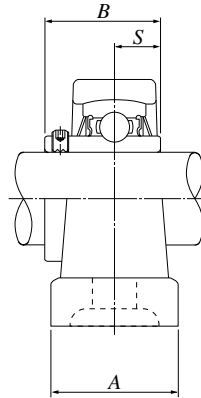
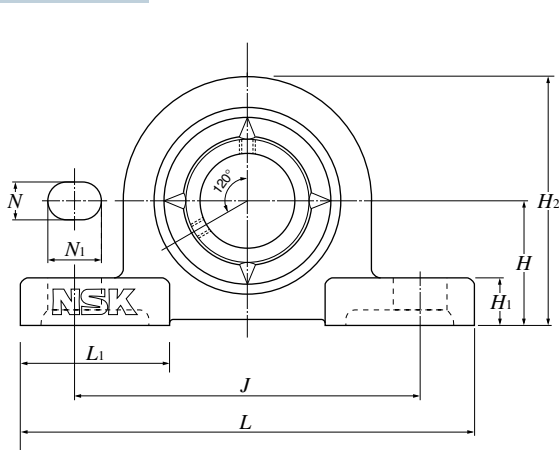


Ball Bearing Units Stainless Series



Pillow type ball bearing unit ; F-UCPM2 series

Cylindrical bore, set screw type with molded-oil



Shaft dia. mm inch	Unit number	Nominal dimensions mm / inch											Bolt size	Bearing number	Housing number	Mass of unit (Ref.) kg / lb
		H	L	J	A	N	N ₁	H ₁	H ₂	L ₁	B	S				
20 3/4	F-UCPM204D0/LP99	33.3	120	95	30	12	14	11	64	42	31	12.7	M10	F-UC204/LP99	PM204	0.6
	F-UCPM204-012D0/LP99	1 5/16	4 23/32	3 3/4	1 3/16	15/32	9/16	7/16	2 17/32	1 21/32	1.2205	0.500	3/8	F-UC204-012/LP99	PM204	1.3
25 13/16 7/8 15/16 1	F-UCPM205D0/LP99	36.5	130	105	30	12	14	12	70	42	34.1	14.3	M10	F-UC205/LP99	PM205	0.7
	F-UCPM205-013D0/LP99	1 7/16	5 1/8	4 1/8	1 3/16	15/32	9/16	15/32	2 3/4	1 21/32	1.3425	0.563	3/8	F-UC205-013/LP99	PM205	1.5
	F-UCPM205-014D0/LP99													F-UC205-014/LP99		
	F-UCPM205-015D0/LP99													F-UC205-015/LP99		
	F-UCPM205-100D0/LP99													F-UC205-100/LP99		
30 1 1/16 1 1/8 3 3/16 1 1/4	F-UCPM206D0/LP99	42.9	155	121	36	17	20	13	82	54	38.1	15.9	M14	F-UC206/LP99	PM206	1.0
	F-UCPM206-101D0/LP99	1 11/16	6 3/32	4 3/4	1 13/32	21/32	25/32	1/2	3 7/32	2 1/8	1.5000	0.626	1/2	F-UC206-101/LP99	PM206	2.2
	F-UCPM206-102D0/LP99													F-UC206-102/LP99		
	F-UCPM206-103D0/LP99													F-UC206-103/LP99		
	F-UCPM206-104D0/LP99													F-UC206-104/LP99		
35 1 1/4 5 5/16 1 3/8 1 7/16	F-UCPM207D0/LP99	47.6	161	127	38	17	20	14	92	54	42.9	17.5	M14	F-UC207/LP99	PM207	1.3
	F-UCPM207-104D0/LP99	1 7/8	6 11/32	5	1 1/2	21/32	25/32	9/16	3 5/8	2 1/8	1.6890	0.689	1/2	F-UC207-104/LP99	PM207	2.9
	F-UCPM207-105D0/LP99													F-UC207-105/LP99		
	F-UCPM207-106D0/LP99													F-UC207-106/LP99		
	F-UCPM207-107D0/LP99													F-UC207-107/LP99		
40 1 1/2 1 9/16	F-UCPM208D0/LP99	49.2	171	137	40	17	20	14	98	52	49.2	19	M14	F-UC208/LP99	PM208	1.8
	F-UCPM208-108D0/LP99	1 15/16	6 23/32	5 13/32	1 9/16	21/32	25/32	9/16	3 27/32	2 1/16	1.9370	0.748	1/2	F-UC208-108/LP99	PM208	4.0
	F-UCPM208-109D0/LP99													F-UC208-109/LP99		
45 1 5/8 1 11/16 1 3/4	F-UCPM209D0/LP99	54	180	146	40	17	20	14	105	60	49.2	19	M14	F-UC209/LP99	PM209	2.1
	F-UCPM209-110D0/LP99	2 1/8	7 3/32	5 3/4	1 9/16	21/32	25/32	9/16	4 1/8	2 3/8	1.9370	0.748	1/2	F-UC209-110/LP99	PM209	4.6
	F-UCPM209-111D0/LP99													F-UC209-111/LP99		
	F-UCPM209-112D0/LP99													F-UC209-112/LP99		
50 1 13/16 1 7/8 1 15/16 2	F-UCPM210D0/LP99	57.2	195	159	45	19	22	16	114	65	51.6	19	M16	F-UC210/LP99	PM210	2.5
	F-UCPM210-113D0/LP99	2 1/4	7 11/16	6 1/4	1 25/32	3/4	7/8	5/8	4 1/2	2 9/16	2.0315	0.748	5/8	F-UC210-113/LP99	PM210	5.5
	F-UCPM210-114D0/LP99													F-UC210-114/LP99		
	F-UCPM210-115D0/LP99													F-UC210-115/LP99		
	F-UCPM210-200D0/LP99													F-UC210-200/LP99		

