IKO

Micro Linear Way

LWL

Micro sizes from **1** mm *to* **6** mm

U.S. PATENTED

CAT-57143

ISO 9001 Certified   ISO 14001 Certified
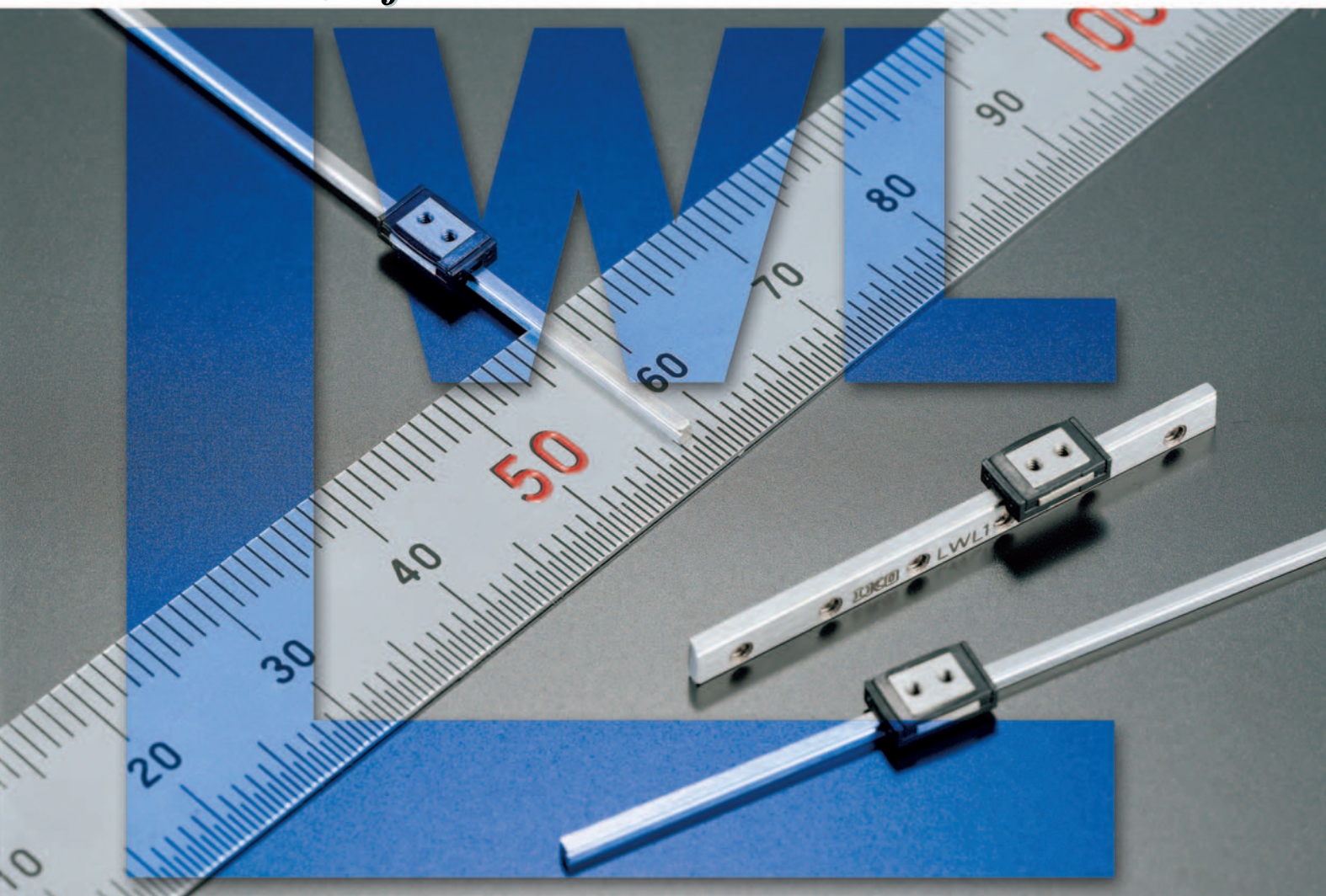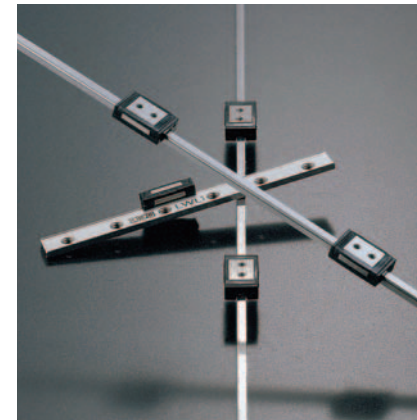
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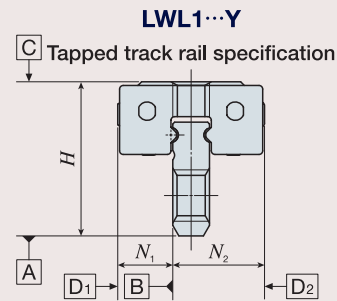Fax: +33 (0)1-48165746
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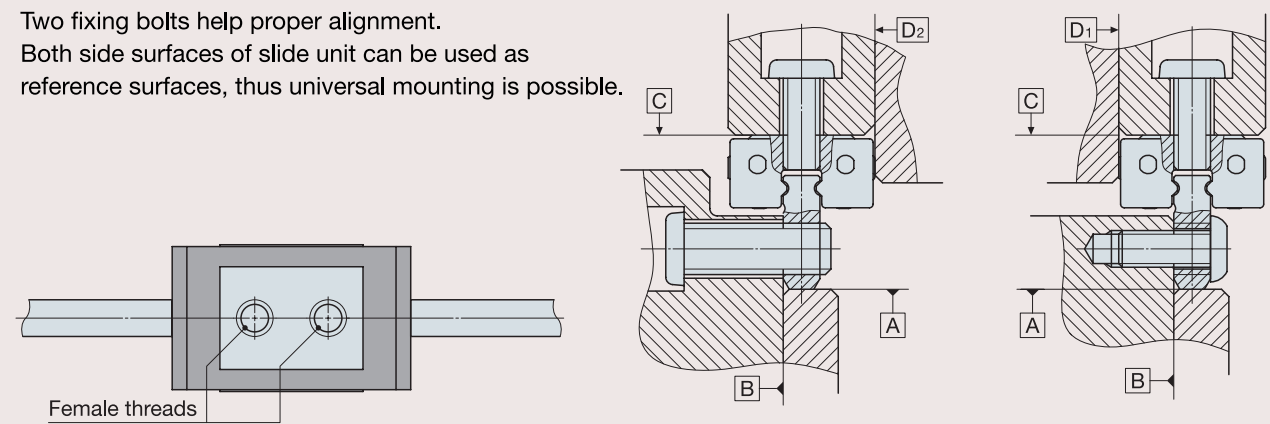# Super micro **1mm** width will take you on a "Fantastic Voyage"

Product accuracy is high level as other sizes.

All dimensional tolerances are strictly controlled with the original precision manufacturing technology. This is the smallest linear motion rolling guide for the places where compactness and high accuracy are required.

