Dimensional tolerance	±0.2mm
Max Deviation of ONE guideway	±0.1mm

Higher accuracy units are available on request



PART NUMBERS EXPLAINED

1. Guideways	
TYPE	These consist of an anodisded aluminium body with inlaid hardened and ground precision steel bars
S..-….	Designed for TEE SLOT Mounting
S.-B….	Supplied with additonal mounting holes for THROUGH bolting
R..-….	CORROSION RESISTANT model for TEE SLOT mounting
R..-B....	CORROSION RESISTANT model for THROUGH bolting
SIZE	
S25-.... / S25 B-....	The number indcates the NOMINAL HEIGHT (H) of the system
S36-.... / S36 B-....	
S54-.... / S54 B-....	
LENGTH	
S..-	The last four dights indicate the LENGTH in mm. Maximum length is 3750mm.
2. Carriages	
LW25 - ..0	The carriage consists of an anodised aluminium body, fitted with maintenance free precision track rollers and gap sealed on the leading faces. They are paired with guideways S and S..B of corresponding size
LW36 - ..0	
LW54 - ..0	
LW.. _ 0.0	Carriage WITHOUT wiping and relubricating components
LW.. - 4.0	Carriage WITH wiping and relubricating components
LW.. - .10	Standard Type with anodised aluminium body and track rollers of bearing steel
LW.. - .50	Corrosion resistant type with surface coated track rollers and other components of stainless steel
3. Cover Strips	
A25 - ….	By using the simple snap in aluminium profiles the upper channel can be covered producing a flat top surface
A36 - ….	
A54 - ….	
	Guideways, carriages and cover strips to be ordered separately
	Example: 2 x S36-1250 + 2 x LW36-410 + A46 -1250
4. Track Rollers	
LR..-0..	Standard track roller
LR..-5..	Stainless steel track roller
5. Bolts (Bushes)	
B..-.M..	Concentric bolts
E..-.M..	Eccentric bolts

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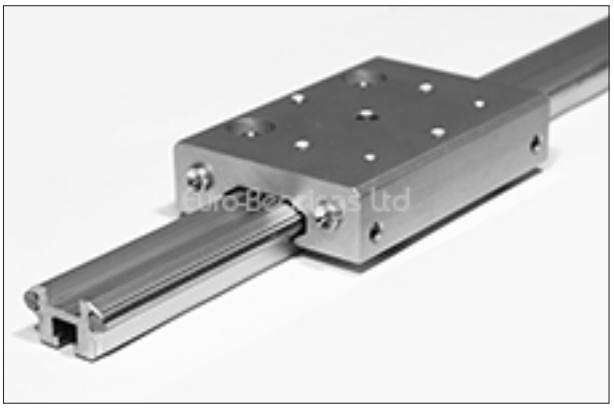
CARRIAGES

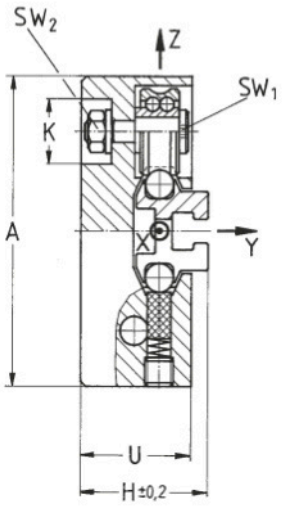
The carriages are characterised by their compact closed design, low mass and optimised precision track roller arrangement. The required light pre-load or clearance can be easily achieved by the adjustment of the eccentric bolts on one side of the carriage.

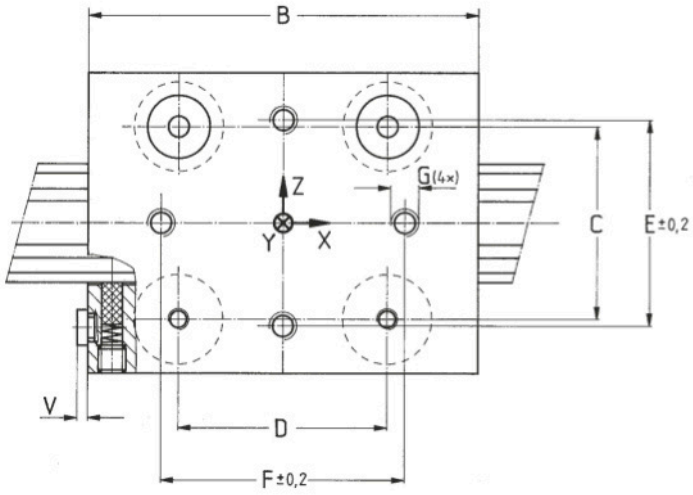


The aluminium body is completely anodised.

Type LW..-4.0 incudes shaft wiping and shaft relubrication components. The track rollers are pre-lubricated for life and are normally maintenance free.

