



PARTS FEEDER

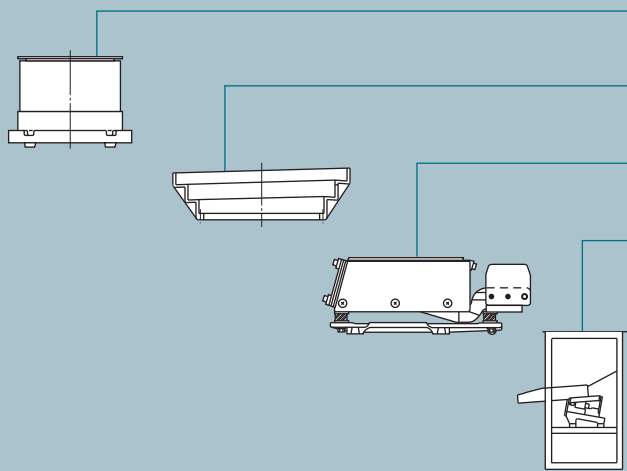
CAT.No.7018-15/E



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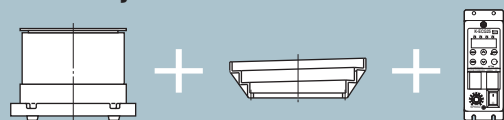
Outline and Features

Standard Series Dimensions and Specifications

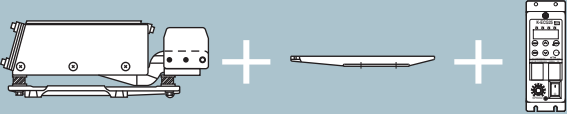


Standard Series Combination Table

Vibratory Drive Unit / Bowl / Controller



Parts Feeders for Special Applications

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Important

Thank you for your interest in **NTN**'s parts feeders. The following notes apply to the products listed within this catalog, and customers are advised to understand their impact before purchasing any product.

Full components other than the controllers listed in this catalog are not RoHS2-compliant. Accordingly, such components may fall under the category of regulated substances, and as such customers should take careful consideration of this fact when making purchases. Products purchased and exported after taking this fact into consideration shall be at the sole responsibility of the customer.

Note that globally-compliant series have acquired NRTL certification in the U.S. (and Canada due to the mutual recognition scheme), while globally-compliant controllers have acquired CE marking certification in Europe and NRTL certification in the U.S. However, the use of these products shall be at the responsibility of the customer, regardless the region of the use, and **NTN** shall not be held liable regarding the use of such products in any regions.

NTN

PARTS FEEDER

From precision machine parts to foods...

■ Four series of vibratory drive units covering a broad range of applications, for anything from miniature parts to large billets

NTN Parts Feeders can automatically align a wide variety of work pieces (such as machine parts, electronic parts, plastic parts, chemicals, pharmaceuticals, foods, and miscellaneous goods), and feed them via a vibratory trough for processing in automated production machines.

Parts feeders are simple devices comprised of leaf springs, electromagnets, the vibratory vessel and various other parts. Their main functions are to align and feed parts in manufacturing and assembly processes—critical tasks in today's increasingly diversified and technologically complex production systems. For improved production efficiency, parts feeders must be both faster and more reliable.

To meet these demands, NTN has developed the following four series of vibratory drive units, each of which is designed for different applications, depending on the size and material of work pieces.

■ **HF-series**, high-frequency drive, for miniature electronic parts and low profile parts

■ **K-series**, simple, high-performance feeders, for small parts from 1 mm to approx. 10 mm.

■ **N-series**, the best-selling traditional horizontal vibration feeder, with an isolated bottom, for general medium size parts.

■ **G-series**, fitted with a powerful W spring, for larger parts.

With these four series to choose from, you can always select the optimum drive unit for your parts. To fully utilize the performance potential of these highly stable vibratory drive units, a variety of tooling units are available, including bowls (vibratory vessels) and controllers (control devices). Using the combinations lists (pages 42 to 55), anyone can quickly, and easily find the ideal combination of equipment for the job at hand.

In addition, many other accessories, including the standard stay assembly parts, which are required for setting linear feeders and vibratory troughs, are also available.

