

Flange Integrated Oil Free Bushings

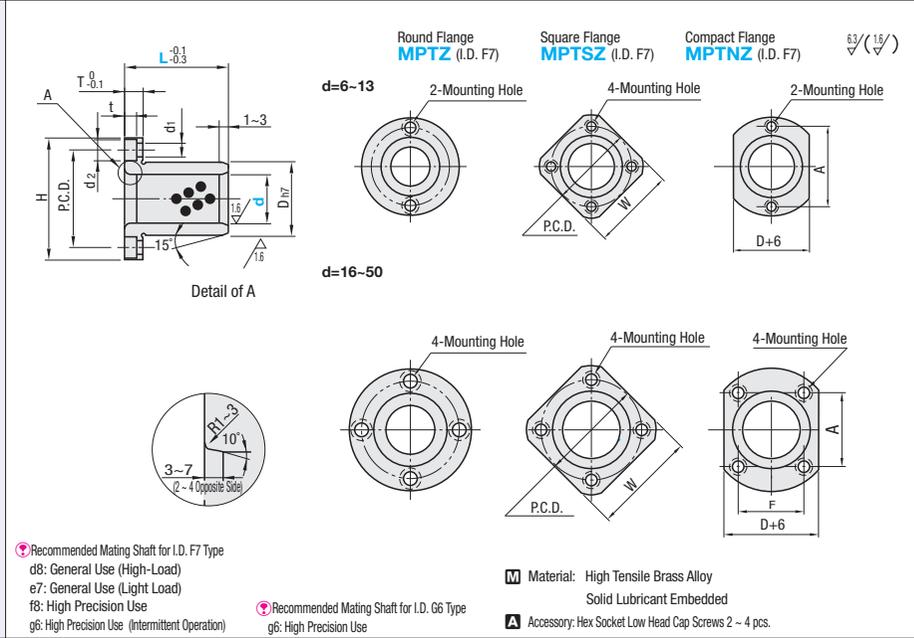
Copper Alloy, Standard Flanged, I.D. F7

Flange Integrated Oil Free Bushings / Oil Free Copper Alloy Washers

Copper Alloy, Pilot Flanged / Center Flanged Flat Head Screw / Low Head Cap Screw

■ **Features:** Flange Integrated Oil Free Bushings can reduce the time of assembling.

Standard Flanged, I.D. F7



Part Number Type	dF7	L										Dh7	H	T	t	d1	d2	P.C.D.	W	F	A	Accessory: Hex Socket Low Head Cap Screw				
		6	8	10	12	13	16	20	25	30	35												40	45	50	60
I.D. F7 MPTZ MPTSZ MPTNZ	6	+0.022 +0.010	15	20									10	0 -0.015	25							17	20		17	M3-10x2
	8	+0.028 +0.013	20	25									12	0	27	4	2.2	3.5	6			19	22		19	(4)
	10		20	25	30								14	0 -0.018	29							21	23		21	
	12		20	25	30								18		36							26	28		26	M4-12x2
	13	+0.034 +0.016	20	25	30	35							19		37	5	3	4.5	7.5			27	29		27	(4)
	16		20	25	30	35	40						22	0 -0.021	40							30	31	18	24	M4-12x4
	20		25	30	35	40	50						28		49	6	3.7	5.5	9			38	38	22	31	
	25	+0.041 +0.020	30	35	40	50	60						33	0	54							43	42	25	35	M5-16x4
	30		35	40	50	60	70						38	0 -0.025	63	8	4.2	6.6	11			50	50	30	40	
	35		50	60	70								44		69							56	54	36	43	M6-20x4
40	+0.050 +0.025	60	70	80								50		82	10	5.2	9	14			66	64	38	54		
50		70	80	100								62	0 -0.030	94							78	73	50	60	M8-25x4	

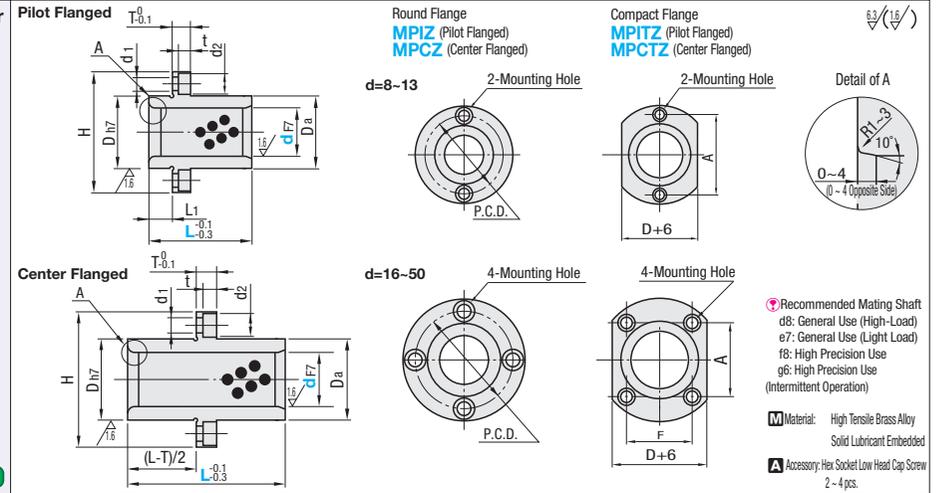
* Values in () are the number of screws included in MPTSZ.

Part Number Type	d-L	Unit Price														
		MPTZ	MPTSZ	MPTNZ												
MPTZ MPTSZ MPTNZ	6-15				13-25				20-40				30-70			
	20				30				50				35-50			
	8-20				35				70				60			
	25				16-20				35				70			
	10-20				25				40				40-60			
	25				30				50				70			
	30				35				60				80			
	12-20				40				30-35				50-70			
	25				20-25				40				80			
	30				30				50				100			
13-20				35				60								

Ordering Example: Part Number - L
 MPTZ12 - 30

■ **Features:** Flange Integrated Oil Free Bushings can reduce the time of assembling. Pilot Flanged: Oil Free Bushings do not project from bushing mounting position. Saves space on the opposite side. Center Flanged: Workpiece located near the center of the bushing provides balanced load and clearance on both sides of the flange.

