

Linear ball slide

LWL IKO

LWLC

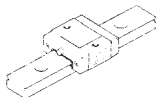
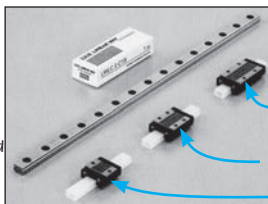
LWLC-C

LWLG-C

LWLC1H

Linear slide: LWL series with ball cage
The slides and guidance rails are stocked separately and can therefore be delivered quickly in whatever combination of size and quantities required.

Introduction

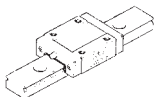


LWLC

7 to 20

<short slide

- Slide only attaches on top
- Slide length: short
- Load capacity: weak

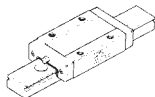


LWLG-C1H

5 to 20

<self-lubricating slide>

- Slide only attaches on top
- Slide length: normal
- Load capacity: normal

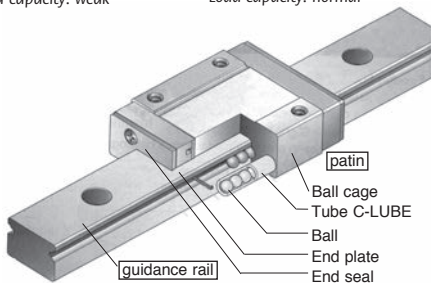


LWLG

7 to 20

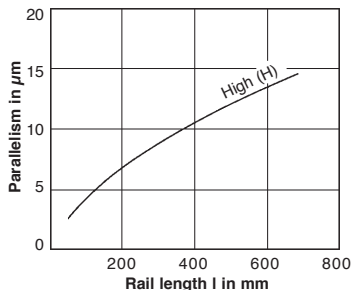
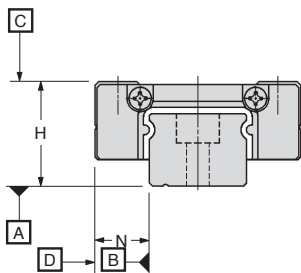
<long slide high rigidity>

- Slide only with attaches on top
- Slide length: long
- Load capacity: excellent



The LWL linear slide consists of a miniature slide and a guide rail. The two rows of precision ball bearings give four point contact with the rail thus offering accuracy, stability and rigidity even when under complex or variable loads

The stainless steel balls are held in a cage which permits easy manipulation of the slide. All the dimensions of the slides and the rails are checked individually allowing interchangeability between parts.



Accuracy

The accuracy of the LWL linear slides are given below.

Tolerance on H (mm)	$\pm 0,020$
Tolerance on N ⁽²⁾ (mm)	$\pm 0,025$
Variation on H ⁽¹⁾ (mm)	0,015
Variation on N ^{(2) (3)} (mm)	0,020
Parallelism between C and A (mm)	See graph below
Parallelism between D and B (mm)	See graph below

Note:

- (1) This is the difference in the dimension H between two slides mounted on the same track or on a pair of tracks when H is measured at a specified position.
- (2) This is the difference in the dimension N between two slides mounted on the same track or on a pair of tracks when N is measured at a specified position.
- (3) These values also apply to an assembly with reversed reference surfaces.

Note: These values also apply when dimensions are measured at the centre of each slide assembled on a rail attached to a flat base.

Preload

IKO LWL interchangeable linear slides are only available as standard with a preload that is equivalent to no preload or very low.

