

Food Machinery Component Guide



CAT. No. 9209-VI/E

NTN Food Machinery Components

As customer needs for food preparation have become increasingly diverse, demands regarding the taste, price, and variety of food have become more stringent. A wide variety of dedicated food-processing machines have been developed to deal with this trend and to contribute to the design of more advanced food-processing centers.

NTN offers a full line of easy-to-use mechanical components optimized for food processing machinery. Significantly, they incorporate hygienic design to allow for easy washing and effectively prevent bacteria propagation. As well, they are made of safe materials that comply with the USDA (U.S. Department of Agriculture) and other food standards.





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Rolling Bearings & Bearing Units

These unique products embody optimal combinations of stainless steel, engineered plastic, and special grease. Ideal for food processing machinery, they take advantage of the basic features of rolling bearings.





Precision Resins (BEAREE products)

This product group covers a wide range of food processing applications. BEAREE products are made from fluorine resinbased super engineered plastic and sliding elastomer. These products are available as plain bearings, seals, and blades.











NTN parts feeders ensure hygienic environments while accommodating the essential functions of automatic food processing lines - storage, alignment, and supply.









NTN constant velocity joints smoothly transmit revolution and even accommodate large operating angles and offsets across shafts. Moreover, they provide extremely high durability.





Feedscrews

NTN feedscrews efficiently convert rotary motion into linear motion by combining polyimide.





Rolling Bearings & Bearing Units



Characteristics of Rolling Bearings for Food Processing Machinery

Lubricant type Characteristics Symbol		Food-grade solid grease Food-grade general-purpose grease LP06 L596		General-purpose solid grease LP03	Resin rolling bearing —
Permissible operating temperature (at bearing outer ring)		-10~100°C (80°C max. for continuous operation)	−20~110°C	−20~80°C (60°C max. for continuous operation)	−20~80°C (60°C max. for continuous operation)
Applicable	Standard product SUJ2	Not permissible	Permissible	Permissible	PPS or
bearing	Stainless steel SUS440C	Permissible	Permissible	Permissible	polyimide
Coat	Short-term	\bigtriangleup	O	\bigtriangleup	
Cost	Long-term (including maintenance)	O	×	O	0
Lubricant lif	e	0	0	O	0
Oil loss or leakage		O		O	0
Bearing torque		Relatively low	Standard	Low	Low
Food safety	,	O	O	0	O

1 "Spot-pack" prelubrication is provided with bearings with solid grease.

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Applicable bearing types are deep-groove ball bearings and ball bearings for bearing units.
 Contact with organic solvent, wash oil or other chemicals can degrade the lubricating performance of solid grease.

Selecting Bearing Units/Food Machinery Bearing Housings

Bearing housing	Corrosion	Food opfoty	Cost		
specifications	resistance	FOOD Salety	Short-term	Long-term	
Standard painted type	×	×	0	×	
Resin (plastic)	O	O		0	
Stainless steel	0	0	×	O	

Bearing Units/Food Machinery Ball Bearings

3.1 Bearings with solid grease

Solid grease is a unique solid bearing lubricant that essentially comprises lubricating grease and super molecular weight polyethylene. Before being packed into a bearing, it resembles ordinary grease. However, once heated and cooled, it solidifies and takes on a solid resin-like appearance. Spot packing is the standard lubricant prefill system. The cage is provided with grease at several spots.

a) Bearings with solid grease for general use (P-03) • Features

- (1) More resistant to centrifugal force-induced leakage.
- (2) Fouling from grease leaks on or around the bearing is positively prevented.
- (3) Water does not emulsify the grease or cause the grease to leak. Thus, the grease has a longer lubricating life.
- (4) Unlike ordinary grease, bearings with solid grease exhibits virtually no stirring drag and therefore contributes to lower bearing torque.
- Permissible operating temperature range and speed Temperature at bearing outer ring: Use the bearing in a temperature range of -20°C to 80°C (60°C max. for continuous operation). Permissible *dn* value: 120 000

 $[dn = bearing bore diameter d(mm) \times operating speed n(min⁻¹)]$

Applicable bearings

Ball bearings for bearing units, with a maximum bore diameter of 140 mm (models UC, UK, AS, CS) Grease code: LP03

b) Bearings with solid grease for food machinery (P-06) • Features

In addition to the advantages of the general-use bearings with solid grease (P-03) as mentioned in a) above, bearings with solid grease type P-06 boasts a high degree of safety because its heat-solidifying grease for food machinery is composed of food-grade lubricating grease that complies with the USDA's H-1 standard (permitting contact with food) and super molecular weight polyethylene approved according to an FDA (US Food and Drug Administration) standard

• Permissible operating temperature range and speed Temperature at bearing outer ring:

Use the bearing in a temperature range of -10 to 100° C (80°C max. for continuous operation).