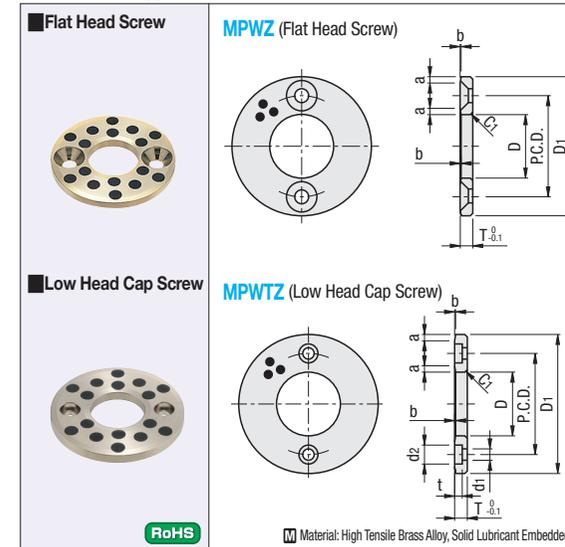
Pilot Flanged / Center Flanged



Part Number Type	dF7	L										Dh7	Da	L1	H	T	t	d1	d2	P.C.D.	F	A	Accessory: Hex Socket Low Head Cap Screw		
		8	10	12	13	16	20	25	30	35	40													45	50
Pilot Flanged MPIZ MPITZ	8	+0.028 +0.013	20	(25)									12	0	11.5	5	27	4	2.2	3.5	6		19	19	M3-10x2
	10		25	30								14	-0.018	13.5		29					21		21		
	12		25	30								18		17.5	6	36					26		26		M4-12x2
	13	+0.034 +0.016	(25)	(30)	35							19		18.5		37	5	3	4.5	7.5	27		27		27
	16		25	30	35	40						22	0 -0.021	21.5		40					30	18	24		M4-12x4
	20		30	35	40	50						28		27.5	8	49	6	3.7	5.5	9	38	22	31		M5-16x4
Center Flanged MPCZ MPCTZ	25	+0.041 +0.020	(30)	(35)	(40)	(50)	60				33	0	32.5		54					43	25	35		M5-16x4	
	30		(35)	(40)	(50)	(60)	70				38	-0.025	37.5	10	63	8	4.2	6.6	11	50	30	40		M6-20x4	

d-L	Unit Price				d-L	Unit Price				d-L	Unit Price			
	MPIZ	MPITZ	MPCZ	MPCTZ		MPIZ	MPITZ	MPCZ	MPCTZ		MPIZ12	MPITZ16	MPCZ16	MPCTZ16
8-20					16-40					30-50				
25					20-30					60				
10-25					35					70				
30					40									
12-25					50									
30					25-30									
13-25					35									
30					40									
35					50									
16-25					60									
30					30-35									
35					40									

■ **Features:** Supports a thrust load.



Part Number Type	No.	T Tolerance	D Tolerance	D1	Mounting Hole			Chamfer	Unit Price		
					MPWZ (Flat Head Screw)	MPWTZ	Quantity		a	b	MPWZ
MPWZ MPWTZ	6		6.2	25	15						
	8		8.2	28	18						
	10		10.2	30	20						
	12	3(4)	12.2	40	28	M3	3.5	6	2.4	1.5	0.3
	13		13.2								
	15		15.2								
	16		16.2								
	18	0	18.2	+0.2	50	35	2				
	20	-0.1	20.2	+0.1							
	25		25.2		55	40					
30		30.2		60	45	M5	4.5	7.5	3	2.5	
35		35.2		70	50						
40		40.2		80	60						
50	7	50.3		100	75	4	M6	5.5	9	4	0.5

* For MPWTZ, T dimensions of No.6 - 18 are values in (). * For Hex Socket Low Head Cap Screws, refer to P. 194. * Indicated dimensions of Flat Head Screws are recommended dimensions.

Ordering Example: Part Number - L
 MPWZ18 - 30
 MPWTZ15 - 30

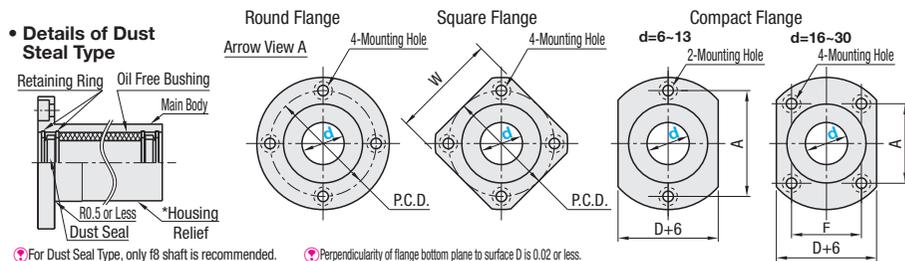
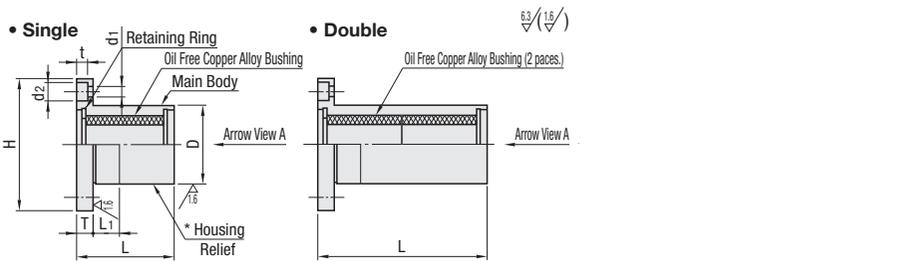
Oil Free Bushing Housing Units - Standard Flanged - Standard - Built-In Copper Alloy Bushings, Single / Double

■ **Features:** Suitable for vertical use. Reduces the time of manufacturing and assembling the housing.

