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CAT-2936E-3

IKO

New

Linear Bushing

LM Series

Flange Type Now Available

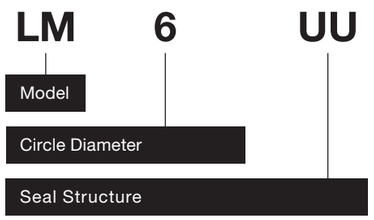
NIPPON THOMPSON CO., LTD.

Synthetic Resin Retainer Type Linear Bushing

LM Series

High-quality, reliable, affordable product - made in Japan!

Identification Number



Model

Standard Type	Metric Series	LM
	Metric European Specification(1)	LME
	Inch Series	LMB
NEW Flange Type	Metric Round Flange	LMFT
	Metric Square Flange	LMKT

Circle Diameter

Metric series is designated in mm.
Inch series is designated in units of 1/16 inch.

Seal Structure

With two end seals : UU
End seals with superior dust protection performance are incorporated on both sides, preventing the intrusion of foreign substances.

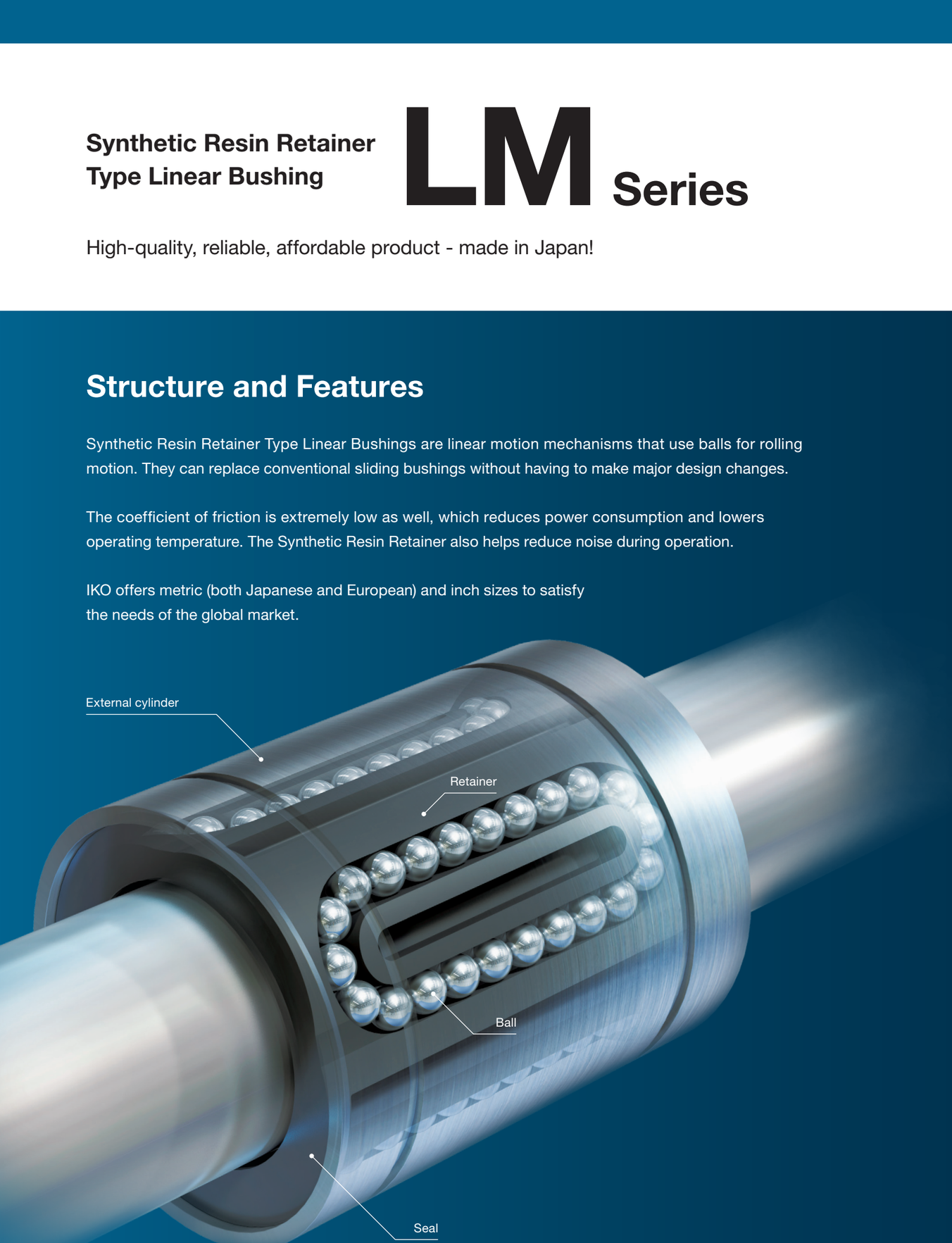
Note(1) The specification dimensions and tolerances are those generally used in Europe.