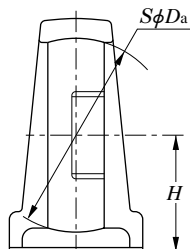
Housing tolerances (JIS B 1559)

1. Tolerances for spherical bore of housing.

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

Housing number (PM, FM)	Tolerance class J7	
	D_a Deviation ΔD_{am}	
	High	Low
204	+14 / + 6	-11 / - 4
205~208	+18 / + 7	-12 / - 5
209, 210	+22 / + 9	-13 / - 5

ΔD_{am} ; Mean spherical bore diameter deviations.



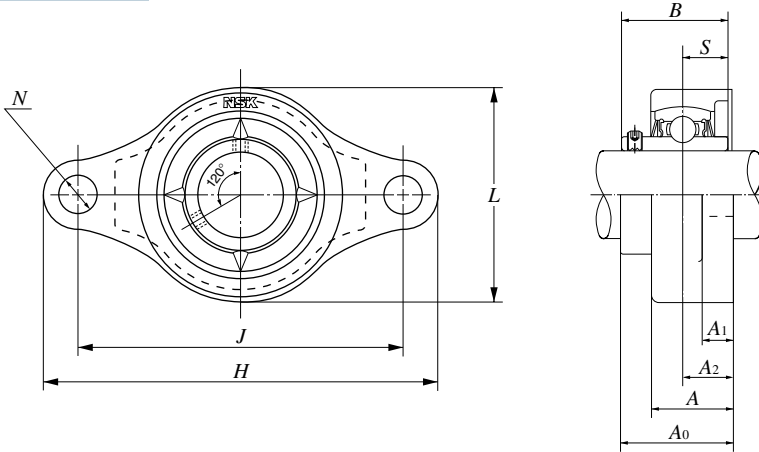
2. Center height tolerances for pillow type bearing unit.

Unit: mm/inch

Housing part number	H deviation ΔH_s
PM204~PM210	$\pm 0.15 / \pm 0.006$

Rhombus flange type ball bearing unit ; F-UCFM2 series

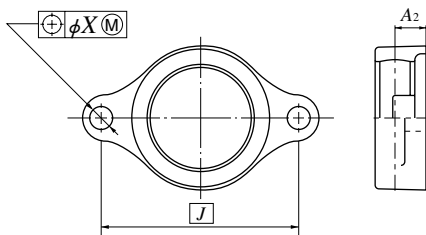
Cylindrical bore, set screw type with molded-oil