LWL1…Y

C Tapped track rail specification

Tapped mounting hole type track rail

LWL 1…Y

Casing

Slide unit

Steel balls

End plate

1mm

Non-mounting hole type track rail

LWL1

Also Low profile Non-mounting hole type track rail can be chosen. (**LWL1**)
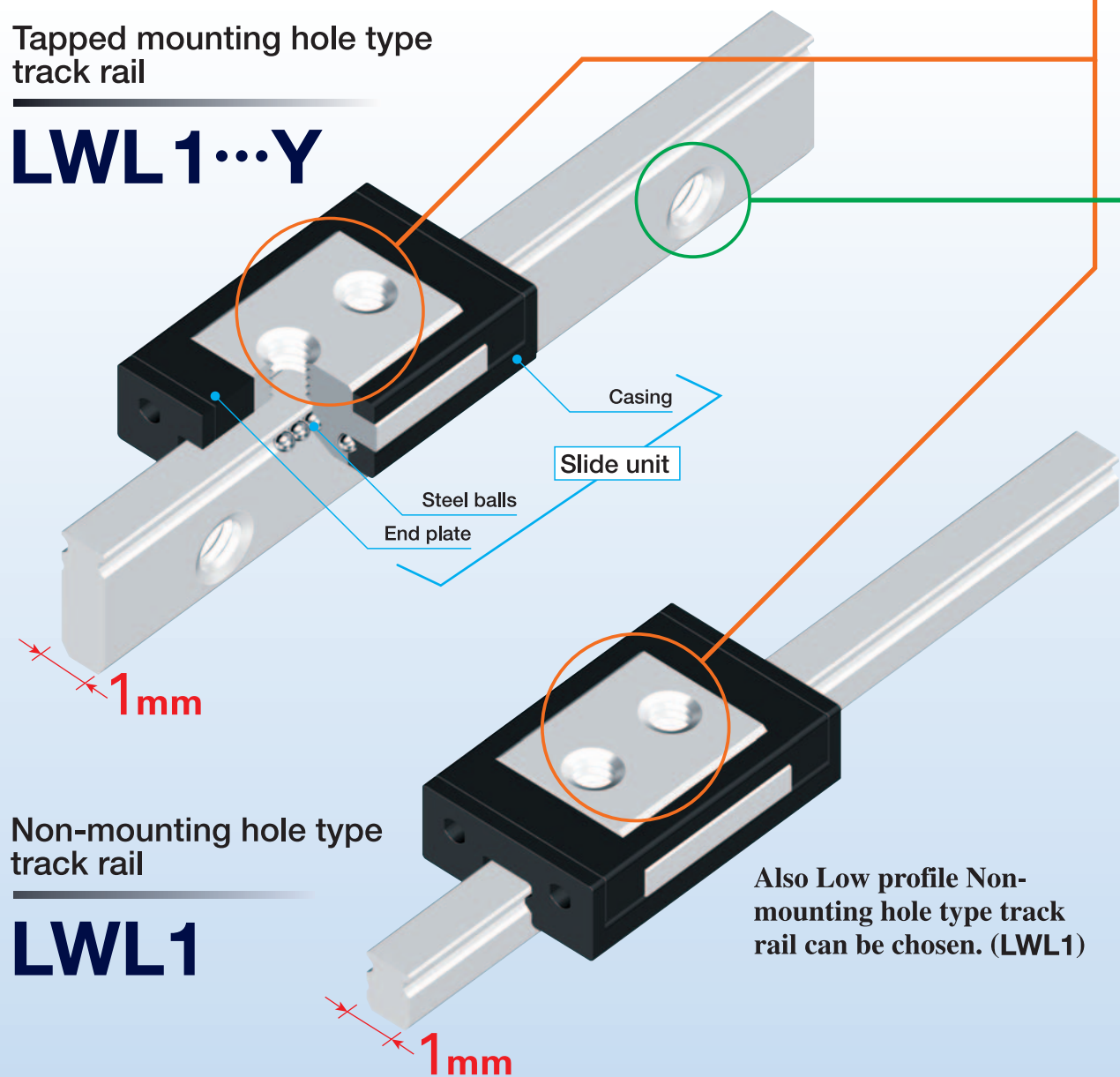
1mm

Two female threads are prepared on the top surface of slide unit as standard.

Two fixing bolts help proper alignment. Both side surfaces of slide unit can be used as reference surfaces, thus universal mounting is possible.

Female threads

Tapped track rail specification

For track rail width 1mm, female threads are prepared for lateral mounting and track rail can be fixed easily and correctly.

Using female thread
(Required bolt size is M1.4)

Using as through hole
(Required bolt size is M1.0)
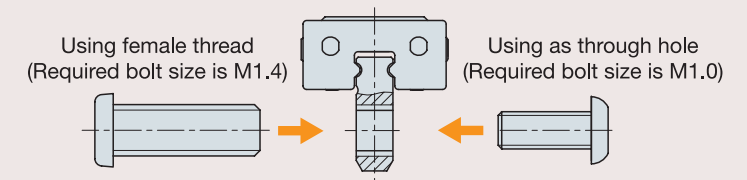
Mounting method (for tapped track rail specification LWL1…Y)

The track rail can be fixed correctly by using prepared female threads. Multiple mounting methods are possible.

IKO Micro Linear Way LWL

We challenge to achieve miniaturization of linear products for down sizing and Here is the product realized by a micro advanced technology field.

higher performance of machines and equipments.

Wide variation

There is a great variation in sizes and shapes.
The best specification can be selected to suite each machine and equipment.

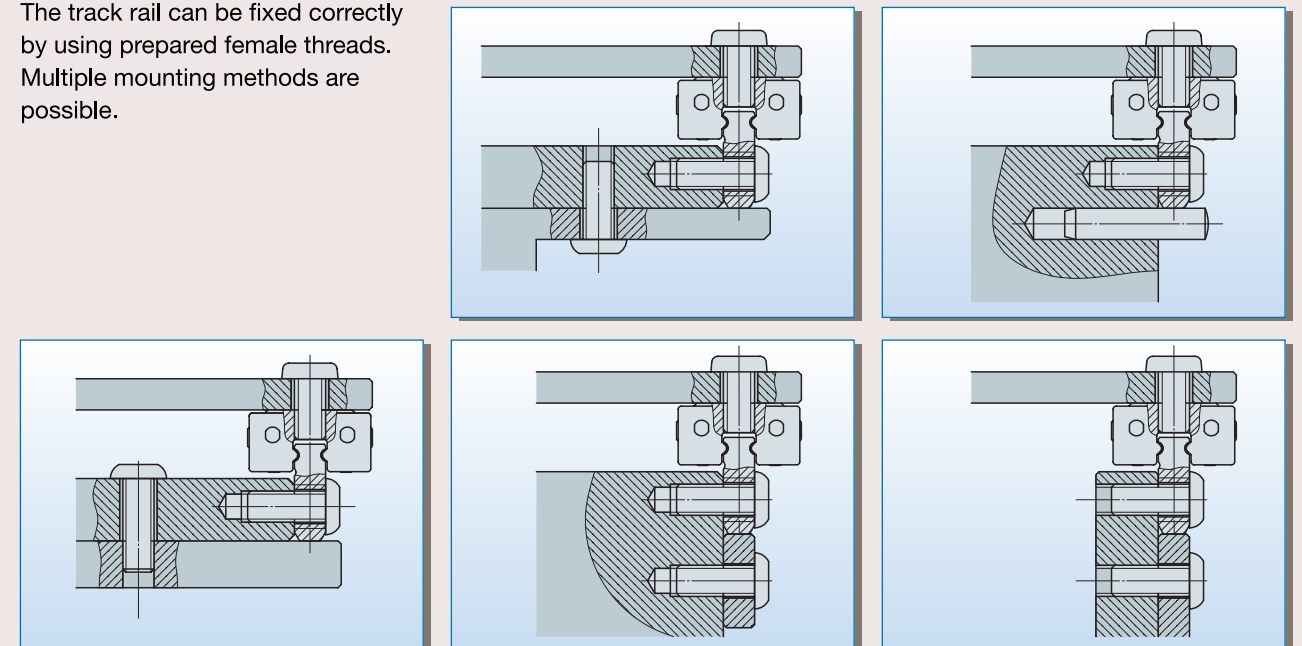- **Track rail width; 1mm to 6mm are available.**

- **Standard type and wide type are available. Wide type is suitable for single row rail arrangement.**

- **Standard type slide unit and short type slide unit are available in the same sectional dimension.**

- **Two kinds of track rails, through mounting holes type and female thread mounting holes type, are available.**

Micro Linear Way LWL is suitable for optical fiber communication device, medical equipments, semiconductor manufacturing system, liquid crystal display manufacturing process.
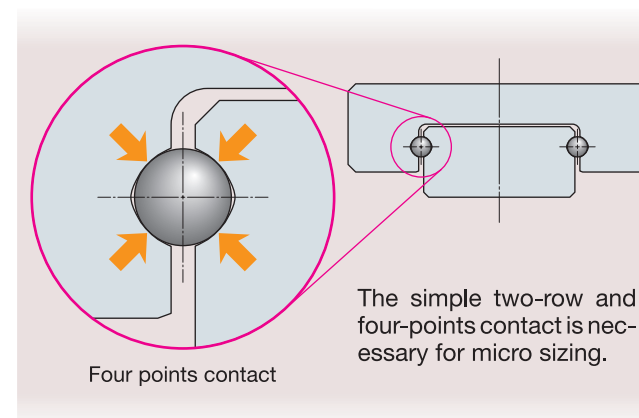
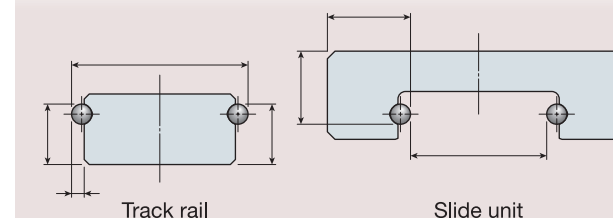## The simple structure for accuracy controlling and micro-sizing

All **IKO** Linear Way features unique design in which large diameter steel balls contacting raceways at four points each are arranged in two rows. High level of accuracy, even in Micro Linear Way, can be realized by **IKO**'s all of accumulated linear motion technology and this simple structure.

