

Keyless Bushings

Standard Type (Centering Function)

For Timing Pulleys with incorporated Keyless Bushing Standard Type, refer to P.1388-1411.

Keyless Bushings – Standard Type (Centering Function)

MLM Black Oxide
MLMB Electroless Nickel Plating
MLMP Black Oxide
MLHS Stainless Steel

Type	Main Body	
	Material	Surface Treatment
MLM	1045 Carbon Steel or Equivalent	—
MLMB		Black Oxide
MLMP		Electroless Nickel Plating
MLHS	304 Stainless Steel	—

*Thread diameter of screw hole for removal is the same as that of locking screw.

Ⓢ Locking screw of MLMB and MLMP is tinted in red due to coating agent.

Part Number	Type	d	D	D ₁	P.C.D.	L ₂	L ₃	T	T ₂	Locking Screw	
										M x L	Qty.
5	MLM	5	16	18.5	11.7	13	8	1.8	1.2	M3 x 10	4
6	MLMB	6	19	21.5	14	14.3	9	2	1.3	M4 x 12	4
8	MLMP	8	21	23.5	15.4	14.6	9.3	2.0	1.3		
10	MLHS	10	23	25.5	17.5	14.8	9.5				
11		11	24	26.5	18.4	15.8					
12		12	26	28.5	20.2	18.0	10.5	2.5	1.5	M4 x 15	6
14		14	28	30.5	22.2						
15		15	29	31.5	23.2	19.0	11.5				
16		16	30	33.0	24.2	19.6	12.0				
17		17	31	33.5	25.2	20.1	12.5	1.6	1.6		
18		18	32	34.5	26.2						
19		19	33	35.5	27.2	24.1	15.3	3.0	1.8	M5 x 18	8
20		20	38	42.0	30.8						
22		22	40	44.0	32.8	25.1	16.3				
24		24	42	46.0	34.8	26.1	17.3				
25		25	43	47.0	35.8	26.6	17.3	3.5	2.0		
28		28	46	50.0	38.8						
30		30	48	52.0	40.8	31.0	20.5	4.0	2.0	M6 x 20	10
32		32	50	54.0	42.8						
35		35	57	62.0	48.4	30.0	19.5				
38		38	60	65.0	51.4	30.5	20.0				
40		40	62	67.0	53.4	32.5	21.5	4.5	2.0		
42		42	64	69.0	55.4					31.0	20.5
45		45	67	72.0	58.4	33.5	22.0	5.0	2.0		
48		48	70	75.0	61.4					32.0	21.0
50		50	72	77.0	63.4	36.1	24.0	5.0	2.0		
55		55	77	83.0	68.4					32.5	21.5
60		60	82	87.0	73.4	36.1	24.0	5.0	2.0		
65		65	87	92.0	78.4					33.5	22.0
70		70	97	103.0	86.2	36.1	24.0	5.0	2.0	M8 x 25	14

⊗ d dimension from 55-70, MLMB & MLHS is not available.

Part Number Example	Part Number
	MLM35

Features

- With pilot on flange of the inner diameter, the tightening lock screw presses hub inner diameter. This generates effect to control instability on the hub end face and outer diameter (centering effect).
- Free phase adjustment and positioning.
- No hub movement in axial direction when tightened with lock screw.
- No backlash after tightening.

Recommended Tolerance of Shaft and Hub

Shaft Outer Diameter	h7 (g6)
Hub Inner Diameter	H7

Finish surface roughness at or below 1.6a in shaft and 3.2a in hub.

Keyless Bushings

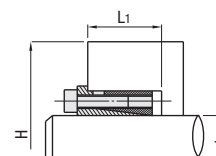
Standard Type (Centering Function), *continued*

kgf=Nx0.101972

Type	MLM / MLMB				MLMP			MLHS			Mass (g)
	d	Max. Allowable Torque (Nm)	Allowable Thrust Load (kN)	Screw Tightening Torque (Nm)	Max. Allowable Torque (Nm)	Allowable Thrust Load (kN)	Screw Tightening Torque (Nm)	Max. Allowable Torque (Nm)	Allowable Thrust Load (kN)	Screw Tightening Torque (Nm)	
5	6.8	2.64	1.9	1.6	4.6	1.84	1.9	2.8	1.13	0.88	18
6	12.7	2.94	3.9	3.2	10.7	2.49	3.9	7.8	2.54	2.7	26
8	19.6	4.83			16.6	4.1		10.7	2.64		35
10	27.5	5.10			19.6	3.9		12.7	2.55		40
11	29.4	5.30			22.5	4.0		14.7	2.64		45
12	44.1	7.36	36.2	5.9	24.5	4.02	53				
14	63.7	9.02	50.9	7.2	28.4		61				
15	80.4	9.91	54.8	7.3	30.4	5.39	66				
16	83.3	10.00	58.8		76.4		32.3	75			
17	92.2	10.10	76.4	8.9	46.1	12.16	75				
18	95.1	10.20	80.3		8.9		49.0	80			
19	98.1	10.30	85.2	8.8	51.9	12.16	81				
20	216.0	21.60	183.0		18.3		121.6	144			
22	255.0	22.60	201.0		21.0		133.4	12.06	165		
24	363.0	29.90	252.0		26.4		146.1	12.16	180		
25	392.0	31.40	264.0	21.1	153.0	15.20	188				
28	441.0	33.30	295.0	26.4	213.8		195				
30	500.0	33.30	396.0	39.0	229.5	15.30	208				
32	530.0	33.30	423.0	39.2	244.2	15.20	219				
35	883.0	47.60	548.0	31.3	301.1	17.16	325				
38	1020.0	49.40	741.0	15.7	409.0	21.48	362				
40	1079.0	50.30	779.0		39.0		430.6	380			
42	1157.0	51.50	823.0	12.7	452.2	9.6	405				
45	1285.0	56.90	882.0		39.2		484.6	435			
48	1402.0	58.40	1117.0	46.5	620.9	25.80	460				
50	1706.0	68.20	1362.0	54.4	754.3	30.11	485				
55	1883.0	68.50	1512.0	55.0			520				
60	2108.0	68.70	1768.0	58.9			560				
65	2236.0		1915.0				610				
70	3285.0	93.20	37.3	31.0	2920.0	83.6	37.3				845