Standard Type



Housing Type	Type			Seal	Seals	Housing	Bushings
	Round Flange	Square Flange	Compact Flange				
Single	MFMS	MFKS	MFNS	No Seal	-	SS400	Electroless Nickel Plating
	MFMS-S	MFKS-S	MFNS-S	With Non-Contact Seals	Teflon Resin		
	MFMS-DS	MFKS-DS	MFNS-DS	With Dust Seals	Nitrile Rubber		
Double	MFMW	MFKW	MFNW	No Seal	-	SS400	Electroless Nickel Plating
	MFMW-S	MFKW-S	MFNW-S	With Non-Contact Seals	Teflon Resin		
	MFMW-DS	MFKW-DS	MFNW-DS	With Dust Seals	Nitrile Rubber		



Type	Part Number	D	L				L1	H	T	d1	d2	t	P.C.D.	W	F	A	
			No Seal, With Non-Contact Seals		With Dust Seals												
			Single	Double	Single	Double											
• Single	(No Seal) (With Non-Contact Seals) (With Dust Seals)	12 15 19 21 23	0 -0.018 0 -0.021	22	37	-	-	5	28	5	3.5	6	3.1	20	22	-	20
				27	47	-	-										
				32	57	-	-										
				37	67	45	75										
				42	77	51	86										
				48	87	57	97										
• Double	(No Seal) (With Non-Contact Seals) (With Dust Seals)	28 32 40 45 52 60 80	0 -0.025 0 -0.030	58	108	70	120	10	40	6	4.5	7.5	4.1	32	32	-	32
				62	118	76	130										
				68	128	81	141										
				74	138	86	151										
				80	148	91	161										
				86	158	96	171										

⚠ Flanged Height-Adjusting Spacers are selectable from **P.330**. ⚠ With Dust Seals are only available in * marked sizes.

■ **Features of Dust Seal Type and Non-Contact Seal Type**
 - Contact Seals built into Dust Seal Type prevent small dust from sliding contact surface.
 - For sliding resistance of Dust Seal Type, refer to Sliding Resistance Test Data.
 - Employed Dust Seals are SER series of SAKAGAMI SEISAKUSHO LTD.
 - With Non-Contact Seals are provided to prevent larger size dust entry. Clearance between shafts and bushings (approx. 0.1mm) lowers the sliding resistance than Dust Seal Type.

■ **Dust Seals Sliding Resistance Test**

d	Sliding Resistance (N)	SAKAGAMI SEISAKUSHO LTD. Dust Seal
16	6	SER16
20	7	SER20
25	8	SER25
30	12	SER30

⚠ Values are for reference only.

■ **Test Conditions**
 1. Tester: Push-Pull Gauge
 2. Bushing: Copper Alloy Type
 3. Shaft: MISUMI f8 shaft

■ **Testing Method**
 Measured the load when the shaft started to move.
 * Velocity 1mm/s approx.

■ **No Seal, With Non-Contact Seals Price List**

d	(No Seal) Unit Price			(With Non-Contact Seals) Unit Price					
	Single	Double		Single	Double	Single	Double	Single	Double
6	MFMS	MFKS	MFNS	MFMS-S	MFKS-S	MFNS-S	MFMS-S	MFKS-S	MFNS-S
8									
10									
12									
16									
20									
25									
30									
35									
40									
50									

■ **With Dust Seals Price List**

d	(With Dust Seals) Unit Price			
	Single	Double	Single	Double
16	MFMS-DS	MFNS-DS	MFMS-DS	MFNS-DS
20				
25				
30				

Ordering Example Part Number MFMS-S6 MFMS-S6

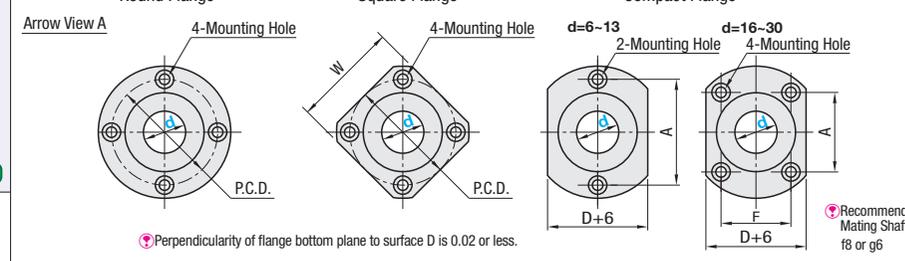
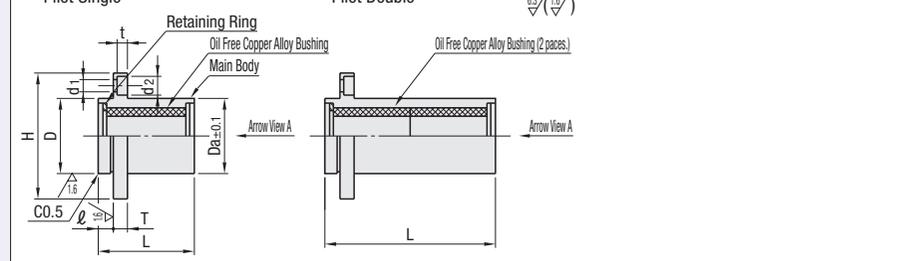
Oil Free Bushing Housing Units - Pilot Flanged - Standard - Built-In Copper Alloy Bushings, Single / Double

■ **Features:** Suitable for vertical use. Reduces the time of manufacturing and assembling the housing. Oil Free Bushings do not project from bushing mounting position. Saves space on the opposite side.

Standard Type



Housing Type	Type			Seal	Housing	Bushings
	Round Flange	Square Flange	Compact Flange			
Single	MFIMS	MFIKS	MFINS	No Seal	SS400	Electroless Nickel Plating
	MFIMS-S	MFIKS-S	MFINS-S	With Non-Contact Seals		
	MFIMW	MFIKW	MFINW	No Seal		
Double	MFIMW-S	MFIKW-S	MFINW-S	With Non-Contact Seals	SS400	Electroless Nickel Plating
				No Seal		
				With Non-Contact Seals		