Permissible dn value: 100 000

 $[dn = bearing bore diameter d(mm) \times operating speed n (min⁻¹))]$

Applicable bearings

Ball bearings for stainless steel bearing units, with a maximum bore diameter of 50 mm (model UC) Grease code: LP06



Bearings with solid grease for food machinery



Prelubricated bearing for food machinery



Stainless steel bearings with solid grease

3.2 Prelubricated bearings for food machinery

Features

This bearing type provides a high degree of safety, as it is filled with lubricating grease compliant with the USDA's H-1 standard.

• Permissible operating temperature range $-20^{\circ}\text{C} \sim 110^{\circ}\text{C}.$

Note : Heat-resistant bearing can be used up to 140°C. • Applicable bearings

Ball bearings for stainless steel bearing units, with a maximum bore diameter of 140 mm (all models). Grease code: L596



Grease



Bearing Units/Stainless Steel Series



Bearings with solid grease for food machinery/prelubricated bearing for food machinery/ bearings with solid grease for general use

4.1 Features

NTN stainless series bearing units comprise a stainless steel ball bearing and a stainless steel bearing housing, which provide much greater corrosion resistance than standard cast iron bearing units.

Bearings with solid grease for food machinery

This ball bearing unit employs foodgrade heat-solidifying grease for improved safety and minimum lubricant leakage. This reduces the possibility of environmental contamination. Another hygienic feature of this bearing unit is the smooth cast surface of its housing, which attracts minimal amounts of foreign matter.

Prelubricated bearing for food machinery

Because the ball bearing employs food-grade grease complying with the USDA's H-1 standard (permitting contact with food), this bearing unit features outstanding safety. • Bearings with solid grease for general use

This ball bearing unit employs general-purpose heat-solidifying grease for minimized lubricant leakage. This reduces the possibility of environmental contamination. Another hygienic feature of this bearing unit is the smooth cast surface of its housing, which attracts minimal amounts of foreign matter.

4.2 Materials

Parts		Materials				
	Bearing ring	Martensitic stainless steel (SUS440C or equivalent)				
	Rolling element	Martensitic stainless steel (SUS440C)				
Bearing	Slinger/cage	Austenitic stainless steel (SUS304)				
	Rubber seal	Nitrile rubber				
	W-point setscrew	Martensitic stainless steel (SUS410)				
Bearing housing		Austenitic stainless steel (SCS13)				

4.3 Lubricants, operating temperature range, and speed

Bearing	Lubricant	Permissible operating temperature range (at outer ring)	Permissible speed
Bearings with solid grease for food machinery	Heat-solidifying grease (P-06)	$-10^{\circ}C \sim +100^{\circ}C \begin{pmatrix} 80^{\circ}C \text{ max. for} \\ \text{continuous operation} \end{pmatrix}$	Permissible <i>dn</i> value : 100 000
Prelubricated bearing for food machinery	CALTEX FM grease EP2	-20°C~+110°C	Permissible
Bearings with solid grease for general use	Heat-solidifying grease (P-03)	$-20^{\circ}C \rightarrow + 80^{\circ}C $ ($^{60^{\circ}C}$ max. for continuous operation)	<i>dn</i> value : 120 000

O Solid lubricant formulated with grease complying with the USDA's H-1 standard and super molecular weight polyethylene approved according to standards of the FDA.
 O Grease satisfying the USDA's H-1 standard
 O an = bearing bore diameter d (mm) × operating speed n (min⁻¹)

4.4 Corrosion resistance

Condition	s In	air	* In v	vater	In a	acid
Material	Ventilated	Humid	Natural water	Seawater	Nitric acid	Hydrochloric acid
Martensitic stainless steel SUS440C, SUS410	0					×
Austenitic stainless steel SUS304, SCS13	\bigcirc	O	O	0	O	
High carbon chromium bearing steel SUJ2				×	×	×
Carbon steel/cast iron		×	×	×	×	×

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4.5 Applicable bearings (unit designations)

Bearing	Pillow block bearing units	Rhombic flanged housing bearing units
Bearings with solid grease for food machinery	F-UCPM204/LP06~F-UCPM210/LP06	F-UCFM204/LP06~F-UCFM210/LP06
Prelubricated bearing for food machinery	F-UCPM204/L596~F-UCPM210/L596	F-UCFM204/L596~F-UCFM210/L596
Bearings with solid grease for general use	F-UCPM204/LP03~F-UCPM210/LP03	F-UCFM204/LP03~F-UCFM210/LP03

• For safety reasons, solid lubricants lack anti-rusting agents. Therefore, only bearings made of stainless steel are applicable.