We are confident that NTN Parts Feeders can satisfy your demands for higher levels of automation and labor savings.

■ Excellent tooling technology through long years of experience

Attachments of various shapes which are fitted either inside or outside the bowls to aid in aligning the parts are also available.

The attachments used for particular types of work pieces greatly affect the performance of parts feeders. NTN's tooling technology, which spans everything from design and production through to fine tuning attachments, has been developed out of many years of experience, and handles the automatic alignment and feeding of many kinds of traditionally difficult parts. NTN products are peerless in their workmanship and finish.

Standard series

Bowl feeder series

(Refer to page 4)



HF-series



K-series



N-series



G-series

Bowl series

(Refer to page 5)



Precision machined bowl



* Optional specifications for black polyurethane coating on inside surface

Cascade bowl



Stainless steel cascade bowl



Straight wall bowl



Cone bowl



Dish bowl

Linear feeder series

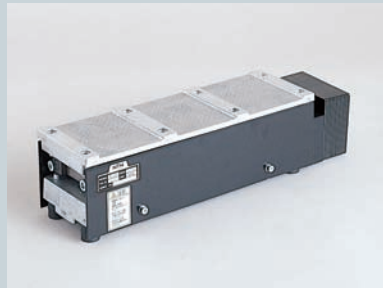
(Refer to page 6)



HS-series



S-series



L-series

Hopper series

(Refer to page 6)



Detached hopper

Note: Level switch sold separately



Space-saving hopper

Note: Level switch sold separately

Controller series

(Refer to page 7)



Variable frequency



General purpose
variable frequency controller



I/O controller unit

Bowl feeder series

Numbers in shaded area indicate reference pages.



HF-series

9

HF-series bowl feeders can smoothly feed miniature and low profile parts at high speed through an F-series horizontal drive running at high-frequency via a variable frequency controller. Use in conjunction with HS-series.

- (1) High-speed, stable feeding
- (2) Highly rigid isolating vibration
- (3) Height adjustment mechanism



K-series

10 · 11

K-series bowl feeders are intended for small parts, including electronic components. Simple, open construction and well thought out spring mechanism design allow precise and stable vibration for long periods of time.

- (1) Precise full wave drive
- (2) Attractive coverless construction



N-series (See exploded view below.)

12 – 17

The N-series are NTN's most representative bowl feeders featuring stable operation and high durability by incorporating a traditional isolated bottom and horizontal drive. The new N32 model has been added to expand the N-series range.

- (1) Low noise
- (2) No adjustment required
- (3) High-speed, stable feeding
- (4) Auxiliary hopper can be fitted.
- (5) Fastening base plate fitted as standard.

Isolated bottom construction

Since the bottom is isolated from the bowl, it does not vibrate. Only the tracks around the bowl are vibrated during operation. This design generates less noise, and keeps the vibrating mass unchanged. Thus, feed speed is always constant. In addition, an auxiliary hopper can be installed in the bowl.

Vibration system

Unlike conventional vertical drive feeders, which have high-capacity electromagnets, a horizontal drive is employed in N-series bowl feeders by evenly distributing several weaker electromagnets around the circumference so that force is distributed evenly and smoothly in the direction of vibration. Good balance in vibrational amplitude allows high-speed feeding without the need for frequent adjustments.

Exploded view of N25 type



G-series

18 · 19

G-series are powerful bowl feeders for large and heavy work pieces. This series of feeders includes the G50 and the more powerful G63.

- (1) Powerful leaf spring
- (2) Enhanced drive system
- (3) Reduced vibration transmission
- (4) Isolated bottom can be installed.

Bowl series

Numbers in shaded area indicate reference pages.

