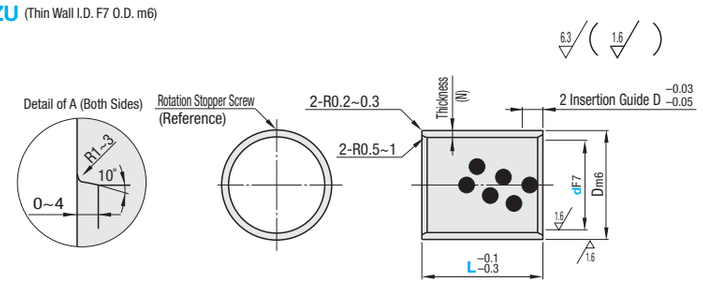
Oil Free Bushings

Copper Alloy Straight / Thin Wall, I.D. F7 O.D. m6

■**Features:** Suitable for use in limited space.

■**Thin Wall I.D. F7 O.D. m6**

MPBZU (Thin Wall I.D. F7 O.D. m6)



RoHS10

Recommended Mating Shaft for I.D. F7 Type
Use of Rotation Stopper Screws is recommended to affix bushings.

d8: General Use (High-Load)
e7: General Use (Light Load),
f8: High Precision Use
g6: High Precision Use (Intermittent Operation)

M Material: High Tensile Brass Alloy
Solid Lubricant Embedded

Part Number Type	d F7		L	Dm6		Thickness (N)	Housing Dia. (Recommended Dimension) Ref. Dim.	Tolerance (H7)	Rotation Stopper Screw (Reference)
MPBZU	5	+0.022 +0.010	8 10 12	7	+0.015 +0.006	1	7	+0.015 0	M4x8
	6		8 10 12 15 16	8			8		
	8	+0.028 +0.013	8 10 12 15 16 20	10			10		
	10		8 10 12 15 16 20 25	12	+0.018 +0.007		12	+0.018 0	
	12	+0.034 +0.016	10 12 15 16 20 25	15		1.5	15		
	13		10 12 15 16 20 25	16			16		
	15		10 12 15 16 20 25 30	18			18		
	16		10 12 15 16 20 25 30	20	+0.021 +0.008	2	20	+0.021 0	
	18		12 15 16 20 25 30	22			22		
	20	+0.041 +0.020	15 16 20 25 30 40	24			24		M5x8
	25		15 16 20 25 30 40	29			29		
	30		15 16 20 25 30 40	34	+0.025 +0.009		34	+0.025 0	M6x16
	35	+0.050 +0.025	20 25 30 40	40		2.5	40		
	40		20 25 30 40 50	45			45		
	50		30 40 50	55	+0.030 +0.011		55	+0.030 0	M8x16

Part Number Type	d	Unit Price L8	L10	L12	L15	L16	L20	L25	L30	L40	L50
MPBZU	5				-	-	-	-	-	-	-
	6						-	-	-	-	-
	8							-	-	-	-
	10								-	-	-
	12	-							-	-	-
	13	-							-	-	-
	15	-								-	-
	16	-								-	-
	18	-	-							-	-
	20	-	-	-							-
	25	-	-	-							-
	30	-	-	-							-
	35	-	-	-	-	-					-
	40	-	-	-	-	-					
	50	-	-	-	-	-	-	-			

Ordering Example

Part Number	-	L
MPBZU16	-	20

■**O.D. Dimension Comparison Table**

d	Dimension Variation O.D. Dm6	Dimension Variation Thickness (N)	Thin Wall MPBZU O.D. Dm6	Thin Wall MPBZU Thickness (N)	Standard Type MPBZ O.D. Dm6	Standard Type MPBZ Thickness (N)
5	-2	-1	7	1	9	2
6	-2	-1	8		10	
8	-2	-1	10		12	
10	-2	-1	12		14	
12	-3	-1.5	15	1.5	18	3
13	-3	-1.5	16		19	
15	-3	-1.5	18		21	
16	-2	-1	20	2	22	
18	-2	-1	22		24	
20	-4	-2	24		28	4
25	-4	-2	29		33	
30	-4	-2	34		38	
35	-4	-2	40	2.5	44	4.5
40	-5	-2.5	45		50	5
50	-7	-3.5	55		62	6