4.6 Applications





Automated pasta-wrapping line

Noodle machine (instant noodles & soups)



Bearing Units/Plastic Series



Bearings with solid grese for food machinery/prelubricated bearings for food machinery/ bearings with solid grease for general use

5.1 Features

NTN plastic series bearing units combine a stainless steel ball bearing and a resin bearing housing. They feature hygienic safety as their bearing housings are free of peeling paint and rusting.

Bearings with solid grease for food machinery

This ball bearing unit employs foodgrade heat-solidifying grease for improved safety and minimum lubricant leakage. This reduces the possibility of environmental contamination. As an added safety feature, the housing does not develop peeling paint or rusting.

Prelubricated bearings for food machinery

This bearing unit features outstanding safety thanks to the ball bearing's lubrication with food-grade grease, complying with the USDA's H-1 standard.

• Bearings with solid grease for general use

This ball bearing unit employs general-purpose heat-solidifying grease for minimized lubricant leakage. This reduces the possibility of environmental contamination. As an added safety feature, the housing does not develop peeling paint or rusting.

5.2 Materials

	Parts	Materials			
	Bearing ring	Martensitic stainless steel (SUS440C or equivalent)			
	Rolling element	Martensitic stainless steel (SUS440C)			
Bearing	Slinger/cage	Austenitic stainless steel (SUS304)			
	Rubber seal	Nitrile rubber			
	W-point setscrew	Martensitic stainless steel (SUS410)			
	Housing proper	Glass fiber-reinforced thermoplastic polyester			
Bearing	Sleeve for mounting bolt	Austenitic stainless steel (SUS304)			
nouonig	Mounting nut for grease nipple	Austenitic stainless steel (SUS303)			
	Cover	Polypropylene			
	Spare plug	Polyethylene			

5.3 Lubricants, operating temperature range, and speed

Bearing	Lubricant	Permissible operating temperature range (at outer ring)	Permissible speed
Bearings with solid grease for food machinery	Heat-solidifying grease (P-06)	-10°C~+ 80°C	Permissible dn value : 100 000
Prelubricated bearing for food machinery	CALTEX FM grease EP2	-20°C~+ 80°C	Permissible
Bearings with solid grease for general use	Heat-solidifying grease (P-03)	$-20^{\circ}C \sim + 80^{\circ}C \left(\begin{array}{c} 60^{\circ}C \text{ max. for} \\ \text{continuous operation} \end{array} \right)$	<i>dn</i> value : 120 000

Solid lubricant formulated with grease complying with the USDA's H-1 standard and super molecular weight polyethylene approved according to standards of the FDA.
 Grease satisfying the USDA's H-1 standard
 dn=bearing bore diameter d (mm) × operating speed n (min⁻¹)

5.4 Corrosion resistance

	Conditions		In air		* In water		In acid	
Material		Ventilated	Humid	Natural water	Seawater	Nitric acid	Hydrochloric acid	
Martensitic stainless steel SUS440C,	SUS410	0	\bigtriangleup	\bigtriangleup			×	
Austenitic stainless steel SUS303, SU	JS304	O	O	O	0	O	\bigtriangleup	
Thermoplastic polyester resin		O	O	O	O		0	
Polypropylene/polyethylene		O	O	O	O	0	0	
High carbon chromium bearing steel S	SUJ2	\bigtriangleup			×	×	×	
Carbon steel/cast iron			×	×	×	×	×	

©Excellent ○Good △Fair ▲Poor ×Unacceptable

5.5 Applicable bearings (unit designations)

Bearing	Pillow block bearing units	Rhombic flanged housing bearing units			
Bearings with solid grease for food machinery	F-UCPR204/LP06~F-UCPR208/LP06	F-UCFLR204/LP06~F-UCFLR208/LP06			
Prelubricated bearing for food machinery	F-UCPR204/L596~F-UCPR208/L596	F-UCFLR204/L596~F-UCFLR208/L596			
Bearings with solid grease for general use	F-UCPR204/LP03~F-UCPR208/LP03	F-UCFLR204/LP03~F-UCFLR208/LP03			

5.6 Applications



Automatic packing machine for Japanese-style fish cake



Automatic onion skinning machine

Triple-Sealed Bearings for Bearing Units

Triple-sealed bearings with secure dustproofing / waterproofing

Provides a longer service life even when exposed to heavy airborne dust and splashing water.