Precision machined bowl

20 · 27



Suitable for aligning and feeding minute parts

- (1) Precision machined tracks
- (2) Selection of bowl shapes for different applications
- (3) NC tooling is possible
- (4) Machined inside surface

Cascade bowl

20 · 21



For general applications (all-purpose)

- (1) A virtually non-stick bowl
- (2) Light weight (aluminum alloy casting)
- (3) Cost-effective (mass-produced by precision casting)
- (4) Optional specifications for black polyurethane coating on inside surface

Stainless steel sheet cascade bowl

22 · 23



Suitable for foods and medicine

- (1) All tracks surfaces can be smooth-finished for complete discharge of minute components.
- (2) A virtually non-stick bowl
- (3) Unfinished stainless steel surface inside the bowl

Straight wall bowl

24 · 25



Suitable for special applications

- (1) Uniform circumference permits easy installation of attachments.
- (2) Longer, more complex attachments than for cascade bowl can be used.
- (3) Easy incorporation of recycling tracks (smooth recycling is possible by returning work pieces to the bottom of the bowl and guiding them to below the first tracks)
- (4) Untreated, as-rolled stainless steel surface inside the bowl

Cone bowl

26



For general applications

- (1) A virtually non-stick bowl
- (2) Uniform circumference permits easy installation of attachments.
- (3) Easier incorporation of recycling tracks than the cascade bowl
- (4) Unfinished, stainless steel surface inside

Dish bowl

27



For high-speed feeding of low-profile parts

- (1) Low-profile parts can be easily fed at high speed via narrow tracks without special reworking for attachments.
- (2) Unfinished, stainless steel surface inside

Linear feeder series

Numbers in shaded area indicate reference pages.

S-series

28 • 29



S-series feeders connect NTN bowl feeders with automated production equipment near-horizontally and near-linearly.

- (1) Constant feed speed
- (2) Stable operation for long periods
- (3) Easy installation and adjustment

HS-series

30

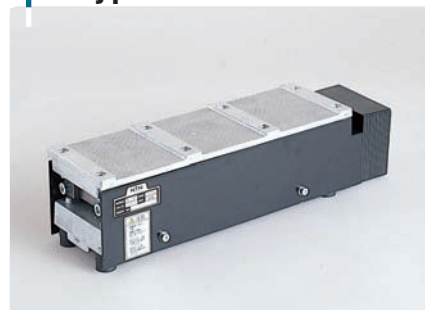


HS-series feeders feed miniature parts, including chips and other electronic components at high speed. Use in conjunction with HF-series.

- (1) Built-in height adjustment mechanism
- (2) Stable positioning

L-type

30



L-type feeders can be operated after a simple adjustment, and are also applicable for low profile parts.

- (1) Easy design of vibratory troughs
- (2) Smooth, high-speed feeding

Hopper series

Numbers in shaded area indicate reference pages.

Detached hopper

32



The detached hopper has a specially designed storage tank to allow the automatic supply of a large number of parts for a long time.

- (1) Low noise
- (2) Stable discharge of work

Note: Level switch sold separately.

Space-saving hopper

33



The space-saving hopper is compact for maximum utilization of available space. The tank and vibratory trough are supported by a round bar, so that the whole hopper unit can be installed directly above the bowl feeder. A compact, highly sensitive level switch is also provided.

- (1) Space-saving
- (2) Easy inspection and maintenance
- (3) Stable discharge of work

Note: Level switch sold separately.

Controller series

Numbers in shaded area indicate reference pages.

Variable frequency controller

36 • 37



Simple to set up, the variable frequency controller reliably controls parts feeders regardless of the power frequency.

- (1) No adjustment of the leaf spring is needed.
- (2) Simple digital setup.
- (3) Capable of controlling a larger parts feeder.

General purpose variable frequency controller

38



The variable frequency controller functions have been narrowed down to achieve a lighter weight, lower priced unit.

Provides the same operating performance as conventional units, despite less functions supplied.

- (1) No adjustment of the leaf spring is needed.
- (2) Simple digital setup.
- (3) Ideal for controlling linear feeders and hoppers.

