



ENGINEERING

TOLERANCES OF BALL BEARINGS FOR MOUNTED UNITS

Cylindrical bore (UC, SER, SB, CSB, HC, SA, CSA)

Unit : $\mu\text{m}/0.0001 \text{ inch}$

Nominal bore diameter d				Cylindrical bore						Radial runout Kia (max.)
				Bore diameter				Width		
over		incl.		Δd mp Deviations		Δd s Deviations		ΔBis1 Deviations	ΔBes Deviations	
mm	inch	mm	inch	high	low	high	low	high	low	
10	0.03937	18	0.7087	+18 + 7	0 0	+22 + 9	-4 -2	0 0	-120 - 47	15 6
18	0.7087	30	1.1811	+21 + 8	0 0	+25 +10	-4 -2	0 0	-120 - 47	18 7
30	1.1811	50	1.9685	+25 +10	0 0	+30 +12	-5 -2	0 0	-120 - 47	20 8
50	1.9685	80	3.1496	+30 +12	0 0	+36 +14	-6 -2	0 0	-150 - 59	25 10
80	3.1496	120	4.7244	+35 +14	0 0	+42 +17	-7 -3	0 0	-200 - 79	30 12
120	4.7244	180	7.0866	+40 +16	0 0	+48 +19	-8 -3	0 0	-250 - 98	35 14

Note : Symbols

Δd_{mp} : Mean bore diameter deviation

Δd_s : Bore diameter deviation

ΔBi_{s1} : Inner ring width deviation

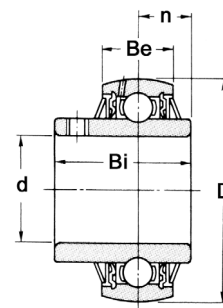
ΔBe_s : Outer ring width deviation

Outer Ring

Unit : $\mu\text{m}/0.0001 \text{ inch}$

Nominal outside diameter D				Mean outside diameter deviation ΔD mp		Radial runout K _{ea} (max.)
over		incl.				
mm	inch	mm	inch	high	low	
30	1.1811	50	1.9685	0 0	-11 - 4	20 8
50	1.9685	80	3.1496	0 0	-13 - 5	25 10
80	3.1496	120	4.7244	0 0	-15 - 6	35 14
120	4.7244	150	5.9055	0 0	-18 - 7	40 16
150	5.9055	180	7.0866	0 0	-25 -10	45 18
180	7.0866	250	9.8425	0 0	-30 -12	50 20
250	9.8425	315	12.4016	0 0	-35 -14	60 24

The low deviation of outside diameter ΔD_{mp} does not apply within the distance of 1/4 the width of the outer ring from the side



Distance Between Radial Plane Passing Through Center of Sphere of Outer Ring and Side of Inner Ring

Nominal bore diameter d				n Deviations Δn s	
over		incl.			
mm	inch	mm	inch	high	low
-	-	50	1.9685	±200	± 79
50	1.9685	80	3.1496	±250	± 98
80	3.1496	120	4.7244	±300	±118
120	4.7244	-	-	±350	±138

TOLERANCES OF HOUSINGS

Spherical Bore Diameter of Housings

Unit : μm/0.0001 inch

Nominal bore diameter Da				Tolerance class H7				Tolerance class J7			
over		incl.		ΔDamp Deviations		ΔDas Deviations		ΔDamp Deviations		ΔDas Deviations	
mm	inch	mm	inch	high	low	high	low	high	low	high	low
30	1.1811	50	1.9685	+25 +10	0 0	+30 +12	-5 -2	+14 +6	-11 -4	+19 +7	-16 -6
50	1.9685	80	3.1496	+30 +12	0 0	+36 +14	-6 -2	+18 +7	-12 -5	+24 +9	-18 -7
80	3.1496	120	4.7244	+35 +14	0 0	+42 +17	-7 -3	+22 +9	-13 -5	+29 +11	-20 -8
120	4.7244	180	7.0866	+40 +16	0 0	+48 +19	-8 -3	+26 +10	-14 -6	+34 +13	-22 -9
180	7.0866	250	9.8425	+46 +18	0 0	+55 +22	-9 -4	+30 +12	-16 -6	+39 +15	-25 -10
250	9.8425	315	12.4016	+52 +20	0 0	+62 +24	-10 -4	+36 +14	-16 -6	+46 +18	-26 -10