Structure and Features

Synthetic Resin Retainer Type Linear Bushings are linear motion mechanisms that use balls for rolling motion. They can replace conventional sliding bushings without having to make major design changes.

The coefficient of friction is extremely low as well, which reduces power consumption and lowers operating temperature. The Synthetic Resin Retainer also helps reduce noise during operation.

IKO offers metric (both Japanese and European) and inch sizes to satisfy the needs of the global market.



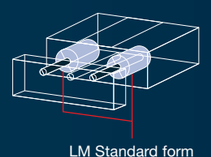
Advantages

1 By revising the entire manufacturing process and the components, we are able to provide a low-cost, reliable product that is made in Japan.

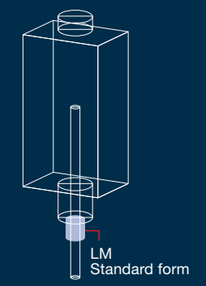
2 In addition to metric sizes (both Japanese and European), we also offer inch sizes to meet various customer needs.

3 An improved manufacturing process results in an exceptional level of quality and smooth motion.

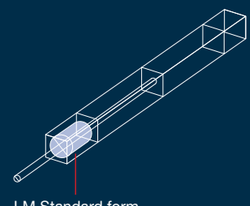
Examples



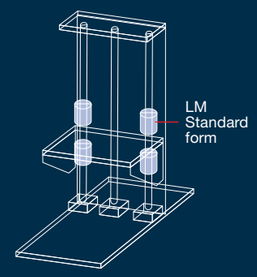
Air cylinder



Measuring instrument (Dial gauge)



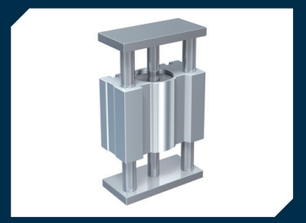
Measuring instrument (Dial gauge)