6.1 Features

• Better dustproofing and waterproofing ensures longer bearing life.

The triple-sealed bearing is provided with a triple-lipped bearing seal. The special seal offers reliable dustproofing and waterproofing superior to those of standard bearings for bearing units. It therefore ensures longer service life even under conditions of heavy airborne dust and dirty splashing water.

• Reduces maintenance cost.

With a longer bearing life than ordinary bearings used in unit configurations, these bearings have longer maintenance intervals, greatly reduced maintenance costs (for inspection, relubrication, replacement, etc.), and increased productivity of machines.

• Decreases price of bearing unit and allows for much more compact machinery.

Under certain operating conditions, the triple-sealed bearing unit can replace conventional covered bearing units, greatly decreasing the cost of bearing units. Furthermore, if the cover is not needed, machinery can be made much more compact.

Balled setscrew ensures secure fastening

The triple-sealed bearing is mounted on the shaft with **NTN**'s unique balled setscrew, which has an embedded ball in its tip. This setscrew boasts much greater resistance to loosening than serrated or cup-point setscrews, and does not readily loosen due to vibration or impact.

Interchangeability

The triple-sealed bearing unit conforms to the JIS standard for UC-type bearings. It can be readily used as a relubricable bearing, and can replace **NTN**'s conventional bearing unit and other manufacturers' products. It can therefore easily be used to replace existing bearing units during machinery maintenance.

6.2 Construction





Triple-seal

6.3 Permissible operating temperature range and speed

Use the triple-sealed bearing within the temperature range of -15 to 100° C.

Permissible *dn* value: 36 000

[*dn*=bearing bore diameter *d* (mm) \times operating speed *n* (min⁻¹)]

6.4 Applicable bearings

Ball bearings for bearing units, with a maximum bore diameter of 90 mm.

UC201D1LLJ~UC218D1LLJ

6.5 Typical applications

Triple-sealed bearing units are suitable for machines used in locations subjected to splashing water and heavy dust, such as bread-making/confectionery machines, noodle-making machines, fish-processing machines, flour mills, rice/barley pearling mills, beverage processing machines, brewing machines, and bottle-making machines.

6.6 Special specification bearing units

The standard products of this series are prelubricated with lithium mineral grease. Contact **NTN** Engineering for information on optional bearings, such as those containing Polylube (heat-solidifying grease) or food-grade grease, and stainless steel bearings.



Resin Rolling Bearings



7.1 Features

Standard bearings cannot be used in environments where they will be exposed to water or liquid chemicals. In contrast, **NTN** resin rolling bearings can operate without relubrication, at a lower torque in such environments because their inner and outer rings, balls, and cage are made of unique corrosion-proof self-lubricating materials.

Note, however, these bearings must be used at a lower load rating and limiting speed because their inner and outer rings are made of resin.

7.2 Materials

Parts	Materials				
Inner/outer rings	BEAREE AS5701 (PPS-base), or BEAREE PI 5001 (polyimide-base)				
Balls	Glass or ceramic				
Cage	Glass fiber reinforced nylon 66 or BEAREE FL3700				

7.3 Bearing number and bearing table



Inner/outer ring: BEAREE AS5701, Cage: Glass fiber reinforced nylon

Boaring	Basic load	Bound	dary din	Mass g		
Dearing	rating (approx.)	d	D	В	С	(approx.)
6000	3	10	26	8	0.3	5
6001	3	12	28	8	0.3	6
6002	3	15	32	9	0.3	8
6003	5	17	35	10	0.3	10
6004	6	20	42	12	0.6	17
6200	4	10	30	9	0.3	8
6201	5	12	32	10	0.6	10
6202	6	15	35	11	1.0	12
6203	8	17	40	12	1.0	17
6204	10	20	47	14	1.0	28