Type	Part Number	d	Tolerance	D	Tolerance	Da	L		ℓ	H	T	d1	d2	t	P.C.D.	W	F	A				
							Single	Double														
							Round Flange	Square Flange											Compact Flange			
• Single	(No Seal) (With Non-Contact Seals)	6 8 10 12 16 20	+0.022 0 +0.028 0 +0.034 0	12 15 19 21 28 32	0 -0.018 0 -0.021 0 -0.025	11.8 14.8 18.8 20.8 27.8 31.6	22 27 32 37 42 47	5 6 8	5	28	5	3.5	6	3.1	20	22	-	20				
																			24	25	-	24
																			29	30	-	29
																			32	32	-	32
																			33	34	-	33
																			38	37	22	31
• Double	(No Seal) (With Non-Contact Seals)	25 30 35 40 50	+0.041 0 +0.050 0 0	40 45 60 80	0 -0.025 0 -0.030	39.6 44.6 51.6 59.6 79.6	58 68 128 150 170	8 10 13	8	54	8	5.5	9	5.1	51	50	32	40				
																			62	64	-	64
																			67	64	-	64
																			67	64	-	64
																			78	75	-	75
																			98	92	-	92

⚠ For Features of Non-Contact Seal Type, refer to **P.393**. ⚠ Flanged Height-Adjusting Spacers are selectable from **P.330**.

d	(No Seal) Unit Price						(With Non-Contact Seals) Unit Price					
	Single			Double			Single			Double		
	MFIMS	MFKS	MFNS	MFIMW	MFIKW	MFINW	MFIMS-S	MFKS-S	MFNS-S	MFIMW-S	MFIKW-S	MFINW-S
6												
8												
10												
12												
16												
20												
25												
30												
35												
40												
50												

Ordering Example Part Number MFIMS-S6 MFIMS-S6

Oil Free Bushings / Oil Free Bushing Housing Units - Standard Flanged

High Precision Built-In Multi-Layer LF Bushings

■ Features: More precise linear and rotary motion compared to Multi-Layer LF Bushings - Straight (MDZB) can be achieved by keeping the clearance between bushings and g6 shafts small.

High Precision

BFLB

Fluor resin Layer

⚡ BFLB is specifically effective if the mating material is soft such as stainless steel, aluminum, brass, etc. (Soft mating material is hardly damaged.)
 ⚡ Excels in relative wear amount: $1.6 \times 10^{-7} \text{mm}^3/\text{N} \cdot \text{m}$ and abrasion resistance. (It varies depending on condition of use.)

Ⓜ Material: Base Material: A2017
 Sliding Material: Fluororesin
 * Base and sliding materials are bonded.
 Allowable Temperature: -50~140°C

Ⓜ Applicable to linear and rotary motion.
 Ⓜ Loctite (thread locking adhesive) is recommended to affix bushings.

RoHS

Part Number Type	d	L					D	Tolerance	T	Unit Price		
		5	6	8	10	12				L5-8	L10-15	L20-25
BFLB	4	5	6			7	0 -0.015	1.5				
	5	5	6	8		8						
	6	5	6	8	10	12			9			
	8	6	8	10	12	15			11			
	10	6	8	10	12	15			13			
	12	10	12	15	20	15						
	16	15	20	25	19							

Ordering Example: Part Number BFLB10 - L 10

■ Features: Suitable for vertical use. Reduces the time of manufacturing and assembling the housing.

Flanged

MDRA (Round Flange, Single)
MDSA (Square Flange, Single)
MDRAW (Round Flange, Double)
MDSAW (Square Flange, Double)

MDCA (Compact Flange, Single)
MDCAW (Compact Flange, Double)

d=6-12
 d=16-30

Bushing: MDZB (P398)
 Seals: NBR (O-Ring)
 * Housing Relief When D≤28, D -0.1 to -0.3; When D≥32, D -0.3 to -0.5

Ⓜ Material: Aluminum Alloy (Housing)
 Ⓜ Surface Treatment: Clear Anodize

Ⓜ Perpendicularity of flange bottom plane to surface D is 0.02 or less.
 Ⓜ Effective length of D Tolerance below is L1.
 Ⓜ 2 Oil Free Bushings are included in Single Type d25, d30.

RoHS

Part Number Type	d	Tolerance	D	Tolerance	L		L1	S		H	T	d1	d2	t	P.C.D.	K	F	A	Unit Price			
					Single	Double		Single	Double										MDRA	MDRAW	MDSA	MDSAW
MDRA (Round Flange)	6	+0.065	12	0	19	32	5	13	26	28	5	3.5	6	3.1	20	22	20					
	8	0	15	-0.013	24	38		18	32	32								24	25			
MDSA (Square Flange)	10	+0.068	19	0	29	50	10	21	42	40	6	4.5	7.5	4.1	32	32	32					
	12	0	21	-0.016	30	51		21.6	42.6	42								29	30			
MDCA (Compact Flange)	20	+0.081	32	0	42	73	10	31.6	62.6	54	8	5.5	9	5.1	43	42	24	36				
	25	0	40	-0.019	59	103		48.6	92.6	62									51	50	32	40
MDCAW (Compact Flange)	30	+0.085	45	0	64	115	10	51.6	102.6	74	10	6.6	11	6.1	60	58	35	49				

Ⓜ Flanged Height-Adjusting Spacers are selectable from P.330.

Ordering Example: Part Number MDRA10

Example

Oil Free Bushing Housing Units - Blocks

Built-In Multi-Layer LF Bushings - Tall Blocks / Tall Blocks Compact / Wide Blocks

■ Features: Best suitable for horizontal use. Reduces the time of manufacturing and assembling the housing. Compact in width (W Dimension) compared to Wide Blocks Type.

Tall Blocks Standard Type

MDBA (Single with Seal)
MDBAW (Double with Seal)

Bushing: MDZB(P398)
 Seals: NBR (O-Ring)
 Ⓜ Material: Aluminum Alloy (Housing)
 Ⓜ Surface Treatment: Clear Anodize

RoHS

Part Number Type	d	Tolerance	h	W	H	D	Single			Double			ℓ	M1	M2	d1xt	Unit Price		
							L	L1	L2	S	L	L1					L2	S	MDBA
MDBA MDBAW	6	+0.065	14	16	22	8.1	27	18	9	21	-	-	-	-	5	M4	M4	6x5 (for M3 Screws)	
	8	0	16	20	26	10.1	32	20	10	26	-	-	-	-	-	-	-	-	
	10	+0.068	19	26	32	12.2	39	27	15	31	62	36	50	54	6	M5	M5	8x6 (for M4 Screws)	
	12	0	20	28	34	14.3	40	27	15	32	62	36	50	54	6	M6	M6	9x7 (for M5 Screws)	
	16	+0.081	27	36	49	18.3	47	32	18	37	78	52	65	68	7	M8	M8	11x8 (for M6 Screws)	
	20	0	31	42	54	23.4	52	36	18	42	85	58	70	75	8	M8	M8	11x8 (for M6 Screws)	
	25	0	37	52	65	28.4	69	42	22	59	120	80	100	110	9	M10	M10	14x10 (for M8 Screws)	
	30	+0.085	40	58	71	34.4	74	44	22	62	128	90	110	116	9	M10	M10	14x10 (for M8 Screws)	

■ Features: Best suitable for horizontal use. Reduces the time of manufacturing and assembling the housing. More compact housing compared to Housing Unit - Tall Blocks - Standard Type.

