For New Technology Network

NTN®

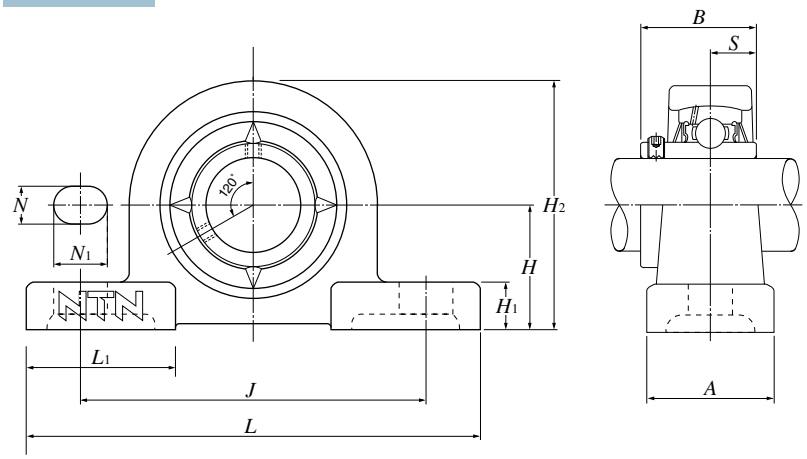
NTN corporation

Bearing Units
Stainless Series

CAT. No. 3903-Ⅳ／E

Pillow type bearing unit ; F-UCPM2 series

Cylindrical bore, set screw type with solid grease



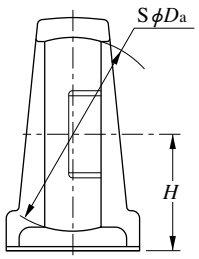
Shaft dia. mm inch	Unit number	Nominal dimensions mm inch H	L	J	A	N	N1	H1	H2	L1	B	S	Bolt size	Bearing number	Housing number	Mass of unit (Ref.) kg lb
20 3/4	F-UCPM204/LP03 F-UCPM204-012/LP03	33.3 1 5/16	120 4 23/32	95 3 3/4	30 1 3/16	12 15/32	14 9/16	11 7/16	64 2 17/32	42 1 21/32	31 1.2205	12.7 0.500	M10 3/8	F-UC204D1/LP03 F-UC204-012D1/LP03	PM204 PM204	0.6 1.3
25 13/16 7/8 15/16 1	F-UCPM205/LP03 F-UCPM205-013/LP03 F-UCPM205-014/LP03 F-UCPM205-015/LP03 F-UCPM205-100/LP03	36.5 1 7/16	130 5 1/8	105 4 1/8	30 1 3/16	12 15/32	14 9/16	12 15/32	70 2 3/4	42 1 21/32	34.1 1.3425	14.3 0.563	M10 3/8	F-UC205D1/LP03 F-UC205-013D1/LP03 F-UC205-014D1/LP03 F-UC205-015D1/LP03 F-UC205-100D1/LP03	PM205 PM205	0.7 1.5
30 1 1/16 1 1/8 1 3/16 1 1/4	F-UCPM206/LP03 F-UCPM206-101/LP03 F-UCPM206-102/LP03 F-UCPM206-103/LP03 F-UCPM206-104/LP03	42.9 1 11/16	155 6 3/32	121 4 3/4	36 1 13/32	17 21/32	20 25/32	13 1/2	82 3 7/32	54 2 1/8	38.1 1.5000	15.9 0.626	M14 1/2	F-UC206D1/LP03 F-UC206-101D1/LP03 F-UC206-102D1/LP03 F-UC206-103D1/LP03 F-UC206-104D1/LP03	PM206 PM206	1.0 2.2
35 1 1/4 1 5/16 1 3/8 1 7/16	F-UCPM207/LP03 F-UCPM207-104/LP03 F-UCPM207-105/LP03 F-UCPM207-106/LP03 F-UCPM207-107/LP03	47.6 1 7/8	161 6 11/32	127 5	38 1 1/2	17 21/32	20 25/32	14 9/16	92 3 5/8	54 2 1/8	42.9 1.6890	17.5 0.689	M14 1/2	F-UC207D1/LP03 F-UC207-104D1/LP03 F-UC207-105D1/LP03 F-UC207-106D1/LP03 F-UC207-107D1/LP03	PM207 PM207	1.3 2.9
40 1 1/2 1 9/16	F-UCPM208/LP03 F-UCPM208-108/LP03 F-UCPM208-109/LP03	49.2 1 15/16	171 6 23/32	137 5 13/32	40 1 9/16	17 21/32	20 25/32	14 9/16	98 3 27/32	52 2 1/16	49.2 1.9370	19 0.748	M14 1/2	F-UC208D1/LP03 F-UC208-108D1/LP03 F-UC208-109D1/LP03	PM208 PM208	1.8 4.0
45 1 5/8 1 11/16 1 3/4	F-UCPM209/LP03 F-UCPM209-110/LP03 F-UCPM209-111/LP03 F-UCPM209-112/LP03	54 2 1/8	180 7 3/32	146 5 3/4	40 1 9/16	17 21/32	20 25/32	14 9/16	105 4 1/8	60 2 3/8	49.2 1.9370	19 0.748	M14 1/2	F-UC209D1/LP03 F-UC209-110D1/LP03 F-UC209-111D1/LP03 F-UC209-112D1/LP03	PM209 PM209	2.1 4.6
50 1 13/16 1 7/8 1 15/16 2	F-UCPM210/LP03 F-UCPM210-113/LP03 F-UCPM210-114/LP03 F-UCPM210-115/LP03 F-UCPM210-200/LP03	57.2 2 1/4	195 7 11/16	159 6 1/4	45 1 25/32	19 3/4	22 7/8	16 5/8	114 4 1/2	65 2 9/16	51.6 2.0315	19 0.748	M16 5/8	F-UC210D1/LP03 F-UC210-113D1/LP03 F-UC210-114D1/LP03 F-UC210-115D1/LP03 F-UC210-200D1/LP03	PM210 FM210	2.5 5.5