Oil Free Bushings

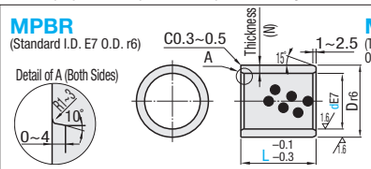
Copper Alloy Straight, Standard / Thin Wall, I.D. E7 O.D. r6 / I.D. G6 O.D. m6

■**Features:** Bushings can be affixed only by Press-fit process. No process using Rotation Stopper Screws is required.

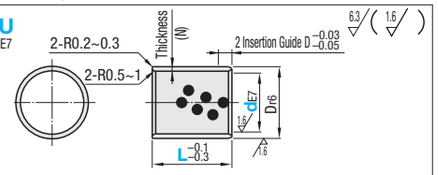
■**Standard / Thin Wall, I.D. E7 O.D. r6**

RoHS10

MPBR (Standard I.D. E7 O.D. r6)



MPBRU (Thin Wall I.D. E7 O.D. r6)



Recommended Mating Shafts for I.D. E7 O.D. r6 Type
Press fitting is recommended to affix bushings.

d8: General Use (High-Load)
e7: General Use (Light Load)

f8: High Precision Use
g6: High Precision Use (Intermittent Operation)

M Material: High Tensile Brass Alloy
Solid Lubricant Embedded

Part Number Type	dE7		L	MPBR Dr6 (*1)	MPBR Thickness (N)	MPBRU Dr6 (*1)	MPBRU Thickness (N)
MPBR MPBRU	5	+0.032	8 10 (12) (15)	9	2	7	1
	6	+0.020	8 10 12 15 16 (20)	10		8	
	8	+0.040	8 10 12 15 16 (20)	12		10	
	10	+0.025	(8) 10 12 15 16 (20) (25)	14		12	
	12	+0.050	(10) 12 15 16 20 (25)	18	3	15	1.5
	15	+0.032	12 15 16 20 (25)	21		18	
	16		12 15 16 20 25 (30) (40)	22		20	2
	20	+0.061	15 16 20 25 30 (40) (50)	28	4	24	
	25	+0.040	16 20 25 30 (40) (50)	33		29	
	30		16 20 25 30 (40) (50)	38		34	

* L dimensions in ( ) are only available for MPBR.

Tolerance H7 (* 2) to D dimensions (* 1) is recommended for housing diameter.

D	O.D. r6 (* 1)	Housing Dia. H7 (* 2)
7~10	+0.028 +0.019	+0.015 0
11~18	+0.034 +0.023	+0.018 0
19~30	+0.041 +0.028	+0.021 0
31~50	+0.050 +0.034	+0.025 0

■**Copper Alloy Bushings: I.D. Variations after Press-Fitted (Reference)**

Inner Diameter after press-fit is almost equal to I.D. F7 O.D. m6 Type. (See below for I.D. Variations after press-fitted)
Housing Diameter Tolerance: H7

Type	I.D. E7 O.D. r6	I.D. F7 O.D. m6
Standard	99.84%	99.95%
Thin Wall	99.83%	99.94%

Data above are obtained by test, not guaranteed.