Shaft dia. mm inch	Unit number	Nominal dimensions mm / inch										Bolt size	Bearing number	Housing number	Mass of unit (Ref.) kg / lb
		H	J	A ₂	A ₁	A	N	L	A ₀	B	S				
20 3/4	F-UCFM204D0/LP99 F-UCFM204-012D0/LP99	112 4 13/32	90 3 35/64	15 19/32	10 13/32	25.5 1	12 15/32	60 2 3/8	33.3 1 5/16	31 1.2205	12.7 0.500	M10 3/8	F-UC204/LP99 F-UC204-012/LP99	FM204 FM204	0.5 1.1
25 13/16 7/8 15/16 1	F-UCFM205D0/LP99 F-UCFM205-013D0/LP99 F-UCFM205-014D0/LP99 F-UCFM205-015D0/LP99 F-UCFM205-100D0/LP99	127 5	99 3 57/64	16 5/8	10 13/32	26.5 1 1/32	16 5/8	68 2 11/16	35.8 1 13/32	34.1 1.3425	14.3 0.563	M14 1/2	F-UC205/LP99 F-UC205-013/LP99 F-UC205-014/LP99 F-UC205-015/LP99 F-UC205-100/LP99	FM205 FM205	0.6 1.3
30 1 1/16 1 1/8 1 3/16 1 1/4	F-UCFM206D0/LP99 F-UCFM206-101D0/LP99 F-UCFM206-102D0/LP99 F-UCFM206-103D0/LP99 F-UCFM206-104D0/LP99	145 5 23/32	117 4 39/64	18 45/64	10 13/32	30 1 3/16	16 5/8	80 3 5/32	40.2 1 37/64	38.1 1.5000	15.9 0.626	M14 1/2	F-UC206/LP99 F-UC206-101/LP99 F-UC206-102/LP99 F-UC206-103/LP99 F-UC206-104/LP99	FM206 FM206	0.9 2.0
35 1 1/4 1 5/16 1 3/8 1 7/16	F-UCFM207D0/LP99 F-UCFM207-104D0/LP99 F-UCFM207-105D0/LP99 F-UCFM207-106D0/LP99 F-UCFM207-107D0/LP99	158 6 7/32	130 5 1/8	19 3/4	12 15/32	32 1 1/4	16 5/8	90 3 17/32	44.4 1 3/4	42.9 1.6890	17.5 0.689	M14 1/2	F-UC207/LP99 F-UC207-104/LP99 F-UC207-105/LP99 F-UC207-106/LP99 F-UC207-107/LP99	FM207 FM207	1.2 2.6
40 1 1/2 1 9/16	F-UCFM208D0/LP99 F-UCFM208-108D0/LP99 F-UCFM208-109D0/LP99	172 6 23/32	144 5 43/64	21 53/64	12 15/32	35 1 3/8	16 5/8	100 3 15/16	51.2 2 1/64	49.2 1.9370	19 0.748	M14 1/2	F-UC208/LP99 F-UC208-108/LP99 F-UC208-109/LP99	FM208 FM208	1.6 3.5
45 1 5/8 1 11/16 1 3/4	F-UCFM209D0/LP99 F-UCFM209-110D0/LP99 F-UCFM209-111D0/LP99 F-UCFM209-112D0/LP99	180 7 3/32	148 5 53/64	22 55/64	13 1/2	36 1 13/32	19 3/4	108 4 1/4	52.2 2 1/16	49.2 1.9370	19 0.748	M16 5/8	F-UC209/LP99 F-UC209-110/LP99 F-UC209-111/LP99 F-UC209-112/LP99	FM209 FM209	1.9 4.2
50 1 13/16 1 7/8 1 15/16 2	F-UCFM210D0/LP99 F-UCFM210-113D0/LP99 F-UCFM210-114D0/LP99 F-UCFM210-115D0/LP99 F-UCFM210-200D0/LP99	189 7 7/16	157 6 3/16	22 55/64	13 1/2	37 1 15/32	19 3/4	115 4 17/32	54.6 2 5/32	51.6 2.0315	19 0.748	M16 5/8	F-UC210/LP99 F-UC210-113/LP99 F-UC210-114/LP99 F-UC210-115/LP99 F-UC210-200/LP99	FM210 FM210	2.2 4.9

Housing tolerances (JIS B 1559)

3. Tolerances for rhombus flange type housing.



Unit: mm/inch

Housing number	A ₂ deviation ΔA _{2S}	Tolerances for mounting bolt holes X
FM204~FM210	±0.5 / ±0.020	0.7 / 0.028

A₂ is distance between the center line of spherical bore diameter of the housing.
J is the bolt hole's center line dimension.

Recommended tightening torque for set screw

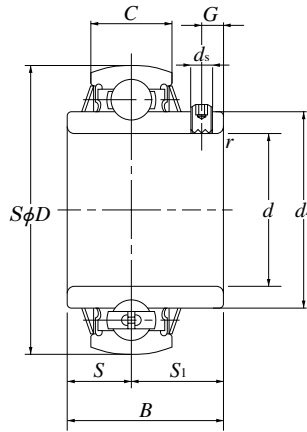
Tighten the two set screws uniformly using the torque listed in this table. Over tightening the set screw may cause the inner ring to crack.