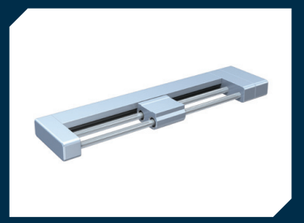
Lifting stage

Applications

Cutting plotter



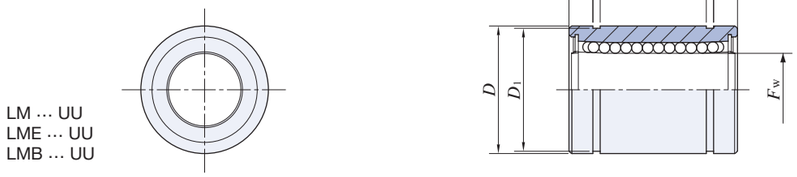
Air cylinder



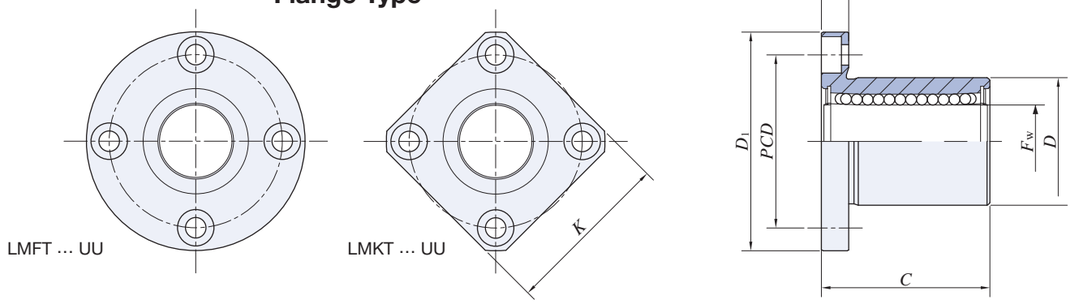
Electric actuator

Dimension table

Standard Type



Flange Type



Type	Series	Shaft diameter mm (inch)	Identification Number	Ball raceway	Mas (Ref.) g	Nominal dimensions and tolerance F_w	Tolerance μm	D	Tolerance μm	C	Tolerance μm	C_1 (1)	Tolerance μm	mm / inch C_2	D_1	H	K	PCD	Mounting Holes	Eccentricity Maximum μm	Perpen-dicularity μm	Basic dynamic load rating C Direction A N	Direction B N	Basic dynamic load rating C_0 Direction A N	Direction B N	Shaft diameter mm (inch)
Standard	Metric series	6	LM 6 UU	4	8.0	6	0 -9	12	0 -11	19	0 -200	13.5	0 -200	1.1	11.5	–	–	–	–	12	–	67.3	77.3	146	206	6
		8	LM 8S UU	4	9.3	8		15		17		11.5		1.1	14.3					12		79.1	90.8	143	202	8
			LM 8 UU		14					24		17.5										128	148	286	405	
		10	LM 10 UU	4	25	10		19	0 -13	29		22		1.3	18					12		242	278	495	700	10
		13	LM 13 UU	4	38	13		23		32		23		1.3	22					12		292	336	578	818	13
		16	LM 16 UU	5	78	16		28		37		26.5		1.6	27					12		373	444	730	1070	16
		20	LM 20 UU	5	86	20	0 -10	32	0 -16	42		30.5		1.6	30.5					15		562	668	1010	1470	20
		25	LM 25 UU	6	210	25		40		59	0 -300	41	0 -300	1.85	38					15		1110	1170	2320	2970	25
	Metric series European specification	5	LME 5 UU	4	11	5	+8 0	12	0 -8	22	0 -200	14.5	0 -200	1.1	11.5	–	–	–	–	12	–	78.5	90.2	197	279	5
		8	LME 8 UU	4	19	8		16		25		16.5		1.1	15.2					12		110	126	229	324	8
		12	LME 12 UU	4	37	12		22	0 -9	32		22.9		1.3	21					12		233	267	431	609	12
		16	LME 16 UU	5	52	16	+9 -1	26		36		24.9		1.3	24.9					12		343	408	649	950	16
		20	LME 20 UU	5	89	20		32	0 -11	45		31.5		1.6	30.3					15		562	668	1010	1470	20
		25	LME 25 UU	6	203	25	+11 -1	40		58	0 -300	44.1	0 -300	1.85	37.5					15		1050	1110	2140	2740	25
	Inch series	6.350 (1/4)	LMB 4 UU	4	8.4	6.350 1/4	0 -8	12.700 1/2	0 -11	19.050 3/4	0 -200	13	0 -200	0.99	11.91	–	–	–	–	12	–	74.5	85.6	165	233	6.350 (1/4)
		9.525 (3/8)	LMB 6 UU	4	12	9.525 3/8		15.875 5/8		22.225 7/8		16.15		0.99	14.94					12		116	133	232	328	9.525 (3/8)
		12.700 (1/2)	LMB 8 UU	4	34	12.700 1/2		22.225 7/8	0 -14	31.750 1 1/4		24.46		1.17	20.85					12		264	303	505	714	12.700 (1/2)
		15.875 (5/8)	LMB 10 UU	4	71	15.875 5/8		28.575 1 1/8		38.100 1 1/2		28.04		1.42	26.90					12		424	488	766	1080	15.875 (5/8)
		19.050 (3/4)	LMB 12 UU	5	88	19.050 3/4	0 -10	31.750 1 1/4	0 -15	41.275 1 5/8		29.61		1.42	29.87					15		554	659	1000	1470	19.050 (3/4)
		25.4 (1)	LMB 16 UU	6	178	25.400 1		39.688 1 9/16		57.150 2 1/4	0 -300	44.57	0 -300	1.73	37.31					15		1050	1110	2140	2740	25.4 (1)
		31.750 (1 1/4)	LMB 20 UU	6	363	31.750 1 1/4	0 -12	50.800 2	0 -17	66.675 2 5/8		50.92		1.73	47.90					20		1580	1670	3070	3920	31.750 (1 1/4)
NEW Flange	Metric series Round Flange	12	LMFT 12 UU	4	68	12	0 -9	21	0 -13	30	0 -200	–	–	–	42	6	–	32	4-Ø4.5 through Ø8 counterbore depth 4.4	12	12	233	267	431	609	12
		16	LMFT 16 UU	5	126	16		28		37					48	6		38		12	12	373	444	730	1070	16
		20	LMFT 20 UU	5	160	20	0 -10	32	0 -16	42					54	8		43	4-Ø5.5 through Ø9.2 counterbore depth 5.4	15	15	562	668	1010	1470	20
		25	LMFT 25 UU	6	305	25		40		59	0 -300				62	8		51		15	15	1050	1110	2140	2740	25
	Metric series Square Flange	12	LMKT 12 UU	4	50	12	0 -9	21	0 -13	30	0 -200	–	–	–	42	6	32	32	4-Ø4.5 through Ø8 counterbore depth 4.4	12	12	233	267	431	609	12
		16	LMKT 16 UU	5	105	16		28		37					48	6	37	38		12	12	373	444	730	1070	16
		20	LMKT 20 UU	5	130	20	0 -10	32	0 -16	42					54	8	42	43	4-Ø5.5 through Ø9.2 counterbore depth 5.4	15	15	562	668	1010	1470	20
		25	LMKT 25 UU	6	270	25		40		59	0 -300				62	8	50	51		15	15	1050	1110	2140	2740	25