I/O controller unit

40



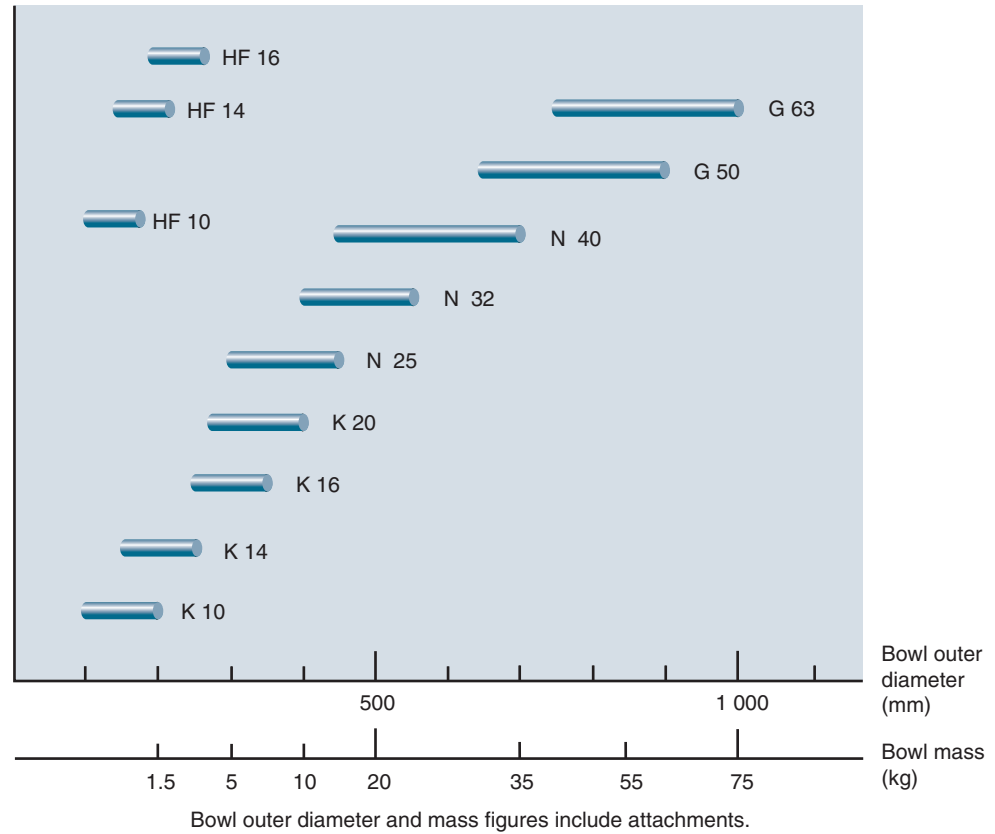
To control the parts feeder system with the I/O controller unit, the operator need only enter a program number and define the timer setting.

- (1) The controller unit is ready to operate once the operator has entered a program number and timer setting.
- (2) Space requirements for installation are greatly reduced.
- (3) Low cost and short lead time