1) Symbols

ΔDamp: Mean spherical bore diameter deviation

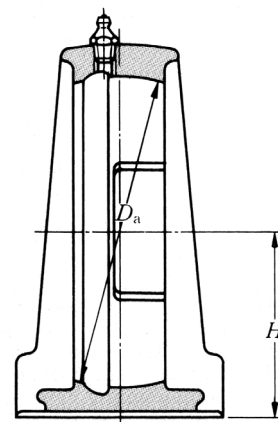
ΔDas: Spherical bore diameter deviation

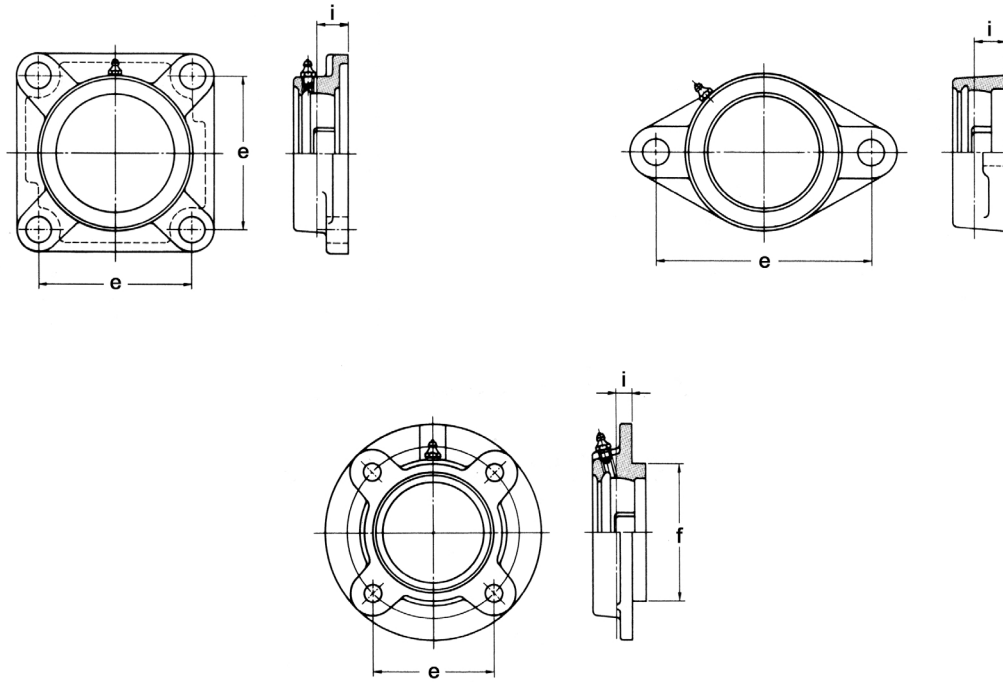
2) Dimensional tolerances for spherical bore diameter of housing are classified as H7 for clearance fit, and J7 for intermediate fit.

Pillow Block Housings (PE, PA, TB, AK)

Housing numbers				H Deviations ΔHs
PE203	-	-	-	Unit : μm/0.0001 inch ±150 ± 59
PE204	PA204	TB204	AK204	
PE205	PA205	TB205	AK205	
PE206	PA206	TB206	AK206	
PE207	PA207	TB207	AK207	
PE208	PA208	TB208	AK208	
PE209	PA209	TB209	AK209	
PE210	PA210	TB210	AK210	
PE211	-	-	-	±200 ± 79
PE212	-	-	-	
PE213	-	-	-	
PE214	-	-	-	
PE215	-	-	-	

1) H is height of the shaft center line





Flange unit housings (F, FS, FC, FCS, FL, FT, FD, LF)

Unit : $\mu\text{m}/0.0001 \text{ inch}$

Housing numbers						e Deviations Δes	i Deviations Δis	f Deviations Δfs		Radial runout of spigot joint Δis (max)			
								FC-FCS					
								high	low				
F203	-	-	FL203	FD203	LF203	±700 ±276	±500 ±197	0 0	-46 -18	200 79			
F204	FC204	FCS204	FL204	FD204	LF204								
F205	FC205	FCS205	FL205	FD205	LF205			0 0	-54 -21				
F206	FC206	FCS206	FL206	FD206	LF206								
F207	FC207	FCS207	FL207	FD207	LF207			±1000 ± 394	±800 ±315		0 0	-63 -25	300 118
F208	FC208	FCS208	FL208	-	-								
F209	FC209	FCS209	FL209	-	-								
F210	FC210	FCS210	FL210	-	-								
F211	FC211	FCS211	FL211	-	-								
F212	FC212	FCS212	FL212	-	-								
F213	FC213	FCS213	FL213	-	-								
F214	FC214	FCS214	FL214	-	-								
F215	FC215	FCS215	FL215	-	-								