Unit: N·m/lbf·inch

Bearing number (F-UC)	Designation of set screws (W shape screw head)	Tightening torques (Max)
204, 205	M5×0.8	3.9
	No. 10-32UNF	34
206	M6×0.75	4.9
	1/4-28UNF	43
207	M6×0.75	5.8
	1/4-28UNF	52
208~210	M8×1	7.8
	5/16-24UNF	69

Stainless insert bearing

Cylindrical bore, set screw type with molded-oil



Shaft dia. mm inch	Bearing number	Nominal dimensions mm / inch										Basic load rating N / lbf		Mass (Ref.) kg / lb
		d	D	B	C	r _{s min}	S	S ₁	G	ds	d ₄	dynamic C _r	static C _{0r}	
20 3/4	F-UC204/LP99 F-UC204-012/LP99	20 0.7500	47 1.8504	31 1.2205	17 0.6693	1 0.039	12.7 0.500	18.3 0.720	4.5 0.177	M5×0.8 No.10-32UNF	29.6 1.1654	9 900 2 220	6 650 1 500	0.17 0.39
25 13/16 7/8 15/16 1	F-UC205/LP99 F-UC205-013/LP99 F-UC205-014/LP99 F-UC205-015/LP99 F-UC205-100/LP99	25 0.8125 0.8750 0.9375 1.0000	52 2.0472	34.1 1.3425	17 0.6693	1 0.039	14.3 0.563	19.8 0.780	5 0.197	M5×0.8 No.10-32UNF	33.9 1.3346	10 800 2 430	7 850 1 770	0.20 0.53 0.51 0.46 0.44
30 1 1/16 1 1/8 1 3/16 1 1/4	F-UC206/LP99 F-UC206-101/LP99 F-UC206-102/LP99 F-UC206-103/LP99 F-UC206-104/LP99	30 1.0625 1.1250 1.1875 1.2500	62 2.4409	38.1 1.5000	19 0.7480	1 0.039	15.9 0.626	22.2 0.874	5 0.197	M6×0.75 1/4-28UNF	40.8 1.6063	15 000 3 350	11 300 2 540	0.33 0.82 0.77 0.73 0.66
35 1 1/4 1 5/16 1 3/8 1 7/16	F-UC207/LP99 F-UC207-104/LP99 F-UC207-105/LP99 F-UC207-106/LP99 F-UC207-107/LP99	35 1.2500 1.3125 1.3750 1.4375	72 2.8346	42.9 1.6890	20 0.7874	1.5 0.059	17.5 0.689	25.4 1.000	6 0.236	M6×0.75 1/4-28UNF	46.8 1.8425	19 700 4 450	15 300 3 450	0.49 1.21 1.15 1.08 1.01
40 1 1/2 1 9/16	F-UC208/LP99 F-UC208-108/LP99 F-UC208-109/LP99	40 1.5000 1.5625	80 3.1496	49.2 1.9370	21 0.8268	1.5 0.059	19 0.748	30.2 1.189	8 0.315	M8×1 5/16-24UNF	53 2.0866	22 400 5 050	17 800 4 000	0.65 1.52 1.46
45 1 5/8 1 11/16 1 3/4	F-UC209/LP99 F-UC209-110/LP99 F-UC209-111/LP99 F-UC209-112/LP99	45 1.6250 1.6875 1.7500	85 3.3465	49.2 1.9370	22 0.8661	1.5 0.059	19 0.748	30.2 1.189	8 0.315	M8×1 5/16-24UNF	57.5 2.2638	25 200 5 650	20 400 4 600	0.70 1.76 1.68 1.57
50 1 13/16 1 7/8 1 15/16 2	F-UC210/LP99 F-UC210-113/LP99 F-UC210-114/LP99 F-UC210-115/LP99 F-UC210-200/LP99	50 1.8125 1.8750 1.9375 2.0000	90 3.5433	51.6 2.0315	24 0.9449	1.5 0.059	19 0.748	32.6 1.283	9 0.354	M8×1 5/16-24UNF	62.4 2.4567	27 000 6 050	23 200 5 200	0.80 2.03 1.92 1.81 1.69

Note) Insert bearings can be supplied with USDA qualified food grade grease. The resulting grease suffix is "L596". Ex. F-UC204/L596.