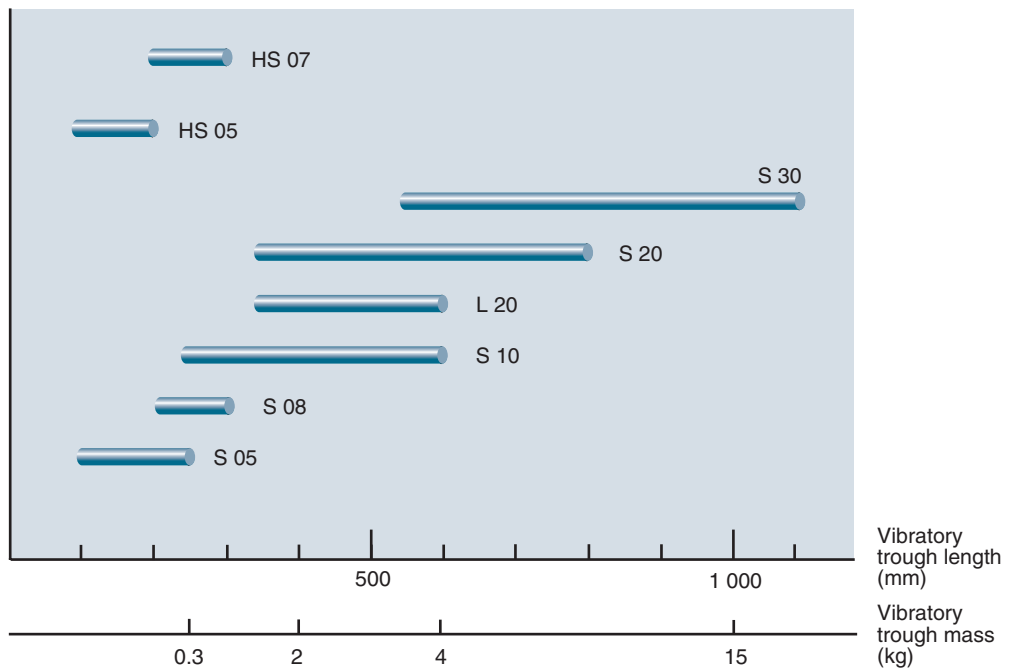
Selection of Vibratory Driving Unit

Once the outer diameter of the bowl and vibratory trough length are determined, suitable vibratory drives can be selected from the graphs below. For details, refer to pages 6 and 7 in the "Parts Feeder Guide Book" (CAT.No.7019/E).

Appropriate bowl sizes for bowl feeders



Appropriate vibratory trough sizes for linear feeders



HF10,14,16

NTN parts feeder

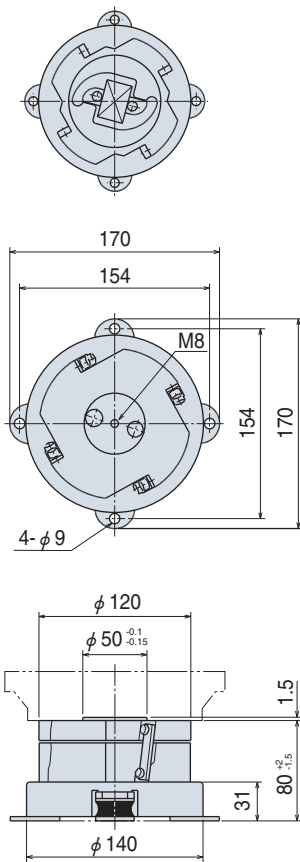
HF series

(High-frequency bowl feeder)

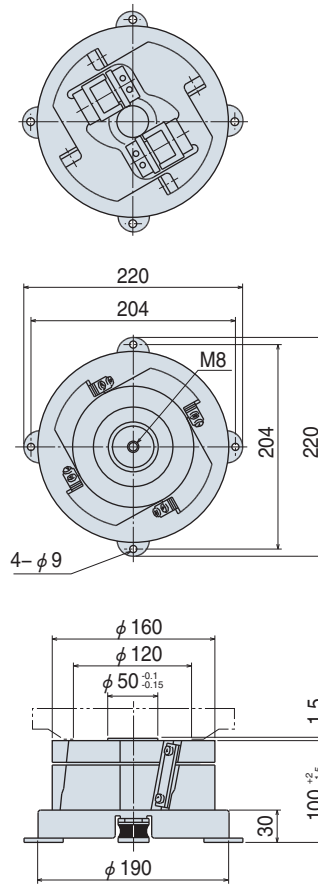
K- HF 14 R 2 1

Voltage and drive system
Design revision code
Supply direction
(R: clockwise, L: counterclockwise)
Size
Model

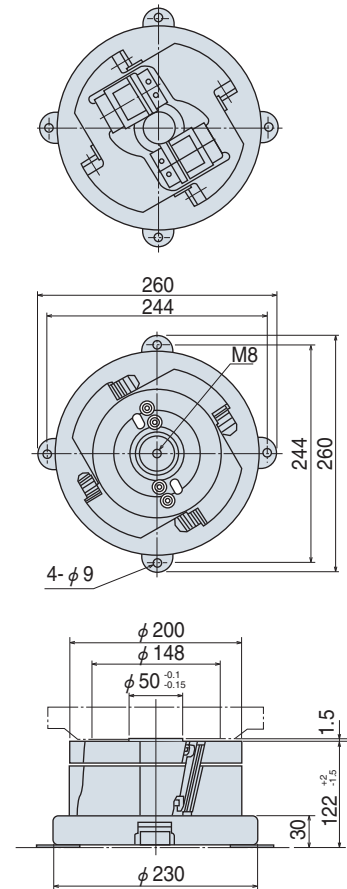
K-HF10^R21



K-HF14^R21



K-HF16^R1



Model and size	Part number	Rated voltage (V)	Rated current (A)	Applicable controller ^①	Applicable leaf spring	Leaf spring angle (°)	Vibration frequency (Hz)	Mass (kg)	Remarks
HF10	K-HF10 ^R 21	100	0.2	K-ECF25 K-ECL25	K-PLS2-35×12	12°	200 —300	4.5	w/ height adjustment mechanism
HF14	K-HF14 ^R 21		0.9		K-PLS2-50×20			10.9	
HF16	K-HF16 ^R 1		1.6		K-PLS2-67×23			19	

① The applicable controllers in the list above are typical ones. For other applicable controllers, refer to the standard series combination table on page 44.