When being used in a corrosive environment the carriage can be specified with stainless steel bearings.
Part number LW..-.**5**0





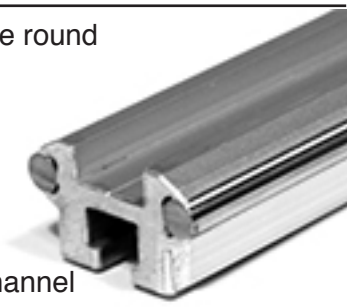
With wiper	Without wiper	H	A	B	C	D	K	U	V	E	F	G	A/F1	A/F2	Weight (kg)
LW25-410	**LW25-010**	25.0	65	95	42	54	14	21	3	50	60	M5x9	3	7	0.26
LW36-410	**LW36-010**	35.5	86	112	55	62	18	31	3	59	70	M8x15	4	10	0.73
LW54-410	**LW36-010**	54.3	130	136	87	70	26	47	3	90	70	M10x21	4	17	1.85

	Maximum permissible loads (N)				Maximum permissible moments (Nm)					
With wiper	**Fy**	**Foy**	**Fz**	**Foz**	**Mx**	**Mox**	**My**	**Moy**	**Mz**	**Moz**
LW25-.10	400	650	700	700	4.4	7.2	19	19	11	18
LW36-.10	850	1400	1400	1400	11	18	43*	43*	26	43
LW54-.10	1500	2500	3500	3500	35	58	123*	123*	53	88

* If the applied loads are more than 70% of these values, the distance between the guideway mounting bolt holes should be halved to t/2 (for 't' value see page 5)

GUIDEWAYS

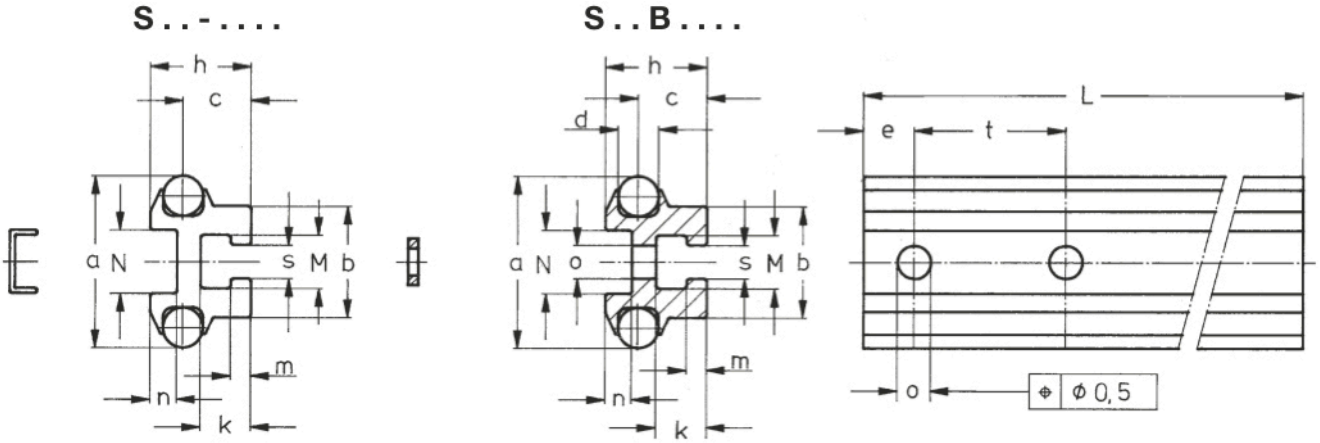
The design of the guideway combines the high accuracy and hardness of the round steel guide bars with the low weight of the aluminium supporting body.



There are 3 variants:

a. Tee slot fixing type : using DIN 931/933 hex- headed bolts
b. S..-B... type for through bolting using cap head bolts (DIN 6912)
c. Optional aluminium cover strip in to prevent particle build-up in the top channel

The aluminium supporting body is anodised as standard.
For tracks with stainless steel shafts, the part number becomes R..-... or R..B-...



Tee Slot	Thru Bolt	h	a	b	c	d	n	N	o & s	Bolt	t	m	k	M
S25-....	**S25B-....**	15.5	27	18	10.6	5	4.6	11	5.5	M5	62.5	3	8	8.2
S36-....	**S36B-....**	20	34	22	13.5	8	5.3	12.5	6.6	M6	125	4	10	10.5
S54-....	**S54B-....**	34	56	38	24.1	10	8	18.5	11	M10	250	6.4	15.4	18.5

.... represents the length of rail required in millimetres

TRACK GUIDANCE SYSTEMS ARE ALSO AVAILABLE IN STAINLESS STEEL

Guideway length:

The standard maximum length is 3750mm but if required it is possible to exceed this.