Part Number Type	d	Unit Price L8	L10	L12	L15	L16	L20	L25	L30	L40	L50
MPBR	5					-	-	-	-	-	-
	6							-	-	-	-
	8							-	-	-	-
	10								-	-	-
	12	-							-	-	-
	15	-	-						-	-	-
	16	-	-								-
	20	-	-	-							
	25	-	-	-	-						
	30	-	-	-	-						

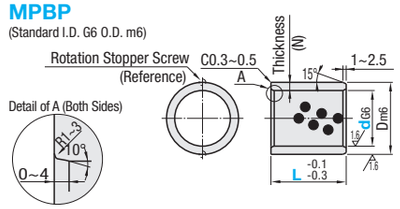
Part Number Type	d	Unit Price L8	L10	L12	L15	L16	L20	L25	L30
MPBRU	5			-	-	-	-	-	-
	6						-	-	-
	8						-	-	-
	10	-					-	-	-
	12	-	-					-	-
	15	-	-					-	-
	16	-	-						-
	20	-	-	-					
	25	-	-	-	-				
	30	-	-	-	-				

■**Features:** More precise linear and rotary motion compared to I.D. F7 O.D. m6 (MPBZ, MPBZU) and I.D. E7 O.D. r6 (MPBR, MPBRU) can be achieved by keeping the clearance between bushings and g6 shafts small.

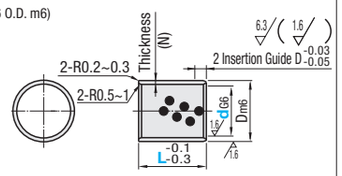
■**Standard / Thin Wall, I.D. G6 O.D. m6**

RoHS10

MPBP (Standard I.D. G6 O.D. m6)



MPBPU (Thin Wall I.D. G6 O.D. m6)



■**How to use MPBP, MPBPU**

Use of Rotation Stopper Screws is recommended to affix bushings.
Recommended Mating Shaft for I.D. G6 Type, g6: High Precision Use

M Material: High Tensile Brass Alloy
Solid Lubricant Embedded

Part Number Type	dG6		L	MPBP Dm6 (*1)	MPBP Thickness (N)	MPBP * Rotation Stopper Screw (Reference)	MPBPU Dm6 (*1)	MPBPU Thickness (N)
MPBP MPBPU	5	+0.012	8 10 12 (15)	9	2	M4X8	7	1
	6	+0.004	8 10 12 15 16	10			8	
	8	+0.014	10 12 15 16 20	12			10	
	10	+0.005	10 12 15 16 20 25	14			12	
	12	+0.017 +0.006	12 15 16 20 25	18	3		15	1.5
	13		12 15 16 20 25	19			16	
	15		12 15 16 20 25	21			18	
	16		12 15 16 20 25	22			20	2
	20	+0.020 +0.007	15 16 20 25 30	28	4	M5X8	24	
	25		16 20 25 30 40	33			29	
	30		16 20 25 30 40	38			34	

* L dimensions in ( ) are only available for MPBP.

Tolerance G7 (*2) to D dimensions (*1) for housing diameter

* Indicated dimensions of Rotation Stopper Screws are recommended dimensions.

D	MPBP O.D. m6 (* 1)	MPBPU Housing Dia. G7 (* 2)
7~10	+0.015 +0.006	+0.020 +0.005
11~18	+0.018 +0.007	+0.024 +0.006
19~30	+0.021 +0.008	+0.028 +0.007
31~50	+0.025 +0.009	+0.034 +0.009

Part Number Type	d	Unit Price L8	L10	L12	L15	L16	L20	L25	L30	L40
MPBP	5					-	-	-	-	-
	6						-	-	-	-
	8	-						-	-	-
	10	-							-	-
	12	-	-						-	-
	13	-	-						-	-
	15	-	-						-	-
	16	-	-						-	-
	20	-	-	-						-
	25	-	-	-	-					
	30	-	-	-	-					

Part Number Type	d	Unit Price L8	L10	L12	L15	L16	L20	L25	L30	L40
MPBPU	5				-	-	-	-	-	-
	6						-	-	-	-
	8	-						-	-	-
	10	-							-	-
	12	-	-						-	-
	13	-	-						-	-
	15	-	-						-	-
	16	-	-						-	-
	20	-	-	-						-
	25	-	-	-	-					
	30	-	-	-	-					

Ordering Example

Part Number	-	L
MPBR12	-	12
MPBP20	-	15