Note (1) The width of hub for fixing with circlip should be the value obtained by subtracting a circlip width value times two from the C_1.

Relationship Between Load Rating and Ball Raceway

The load rating of the LM series varies according to the loading direction and position of the ball raceways. The dimension table describes two types of values shown in Fig. 1.1 and Fig. 1.2 according to the loading direction and position of the ball raceways.
Fig. 1.1 shows the case where the loading direction and ball raceway position coincide with each other, representing the loading direction A in the dimension table. Generally, these load ratings are applied when the ball raceway position cannot be specified or the load direction is unknown.
Fig. 1.2 shows the case where the loading direction is positioned between two (2) ball raceways, representing the loading direction B in the dimension table. Generally, this can handle a higher load than loading direction A.

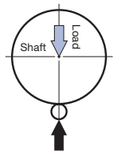


Fig.1.1
Loading direction A

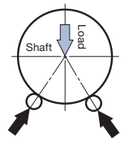


Fig.1.2
Loading direction B

Lubrication

Grease is not pre-packed in the LM series. Please perform adequate lubrication as needed.
Both oil lubrication and grease lubrication are available in the LM series.
For grease lubrication, the use of high-quality lithium-soap base grease is recommended.

Precaution for Use

❶Fitting

For fitting with a housing hole, clearance fit is usually used but transition fit can also be used for special circumstances.
For adjustable clearance type and open type, the shaft diameter should be set as close as possible to less than the lower limit of the allowance of the inscribed circle diameter, and the dimension of the housing hole should be set to more than the upper limit of the allowance of the outside diameter of the external cylinder.

Table1 Recommended fit

Models	Tolerance class			
	Shaft		Housing hole	
	Ordinary clearance	Interference fit	Clearance fit	Transition fit
LM, LMB, LMFT, LMKT	f6, g6	h6	H7	J7
LME	h6	j6	H7	J7

❷Raceway

Since LM series operates with a shaft as a raceway surface, the shaft should be heat-treated and ground. Recommended values for surface hardness and roughness of the shaft are shown in Table 2 and the recommended value for the minimum effective hardening depth is shown in Table 3.

Table2 Surface hardness and roughness of shaft

Item	Recommended value	Remark
Surface hardness	58~64HRC	When the surface hardness is low, multiply the load rating by hardness factor(1).
Surface roughness	0.2 μmRa or lower (0.8 μmRy or lower)	Where accuracy standard is low, around 0.8 μmRa (3.2 μmRy) is also allowed.

Note (1) For hardness factor, refer to Fig. 3 in general catalog (Linear Motion Rolling Guide Series RED) page III-5

Table3 Minimum effective hardening depth of shaft

Shaft diameter		Recommended value for minimum effective hardening depth
Over	Incl.	
—	28	0.8
28	50	1.0

❸If rotational motion is required

LM Series units do not support rotational motion. When performing rotational and linear motion with a short stroke length, IKO Stroke Rotary Bushings.

❹Operating temperature

Since the cage is made of synthetic resin, the maximum operating temperature is 100°C. For continuous use, the maximum temperature is 80°C.