F = FS

FL = FT

1) **e** is the bolt hole's center line dimension. **i** is distance between the center line of spherical bore diameter of the housing and mounting surfaces, and **f** is outside diameter of the spigot joint.

2) Radial runout of spigot joint is applied for flange units with spigot joints.

3) For FS and FT types, tolerances for F shall be applied.

TOLERANCES OF HOUSINGS

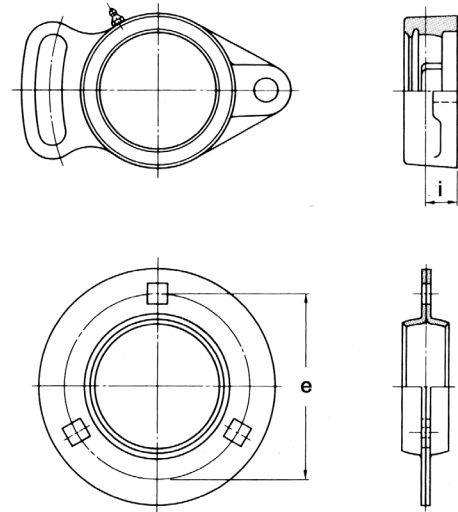
Flange Unit Housings (FB, FK, FA)

Housing numbers	i Deviations Δi_s	Housing Numbers	e Deviations Δe_s
- FB, FK, FA204 FB, FK, FA205 FB, FK, FA206	± 500 ± 197	PF203 PF204 PF205	± 500 ± 197
FB, FK, FA207 FB, FK, FA208 FB, FK, FA209		PF206 PF207 PF208	
FB, FK, FA210		PFL203 PFL204 PFL205	
FA211		PFL206 PFL207	

Unit: $\mu\text{m}/0.0001$ inch

1) i is distance between the center line of spherical bore diameter of housings.

2) e is the bolt hole's center line dimension



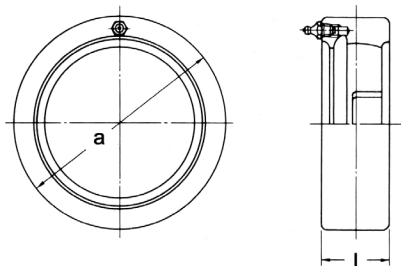
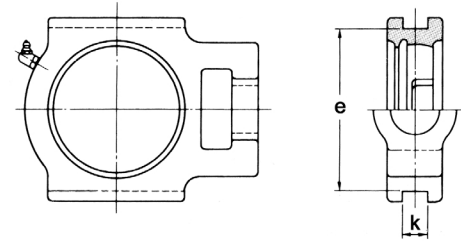
Take-Up Unit Housings (T)

Unit: $\mu\text{m}/0.0001$ inch

Housing numbers		k Deviations Δk_s		e Deviations Δe_s		Parallelism of guide (max.)
		high	low	high	low	
T204 T205 T206	ST204 ST205 ST206	0 0	+200 +79	0 0	-500 -197	500 197
T207 T208 T209	ST207 ST208 ST209					
T210 T211 T212	ST210 ST211 ST212					
T213 T214 T215	ST213 ST214 ST215	0 0	± 300 ± 118	0 0	-800 -315	600 236
-	-					
-	-					
-	-					

1) k is the width of guide rail grooves

2) e is the maximum span of guide rail grooves



Cartridge Unit Housings (C)

Unit: $\mu\text{m}/0.0001$ inch

Housing numbers	a Deviations Δa_s		Radial runout of outside surface (max.)	l Deviations Δl_s
	high	low		
C204 C205 C206	0 0	-30 -12	200 79	± 200 ± 79
C207 C208 C209	0 0	-35 -14		
C210 C211 C212	0 0	-40 -16		
C213	0 0	-40 -16	300 118	± 300 ± 118

1) a is the outside diameter of cartridge housings

2) l is width of cartridge housings