Life expectancy

The life expectancy of an LWL linear slide can be calculated using the following formula:

$$L = 50 \left(\frac{C}{P}\right)^{10/3} \quad (1)$$

where:

L : life expectancy in kilometres (or **10³ m**)

C : Basic Dynamic load capacity (**N**)

P : Applied load (**N**)

Actual loads applied to the linear guide sometimes exceed the theoretically calculated load due to vibration and shocks caused by the operation of the machine. A more realistic life expectancy can be calculated using the following formula which takes the load factor into account:

$$L = 50 \left(\frac{C}{f_w C}\right)^{10/3} \quad (2)$$

where:

f_w : load factor (see table 1)

C : Calculated theoretical load (**N**)

In applications where the stroke length and the number of strokes per minute are known, the life expectancy in hours can be calculated as follows:

$$L_h = \frac{10^6 L}{2 S n \times 60} \quad (3)$$

where:

L_h : Life expectancy in hours (**h**)

S : Stroke length (**mm**)

n : Number of strokes per minute (**spm**)

Table 1: Load factor

Operating conditions	f _w
Smooth working without vibrations and/or shocks	1 ~ 1.2
Normal working	1.2 ~ 1.5
Working with shocks	1.5 ~ 3

Static security factor

The static security factor of LWL linear slide rules is calculated using the formula below. The general values are given in table 6.

$$f_s = \frac{C_0}{P_0} \quad (4)$$

for which:

f_s : static security factor

C₀ : Basic static load rating (**N**)

P₀ : static load (**N**)

Table 2: Static security factor

Operating conditions	f _s
Smooth working without vibrations and/or shocks	3 ~ 5
High performance working	2 ~ 4
Normal working	1 ~ 3

Assembly

To assemble LWL slides, correctly fit the slide and rail reference surfaces to the table and frame reference surfaces, then fix them together solidly.

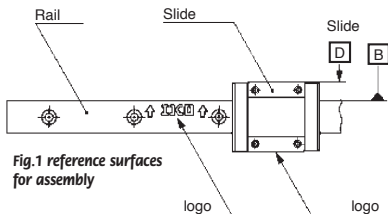


Fig.1 reference surfaces for assembly

Reference surface

The slide reference surface is always opposite the surface where the brand-name is marked. The rail reference surface is marked by the manufacturer's logo engraved on the upper surface. It is always on the side indicated by the arrows engraved with the manufacturer's logo (see fig.1).

Safety

1 Manipulation

On delivery, the slide is attached to a dummy rail. To assemble the slide onto the guidance rail, line up the grooves on the sides of the slide making sure the slide stays on the mock rail. Then carefully move the slide from the dummy rail onto the guidance rail.



2 Load considerations when multiple slide units are mounted close together

When using multiple slide units mounted close together, the actual load may be greater than the calculated load depending on the accuracy of the mounting and reference surfaces of the machine. In such a case, it is suggested to assume a greater load than that previously calculated.

3 Example of multiple slide units mounted close together

Referring to Figure 2, the reference mounting surfaces B and D and mounting surfaces A and C of the LWL linear slides are accurately finished by grinding. Stable and high accurate linear motion will be obtained by finishing the mating mounting surfaces of machines or equipment to the same high accuracy and correctly mounting the guides on these surfaces.

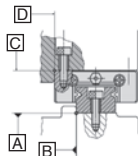


Fig. 2 Assembly example

4 Working temperature

The normal continuous operating temperature of the LWL linear slides is 100°C with occasional use at up to 120°C. If your application will exceed 100°C, please contact us for advice.