7.4 Operation



Bearing operation in water

 $*B^{+0}_{-0.2}$ Radial internal clearance(mm) : $0.05\sim0.20$ * The dimensional and running accuracy differ from that of standard bearings

7.5 Typical applications

Photographic film developing machine (Types #6202 and 6203)						
Operating conditions: Radial load: max. 0.95 kgf						
Speed: 1000 min ⁻¹						
Environment: Developer solution of pH 0.9 to 12						
 Aluminum foil forming line (Types UC205 and 206) 						
Operating conditions: Radial load: 13~15 kgf						
Speed: 1 min ⁻¹						
Magneto-optical disk sputtering machine (dia. 20×dia. 25×4 mn)						
• Magneto-optical disk sputtering machine (dia. 20×dia. 25×4 mm)						
Operating conditions: Radial load: 1.0 kgf						
Speed: 120 min ⁻¹						
Environment: Vacuum						
 Hard disk washing machine 						
Operating conditions: Radial load: 2.0 kgf						
Limiting speed: 400 min ⁻¹						
Environment: Pure water						



Aromatic thermosetting resin rolling bearings



BEAREE Products Meet Diverse Needs in the Food Machinery Industry.

 BEAREE satisfies the specification test for synthetic resin utensils, containers, and packaging materials by Japan Food Research Laboratories.
 It is available in the hygienic colors of white or pale yellow.



BEAREE FL3642 〈Fluororesin Series〉



1.1 Features

- 1. Excellent friction/wear characteristics when not lubricated or when operating in liquid.
- 2. Higher permissible PV value. Maximum permissible operating temperature is 260°C.
- 3. Good compatibility with mild steel or stainless steel.
- 4. Least affected by acid, base, or solvent.

1.2 Sliding characteristics

Comparison of wear characteristics with various BEAREE products

Wear characteristics of FL3642, either in a dry state or with water lubrication, are compared with those of other BEAREE materials.

Test conditions: Thrust tester Bearing pressure: 0.98 MPa Peripheral speed: 32 m/min Mating material: SUS304 Lubrication: Dry or water Test duration: 50 hrs.



•Time-dependent change in dynamic friction coefficient The graphical plot below represents the time-dependent change in the dynamic friction coefficient under the above-mentioned test conditions, either in dry state or with water lubrication.





Products for food machinery

Other BEAREE materials also satisfy the above specification test, and are used according to the intended applications.

Typical BEAREE materials that satisfy the specification test for synthetic resin containers and packaging materials

Material description	Color	Applications
BEAREE FL 3040	Black	Bearing for soft mating materials
BEAREE FL 3700	Black	Bearing for underwater applications
BEAREE AS 5000	Light brown	General-purpose



BEAREE ER3600 〈Sliding Fluororubber〉



3.1 Features

- 1. Its elasticity ensures an excellent seal.
- 2. Better friction/wear characteristics than general-purpose fluororubber
- 3. Maximum continuous operating temperature of 230°C
- 4. Good compatibility with soft mating materials

3.2 Characteristics of BEAREE ER as a sliding material



3.3 PV value and relative wear





BEAREE UH3000 〈Base Resin PE〉

4.1 Features

- 1. Excellent friction/wear characteristics at lower PV value
- 2. Excellent impact resistance
- 3. Very economical

Note: NTN also supplies BEAREE UH300 in rod and pipe forms.



Specific gravity	Compression creep %	Hardness	Tensile strength		Elongation	n Bending strength		Young's modulus in flexure		Water	Coefficient 2 of linear	Max. permissible
			MPa	kgf/cm ²	%	MPa	kgf/cm ²	MPa	kgf/cm ²	%	×10 ⁻⁵ /°C	temp.°C
0.94	11.0	65	20	200	200	20	200	610	6 100	0.01	20.0	80

Hardness: Durometer

Ocertificient of linear expansion: Average coefficient in the range from room temperature to 80°C.



Parts Feeders





Functions of Parts Feeders

Parts feeders are generally used for the following:



ent Supply

The most important task is alignment. Alignment techniques include the attachment alignment system (the most common method) and the use of sensors or image processing systems.

With the attachment alignment system, variously configured lanes and mechanical arrangements are provided in and around the bowl to align the work pieces.

An automatic food processing line can run stably and reliably with a combination of **NTN**'s unique parts feeder and an alignment system optimized for each type of work piece.



Alignment

Work pieces in random orientations and traveling upward on a track on a bowl are arranged into a common orientation.