Four points contact

The simple two-row and four-points contact is necessary for micro sizing.

Track rail   Slide unit

The simple two-row and four-points contact design minimizes the number of potential errors in manufacturing. High level of accuracy control is possible.

Micro Linear Way made of stainless steel is corrosion resistant, so these product is the most suitable for applications where the use of oil or grease (including rust preventive oil) should be avoided or kept to a minimum.

Special fixing screws are available for M1 to M2. For details, please see page 16.

	Standard type			Wide type	
	LWL1 **NEW**	LWL2	LWL3	LWLF4	LWLF6
Cross section (Full-scale)	1mm / 1mm	2mm	3mm	4mm	6mm
Length of slide unit (Full-scale) — Short	—	—		—	
Length of slide unit (Full-scale) — Standard					

	Standard track rail	Tapped track rail	Tapped track rail (Lateral)	Non-mounting hole type track rail
Shape of track rail	Applicable to size 4 and 6	Applicable to size 2, 3 and 6	Applicable to size 1	Applicable to size 1

The ultimate **IKO** miniature technology for super micro machine

Other micro series are also available.
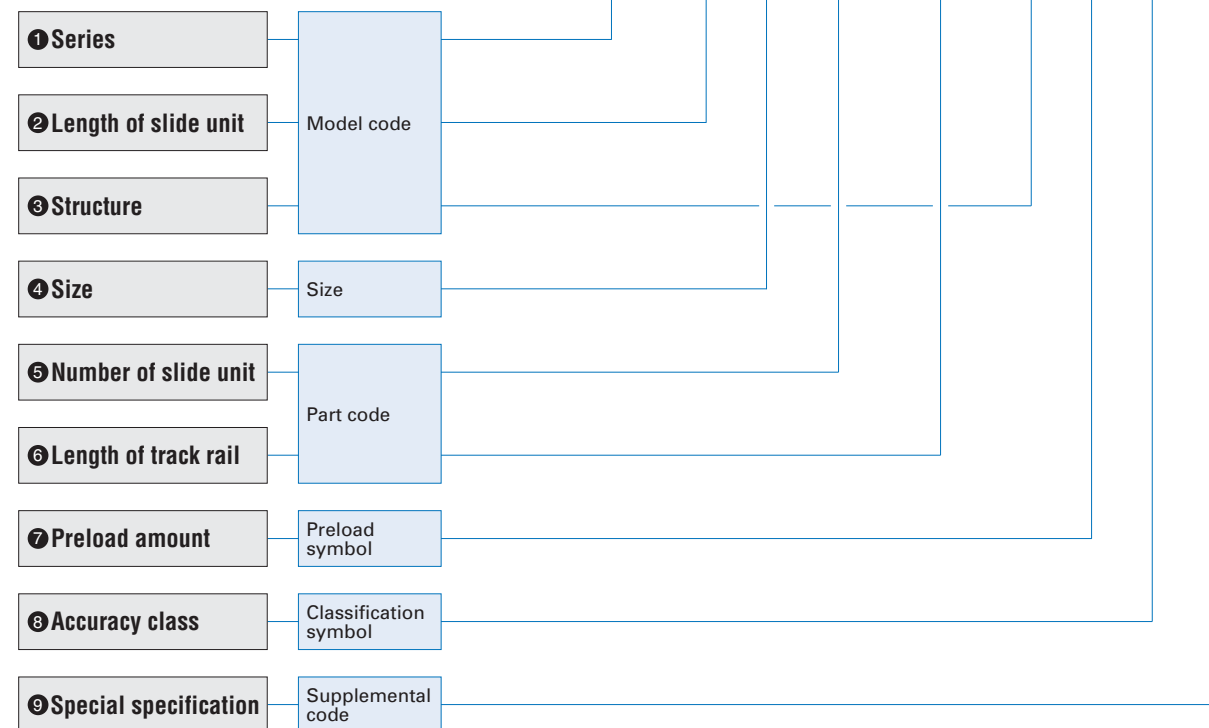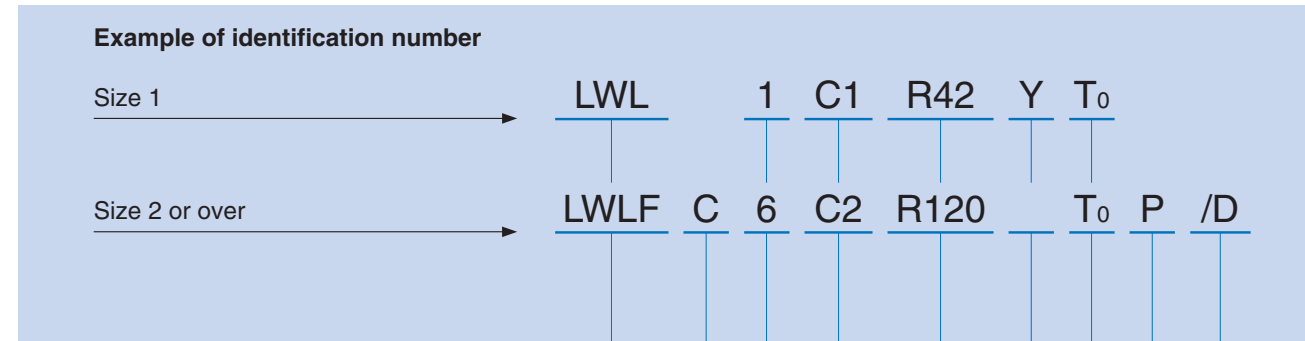Please consult **IKO** for future information.

Spline shaft diameter: **2mm**

Linear Ball spline G LSAG 2, LSAGF 2

Shaft diameter: **2mm**

Miniature Stroke Rotary Bushing STSI 2

Stud diameter: **2mm**

Miniature Cam Follower CFS 2

Identification Number

The specification of Micro Linear Way LWL is specified by the identification number, which consists of a model code, a size, a part code, a preload symbol, a classification symbol, interchangeable code and special supplemental codes.

Example of identification number

Size 1 → LWL　1　C1　R42　Y　T₀

Size 2 or over → LWLF　C　6　C2　R120　T₀　P　/D

❶ Series
❷ Length of slide unit
❸ Structure
❹ Size
❺ Number of slide unit
❻ Length of track rail
❼ Preload amount
❽ Accuracy class
❾ Special specification

Model code — Size — Part code — Preload symbol — Classification symbol — Supplemental code

❶ Series	Standard type　: LWL Wide type　: LWLF

❷ Length of slide unit	Short　: C Standard　: Non symbol

❸ Structure	Standard 　Tapped track rail specification　: Non symbol, Y 　Non-mounting hole type 　　track rail specification　: Non symbol Wide type 　Tapped track rail specification　: Non symbol 　Non-mounting hole type 　　track rail specification　: N	Applicable type and size are shown in Table 1.

❹ Size	1, 2, 3, 4 and 6

Table1 Type and size of Micro Linear Way LWL
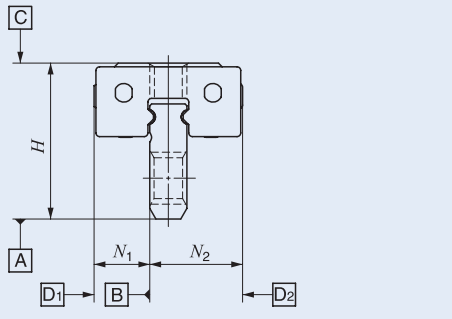
Series	Material	Structure	Length of the slide unit	Model code	Size 1	Size 2	Size 3
Standard type	Stainless steel	Tapped track rail specification	Short	LWLC	—	—	○
			Standard	LWL	—	○	○
			Standard	LWL…Y	○	—	—
		Non-mounting hole type track rail specification	Standard	LWL	○	—	—

Series	Material	Structure	Length of the slide unit	Model code	Size 4	Size 6
Wide type	Stainless steel	Standard rail specification	Short	LWLFC	—	○
			Standard	LWLF	○	○
		Tapped track rail specification	Short	LWLFC…N	—	○
			Standard	LWLF…N	—	○

❺ Number of slide unit	C○	Indicate the number of slide units assembled on one track rail.