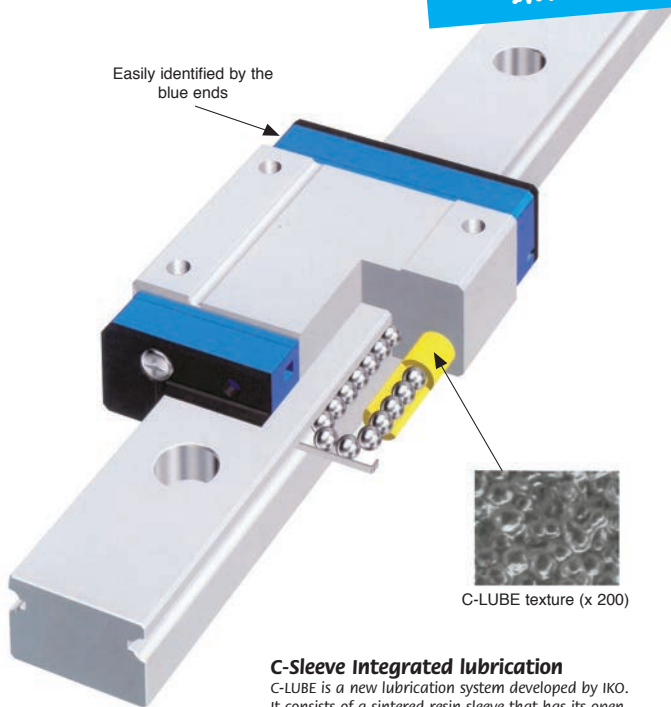
Linear ball slide

LWL **IKO**

C-LUBE self lubricating slide
for LWL slides

Use in place of standard
LWL slides

Easily identified by the
blue ends



C-LUBE texture (x 200)

C-Sleeve Integrated lubrication

C-LUBE is a new lubrication system developed by IKO. It consists of a sintered resin sleeve that has its open pores impregnated with lubricating oil.

C-LUBE with its integrated lubrication system, offers many advantages to the user

Limited maintenance

Reduced maintenance. Being self lubricating, C-LUBE slides require very infrequent maintenance (every 5 years or 20,000kms)

Light and compact

Clever design means that the self-lubricating C-LUBE slide is very compact (Same dimensions as the LWL slides)

Smooth movement

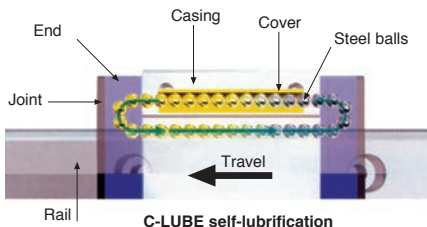
C-LUBE slides are not in contact with the track rail. This permits smooth and light slide motion without increasing the rolling resistance

Clean

There is no risk that C-LUBE slides will spray excess lubricant to nearby machines or surfaces

In stainless steel

C-LUBE slides are manufactured in corrosion resistant stainless steel. This makes the units suitable for applications in special environments where lubricants and corrosion protection oils are prohibited



Circulating in the slide, the steel balls pass through the C-LUBE cover and are covered in lubricant. This is then deposited on the moving parts. This means that the balls, the recirculation path and the rails are all self lubricated during use and maintenance intervals can be extended.

LWL **IKO** Dynamic load from 514 N to 1510 N

- **Linear slide for normal loads**
- Recirculating ball type linear slide
- Material: Similar to stainless steel 440C
- LWL5 uses steel balls which are not restrained
- Standard accuracy
- Max. speed: 3m/s
- Max. temperature: +100°C (continuous)
+120°C (occasionally)
- **Note: part numbers of rails and slides are separate: remember to order both**