Tall Blocks Compact Type

MDBAC

Bushing: MDZB (P398)
 Seals: NBR (O-Ring)
 Ⓜ Material: Aluminum Alloy (Housing)
 Ⓜ Surface Treatment: Clear Anodize

RoHS

Part Number Type	d	Tolerance	h	W	H	D	L	L1	L2	S	ℓ	M1	M2	d1xt	Unit Price
12	0	18	22	28	14.3	40	26	14	32	5					
16	+0.081	21	28	35	18.3	47	28	15	37	5.5	M8	M8	11x8 (for M6 Screws)		
20	0	24	34	40	23.4	52	34	21	42	5.5					
25	0	30	42	50	28.4	69	42	25	59	8					
30	+0.085	33	48	57	34.4	74	54	37	62	8					

■ Features: Best suitable for horizontal use. Reduces the time of manufacturing and assembling the housing. Sufficient clamping strength can be obtained with 4 Mounting Holes.

Wide Blocks Standard Type

MDWBA

Bushing: MDZB (P398)
 Seals: NBR (O-Ring)
 Ⓜ Material: Aluminum Alloy (Housing)
 Ⓜ Surface Treatment: Clear Anodize

RoHS

Part Number Type	d	Tolerance	h	W	H	D	L	L1	S	W1	W2	M	d1	ℓ	A	Unit Price
8	0	11	34	20	10.1	32	18	26	24	5	M4	3.4	8	10		
10	+0.068	13	44	30	12.2	39	21	31	28	8	M5	4.3	12	20		
12	0	15	44	30	14.3	40	26	32	30.5	6.75	M5	4.3	12	20		
16	+0.081	19	54	42	18.3	47	34	37	36	9	M5	4.3	12	26		
20	0	21	54	42	23.4	52	40	42	40	7	M6	5.2	12	26		
25	0	26	78	60	28.4	67	50	59	54	12	M8	7	18	38		
30	+0.085	30	78	60	34.4	74	58	62	58	10	M8	7	18	38		

Ordering Example: Part Number MDBA10, MDBAC12, MDWBA16

Example

Oil Free Bushings

Polyacetal Resin / PTFE Resin

■ Features: Conforms to Food Sanitation Law. The bulk-purchase is a better deal.

■ Straight / Flanged (Polyacetal Resin)

RoHS

JZB (Straight)

JZF (Flanged)

* When L≤10, tolerance $\begin{matrix} 0 \\ -0.3 \end{matrix}$
 When L≥12, tolerance $\begin{matrix} 0 \\ -0.5 \end{matrix}$
 * Press fitting is recommended to affix bushings.
 M Material: Polyacetal Resin Lubricating Oil and Special Filler Added Allowable Temperature: -40 ~ 80°C

Part Number Type	d (Tolerance after press fitting)	L										D	F	T	Chamfer			*1 Housing Dia.		*1 Shaft Diameter		
		3	4	5	6	8	10	12	15	20	25				a	b	c	Ref. Dim.	Tolerance (H7)	Ref. Dim.	Tolerance (H7)	
Straight JZB	3	+0.095	3	4	5	6	8	10	12	15	20	25	5	7	9	1	0	0	5	+0.012	3	-0.012
	4	+0.095	3	4	5	6	8	10	12	15	20	25	6	8	10	1*	0	0	6	0	4	0
	5	+0.045	3	4	5	6	8	10	12	15	20	25	7	9	11	1*	0	0	7	+0.015	5	0
	6		(3)	4	5	6	8	10	12	15	20	25	8	10	12	1*	0	0	8	0	6	-0.012
	8			5	6	8	10	12	15	20	25	30	10	12	14	1*	0	0	10	0	8	0
	10			6	8	10	12	15	20	25	30	35	12	14	16	1*	0	0	12	+0.018	10	-0.015
	12	+0.120		8	10	12	15	20	25	30	35	40	14	16	18	1*	0	0	14	0	12	0
	15	+0.060		10	12	15	20	25	30	35	40	45	17	19	21	1*	0	0	17	0	15	0
	16			10	12	15	20	25	30	35	40	45	18	20	22	1*	0	0	18	0	16	-0.018
	Flanged JZF	18		12	15	20	25	30	35	40	45	50	20	22	24	1	1.5	0	20	+0.021	18	0
20		+0.145	12	15	20	25	30	35	40	45	50	23	25	27	1	1.5	0	23	+0.021	20	0	
22		+0.075	12	15	20	25	30	35	40	45	50	25	27	29	1	1.5	0	25	0	22	0	
25		+0.170	12	15	20	25	30	35	40	45	50	28	30	32	1	1.5	0	28	0	25	-0.021	
30		+0.090	12	15	20	25	30	35	40	45	50	34	36	38	1	1.5	0	34	0	30	0	
35		+0.215	12	15	20	25	30	35	40	45	50	39	41	43	2	0.15	0	39	+0.025	35	0	
40		+0.115	12	15	20	25	30	35	40	45	50	44	46	48	2	0.15	0	44	0	40	0	
50		+0.235	12	15	20	25	30	35	40	45	50	55	57	59	2	0.15	0	55	+0.030	50	-0.025	

* When selecting 3-3, 3-4, 4-3, 4-4, 4-6, 5-3, 5-4, 6-4 and 6-5 of Straight Type, a=0.5. d tolerance is the value after press fitting into ring gauge of d±0.002. *1 Housing diameters and shaft diameters listed here are recommended dimensions.
 * marked L dimension is applicable to JZB only. L dimension in () is applicable to JZF only. I.D. Tolerance is guaranteed value after press fit.