❻ Length of track rail	R○	Indicate the length of track rail in mm. For standard and maximum lengths, see "Track rail length" in Table 15 on page 15.

❼ Preload	Clearance　: T₀	Applicable preload for Micro Linear Way LWL is only T₀ preload. It is zero or minimal amount of clearance.

❽ Accuracy code	High class　: H Precision class　: P	Accuracy code is applicable for size 2 or over and not applicable for size 1. (No symbol) For applicable accuracy, see Table 2 and Table 3 on page 7.

❾ Special specifications	/D, /E, / I , /MN, /W○, /Y○	Applicable special specifications are shown in Table 4 on page 8. Special specification is not applicable for size 1.

1N=0.102kgf=0.2248lbs.
1mm=0.03937inch

Accuracy

Accuracy of Micro Linear Way LWL is show in Table 2 and 3.
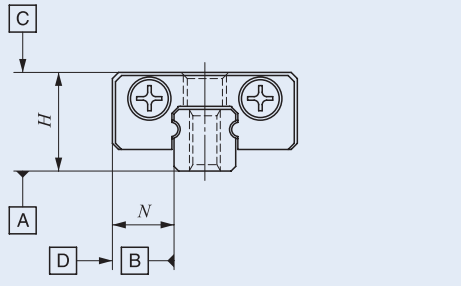
Table 2 Accuracy of Micro Linear Way LWL (for LWL1-Y)

unit: mm

Item	Tolerance
Dim. H tolerance	± 0.020
Dim. N_1 and N_2 tolerance	± 0.025

## Table 3 Accuracy of Micro Linear Way LWL (for LWL2 and larger)

unit: mm

Item	Classification (Symbol) High (H)	Precision (P)
Dim. H tolerance	± 0.020	± 0.010
Dim N tolerance	± 0.025	± 0.015
Dim. Variation of H ([1])	0.015	0.007
Dim. Variation of N ([1])	0.020	0.010
Parallelism in operation of C to A	See Fig.1	
Parallelism in operation of D to B	See Fig.1	

Note([1]): It means the size variation between slide units mounted on the same track rail.

Fig. 1 Parallelism in operation of Micro Linear Way LWL (Size 2 or larger)
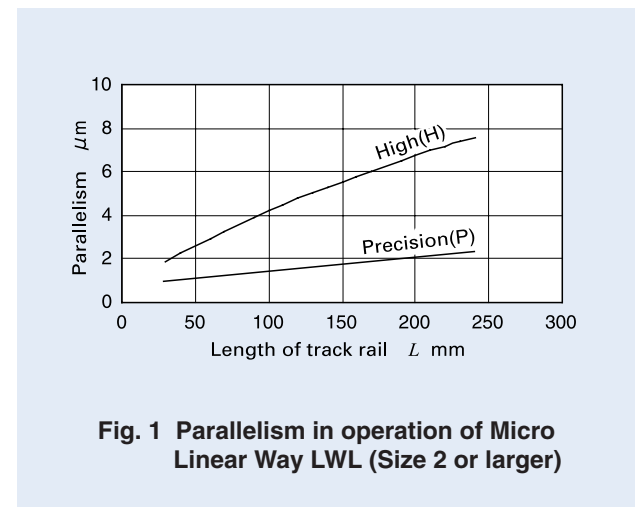
Special Specifications

Micro Linear Way LWL series with the special specifications shown in Table 4 are optionally available for various applications. When ordering, add any supplemental codes onto the identification number. If a combination of special specifications is required (See Table 5), indicate the supplemental codes in alphabetical order. These optional items can be combined to achieve further improvements in performance.

Table 4 Applicable specifications

| Specifications	Supplemental code
Opposite reference surface arrangement	/D
Specified rail mounting hole positions	/E
Appending inspection sheet	/ I
Without track rail mounting bolts ([1])	/MN
Matched sets to be used as an assembled group	/W○
Specified grease	/Y○

Note([1]): Applicable to sizes 4 and 6.

Table 5 Combination of special specifications

|	D	E	I	MN	W
E	—				
I	○	○			
MN	○	○	○		
W	○	—	○	○	
Y	○	○	○	○	○

Remark: In the table, the mark ○ indicates that this combination can be made.

Opposite reference surfaces arrangement /D

Reference mounting surface

Reference mounting surface
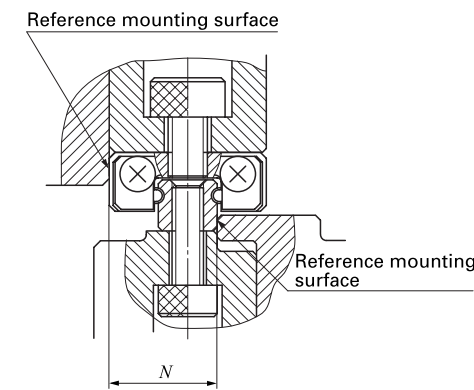
The reference mounting surface of track rail is made opposite to the standard side. The accuracy of dimension N including parallelism in operation is the same with that of standard specification.

Specified track rail mounting hole positions /E

IKO mark
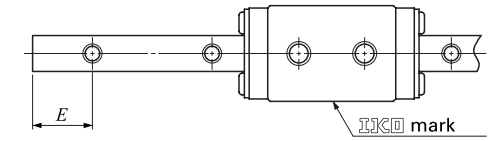
The mounting hole positions of track rail can be specified by specifying dimension E at the left end, which is the distance from the mounting hole nearest to the left end of the track rail to the left end face of the track rail in sight of IKO mark on the slide unit. When ordering, add the dimension (in mm) after "/E". Dimension E can be specified in a limited range. Consult IKO for further information.
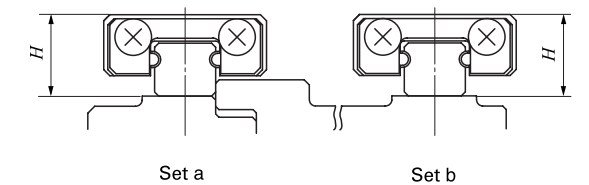
With inspection sheet / I

The inspection sheet recording dimensions H and N (See "Accuracy"), dimensional variations of H and N, and parallelism in operation of the slide unit is attached to each set.

Without track rail mounting bolts /MN

Track rail mounting bolts are not appended.
(Applicable to sizes 4 and 6)

Matched sets to be used as an assembled group /W

Set a   Set b

For two or more sets of Micro Linear Way LWL used on the same plane, the dimensional variation of H of Micro Linear Way LWL is kept within the specified range. The dimensional variation of dimension H in matched sets in the same as that of single set. Indicate the number of sets after "/W".

Specified grease /YCG /YCL /YBR /YNG

The type of pre-packed grease in the slide unit can be changed by a supplemental code.
❶ /YCG   Low Dust Generation Grease for Clean Environment CG2 is pre-packed.
❷ /YCL   Low Dust Generation Grease for Clean Environment CGL is pre-packed.
❸ /YBR   MOLYKOTE BR-2 PLUS Grease (Dow Corning) is pre-packed.
❹ /YNG   No grease is pre-packed.

Note: For sizes 2 and 4, only /YNG is applicable.

1N=0.102kgf=0.2248lbs.
1mm=0.03937inch

Load Rating and Life

Basic dynamic load rating C

The basic dynamic load rating is defined as a constant load both in direction and magnitude under which a group of identical Micro Linear Way LWL series are individually operated and 90% of those in the group can travel 50×10^3 m free from material damage due to rolling contact fatigue.

Basic static load rating C_0

The basic static load rating is defined as a static load that gives a prescribed constant contact stress at the center of the contact area between rolling elements and raceways receiving the maximum load.
It is the allowable limit load that permits normal rolling motion.
Generally, the basic static load rating is used in combination with the static safety factor.