Self-lubricating slide
LWL-C1H



Short slide
LWLC-C1H

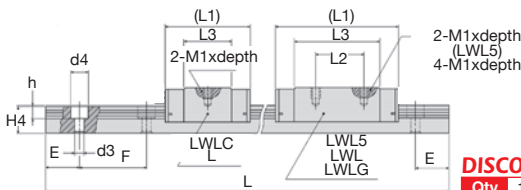
stainless steel



Long slide
LWLG-C1H

Uses

- Medical equipment, measurement and optical systems

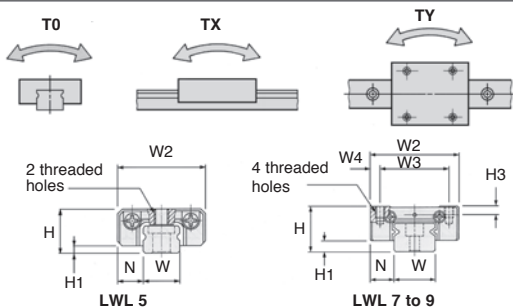


DISCOUNTS

Qty	1+	5+	10+
Disc.	List	-6%	On request

Part number	L (mm)	No. of holes	Max. length	Type of slide	Stock*	Price each 1 to 4
LWL5-60	60	4	210	-	✓	29,83 €
LWL5-90	90	6	210	-	✓	44,78 €
LWL5-120	120	8	210	-	✓	59,75 €
LWL5-150	150	10	210	-	✓	74,72 €
LWL5-180	180	12	210	-	✓	89,67 €
LWL5-210	210	14	210	-	✓	104,64 €
LWL5C-C1H	-	Slide	-	Short Autolubricant	✓	71,76 €
LWL5-C1H	-	Slide	-	Self-lubricating	✓	85,53 €
LWL7-60	60	4	300	-	✓	27,84 €
LWL7-90	90	6	300	-	✓	41,84 €
LWL7-120	120	8	300	-	✓	55,80 €
LWL7-150	150	10	300	-	✓	69,76 €
LWL7-180	180	12	300	-	✓	83,73 €
LWL7-240	240	16	300	-	✓	111,68 €
LWL7-300	300	20	300	-	✓	139,58 €
LWL7C-C1H	-	Slide	-	Short Autolubricant	✓	64,64 €
LWL7G-C1H	-	Slide	-	Long Autolubricant	✓	92,68 €
LWL7-C1H	-	Slide	-	Self-lubricating	✓	77,11 €

*Depending on availability - Dimensions in mm



	LWL5C-C1H	LWL5-C1H	LWL7C-C1H	LWL7G-C1H	LWL7-C1H
Weight (g)					
Slide	3,40	4,30	7,10	9,10	14,00
rail (par 100mm)	12,00	12,00	22,00	22,00	22,00
Total dimensions (mm)					
H+/- 0,02	6,00	6,00	8,00	8,00	8,00
H1	1,00	1,00	1,50	1,50	1,50
N+/- 0,025	3,50	3,50	5,00	5,00	5,00
Slide dimensions (mm)					
W2	12,00	12,00	17,00	17,00	17,00
W3	8,00	8,00	12,00	12,00	12,00
W4	2,00	2,00	2,50	2,50	2,50
L1	16,00	19,00	19,00	23,50	31,00
L2	-	-	-	8,00	12,00
L3	9,60	12,60	9,60	14,30	21,60
M1 x depth	M2 x 1,5	M2 x 1,5	M2 x 2,5	M2 x 2,5	M2 x 2,5
H3	1,20	1,20	1,50	1,50	1,50
Rail dimensions (mm)					
W	5,00	5,00	7,00	7,00	7,00
H4	3,70	3,70	5,00	5,00	5,00
d3	2,40	2,40	2,40	2,40	2,40
d4	3,60	3,60	4,20	4,20	4,20
h	0,80	0,80	2,30	2,30	2,30
E	7,50	7,50	7,50	7,50	7,50
F	15,00	15,00	15,00	15,00	15,00
Rail fixing holes	M2 x 6	M2 x 6	M2 x 6	M2 x 6	M2 x 6
Basic dynamic load C (N)	514	612	856	1200	1510
Basic static load Co (N)	872	1130	1180	1960	2750
* Static torque					
T0 (Nm)	2,00	3,00	4,30	7,20	10,00
Tx (Nm)	1,50	2,40	1,90	4,90	9,10
	9,00	13,30	15,40	29,20	52,60
Ty (Nm)	1,20	2,00	1,60	4,10	7,70
	7,60	11,20	12,90	24,50	44,10

Data given in row T0 and first rows of Tx and Ty are for a single slide

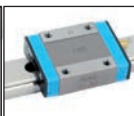
Data given in second rows of Tx and Ty are for a two slides in close contact