Part Number Type	d	Unit Price												
		L3	L4	L5	L6	L8	L10	L12	L15	L20	L25	L30	L40	L50
JZB	3	-	-	-	-	-	-	-	-	-	-	-	-	-
JZB	4	-	-	-	-	-	-	-	-	-	-	-	-	-
JZB	5	-	-	-	-	-	-	-	-	-	-	-	-	-
JZB	6	-	-	-	-	-	-	-	-	-	-	-	-	-
JZB	8	-	-	-	-	-	-	-	-	-	-	-	-	-
JZB	10	-	-	-	-	-	-	-	-	-	-	-	-	-
JZB	12	-	-	-	-	-	-	-	-	-	-	-	-	-
JZB	15	-	-	-	-	-	-	-	-	-	-	-	-	-
JZB	16	-	-	-	-	-	-	-	-	-	-	-	-	-
JZB	18	-	-	-	-	-	-	-	-	-	-	-	-	-
JZB	20	-	-	-	-	-	-	-	-	-	-	-	-	-
JZB	22	-	-	-	-	-	-	-	-	-	-	-	-	-
JZB	25	-	-	-	-	-	-	-	-	-	-	-	-	-
JZB	30	-	-	-	-	-	-	-	-	-	-	-	-	-
JZB	35	-	-	-	-	-	-	-	-	-	-	-	-	-
JZB	40	-	-	-	-	-	-	-	-	-	-	-	-	-
JZB	50	-	-	-	-	-	-	-	-	-	-	-	-	-

Part Number Type	d	Unit Price												
		L3	L4	L5	L6	L8	L10	L12	L15	L20	L25	L30	L40	L50
JZF	3	-	-	-	-	-	-	-	-	-	-	-	-	-
JZF	4	-	-	-	-	-	-	-	-	-	-	-	-	-
JZF	5	-	-	-	-	-	-	-	-	-	-	-	-	-
JZF	6	-	-	-	-	-	-	-	-	-	-	-	-	-
JZF	8	-	-	-	-	-	-	-	-	-	-	-	-	-
JZF	10	-	-	-	-	-	-	-	-	-	-	-	-	-
JZF	12	-	-	-	-	-	-	-	-	-	-	-	-	-
JZF	15	-	-	-	-	-	-	-	-	-	-	-	-	-
JZF	16	-	-	-	-	-	-	-	-	-	-	-	-	-
JZF	18	-	-	-	-	-	-	-	-	-	-	-	-	-
JZF	20	-	-	-	-	-	-	-	-	-	-	-	-	-
JZF	22	-	-	-	-	-	-	-	-	-	-	-	-	-
JZF	25	-	-	-	-	-	-	-	-	-	-	-	-	-
JZF	30	-	-	-	-	-	-	-	-	-	-	-	-	-
JZF	35	-	-	-	-	-	-	-	-	-	-	-	-	-
JZF	40	-	-	-	-	-	-	-	-	-	-	-	-	-
JZF	50	-	-	-	-	-	-	-	-	-	-	-	-	-

■ Features: Conforms to Food Sanitation Law and excels in chemical resistance.

■ Straight / Flanged (PTFE)

RoHS

TFZB (Straight)

TFZF (Flanged)

* L Dimension Tolerance: 8≤L<0.2 (TFZB, TFZF) 10≤L<0.25 (TFZF)
 M Material: PTFE Resin Lubricating Oil and Special Filler Added Allowable Temperature: -200 ~ 200°C

Part Number Type	d (Tolerance before press fitting)	L										D	F	T	Chamfer a	* Housing Dia.		* Shaft Diameter				
		3	4	5	6	8	10	12	15	20	25					Ref. Dim.	Tolerance (H7)	Ref. Dim.	Tolerance (g6)			
Straight TFZB	3	+0.179	3	4	5	6	8	10	12	15	20	25	6	7	9	1	1.5	0	6	+0.090	3	-0.004
	4	+0.129	3	4	5	6	8	10	12	15	20	25	7	8	10	1*	0	0	7	+0.015	4	-0.012
	5		3	4	5	6	8	10	12	15	20	25	8	9	11	1*	0	0	8	+0.040	5	-0.012
	6		3	4	5	6	8	10	12	15	20	25	9	10	12	1*	0	0	9	0	6	0
	8		3	4	5	6	8	10	12	15	20	25	12	14	16	1*	0	0	12	0	8	-0.005
Flanged TFZF	10		8	10	12	15	20	25	30	35	40	45	14	16	18	1	2	0	14	+0.018	10	-0.014
	12		8	10	12	15	20	25	30	35	40	45	16	18	20	1	2	0	16	0	12	-0.006
	16		10	12	15	20	25	30	35	40	45	50	22	24	26	1	3	0	22	+0.021	16	-0.017
	20		12	15	20	25	30	35	40	45	50	55	26	28	30	1	3	0	26	0	20	-0.002

* Dimension tolerance is measured at +25°C. d tolerance is the value before press fitting into housing. * Housing diameters and shaft diameters listed here are recommended dimensions.