Static moment rating T_0, T_X, T_Y

The static moment rating is defined as a static moment load (See Fig.3) that gives a prescribed constant contact stress at the center of the contact area between rolling elements and raceways receiving the maximum load.
The static moment rating is used in combination with the static safety factor to give the limiting load for normal rolling motion.
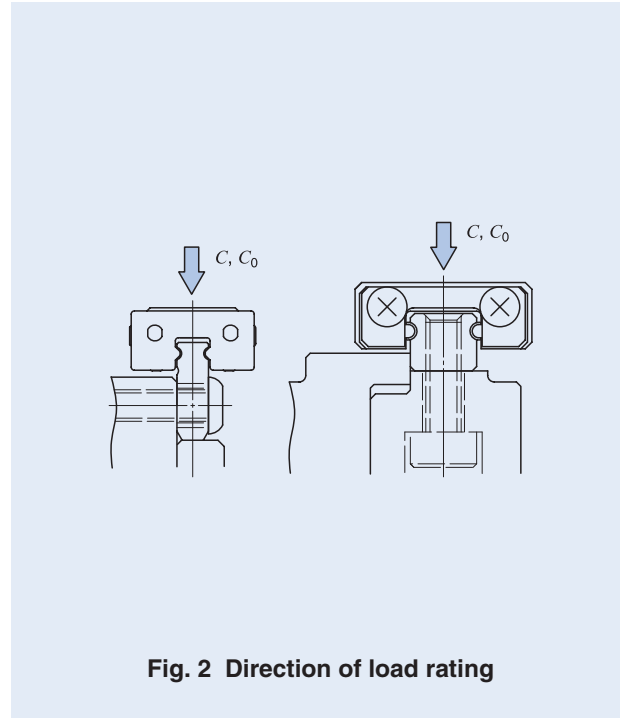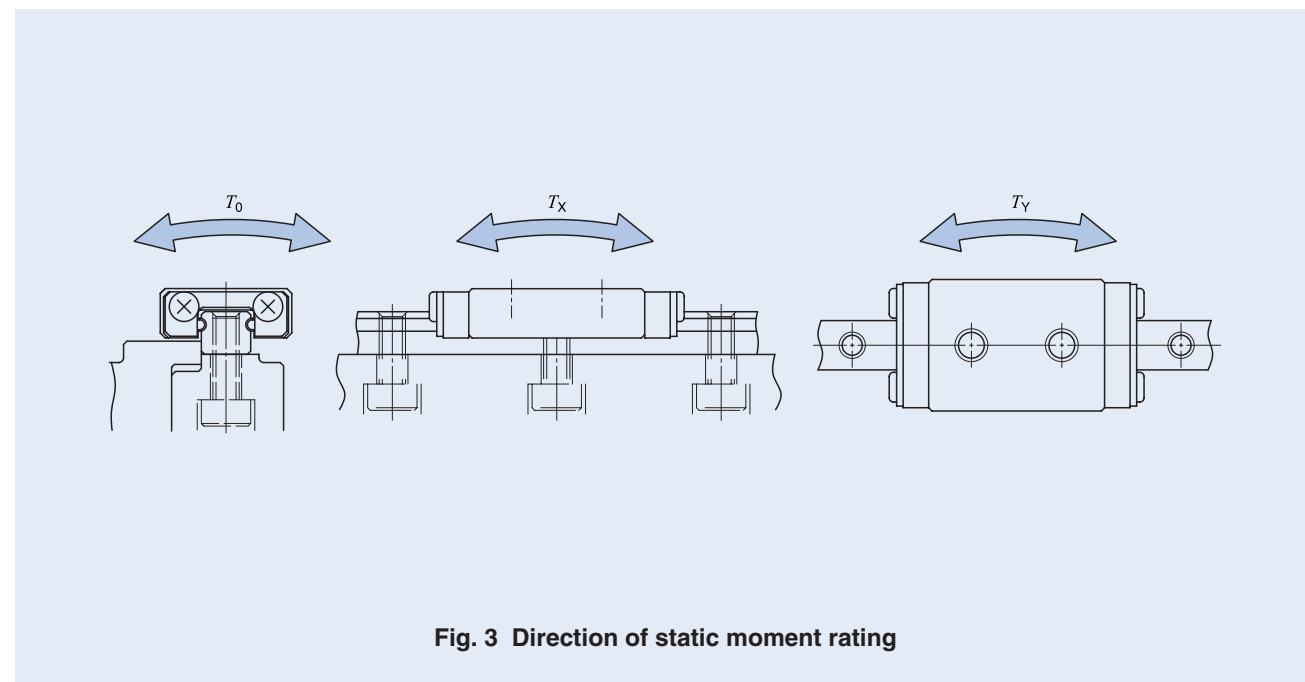

Fig. 2 Direction of load rating

Fig. 3 Direction of static moment rating

Life

The rating life of Micro Linear Way LWL series is obtained from the following calculation formula.

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

where, L : Rating life, 10^3m
C : Basic dynamic load rating, N
P : Dynamic equivalent load, N

If the stroke length and the number or strokes per minute are known, the life in hours must be calculated by the following formula.

$$L_h = \frac{10^6 L}{2 S n_1 \times 60} \quad \cdots\cdots\cdots\cdots\cdots\cdots (2)$$

where, L_h : Rating life in hours, hours
S : Stroke length mm
n_1 : Number of strokes per minute cpm

Static safety factor

The static safety factor f_S of Micro Linear Way LWL is given in the following formula, and general values of this factor are shown in Table 6.

$$f_S = \frac{C_0}{P_0} \quad \cdots\cdots\cdots\cdots\cdots\cdots (3)$$

where, f_S : Static safety factor
C_0 : Basic static load rating, N
P_0 : Static equivalent load, N

Table 6 Static safety factor

Operating conditions	f_S
Operation with vibration and/or shocks	3~5
High operating performance	2~4
Normal operation	1~3

Load factor

Actual loads applied to the linear motion rolling guide sometimes exceed the theoretically calculated load due to vibration and shocks caused by machine operation. The actual life is calculated by multiplying the theoretical load by the load factor indicated in Table 7.

Table 7 Load factor

Conditions	f_W
Smooth operation free from vibration and/or shocks	1 ~1.2
Normal operation	1.2~1.5
Operation with shock loads	1.5~3

Dynamic equivalent load for rating life

When a load is applied in a direction other than that of the basic dynamic load rating of Linear Way or a complex load is applied, the dynamic equivalent load must be calculated to obtain the basic rating life. Obtain the downward and lateral conversion loads from the loads and moments in various directions.

$$F_{re} = k_r |F_r| + \frac{C_0}{T_0}|M_0| + \frac{C_0}{T_X}|M_X| \quad \cdots\cdots\cdots (4)$$

$$F_{ae} = k_a |F_a| + \frac{C_0}{T_Y}|M_Y| \quad \cdots\cdots\cdots (5)$$

where, F_{re} : Downward conversion load, N
F_{ae} : Lateral conversion load, N
F_r : Downward load, N
F_a : Lateral load, N
M_0 : T_0 moment, N·m
M_X : T_X moment, N·m
M_Y : T_Y moment, N·m
k_r, k_a : Conversion factor by load direction (See Table 8)
C_0 : Basic static load rating, N
T_0 : T_0 static moment, N·m
T_X : T_X static moment, N·m
T_Y : T_Y static moment, N·m

Table 8 Conversion factor by load direction

Condition	Conversion factor	
	k_r	k_a
$F_r \geqq 0$	1	0.84
$F_r < 0$	1	

From the converted downward and lateral load, mean equivalent dynamic load must be corrected by the following formula.

$$P = X F_{re} + Y F_{ae} \quad \cdots\cdots\cdots\cdots\cdots (6)$$

where, P : Mean equivalent dynamic load, N
X, Y : Mean equivalent dynamic load factor (See Table 9)
F_{re} : Converted downward load, N
F_{ae} : Converted lateral load, N

Table 9 Mean equivalent dynamic load factor

Condition	X	Y
$|F_{re}| \geqq |F_{ae}|$	1	0.6
$|F_{re}| < |F_{ae}|$	0.6	1

1N=0.102kgf=0.2248lbs.
1mm=0.03937inch

Lubrication and Dust Protection

Static equivalent load for static safety factor

When a load is applied in a direction other than that of the basic static load rating of Linear Way or a complex load is applied, the static equivalent load must be calculated to obtain the static safety factor.

From each directional load, converted load equal to downward or lateral is given by following formula.

$$P_0 = k_{0r}|F_r| + k_{0a}|F_a| + \frac{C_0}{T_0}|M_0| + \frac{C_0}{T_X}|M_X| + \frac{C_0}{T_Y}|M_Y| \quad \cdots(7)$$

where, P_0 : Static equivalent load, N

F_r : Downward load, N

F_a : Lateral load, N

M_0 : T_0 moment, N·m

M_X : T_X moment, N·m

M_Y : T_Y moment, N·m

k_{0r}, k_{0a} : Conversion factor by load direction (See Table 10)

C_0 : Basic static load rating, N

T_0 : T_0 static moment, N·m

T_X : T_X static moment, N·m

T_Y : T_Y static moment, N·m

Table 10 Conversion factor by load direction

Condition	Conversion factor	
	k_{0r}	k_{0a}
$F_r \geqq 0$	1	0.84
$F_r < 0$	1	

Quality lithium-soap base grease (MULTEMP PS No.2: KYODO YUSHI) is pre-packed in Micro Linear Way LWL.