LWL **IKO** Dynamic load from 1070 N to 3780 N

- **Linear slide for normal loads**
- Recirculating ball type linear slide
- Material: Similar to stainless steel 440C
- Standard accuracy
- For LWL5, the balls are made of steel and are not contained
- Max. speed: 3m/s
- Max. temperature: +100°C (continuous) +120°C (occasionally)
- **Note. Rails and slides have separate part numbers, remember to order both**



Short slide
LWLC-C1H



Self-lubricating
slide LWL-C1H

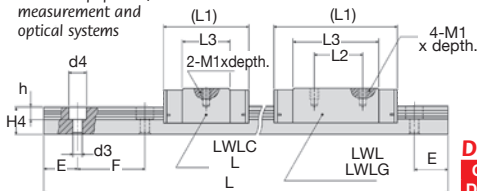
stainless steel



Long slide
LWLG-C1H

Uses

- Medical equipment, measurement and optical systems

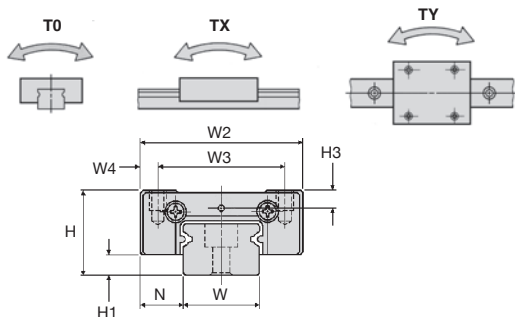


DISCOUNTS

Qty	1+	5+	10+
Disc.	List	-6%	On request

Part number	L (mm)	No. of holes	Max. length	Type of slide	Stock*	Price each 1 to 4
LWL9-60	60	3	860	-	✓	31,40 €
LWL9-120	120	6	860	-	✓	67,69 €
LWL9-160	160	8	860	-	-	90,28 €
LWL9-240	240	12	860	-	✓	135,41 €
LWL9-280	280	14	860	-	✓	157,98 €
LWL9-480	480	24	860	-	-	270,90 €
LWL9-720	720	36	860	-	-	406,41 €
LWL9-860	860	43	860	-	-	485,38 €
LWL9C-C1H	-	Slide	-	Short Autolubricant	✓	58,37 €
LWL9G-C1H	-	Slide	-	Long Autolubricant	✓	88,66 €
LWL9-C1H	-	Slide	-	Self-lubricating	✓	73,98 €
LWL12-50	50	3	1000	-	✓	27,23 €
LWL12-100	100	4	1000	-	✓	54,57 €
LWL12-150	150	6	1000	-	✓	81,87 €
LWL12-200	200	8	1000	-	✓	109,16 €
LWL12-275	275	11	1000	-	✓	150,12 €
LWL12-350	350	14	1000	-	✓	191,11 €
LWL12-400	400	16	1000	-	✓	218,39 €
LWL12-475	475	19	1000	-	-	259,36 €
LWL12-1000	1000	40	1000	-	-	546,12 €
LWL12C-C1H	-	Slide	-	Short Autolubricant	✓	59,02 €
LWL12G-C1H	-	Slide	-	Long Autolubricant	✓	95,31 €
LWL12-C1H	-	Slide	-	Self-lubricating	✓	78,73 €