Part Number Type	d	Unit Price												
		L3	L4	L5	L6	L8	L10	L12	L15	L20	L25	L30		
TFZB	3	-	-	-	-	-	-	-	-	-	-	-	-	-
TFZB	4	-	-	-	-	-	-	-	-	-	-	-	-	-
TFZB	5	-	-	-	-	-	-	-	-	-	-	-	-	-
TFZB	6	-	-	-	-	-	-	-	-	-	-	-	-	-
TFZB	8	-	-	-	-	-	-	-	-	-	-	-	-	-
TFZB	10	-	-	-	-	-	-	-	-	-	-	-	-	-
TFZB	12	-	-	-	-	-	-	-	-	-	-	-	-	-
TFZB	16	-	-	-	-	-	-	-	-	-	-	-	-	-
TFZB	20	-	-	-	-	-	-	-	-	-	-	-	-	-

Part Number Type	d	Unit Price												
		L3	L4	L5	L6	L8	L10	L12	L15	L20	L25	L30		
TFZF	3	-	-	-	-	-	-	-	-	-	-	-	-	-
TFZF	4	-	-	-	-	-	-	-	-	-	-	-	-	-
TFZF	5	-	-	-	-	-	-	-	-	-	-	-	-	-
TFZF	6	-	-	-	-	-	-	-	-	-	-	-	-	-
TFZF	8	-	-	-	-	-	-	-	-	-	-	-	-	-
TFZF	10	-	-	-	-	-	-	-	-	-	-	-	-	-
TFZF	12	-	-	-	-	-	-	-	-	-	-	-	-	-
TFZF	16	-	-	-	-	-	-	-	-	-	-	-	-	-
TFZF	20	-	-	-	-	-	-	-	-	-	-	-	-	-

Ordering Example: Part Number - L, JZB10 - 12, TFZF12 - 15

Oil Free Resin Washers / Oil Free Bushing Housing Units - Flanged / Housing Units - Blocks Built-In Polyacetal Bushings

■ Features: Supports a thrust load. The bulk-purchase is a better deal.

■ Oil Free Resin Washers

RoHS

JZW

M Material: Polyacetal Resin Lubricant and Special Filler Added Allowable Temperature: -40 ~ 80°C

Part Number Type	No.	T	d	D	Unit Price
	10		10.5	24	
	12		12.5	28	
	17		17	30	
	21		21	37	
	23		23	39	

■ Features: Suitable for vertical use. Reduces the time of manufacturing and assembling the housing.

■ Oil Free Bushing Housing Units - Flanged

RoHS

Type	Housing		Bushing	
	Round Flange	Compact Flange	M Material	S Surface Treatment
JFMA	JFRA	Aluminum Alloy	Clear Anodize	Polyacetal Resin

Part Number Type	d	Tolerance	Dh7	Tolerance	L	L1	S	H	T	d1	d2	t	P.C.D.	F	A	Unit Price	
																JFMA	JFRA
JFMA JFRA	6	+0.095	12	0	19	5	13	28	5	3.5	6	3.1	20	-	20		
	8	+0.045	15	-0													

Oil Free Bushing Housing Units - Standard Flanged

Standard Type

-Built-In Copper Alloy Bushings Single / Double / Long Type-

Features: Suitable for vertical use. Reduces the time of manufacturing and assembling the housing.

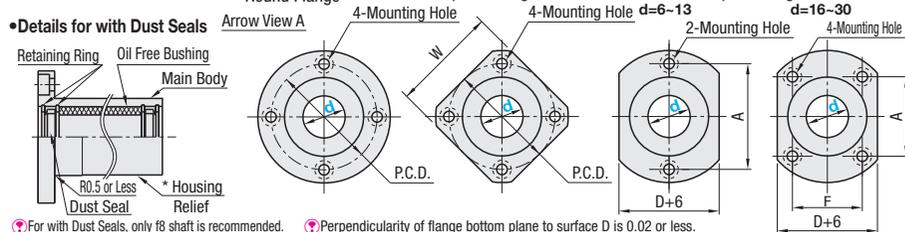
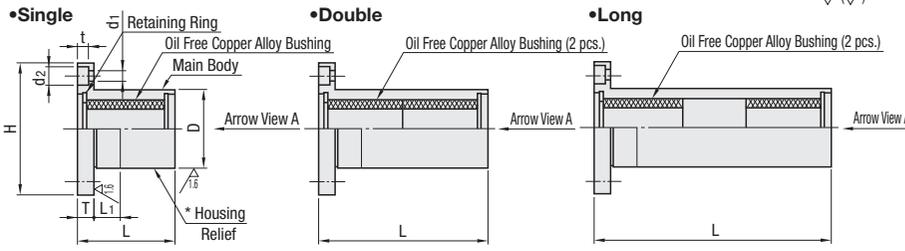
Ordering Example
Part number (Type-d)
MFMS6
MFMS-S6

Standard Type



Housing Type	Type			Seal	Seals		Housing		Bushing
	Round Flange	Square Flange	Compact Flange		Material	Surface Treatment	Material	Material	
Single	MFMS	MFKS	MFNS	No Seal	-	-	SS400	Electroless Nickel Plating	High Tensile Brass Alloy Solid Lubricant Embedded
	MFMS-S	MFKS-S	MFNS-S	With Non-Contact Seals	Teflon Resin	-			
	MFMS-DS	-	MFNS-DS	With Dust Seals	Nitrile Rubber	-			
Double	MFMW	MFKW	MFNW	No Seal	-	-	SS400	Electroless Nickel Plating	High Tensile Brass Alloy Solid Lubricant Embedded
	MFMW-S	MFKW-S	MFNW-S	With Non-Contact Seals	Teflon Resin	-			
	MFMW-DS	-	MFNW-DS	With Dust Seals	Nitrile Rubber	-			
Long	MFML	MFKL	-	No Seal	-	-	SS400	Electroless Nickel Plating	High Tensile Brass Alloy Solid Lubricant Embedded
	MFML-S	MFKL-S	-	With Non-Contact Seals	Teflon Resin	-			

*Housing Relief
When D_s≥28, -0.1
-0.3
When D_s≥32, -0.3
-0.5
*Recommended Mating Shaft
f8 or g6



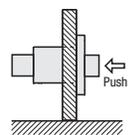
Type	d	D	L																		
			No Seal-With Non-Contact Seals			With Dust Seals		L ₁	H	T	d ₁	d ₂	t	P.C.D.	W	F	A				
			Single	Double	Long	Single	Double														
• Single (No Seal)	6	12	22	37	52	-	-	5	28	5	3.5	6	3.1	20	22	-	20				
	8	15	27	47	67	-	-											24	25	-	24
	10	19	32	57	82	-	-											29	30	-	29
	12	21	32	57	82	-	-											32	32	-	32
• Double (No Seal)	16*	28	37	67	97	45	75	10	48	8	5.5	9	5.1	38	37	22	31				
	20*	32	42	77	112	51	86											43	42	24	36
	25*	40	58	108	158	70	120											51	50	32	40
	30*	45	68	128	188	81	141											60	58	35	49
• Long (No Seal)	35	52	68	128	-	-	-	15	82	10	6.6	11	6.1	67	64	-	-				
	40	60	80	150	-	-	-											78	75	-	-
	40	80	90	170	-	-	-											98	92	-	-
	50	80	90	170	-	-	-											98	92	-	-

*Height-Adjusting Spacers for Flanged Bushings can be selected from P. 238. *With Dust Seals are only available in * marked sizes.