Bowl feeder dimensions and specifications

This product doesn't correspond to the overseas standard of anything.

K10,14

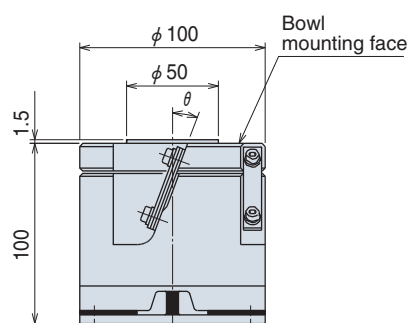
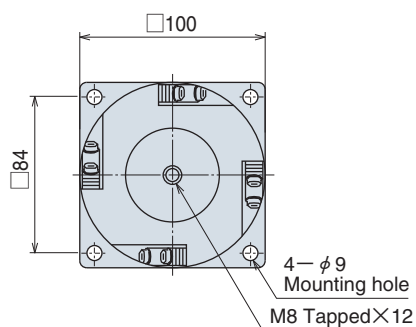
NTN parts feeder

K series

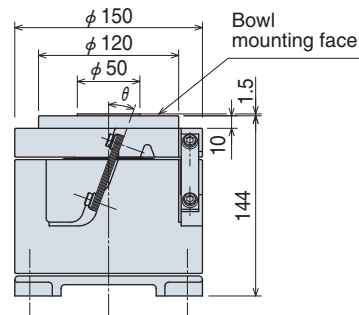
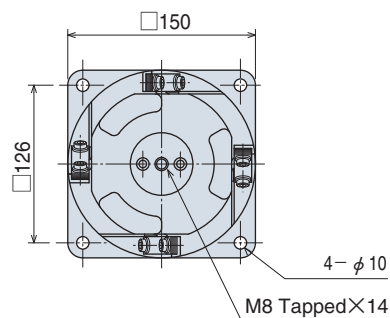
K- K 10 R 1

Voltage and drive system
 Design revision code
 Supply direction
 (R: clockwise, L: counterclockwise)
 Size
 Model

K-K10^{R1}_{L2}



K-K14^{R1}_{L2}



Model and size	Part number	Rated voltage (V)	Rated current (A)	Applicable controller ^①	Applicable leaf spring	Leaf spring angle (θ °)	Vibration frequency (Hz)	Mass (kg)	Remarks
K10	K-K10 ^{R1} _{L2}	100	0.3	K-ECF25 K-ECL25	K-PLS2-35×5	20°	90—130	3.6	—
	K-K10 ^{R2} _{L2}	200	0.15		K-PLS2-50×9			10.0	—
K14	K-K14 ^{R1} _{L2}	100	0.7						
	K-K14 ^{R2} _{L2}	200	0.35						

① The applicable controllers in the list above are typical ones. For other applicable controllers, refer to the standard series combination table in page 45.

K16,20

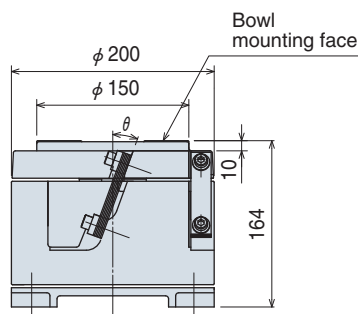
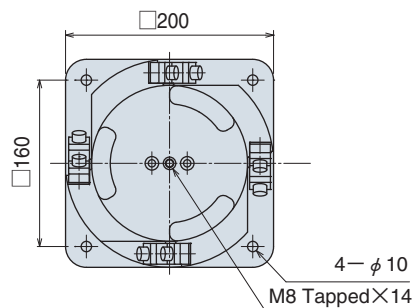
NTN parts feeder