The quality of any grease will gradually deteriorate as operating time passes. Therefore, periodic re-lubrication is necessary. The re-lubrication interval varies depending on the operating conditions of the rolling guides. A six months interval of generally recommended and, if the machine operation consists of reciprocating motions with many cycles and long strokes, re-lubrication every three months is recommended.

Micro Linear Way LWL does not have oil hole thus, grease must be directly applied on the raceways of track rail. Miniature Grease Injector is available and please consult IKO if necessary.

After grease is replenished, running in is performed and excess grease will be discharged from the inside of rolling guide. Discharged grease must then be removed before starting the operation. Low and stable friction can be obtained after ten to twenty times of manual strokes. It is possible to reduce the amount of grease to make frictional resistance lower. But careful attention is necessary to keep minimum amount of lubricant strictly for the product safety.

Micro Linear Way LWL does not have end seals. When it is used in places except clean environment, preparing dust protection cover is recommended to avoid intruding harmful dust and particles from outside.

Precautions for Use

❶ Mounting surface, reference mounting surface, and general mounting structure

To mount Micro Linear Way LWL, correctly fit the reference mounting surfaces B and D (D_1 or D_2) of the slide unit and track rail to the reference mounting surfaces of the table and the bed, and then fix them tightly. (See Fig.5.3)

In size 1, reference surfaces are available to both side of slide unit. (D_1 and D_2)

Track rail of LWL1-Y can be mounted in lateral direction.

Two kinds of mounting methods can be chosen. (See Fig.5.1 and 5.2)

The reference mounting surfaces B and D (D_1 and D_2) and the mounting surfaces A and C of Micro Linear Way LWL are accurately finished by grinding. Stable and high accuracy liner motion can be obtained by finishing the mating mounting surfaces of machines or equipment with high accuracy and correctly mounting the guide on these surfaces.

Reference mounting surfaces of slide unit and track rail are shown in Table 11.

Table 11 Reference mounting surface of slide unit and track rail

Model number	Slide unit	Track rail
LWL1	Either side is possible. (See Fig.6.1)	—
LWL1···Y		Opposite to IKO mark. (See Fig.6.1)
LWL2 or larger	Opposite to IKO mark. (See Fig.6.2)	Side surface above the IKO mark (in the direction of the arrow. See Fig.6.2)

Fig. 5.1 Reference mounting surface and general mounting structure I of LWL1···Y
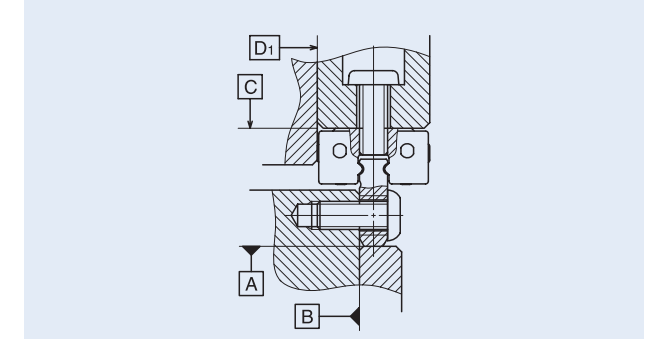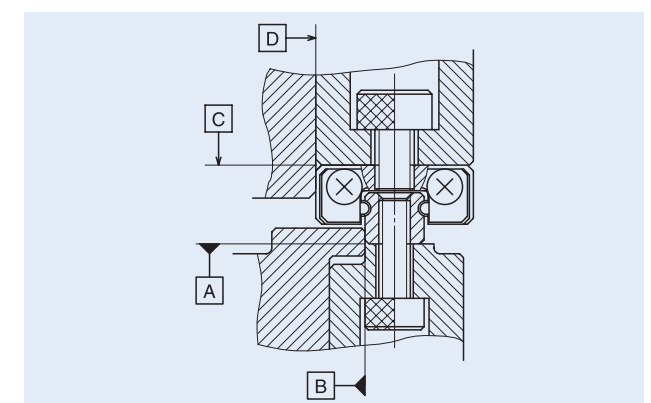

Fig. 5.2 Reference mounting surface and general mounting structure II of LWL1···Y

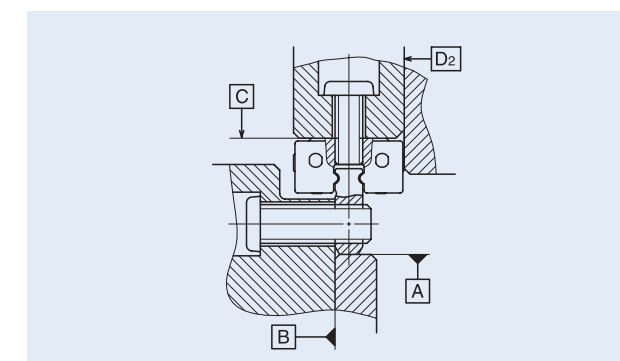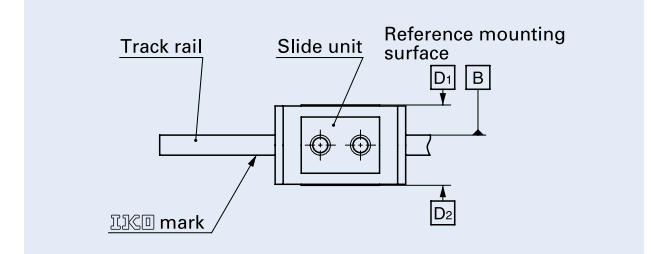**Fig. 5.3 Reference mounting surface and general mounting structure of LWL2 or larger**

Fig. 6.1 Reference mounting surface of LWL1
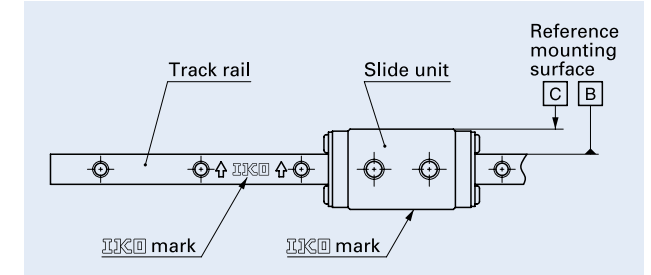
Fig. 6.2 Reference mounting surface of LWL2 or larger

1N=0.102kgf=0.2248lbs.
1mm=0.03937inch

❷ **Female threads for mounting the slide unit and track rail are through holes.**

If the fixing depth of the mounting bolts is too long, the bolts will interfere with the slide unit or track rail, resulting in poor traveling accuracy and short life. The fixing depth of the mounting bolts should be kept within the values shown in the table of dimensions. Also, small head (less than 1.8mm) screw for precision equipment is recommended for mounting of size 1.

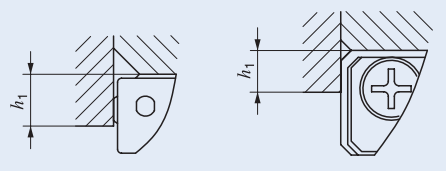❸ **The mounting bolts for track rail are not appended.**

For sizes 2 and 3, prepare bolts with a fixing depth not exceeding H4 shown in the dimension table.

❹ **Corner radius and shoulder height of reference mounting surfaces**

It is recommended to make a relieved fillet at the corner of the mating reference mounting surface as shown in Fig.5.1 and Fig. 5.2.
Table 12 and Table 13 show recommended shoulder height and radius of the reference mounting surfaces.
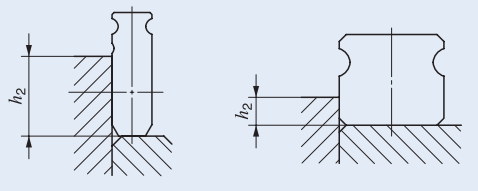
Table 12 Shoulder height for the reference mounting surface of slide unit

unit: mm

Model number	Shoulder height for slide unit h_1
LWL 1	1.3
LWL 2	1
LWLC 3, LWL 3	1.2
LWLF 4	1.5
LWLFC 6, LWLF 6	2

Table 13 Shoulder height for the reference mounting surface of track rail

unit: mm

Model number	Shoulder height for track rail h_2
LWL 1 ··· Y	2
LWL 2	0.5
LWLC 3, LWL 3	0.8
LWLF 4	0.8
LWLFC 6, LWLF 6	0.8

Remark: For LWL1, prepare the reference mounting surface not to interference with slide unit.