❺Mounting

When pressing an external cylinder into the housing hole, do so carefully while applying a jig to the sides of the external cylinder, and make sure not to hit the end plate (see Fig.2). After pressing it in, use a stop ring or stopper plate to fix it in an axial direction. When inserting a shaft after mounting the external cylinder, be careful not to shock the ball or retainer.

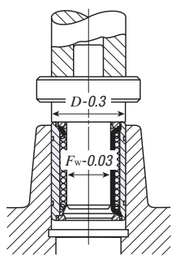


Fig.2 Press-fitting of external cylinder

Dimension Sheet

Inner Diameter	Outer Diameter	Length	IKO	THK	SAMICK	NB	MISUMI
mm(inch)							
6	12	19	**LM 6 UU**	LM 6 UU	LM 6 UU	SM 6 G UU	LMU 6
8S	15	17	**LM 8S UU**	LM 8S UU	LM 8S UU	SM 8s G UU	—
8	15	24	**LM 8 UU**	LM 8 UU	LM 8 UU	SM 8 G UU	LMU 8
10	19	29	**LM 10 UU**	LM 10 UU	LM 10 UU	SM 10 G UU	LMU 10
13	23	32	**LM 13 UU**	LM 13 UU	LM 13 UU	SM 13 G UU	LMU 13
16	28	37	**LM 16 UU**	LM 16 UU	LM 16 UU	SM 16 G UU	LMU 16
20	32	42	**LM 20 UU**	LM 20 UU	LM 20 UU	SM 20 G UU	LMU 20
25	40	59	**LM 25 UU**	LM 25 UU	LM 25 UU	SM 25 G UU	LMU 25
5	12	22	**LME 5 UU**	LME 5 UU	LME 5 UU	KB 5 G UU	—
8	16	25	**LME 8 UU**	LME 8 UU	LME 8 UU	KB 8 G UU	—
12	22	32	**LME 12 UU**	LME 12 UU	LME 12 UU	KB 12 G UU	—
16	26	36	**LME 16 UU**	LME 16 UU	LME 16 UU	KB 16 G UU	—
20	32	45	**LME 20 UU**	LME 20 UU	LME 20 UU	KB 20 G UU	—
25	40	58	**LME 25 UU**	LME 25 UU	LME 25 UU	KB 25 G UU	—
6.35 (1/4)	12.700 (1/2)	19.050 (3/4)	**LMB 4 UU**	LMB 4 UU	—	SW 4 G UU	—
9.525 (3/8)	15.875 (5/8)	22.225 (7/8)	**LMB 6 UU**	LMB 6 UU	—	SW 6 G UU	—
12.7 (1/2)	22.225 (7/8)	31.750 (1 1/4)	**LMB 8 UU**	LMB 8 UU	—	SW 8 G UU	—
15.875 (5/8)	28.575 (1 1/8)	38.100 (1 1/2)	**LMB 10 UU**	LMB 10 UU	—	SW 10 G UU	—
19.05 (3/4)	31.750 (1 1/4)	41.275 (1 5/8)	**LMB 12 UU**	LMB 12 UU	—	SW 12 G UU	—
25.4 (1)	39.688 (1 9/16)	57.150 (2 1/4)	**LMB 16 UU**	LMB 16 UU	—	SW 16 G UU	—
31.75 (1 1/4)	50.8 (2)	66.675 (2 5/8)	**LMB 20 UU**	LMB 20 UU	—	SW 20 G UU	—
12	21	30	**LMFT 12 UU**	LMF 12 UU	LMF 12 UU	SMF 12 G UU	LHFR 12
16	28	37	**LMFT 16 UU**	LMF 16 UU	LMF 16 UU	SMF 16 G UU	LHFR 16
20	32	42	**LMFT 20 UU**	LMF 20 UU	LMF 20 UU	SMF 20 G UU	LHFR 20
25	40	59	**LMFT 25 UU**	LMF 25UU	LMF 25UU	SMF 25 G UU	LHFR 25
12	21	30	**LMKT 12 UU**	LMK 12 UU	LMK 12 UU	SMK 12 G UU	LHFS 12
16	28	37	**LMKT 16 UU**	LMK 16 UU	LMK 16 UU	SMK 16 G UU	LHFS 16
20	32	42	**LMKT 20 UU**	LMK 20 UU	LMK 20 UU	SMK 20 G UU	LHFS 20
25	40	59	**LMKT 25 UU**	LMK 25UU	LMK 25UU	SMK 25 G UU	LHFS 25

Some dimensions may vary. Please contact IKO before replacing.