Housing tolerances (JIS B 1559)

1. Tolerances for spherical bore of housing.

Unit: μm/0.0001 inch

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



ΔD_{am}; Mean spherical bore diameter deviations.

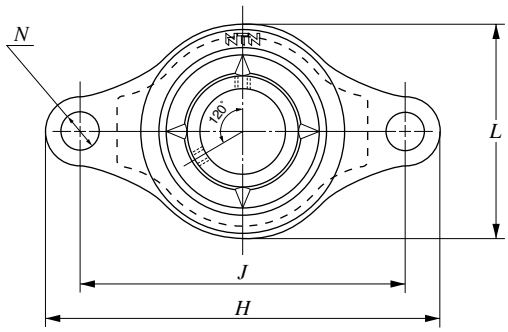
2. Center height tolerances for pillow type bearing unit.

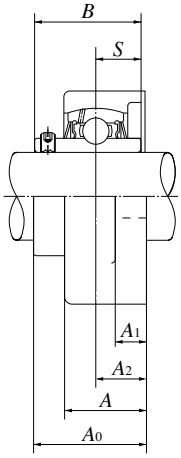
Unit: mm/inch

Housing part number	H deviation ΔH_s
PM204～PM210	±0.15 ±0.006

Rhombus flange type bearing unit ; F-UCFM2 series

Cylindrical bore, set screw type with solid grease

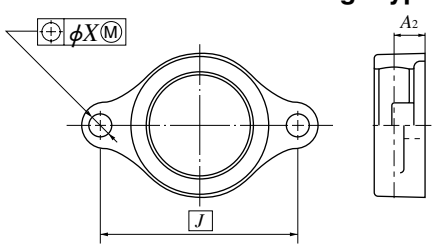




Shaft dia. mm / inch	Unit number	Nominal dimensions mm / inch H	J	A_2	A_1	A	N	L	A_0	B	S	Bolt size	Bearing number	Housing number	Mass of unit (Ref.) kg / lb
20 3/4	F-UCFM204/LP03 F-UCFM204-012/LP03	112 4 13/32	90 3 35/64	15 19/32	10 13/32	25.5 1	12 15/32	60 2 3/8	33.3 1 5/16	31 1.2205	12.7 0.500	M10 3/8	F-UC204D1/LP03 F-UC204-012D1/LP03	FM204 FM204	0.5 1.1
25 13/16 7/8 15/16 1	F-UCFM205/LP03 F-UCFM205-013/LP03 F-UCFM205-014/LP03 F-UCFM205-015/LP03 F-UCFM205-100/LP03	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-UC205D1/LP03 F-UC205-013D1/LP03 F-UC205-014D1/LP03 F-UC205-015D1/LP03 F-UC205-100D1/LP03	FM205 FM205	0.6 1.3
30 1 1/16 1 1/8 1 3/16 1 1/4	F-UCFM206/LP03 F-UCFM206-101/LP03 F-UCFM206-102/LP03 F-UCFM206-103/LP03 F-UCFM206-104/LP03	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-UC206D1/LP03 F-UC206-101D1/LP03 F-UC206-102D1/LP03 F-UC206-103D1/LP03 F-UC206-104D1/LP03	FM206 FM206	0.9 2.0
35 1 1/4 1 5/16 1 3/8 1 7/16	F-UCFM207/LP03 F-UCFM207-104/LP03 F-UCFM207-105/LP03 F-UCFM207-106/LP03 F-UCFM207-107/LP03	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-UC207D1/LP03 F-UC207-104D1/LP03 F-UC207-105D1/LP03 F-UC207-106D1/LP03 F-UC207-107D1/LP03	FM207 FM207	1.2 2.6
40 1 1/2 1 9/16	F-UCFM208/LP03 F-UCFM208-108/LP03 F-UCFM208-109/LP03	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-UC208D1/LP03 F-UC208-108D1/LP03 F-UC208-109D1/LP03	FM208 FM208	1.6 3.5
45 1 5/8 1 11/16 1 3/4	F-UCFM209/LP03 F-UCFM209-110/LP03 F-UCFM209-111/LP03 F-UCFM209-112/LP03	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-UC209D1/LP03 F-UC209-110D1/LP03 F-UC209-111D1/LP03 F-UC209-112D1/LP03	FM209 FM209	1.9 4.2
50 1 13/16 1 7/8 1 15/16 2	F-UCFM210/LP03 F-UCFM210-113/LP03 F-UCFM210-114/LP03 F-UCFM210-115/LP03 F-UCFM210-200/LP03	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-UC210D1/LP03 F-UC210-113D1/LP03 F-UC210-114D1/LP03 F-UC210-115D1/LP03 F-UC210-200D1/LP03	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_2	Tolerances for mounting bolt holes
FM204～FM210	±0.5	0.7
	±0.020	0.028