How to Determine Hub Outer Diameter

After selecting Keyless Bushing size, hub size and material, confirm that the selected values meet the conditions H ≤ hub minimum outer diameter in the right table.



Hub Minimum Outer Diameter Table

kgf/mm²=MPax0.101972

Type	d	MLM / MLMB				Hub Machining Depth L ₁	MLMP				Hub Machining Depth L ₁	MLHS				Hub Machining Depth L ₁
		H Hub Minimum Outer Diameter					H Hub Minimum Outer Diameter					H Hub Minimum Outer Diameter				
		Yield Point Stress of Hub Material (MPa)					Yield Point Stress of Hub Material (MPa)					Yield Point Stress of Hub Material (MPa)				
		206	294	392	Side Surface Pressure of Hub MPa		206	294	392	Side Surface Pressure of Hub MPa		206	294	392	Side Surface Pressure of Hub MPa	
		FC350 1018 Carbon Steel or Equivalent 1010 Carbon Steel	FCD Cast Iron 450 1035 Carbon Steel	FCD Cast Iron 600 1055 Carbon Steel		304 Stainless Steel 1018 Carbon Steel or Equivalent 1010 Carbon Steel	1035 Carbon Steel	S40300 Stainless Steel 1055 Carbon Steel		304 Stainless Steel 1018 Carbon Steel or Equivalent 1010 Carbon Steel	1035 Carbon Steel	S40300 Stainless Steel 1055 Carbon Steel				
5	57	22	20.5	20.5	13	21	20	19	13	42.0	20	19	18	13		
6	65	27	24	23.5	14	26	24	23	14	58.0	26	24	22	14		
8	127	35	31	29	15	29	29	27	15	62.6	28	26.0	25.5	15		
10	114	37	33	32	16	35	31	29	16	55.9	29	27.5	27.5	16		
11	109	39	35	33	17	36	36	30	17	53.6	30	28.5	28.5	17		
12	136	46	38	35	17	43	43	33	17	67.1	35	32.0	30.5	17		
14	127	49	41	38	17	44	44	35	17	62.3	36	34.0	32.5	17		
15	112	52	44	41	18	47	47	37	18	55.0	37	35.0	33.5	18		
16	103	53	46	43	18	48	48	38	18	50.9	38	35.0	35.0	18		
17	128	54	47	44	19	53	53	40	19	63.1	40	37.0	36.0	19		
18	124	55	48	45	19	54	54	41	19	61.2	40	37.0	36.0	19		
19	115	55	48	45	19	55	55	42	19	59.2	42	39.0	38.0	19		
20	130	69	57	51	23	64	64	49	23	69.8	51	47.0	44.0	23		
22	117	72	60	54	23	65	65	51	23	66.3	53	49.0	46.0	23		
24	111	75	64	60	24	74	74	56	24	59.2	54	50.0	48.0	24		
25	102	77	66	61	24	75	75	57	24	54.5	54	51.0	49.0	24		
28	119	83	70	63	25	82	82	61	25	63.7	60	55.0	53.0	25		
30	114	90	75	66	25	86	86	63	25	61.1	62	57.0	55.0	25		
32	104	91	76	67	26	87	87	66	26	55.4	63	59.0	57.0	26		
35	114	112	91	82	28	100	100	75	28	51.4	72	67.0	67.0	28		
38	132	120	105	88	28	109	109	80	28	59.5	79	73.0	70.0	28		
40	124	127	107	92	29	110	113	83	29	56.2	80	74.0	72.0	29		
42	120	133	110	95	29	114	114	85	29	54.4	82	76.0	74.0	29		
45	112	139	111	96	30	117	117	88	30	50.8	85	79.0	77.0	30		
48	129	141	116	99	30	135	135	96	30	58.4	91	84.0	81.0	30		
50	143	147	120	105	30	140	140	99	30	64.6	97	88.0	84.0	30		
55	133	154	126	109	31	137	137	102	31							
60	131	155	129	113	31	143	143	108	31							
65	124	160	131	118	31	146	146	113	31							
70	169	190	180	156	34	188	188	133	34							