Features of Dust Seal Type and Non-Contact Seal Type
 * Contact Seals built into Dust Seal Type prevent small dust from sliding contact surface.
 * For sliding resistance of Dust Seal Type, refer to Sliding Resistance Test Data.
 * Employed Dust Seals are SER series of SAKAGAMI SEISAKUSHO LTD.
 * With Non-Contact Seals are provided to prevent larger size dust entry. Clearance between shafts and bushings (approx. 0.1mm) lowers the sliding resistance than Dust Seal Type.

d	Sliding Resistance (N)	SAKAGAMI SEISAKUSHO LTD. Dust Seal
16	6	SER16
20	7	SER20
25	8	SER25
30	12	SER30

Test Conditions
 1. Tester: Push-Pull Gauge
 2. Bushing: Copper Alloy Type
 3. Shaft: MISUMI f8 shaft
 Testing Method
 Measured the load when the shaft started to move.
 * Velocity 1mm/s approx.



Oil Free Bushing Housing Units - Pilot Flanged

Standard Type

-Built-In Copper Alloy Bushings Single / Double / Long Type-

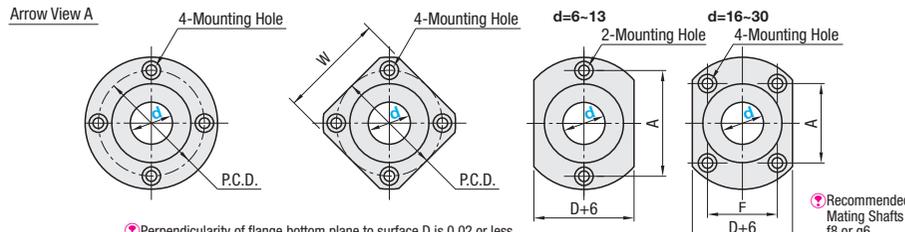
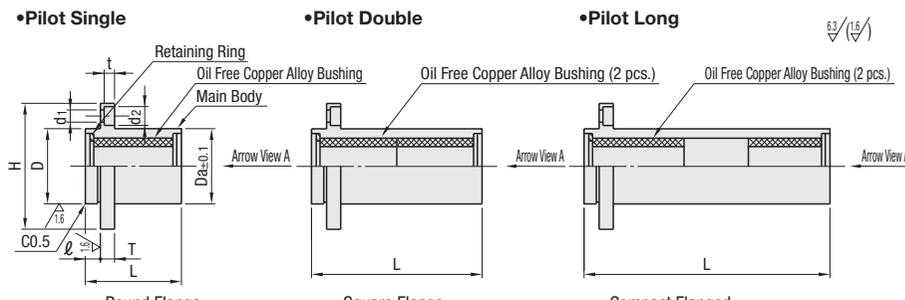
Features: Suitable for vertical use. Reduces the time of manufacturing and assembling the housing. Oil Free Bushings do not project from bushing mounting position. Saves space on the opposite side.

Ordering Example
Part number (Type-d)
MFIMS6
MFIMS-S6

Standard Type



Housing Type	Type			Seal	Housing		Bushing
	Round Flange	Square Flange	Compact Flange		Material	Surface Treatment	Material
Single	MFIMS	MFIKS	MFINS	No Seal	SS400	Electroless Nickel Plating	High Tensile Brass Alloy Solid Lubricant Embedded
	MFIMS-S	MFIKS-S	MFINS-S	With Non-Contact Seals			
	MFIMS-DS	-	MFINS-DS	With Non-Contact Seals			
Double	MFIMW	MFIKW	MFINW	No Seal	SS400	Electroless Nickel Plating	High Tensile Brass Alloy Solid Lubricant Embedded
	MFIMW-S	MFIKW-S	MFINW-S	With Non-Contact Seals			
	MFIMW-DS	-	MFINW-DS	With Non-Contact Seals			
Long	MFIML	MFIKL	-	No Seal	SS400	Electroless Nickel Plating	High Tensile Brass Alloy Solid Lubricant Embedded
	MFIML-S	MFIKL-S	-	With Non-Contact Seals			



* With Non-Contact Seals
Teflon seal of 0.3mm thick is attached on the inner side of each retaining ring.
* Perpendicularity of flange bottom plane to surface D is 0.02 or less.

Type	d	Tolerance	D	Tolerance	Da	L			l	H	T	d ₁	d ₂	t	P.C.D.	W	F	A					
						Single	Double	Long															
						Single	Double	Long															
• Single (No Seal)	6	+0.022 0	12	0 -0.018	11.8	22	37	52	5	28	5	3.5	6	3.1	20	22	-	20					
	8	+0.028 0	15	0 -0.018	14.8	27	47	67											32	24	25	-	24
	10	0	19	0	18.8	32	57	82											40	29	30	-	29
	12	+0.034 0	21	0	20.8	32	57	82											42	32	32	-	32
• Double (No Seal)	16	+0.041 0	28	0 -0.021	22.8	37	67	97	6	48	8	5.5	9	5.1	38	37	22	31					
	20	0	32	0	27.8	42	77	112											43	42	24	36	
	25	+0.041 0	40	0	31.6	42	77	112											48	43	24	36	
	30	0	45	0	39.6	58	108	158											54	50	32	40	
• Long (No Seal)	35	+0.050 0	52	0 -0.025	44.6	68	128	188	8	74	10	6.6	11	6.1	67	64	-	-					
	40	0	60	0	51.6	80	150	218											82	78	75	-	49
	40	+0.050 0	80	0	59.6	80	150	218											10	82	75	-	49
	50	0	80	0	79.6	90	170	248											13	96	92	-	-

* For Features of Non-Contact Seal Type, refer to P. 281. * Flanged Height-Adjusting Spacers are selectable from P. 238.