Grease name	Allowable temp. range.	Applications	Note
CALTEX FM Grease EP2	-20~+110°C ●	Food processing and general machines.	H-2 standard grease qualified by USDA.

● Heat-resistant bearing can be used up to 200°C

Unit ball bearing tolerances (JIS B 1558)

1. Inner ring tolerances.

Unit: μm/0.0001 inch

Nominal bore diameter d				Bore diameter		Width		Radial runout (ref.)	
over		incl.		Δd _{mp} Deviations		ΔB _s Deviations (ref.)			
mm	inch	mm	inch	high	low	high	low		
18	0.7087	31.750	1.2500	+18 -7	0 0	12 5	0 0	-120 -47	18 7
31.750	1.2500	50.800	2.0000	+21 +8	0 0	14 6	0 0	-120 -47	20 8

Δd_{mp}; Mean bore diameter deviation. ΔV_{dφ}; Bore diameter variation.
ΔB_s; Inner ring width deviation.

2. Outer ring tolerances. Unit: μm/0.0001 inch

Nominal outside diameter D				ΔD _m Deviations		Radial runout (ref.)
over		incl.		high	low	
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

ΔD_m; Mean outside diameter deviation.
The low deviation of outside diameter ΔD_m does not apply within the distance of 1/4 the width of the outer ring from the side.

This new series from NSK provides corrosion resistance and longer lubrication life in a clean unit with low torque characteristics.

1. Features

Guards against corrosion

NSK Ball Bearing Units in the stainless series feature ball bearings inserted into housings made of stainless that provide superior resistance to corrosion as compared to standard series cast iron units. This series is especially useful in a wide variety of applications because of the rust free properties of the housing.

Longer lubrication life

Molded-Oil Bearings are lubricated with NSK's own oil-impregnated material, Molded Oil. Molded Oil consists of lubricating oil and polyolefin resin that has an affinity for oil. Oil slowly seeping from this material provides ample lubrication to the bearing for extended periods.

Maintains a clean operating environment

As oil seeping from the Molded Oil inside the bearing provides sufficient lubrication, troublesome oil refilling is not required and contamination of the surrounding environment is prevented.

Low torque characteristics

Prior to filling the bearings with Molded Oil, their interior surfaces are specially treated. As a result, bearing torque is not much higher than that of grease-lubricated bearings. (Patent pending)

Interchangeability

The basic dimensions are the same as current NSK units and are also compatible with units from other manufacturers ISO standard.

2. Materials

Parts		Materials
Bearing	Raceways	Martensite stainless steel (equivalent to SUS440C)
	Rolling element	Martensite stainless steel (SUS440C)
	Slinger, Retainer	Austenite stainless steel (SUS304)
	Rubber seal	Nitril rubber
	Set screw (W shape screw head)	Martensite stainless steel (SUS410)
Bearing housing		Austenite stainless steel casting (SCS13)

3. Recommended operating temperature and allowable speed

Molded-Oil™ Bearings are recommended to operate under -15 to +80°C. However, operating temperature should be below +60°C when the bearing is operated under continuous use.

dn value : 12×10^4 max
(dn =bore diameter in mm x speed in min^{-1})

Remarks: This recommended operating temperature range and allowable speed is applied to all bearings with Molded-Oil™ Bearings. Contact NSK when your application exceeds these recommendations.

4. Anti-Corrosion

NSK recommends ratings of ◎ to ○ for optimum corrosion resistance. ◎ ← excellent → poor

Materials	Condition	Atmosphere		Water		Acid		
		Dry	Wet	Natural water	Sodium water	Nitric acid	Sulfuric acid	Hydrochloric acid
Martensite stainless steel JIS.SUS440C, JIS.SUS410		○	△	△	▲	▲	×	×
Austenite stainless steel JIS.SUS304, JIS.SCS13		◎	◎	◎	○	◎	○	△
High carbon steel JIS.SUJ2		△	▲	▲	×	×	×	×
Carbon steel, Cast iron		▲	×	×	×	×	×	×

Remarks: This data is obtained by observation of the surface conditions of materials. Note that these anti-corrosion capabilities are altered by anti-corrosion surface treatment. Not recommended for use in liquid.

5. Applications

Molded-Oil™ Bearings are suitable in applications requiring a clean operating environment such as : food processing and packaging machinery, chemical processing machines, etc.

6. Option

The stainless series can also be filled with special grease, i. e., food processing grade, high temperature grease, etc. Also, a grease nipple can be applied upon request. Contact NSK for additional information.