Preferable length of S..B... is: L = (No. of fixing holes +1) x t -4mm and e = t/2 -2mm

Cover Strips:

The wall thickness of the aluminium cover strip is 1mm and is a push fit into the top channel. They can be used for both types of guideway. When using the tee-slot type of guideway the top channel can be used for cables etc and protected with a cover strip.

A 25 - . . . .
A 36 - . . . .
A 54 - . . . .

INSTALLATION

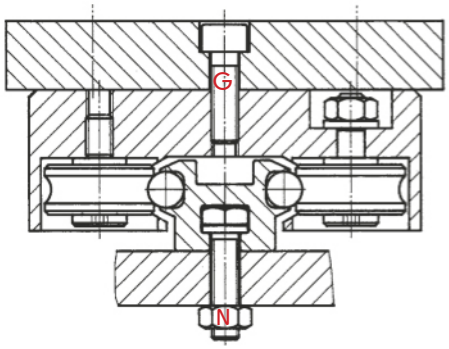
To ensure the accuracy of the guidance system it is essential that the surface to which the guideway is fixed is flat and distortion free.

Take care when handling the various components.

Guideway fixing bolts should initially be lightly tightened (whilst adjustments are made) and then finally tightened to the recommended torque value as per table “Torque M_a” on this page.

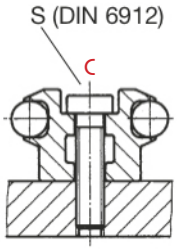
When using parallel guideways in one system it is necessary to ensure precise alignment of the guideways.

If a side load F_Z is expected during operation, the carriage should be installed so that the load is acting on the CONCENTRIC bolt side of the carriage.



Left: Bolting the rail from below using the slot.

Right: Bolting the rail from above using a caphead



Torque M_a			
Carriage	**LW25-....**	**LW36-....**	**LW54-....**
Thread (G)	5.5 Nm	23 Nm	46 Nm
Eccentric Bolt	2.4 Nm	8 Nm	40 Nm
Concentric Bolt	2.4 Nm	8 Nm	40 Nm
Guideway	**S25-....**	**S36-....**	**S54-....**
Nut (N)	M5	M6	M10
Caphead (C)	6 Nm	10 Nm	46 Nm

Clearance Free Adjustment:
Use the eccentric bolts which are locked in position by lock nut. When correctly adjusted, the carriage can be moved by hand with a very light force. Ensure all track rollers are rotating.

If pre-load is required this can be achieved. Remember that excessive pre-load reduces system life.

Lubrication:
To achieve a long operating life we recommend lubrication of the guideway surfaces.
The optional integral lubricating and wiping components are installed in the end faces of the carriage on LW..-4.. type. Re-lubrication is carried out through the nipples. Use light oil (Viscoisty: 300mm²/sec at 40°C). Lubricate before use. Re-lube period depends on usage. Inspection of the shafts from time to time should show a light film of oil. If not, re-lube! The track rollers are pre-lubricated and sealed for life and therefore no further lubrication is necessary.

LOAD CALCULATIONS

The method is the theoretical calulation for ball bearing life.

When calculating load values take into account non-calculable peak loads in applications involving high speed, vibrations, shock loads etc.

For the value of f_B refer to the chart below.

The applied load must not exceed the maximum permissible loads for $F_{Y.perm}$; $F_{Z.perm}$; $M_{X.perm}$; $M_{Y.perm}$ or $M_{Z.perm}$. See table on page 4.

Life expectancy with force F_y or F_z:

$$L = \left(\frac{C_{y,z}}{F_{y,z}.f_B} \right)^3 .10^5$$

Life expectancy with moment M_x, M_y or M_z:

$$L = \left(\frac{M_{dx,dy,dz}}{M_{x,y,z}.f_B} \right)^3 .10^5$$

$$L_h = \frac{L}{120.s.n}$$

Definition of Symbols:

L	=	Nominal Life expectancy (m)
L_h	=	Nominal Life expectancy (h)
C_y C_z	=	Dynamic load rating (N)
F_y F_z	=	Actual load (N)
M_{dx} M_{dy} M_{dz}	=	Dynamic Moment rating (Nm)
M_x M_y M_z	=	Actual Moment (Nm)
s	=	Stroke length (m)
n	=	Stroke Frequency (min^{-1})

f_B	Operating conditions
1 to 1.2	Smooth running, insignificant vibrations or shocks
1.2 to 1.5	Small to medium vibrations or shocks
1.5 to 3.0	Strong vibrations and shocks

Vee Bearings
& Rails

Linear Bearings & Shafts

Combined Roller
Bearings & Rails

NEED TECHNICAL ADVICE?
Contact Kate or Matt

Tel. 01908 511733
email: sales@euro-bearings.com
www.euro-bearings.com

EURO-BEARINGS LTD
29-31 Lodge Farm Business Centre
Wolverton Road
Castlethorpe
Milton Keynes
MK19 7ES