A_2 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

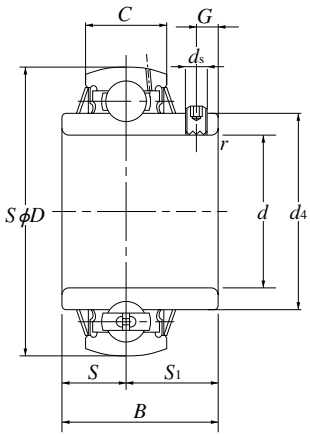
Tighten the two set screws uniformly using the torque listed in this table. Over tightening the set screw may cause the inner ring to crack.

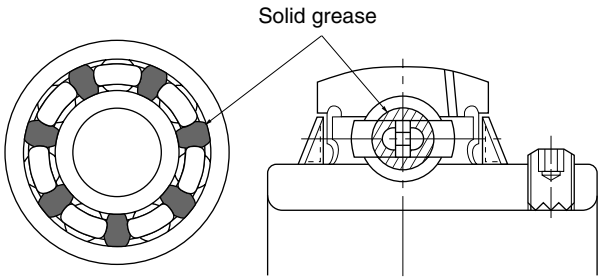
Unit: N·m/lbf·inch

Bearing number (F-UC)	Designnation 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 solid grease





Grease fill plan (Spot-pack type is standard)