*Depending on availability - Dimensions in mm



	LWL9C-C1H	LWL9G-C1H	LWL9-C1H	LWL12C-C1H	LWL12G-C1H	LWL12-C1H
Weight (g)						
Slide	11,00	18,00	28,00	22,00	34,00	51,00
rail (par 100mm)	35,00	35,00	35,00	65,00	65,00	65,00
Total dimensions (mm)						
H+/- 0,02	10,00	10,00	10,00	13,00	13,00	13,00
H1	2,00	2,00	2,00	3,00	3,00	3,00
N+/- 0,025	5,50	5,50	5,50	7,50	7,50	7,50
Slide dimensions (mm)						
W2	20,00	20,00	20,00	27,00	27,00	27,00
W3	15,00	15,00	15,00	20,00	20,00	20,00
W4	2,50	2,50	2,50	3,50	3,50	3,50
L1	21,50	30,00	40,50	25,00	34,00	44,00
L2	-	10,00	15,00	-	15,00	20,00
L3	11,90	20,80	30,90	13,00	21,60	32,00
M1 x depth	M3 x 3	M3 x 3	M3 x 3	M3 x 3,5	M3 x 3,5	M3 x 3,5
H3	2,20	2,20	2,20	2,70	2,70	2,70
Rail dimensions (mm)						
W	9,00	9,00	9,00	12,00	12,000	12,00
H4	6,00	6,00	6,00	8,00	8,00	8,00
d3	3,50	3,50	3,50	3,50	3,50	3,50
d4	6,00	6,00	6,00	6,50	6,50	6,50
h	3,50	3,50	3,50	4,50	4,50	4,50
E	10,00	10,00	10,00	12,50	12,50	12,50
F	20,00	20,00	20,00	25,00	25,00	25,00
Rail fixing holes	M3 x 8	M3 x 8	M3 x 8	M3 x 8	M3 x 8	M3 x 8
Basic dynamic load C(N)	1070	1610	2080	2000	2960	3780
Basic static load Co (N)	1540	2860	4180	2470	4450	6430
* Static torque						
T0 (Nm)	7,20	13,30	19,40	15,30	27,60	39,90
Tx (Nm)	3,00	9,40	19,40	5,50	16,00	36,80
	22,20	53,00	16,20	43,30	96,60	19,40
Ty (Nm)	2,50	7,90	16,30	4,70	13,40	27,00
	18,60	44,50	85,60	36,30	81,10	145,00

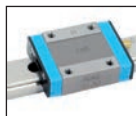
Data given in row T0 and first rows of Tx and Ty are for a single slide
Data given in second rows of Tx and Ty are for a two slides in close contact

LWL **I**KO Dynamic load from 3120 N to 7350 N

- **Linear slide for normal loads**
- Recirculating ball type linear slide
- Material: Similar to stainless steel 440C
- Standard accuracy
- Max. speed: 3m/s
- Max. temperature: +100°C (continuous)
+120°C (occasionally)
- **Note. Rails and slides have separate part numbers, remember to order both**