❺ **Multiple slide units mounted in close distance**

When using multiple slide units in close distance to each other, actual load may be greater than the calculated load depending on the mounting accuracy of the slide units on the mounting surfaces and the reference mounting surfaces of the machines. It is suggested in such cases to assume a greater load than the calculated load.

❻ **Operating temperature**

The maximum operating temperature is 120°C and a continuous operation is possible at temperatures up to 100°C. When the temperature exceeds 100°C, consult Ⅱ🄚🄒🄞.

Mounting

❶ **When assembling two or more sets**

Use an assembly of slide unit and track rail as delivered without changing the combination.
Matched sets to be used as an assembled group
Special specification products of matched sets (by supplemental code"/W") are delivered as a group in which dimensional variations are specially controlled. Mount them without mixing with the sets of another group.

❷ **Assembling a slide unit and a track rail**

When assembling Micro Linear Way LWL, correctly fit the groove of the slide unit mounted on a steel ball holder to the groove of the track rail, and then move the slide unit gently from the steel ball holder to the track rail in parallel direction.
Steel balls are not retained in Micro Linear Way, so using steel ball holder is necessary when re-assemble the slide unit from the track rail.
For sizes 2 or larger, a steel ball holder is appended as an accessory. If a steel ball holder for size 1 is required, please consult Ⅱ🄚🄒🄞.

❸ **Cleaning the mounting surfaces**

When mounting Micro Linear Way LWL, first clean all mounting and reference mounting surfaces. (See Fig.7)
Remove burrs and blemishes from the reference mounting surfaces and mounting surfaces of the machine using an oilstone, etc., and then wipe the surfaces with clean cloth.
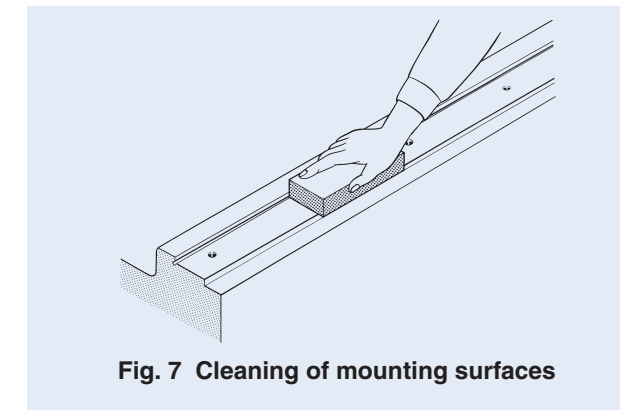
Fig. 7 Cleaning of mounting surfaces

❹ **Tightening torque of mounting bolts**

The standard torque values for Micro Linear Way mounting bolts are shown in Table 14. When machines or equipment are subjected to serve vibration, shock, large fluctuating load, or moment load, the bolts should be tightened with a torque 1.2 to 1.5 times higher than the standard torque values shown. When the mating member material is cast iron or aluminum, tightening torque should be lowered in accordance with strength characteristics of the material.

Table 14 Tightening torque of mounting bolts

Bolt size	Tightening torque N-m
	Stainless steel bolt (Property division A2-70)
M1 × 0.25	0.04
M1.4 × 0.3	0.10
M1.6 × 0.35	0.15
M2 × 0.4	0.31

Remark: Tightening torque for LWL1 is recommended to be 70 to 80% of the values in the table.

1N=0.102kgf=0.2248lbs.
1mm=0.03937inch

Track Rail Lengths

Standard and maximum lengths of track rails of Micro Linear Way LWL are shown in Table 15.

Track rail in any length are also available. Simply indicate the necessary length of track rail in millimeter (mm) in the identification number.

E-dimensions at both ends are the same unless otherwise specified. To change these dimensions, specify the specified rail mounting hole positions (supplemental code "/E") of special specification.

Table 15 Standard and maximum lengths of track rail

unit: mm

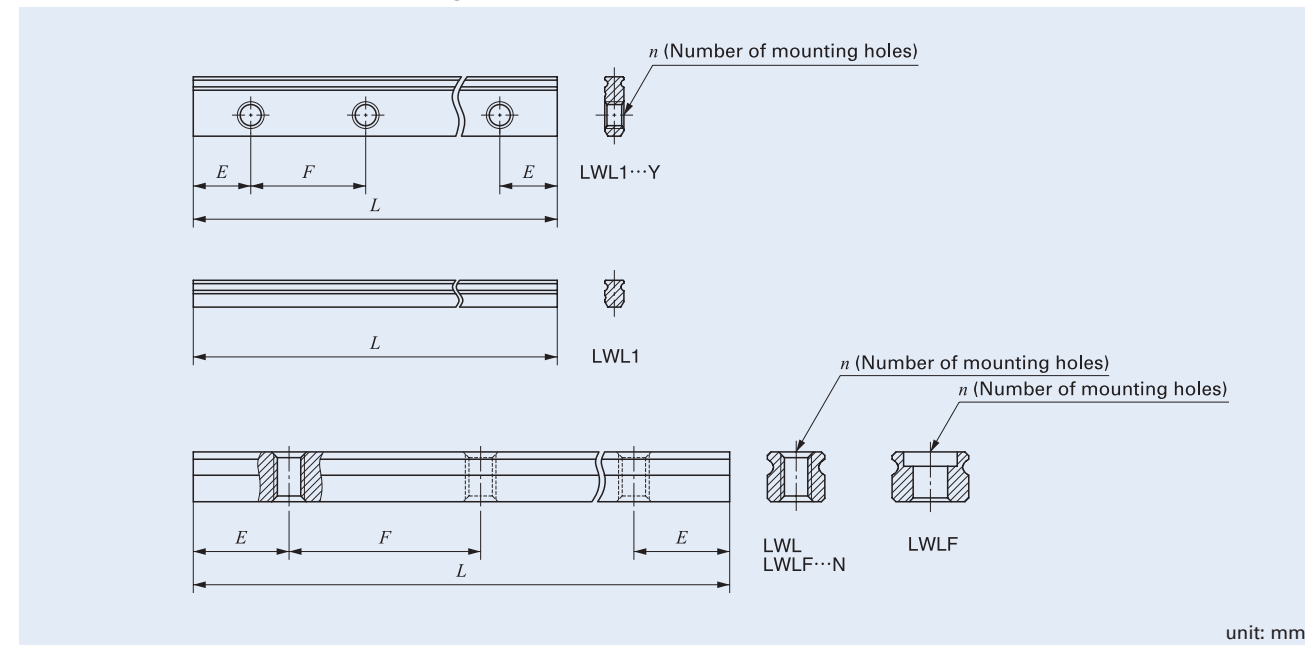| Item \ Model number	LWL 1 ··· Y	LWL 1	LWL 2	LWL 3	LWLF 4	LWLF 6
Standard length L (n)	18(3) 30(5) 42(7)	18(−) 30(−) 42(−)	32(4) 40(5) 56(7) 80(10)	30(3) 40(4) 60(6) 80(8) 100(10)	40(4) 60(6) 70(7) 80(8) 100(10)	60(4) 90(6) 105(7) 120(8) 150(10)
Mounting hole pitch F	6	—	8	10	10	15
E	3	—	4	5	5	7.5
Standard range of E — Over (Incl.)	2.5	—	2.5	3	3.5	4.5
Standard range of E — Under	5.5	—	6.5	8	8.5	12
Maximum length([1])	102	102	104 (200)	150 (300)	180 (300)	240 (300)

Note([1]): The track rails can be manufactured up to the maximum length shown in parentheses. If required, please consult IKO.
Remarks: The above table shows representative model numbers but is applicable to all models of the same size.

Mounting Bolts

For Micro Linear Way LWL, fixing bolts for slide unit and tapped track rail are available as shown in Table 16.1 and Table 16.2.