K series

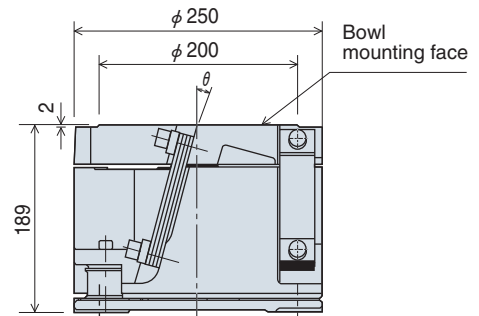
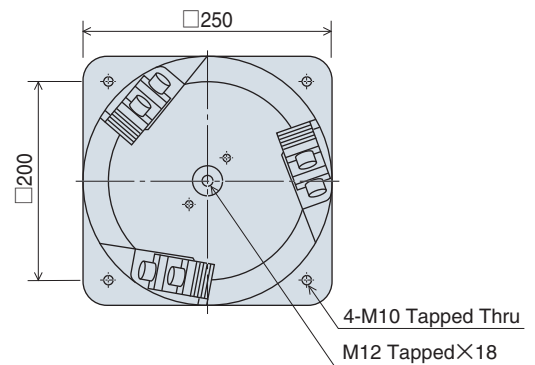
K- K 16 R 3 1

- Voltage and drive system
- Design revision code
- Supply direction
(R: clockwise, L: counterclockwise)
- Size
- Model

K-K16^R 4¹₂



K-K20^R 1¹₂, K-K20^R 1³₄



Model and size	Part number	Rated voltage (V)	Rated current (A)	Applicable controller ^①	Applicable leaf spring	Leaf spring angle (θ°)	Vibration frequency (Hz)	Mass (kg)	Remarks
K16	K-K16 ^R 41	100	1.8	K-ECF25 K-ECL25 K-ECH45	K-PLS2-67×12-1	20°	90—130	20	Full wave
	K-K16 ^R 42	200	0.3		K-PLS2-116×35-1	15°			
K20	K-K20 ^R 11	100	2.5		K-PLS2-116×20-2	25°	45—65	35	Half wave
	K-K20 ^R 12	200	1.5						
	K-K20 ^R 13	100	2.0						
	K-K20 ^R 14	200	1.0						

① The applicable controllers in the list above are typical ones. For other applicable controllers, refer to the standard series combination table in page 45.

Bowl feeder dimensions and specifications

This product doesn't correspond to the overseas standard of anything.

N25

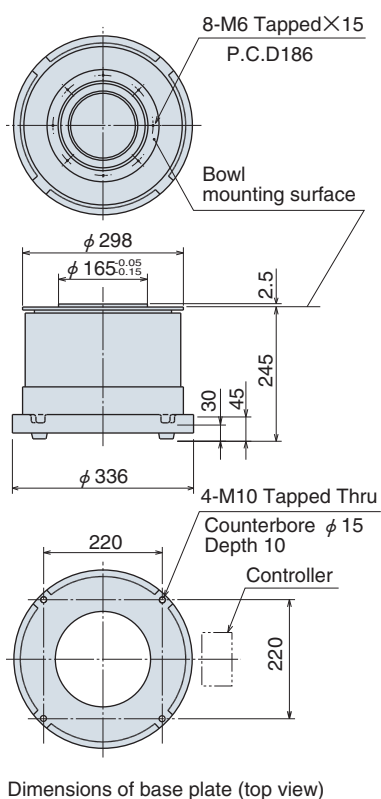
NTN parts feeder

N series

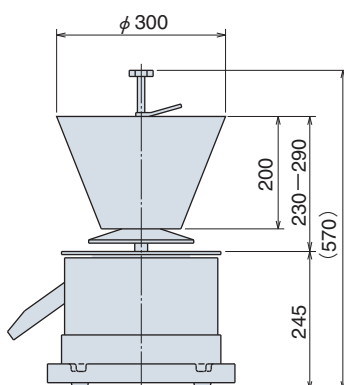
K-N25RAM2

— Voltage and drive system
— Bowl mounting type
— Design revision code
— Supplying direction (R: clockwise, L: counterclockwise)
— Size
— Model