Short slide
LWLC-C1H



Self-lubricating
slide LWL-C1H

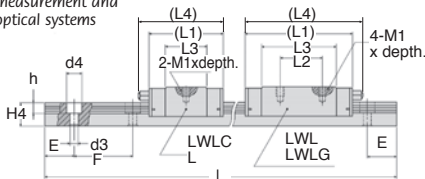
stainless steel



Long slide
LWLG-C1H

Uses

- Medical equipment, measurement and optical systems

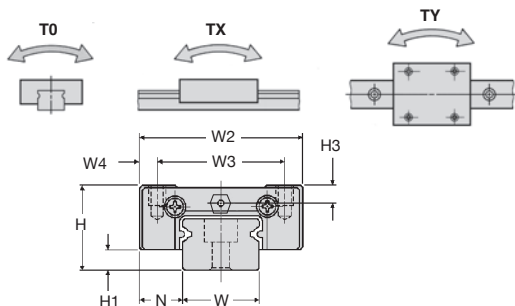


DISCOUNTS

Qty	1+	5+	10+
Disc.	List	-6%	On request

Part number	L (mm)	No. of holes	Max length	Type of slide	Stock*	Price each 1 to 4
LWL15-80	80	2	1000	-	✓	49,34 €
LWL15-120	120	3	1000	-	✓	75,15 €
LWL15-160	160	4	1000	-	✓	100,22 €
LWL15-240	240	6	1000	-	✓	150,36 €
LWL15-320	320	8	1000	-	✓	200,52 €
LWL15-440	440	11	1000	-	-	275,73 €
LWL15-480	480	12	1000	-	-	300,82 €
LWL15-560	560	14	1000	-	-	350,95 €
LWL15-680	680	17	1000	-	-	426,21 €
LWL15-960	960	24	1000	-	-	601,68 €
LWL15-1000	1000	25	1000	-	-	626,76 €
LWL15C-C1H	-	Slide	-	Short Autolubricant	✓	65,90 €
LWL15G-C1H	-	Slide	-	Long Autolubricant	✓	106,41 €
LWL15-C1H	-	Slide	-	Self-lubricating	✓	88,66 €
LWL20-120	120	2	1440	-	✓	78,67 €
LWL20-180	180	3	1440	-	✓	118,02 €
LWL20-240	240	4	1440	-	✓	157,42 €
LWL20-360	360	6	1440	-	✓	236,14 €
LWL20-480	480	8	1440	-	✓	314,89 €
LWL20-660	660	11	1440	-	-	433,00 €
LWL20-840	840	14	1440	-	✓	551,10 €
LWL20-960	960	16	1440	-	✓	629,83 €
LWL20C-C1H	-	Slide	-	Short Autolubricant	✓	72,51 €
LWL20G-C1H	-	Slide	-	Long Autolubricant	✓	116,49 €
LWL20-C1H	-	Slide	-	Self-lubricating	✓	97,26 €

*Dans la limite du disponible - Dimensions en mm



	LWL15C-C1H	LWL15G-C1H	LWL15-C1H	LWL20C-C1H	LWL20G-C1H	LWL20-C1H
Weight (g)						
Slide	42,00	63,00	95,00	89,00	130,00	196,00
rail (par 100mm)	107,00	107,00	156,00	156,00	156,00	156,00
Total dimensions (mm)						
H+/- 0,02	16,00	16,00	16,00	20,00	20,00	20,00
H1	4,00	4,00	4,00	5,00	5,00	5,00
N+/- 0,025	8,50	8,50	8,50	10,00	10,00	10,00
Slide dimensions (mm)						
W2	32,00	32,00	32,00	40,00	40,00	40,00
W3	25,00	25,00	25,00	30,00	30,00	30,00
W4	3,50	3,50	3,50	5,00	5,00	5,00
L1	32,00	42,00	57,00	38,00	50,00	68,00
L2	-	20,00	25,00	-	25,00	30,00
L3	17,70	27,90	42,70	22,30	34,60	52,30
L4	36,00	47,00	62,00	42,00	55,00	72,00
M1 x depth	M3 x 4,0	M3 x 4,0	M3 x 4,0	M4 x 6,0	M4 x 6,0	M4 x 6,0
H3	3,10	3,10	3,10	4,20	4,20	4,20
Rail dimensions (mm)						
W	15,00	15,00	15,00	20,00	20,00	20,00
H4	10,00	10,00	10,00	11,00	11,00	11,00
d3	3,50	3,50	3,50	6,00	6,00	6,00
d4	6,50	6,50	6,50	9,50	9,50	9,50
h	4,50	4,50	4,50	5,50	5,50	5,50
E	20,00	20,00	20,00	30,00	30,00	30,00
F	40,00	40,00	40,00	60,00	60,00	60,00
Rail fixing holes	M3 x 10	M3 x 10	M3 x 10	M5 x 14	M5 x 14	M5 x 14
Basic dynamic load C(N)	3120	4390	5750	4070	5830	7350
Basic static load Co (N)	4040	6730	10100	5490	9420	13000
* Static torque						
T0 (Nm)	31,10	51,80	77,70	56,00	96,10	136,00
Tx (Nm)	12,10	30,80	66,00	80,00	54,60	106,00
	87,60	178,00	351,00	138,00	291,00	549,00
Ty (Nm)	10,00	25,90	56,00	16,90	45,80	89,00
	73,50	149,00	294,00	116,00	244,00	461,00

Data given in row T0 and first rows of Tx and Ty are for a single slide

Data given in second rows of Tx and Ty are for a two slides in close contact