Typical Parts Feeder Applications

NTN parts feeders can feed work pieces of various forms and textures, including candy, ice cream, biscuits, dried noodles, and powders.





5.1 Features

The bowl can be attached or detached quickly and easily.

5.2 Applications

- When the bowl must be sterilized or washed at regular intervals, for example, on food-processing or medicine-packing lines.
- When the bowl must be replaced frequently to accommodate small-lot, multiple-product manufacturing. (The one-touch clamp feature is most useful when combined with a computerized variable frequency controller.)





Parts Feeder Applications



Work piece: Biscuits



Work piece: Rice cakes



Work piece: Ice cream (chocolate coating)



Work piece: Caramels



Work piece: Candy



Constant Velocity Joints



Constant Velocity Joints



1.1 Features

Smooth operation

The constant velocity mechanism ensures smooth and quiet rotation.

- Secure sealing The grease is fully contained within a boot, ensuring a clean and hygienic environment.
- Requires no relubrication for a prolonged period.

The boot provides a reliable seal that prevents grease leakage and water ingress, ensuring a long period of relubrication-free operation.

• Wide range of variants

We offer a wide range of constant velocity joints of various types and sizes. Choose the optimal joint design or configuration to meet the intended application and operating conditions.

1.2 Types and features of constant velocity joint

Туре		Model Joint number Max. perr operation		Max. permissible operating angle	Features		
Fixed type	Cup type		BJ75C ~BJ225C	25°	Greater permissible		
	Drum type		Outstanding sealing performance				
Sliding type	DOJ flanged type		DOJ 68F~DOJ200F DOJ225F~DOJ625F	20° 8°~10°	Expansion is possible within the joint. Low sliding resistance (expanding resistance)		
	TBJ flanged type		TBJ8SF~TBJ60SF	16°∼18°			
	TBJ bossed type		TBJ8SB~TBJ60SB				
Coupling type	BC series		BC68~BC200	5°			
	TBJ DF series		TBJ8DF~TBJ60DF	8°	No alignment work is needed. Easy mounting.		
	TBJ DB series		TBJ8DB~TBJ60DB				

• The maximum permissible operating angle is limited by the boot, as well as the number of revolutions and operating conditions of the joint assembly.

2 We can manufacture larger joints upon customer request. For details, contact NTN Engineering.

1.3 Type selection flowchart



1.4 Typical applications

Canning lines for fish, meat, fruit, beverages, food and delicacies.

Bottling lines for beverages, liquid seasonings, etc.

Packing lines for instant foods/retort-packaged foods.

Rotary drives in bottle-washing machines, labelers, kneading machines, etc.







Feedscrews



Miniature Resin Slide Screws



NTN miniature resin slide screws incorporate both BEAREE AS5000 nuts, which feature excellent friction/wear characteristics, and stainless steel threaded shafts.

1.1 Features

- 1 Accommodates a variety of environments. Lubrication-free, corrosion-resistant, and heat-resistant
- 2. Lower noise than ball screw configurations.
- 3. The low-friction resin nut ensures higher screw efficiency.
- 4. NTN will machine the shaft end to customer specifications.

1.3 Bearing numbers and bearing table

1.2 Specifications

Type Material/resin nut Threaded shaft : Single-flanged single nut : AS 5000 : SUS304





unit : mm												
Th	Threaded shaft		Resin nut									Standard
Bearing number	minal dia. d	Nominal lead	Outside dia. D .0.2	Length	Flai A	nge B	Mo P.C.D	unting h Hole dia. X	nole No. of holes	Width across flats T	No. of start	shaft length
R-MSS0401Y R-MSS0402Y	4	1	10	10	23		23	2.9	4	15	1 2	200
R-MSS0601Y R-MSS0602Y	6	1 2	12	12	26	3.5	26	3.4		17	1	
R-MSS0609Y R-MSS0618Y	-	9 18					20				4	300
R-MSS0801Y R-MSS0802Y		1	4.4	12	29	4	26			18	1	
R-MSS0812Y R-MSS0824Y	0	12 24	14								4 6	400
R-MSS1002Y		2			33	5	33	· 4.5		21	1	300
R-MSS1015Y 1	10	15	16	16							4	450
R-MSS1030Y		30									6	400
R-MSS1202Y		2	18		35					22	1	300
R-MSS1218Y 1 R-MSS1236Y	12	18 36		16			33				6	500