Table 16.1 Cross-recessed head cap screw for precision equipment

unit: mm
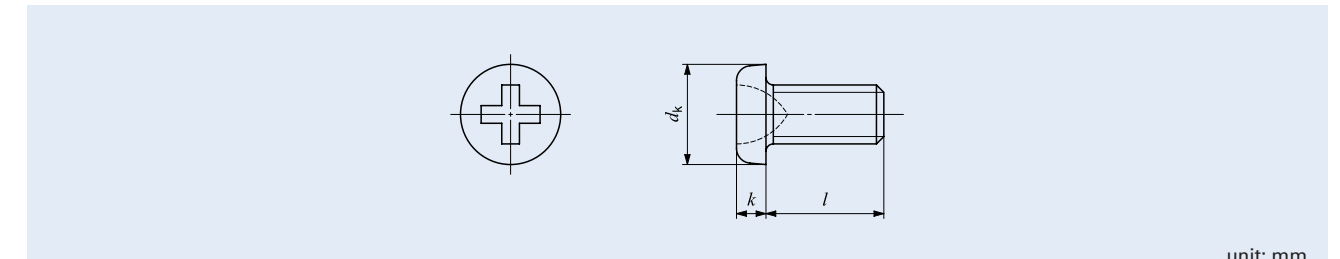
Nominal size d	Boundary dimension			
	Pitch of screw P	d_k	k	l
M1	0.25	1.8	0.45	3, 4, 5
M1.4	0.3	2.5	0.8	2.5, 3, 4
M1.6	0.35	2.8	0.85	4, 5, 6
M2	0.4	3.5	1	3, 4, 5

Remark: They differ from appended track rail mounting bolt.

Table 16.2 Hexagon socket head bolt

unit: mm
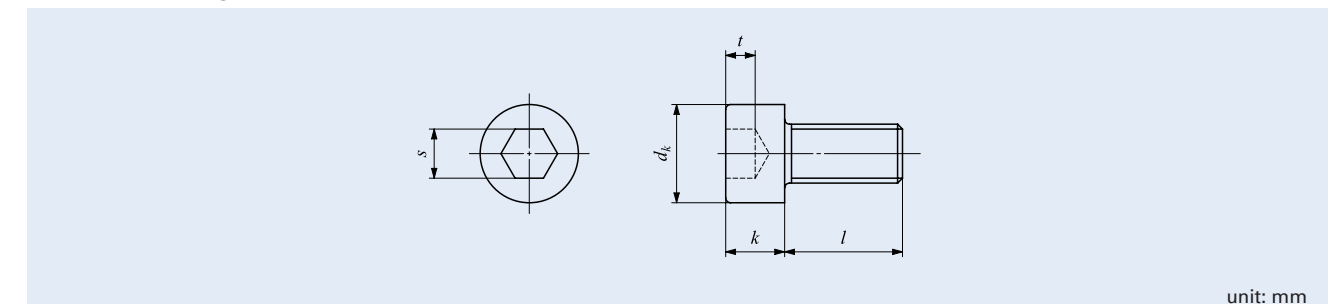
Nominal size d	Boundary dimension					
	Pitch of screw P	d_k	k	s	t	l
M1.4	0.3	2.6	1.4	1.3	0.6	2.5, 3, 4
M1.6([1])	0.35	3	1.6	1.5	0.7	4, 5, 6
M2([1])	0.4	3.8	2	1.5	1	3, 4, 5

Note([1]): They conform to JIS 1176.

1N=0.102kgf=0.2248lbs.
1mm=0.03937inch

LWLC・LWL・LWLFC・LWLF

LWL1…Y

LWL1

Holeless track rail

LWL 2
LWLC 3
LWL 3

LWLF 4
LWLFC 6
LWLF 6

Tapped track rail
LWLFC 6…N
LWLF 6…N

Model number	Mass (Reference) g		Dimension of assembly mm			Dimension of slide unit mm								
	Slide unit	Track rail (per 100mm)	H	H_1	N	W_2	L_1	L_2	L_3	$M_1 \times$ depth	H_2	W	H_4	H_5
LWL 1…Y	0.16	2.1	4.2	2.2	1.5	4	6.5	2	3.9	M1 ×0.9	1.2	1	3.1	1.1
LWL 1	0.16	1.0	2.5	0.5	1.5	4	6.5	2	3.9	M1 ×0.9	1.2	1	1.4	—
LWL 2	0.9	2.8	3.2	0.7	2	6	12.4	4	8.8	M1.4×1.4	—	2	2	—
LWLC 3	1.0	5.3	4	1	2.5	8	12	3.5	6.7	M1.6×1.3	—	2.6	2.6	—
LWL 3	1.6	5.3	4	1	2.5	8	16	5.5	10.7	M2 ×1.3	—	2.6	2.6	—
LWLF 4	2.1	6.8	4	1	3	10	17	6.5	11.9	M2 ×1.3	—	2.6	2.6	—
LWLFC 6	2.4	13	4.5	1	3	12	15	4.5	9.8	M2 ×1.6	—	2.8	2.8	—
LWLFC 6…N	2.4	12	4.5	1	3	12	15	4.5	9.8	M2 ×1.6	—	2.8	2.8	—
LWLF 6	3.4	13	4.5	1	3	12	20	8	14.6	M2 ×1.6	—	2.8	2.8	—
LWLF 6…N	3.4	12	4.5	1	3	12	20	8	14.6	M2 ×1.6	—	2.8	2.8	—

Dimension of track rail mm						Appended mounting bolt for track rail mm	Basic dynamic load rating[4] C	Basic static load rating[4] C_0	Static moment rating			Model number
M_2	d_3	d_4	h	E	F	Bolt size × length	N	N	T_0 N·m	T_X N·m	T_Y N·m	
M1.4 Through	1.1	—	—	3	6	M1 × ℓ or M1.4 × ℓ [2] (Not appended)	66.8	113	0.06	0.07 0.47	0.09 0.56	LWL 1…Y
—	—	—	—	—	—	—	66.8	113	0.06	0.07 0.47	0.09 0.56	LWL 1
M1 Through	—	—	—	4	8	M1 × ℓ [3] (Not appended)	211	381	0.42	0.54 2.9	0.64 3.4	LWL 2
M1.6 Through	—	—	—	5	10	M1.6 × ℓ [3] (Not appended)	251	361	0.58	0.39 2.9	0.47 3.4	LWLC 3
M1.6 Through	—	—	—	5	10	M1.6 × ℓ [3] (Not appended)	353	587	0.94	0.98 5.9	1.2 7.0	LWL 3
—	1.8	2.8	0.75	5	10	Cross-recessed head screw for precision equipment M1.6 × 5	390	677	1.4	1.3 7.1	1.5 8.4	LWLF 4
—	2.4	4	1.5	7.5	10	Cross-recessed head screw for precision equipment M2 × 4	334	542	1.7	0.84 5.1	1.0 6.1	LWLFC 6
M3 Through	—	—	—	7.5	10	Cross-recessed head screw for precision equipment M2 × 4	334	542	1.7	0.84 5.1	1.0 6.1	LWLFC 6…N
—	2.4	4	1.5	7.5	10	Cross-recessed head screw for precision equipment M2 × 4	443	813	2.5	1.8 9.9	2.2 11.8	LWLF 6
M3 Through	—	—	—	7.5	10	Cross-recessed head screw for precision equipment M2 × 4	443	813	2.5	1.8 9.9	2.2 11.8	LWLF 6…N

Note([1]): Track rail lengths L are shown in Table 15.
([2]): Bolt is required suit to mounting structure.
([3]): Prepare track rail mounting bolts with a fixing depth less than H_4.
([4]): The directions of basic dynamic load rating (C), basic static load rating (C_0) and static moment rating (T_0, T_X and T_Y) are shown in the sketches below. The upper values in the T_X and T_Y column apply to one slide unit, and the lower values apply to two units in close contact.

Remarks: 1. Steel parts are made of stainless steel.
2. Steel balls are not retained. End seals are not attached.
3. For LWLF4, LWLFC6 and LWLF6, stainless cross-recessed head screw for precision equipment is appended for fixing track rail. Please indicate supplemental code /MN if unnecessary.

C, C_0 T_0 T_X T_Y

Example of identification number for assembled set

LWLFC 6 C2 R120 N T_0 P /D

Model code
LWL
LWL …Y
LWLC
LWLF
LWLF …N
LWLFC
LWLFC…N

Size

Number of slide unit (Two slide units)

Length of track rail (120mm)

Preload amount
T_0 : Clearance

Accuracy class
No symbol (for LWL1)
H : High
P : Precision

Special specification
Opposite reference surfaces arrangement / D

1N=0.102kgf=0.2248lbs.
1mm=0.03937inch