Shaft dia. mm inch	Bearing number	Nominal dimensions mm inch d	D	B	C	$r_{s\,min}$	S	S_1	G	d_s	d_4	Basic load rating N dynamic C_r	lbf static C_{or}	Mass (Ref.) kg lb
20	F-UC204D1/LP03	20	47	31	17	1	12.7	18.3	4.5	M5×0.8	29.6	9 900	6 650	0.17
3/4	F-UC204-012D1/LP03	0.7500	1.8504	1.2205	0.6693	0.039	0.500	0.720	0.177	No.10-32UNF	1.1654	2 220	1 500	0.39
25	F-UC205D1/LP03	25	52	34.1	17	1	14.3	19.8	5	M5×0.8	33.9	10 800	7 850	0.20
13/16	F-UC205-013D1/LP03	0.8125												0.53
7/8	F-UC205-014D1/LP03	0.8750												0.51
15/16	F-UC205-015D1/LP03	0.9375	2.0472	1.3425	0.6693	0.039	0.563	0.780	0.197	No.10-32UNF	1.3346	2 430	1 770	0.46
1	F-UC205-100D1/LP03	1.0000												0.44
30	F-UC206D1/LP03	30	62	38.1	19	1	15.9	22.2	5	M6×0.75	40.8	15 000	11 300	0.33
1 1/16	F-UC206-101D1/LP03	1.0625												0.82
1 1/8	F-UC206-102D1/LP03	1.1250												0.77
1 3/16	F-UC206-103D1/LP03	1.1875	2.4409	1.5000	0.7480	0.039	0.626	0.874	0.197	1/4-28UNF	1.6063	3 350	2 540	0.73
1 1/4	F-UC206-104D1/LP03	1.2500												0.66
35	F-UC207D1/LP03	35	72	42.9	20	1.5	17.5	25.4	6	M6×0.75	46.8	19 700	15 300	0.49
1 1/4	F-UC207-104D1/LP03	1.2500												1.21
1 5/16	F-UC207-105D1/LP03	1.3125												1.15
1 3/8	F-UC207-106D1/LP03	1.3750	2.8346	1.6890	0.7874	0.059	0.689	1.000	0.236	1/4-28UNF	1.8425	4 450	3 450	1.08
1 7/16	F-UC207-107D1/LP03	1.4375												1.01
40	F-UC208D1/LP03	40	80	49.2	21	1.5	19	30.2	8	M8×1	53	22 400	17 800	0.65
1 1/2	F-UC208-108D1/LP03	1.5000												1.52
1 9/16	F-UC208-109D1/LP03	1.5625	3.1496	1.9370	0.8268	0.059	0.748	1.189	0.315	5/16-24UNF	2.0866	5 050	4 000	1.46
45	F-UC209D1/LP03	45	85	49.2	22	1.5	19	30.2	8	M8×1	57.5	25 200	20 400	0.70
1 5/8	F-UC209-110D1/LP03	1.6250												1.76
1 11/16	F-UC209-111D1/LP03	1.6875	3.3465	1.9370	0.8661	0.059	0.748	1.189	0.315	5/16-24UNF	2.2638	5 650	4 600	1.68
1 3/4	F-UC209-112D1/LP03	1.7500												1.57
50	F-UC210D1/LP03	50	90	51.6	24	1.5	19	32.6	9	M8×1	62.4	27 000	23 200	0.80
1 13/16	F-UC210-113D1/LP03	1.8125												2.03
1 7/8	F-UC210-114D1/LP03	1.8750												1.92
1 15/16	F-UC210-115D1/LP03	1.9375	3.5433	2.0315	0.9449	0.059	0.748	1.283	0.354	5/16-24UNF	2.4567	6 050	5 200	1.81
2	F-UC210-200D1/LP03	2.0000												1.69

Note) Insert bearings can be supplied with USDA qualified food grade grease. The resulting grease suffix is "L458". Ex. F-UC204 D1/L458.

Grease name	Allowable temp. range.	Applications	Note
High temp. Food grade grease.	−20～+110˚C ❶	Food processing and general machines.	H-1 standard grease qualified by USDA.

❶ 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 over mm	over inch	incl. mm	incl. inch	Bore diameter Δd_{mp} Deviations high	low	ΔV_{dp} Variations max.	Width ΔB_s Deviations (ref.) high	low	Radial runout (ref.) max.
18	0.7087	31.750	1.2500	+18	0	12	0	−120	18
				+ 7	0	5	0	− 47	7
31.750	1.2500	50.800	2.0000	+21	0	14	0	−120	20
				+ 8	0	6	0	− 47	8

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

2. Outer ring tolerances.

Unit: μm/0.0001 inch

Nominal outside diameter D over mm	over inch	incl. mm	incl. inch	ΔD_m Deviations high	low	Radial runout (ref.) max.
30	1.1811	50	1.9685	0	−11	20
				0	− 4	8
50	1.9685	80	3.1496	0	−13	25
				0	− 5	10
80	3.1496	120	4.7244	0	−15	35
				0	− 6	14

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

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

1. Features

Guards against corrosion

NTN 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

The solid grease lubricating the bearing has been heat-hardened and is a mixture of lubricant and ultra high moleculer weight polyethylene. The solid grease reduces leakage, prolonging lubricant life especially when used under conditions of vibration or centrifugal force. Also, this grease will not homogenize when water penetrates into the bearing raceway.

Maintains a clean operating environment

The solid grease lubricant in the ball bearing, solely developed by **NTN**, reduces leakage from the bearing, significantly reducing environmental pollution.

Low torque characteristics

The standard solid grease type for these ball bearing units is spot-pack which places the lubricant on the bearing retainer. Torque consumption capabilities of spot-pack bearings is low due to reduced whip resistance in comparison to standard grease lubricated ball bearings.

Interchangeability

The basic dimensions are the same as current **NTN** 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	Nitryl 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

Bearings with solid grease are recommended to operate under −20 to +80℃. However, operating temperature should be below +60℃ when the bearing is operated under continuous use.

dn value : 12×10^4 max
(dn=bore diameter in mm×speed in rpm)

Remarks: This recommended operating temperature range and allowable speed is applied to all bearings with solid grease. Contact **NTN** when your application exceeds these recommendations.

4. Anti-Corrosion

NTN recommends ratings of ◎ to ○ for optimum corrosion resistance.

◎ ○ △ ▲ ×
excellent ◄——► poor

Condition / Materials	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

Bearings with solid grease 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 **NTN** for additional information.