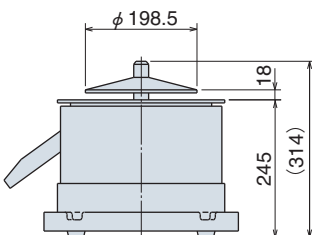
K-N25^RL^M₂



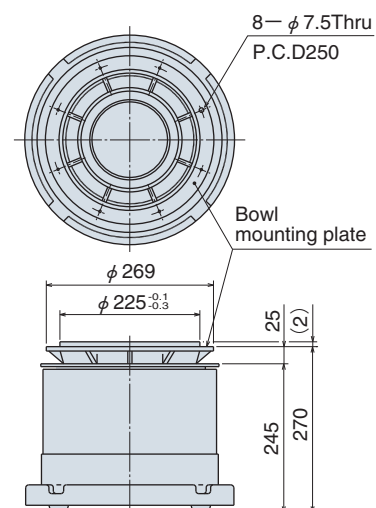
K-N25^RL^H₂



K-N25^RL^T₂



K-N25^RL^F₂



Model and size	Part number	Rated voltage (V)	Rated current (A)	Applicable controller ^①	Applicable leaf spring	Leaf spring angle (θ°)	Vibration frequency cycles/min	Mass (kg)	Remarks
N25	K-N25 ^R L ^M ₁	100	3.6	K-ECF25 K-ECL25 K-ECH45	K-PLS2-86×20	15°	90—130	48	Basic type
	K-N25 ^R L ^M ₂	200	1.8					52	w/ aux. hopper in the bowl
	K-N25 ^R L ^H ₁	100	3.6					49	w/ isolated bottom
	K-N25 ^R L ^H ₂	200	1.8					49	w/ bowl mounting flange
	K-N25 ^R L ^T ₁	100	3.6						
	K-N25 ^R L ^T ₂	200	1.8						
	K-N25 ^R L ^F ₁	100	3.6						
	K-N25 ^R L ^F ₂	200	1.8						

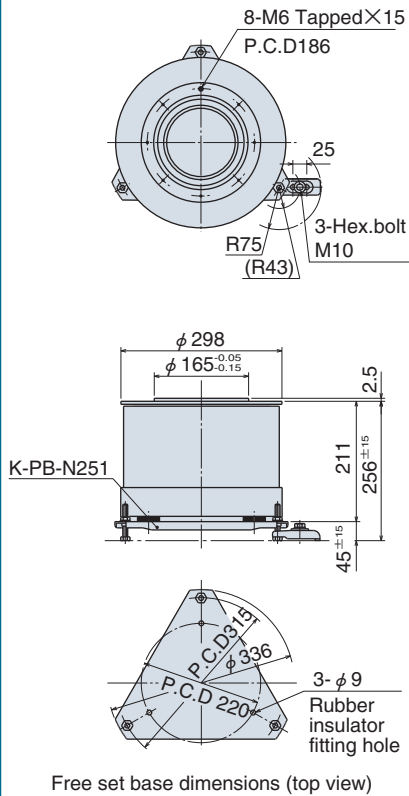
①The applicable controllers in the list above are typical ones. For other applicable controllers, refer to the standard series combination table in page 46.

Bowl feeder dimensions and specifications

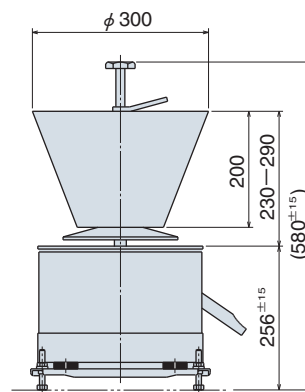
This product doesn't correspond to the overseas standard of anything.

N25·A

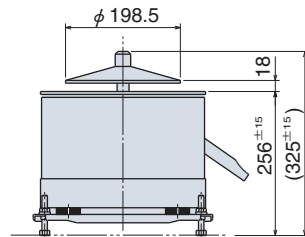
K-N25^RAM₂¹



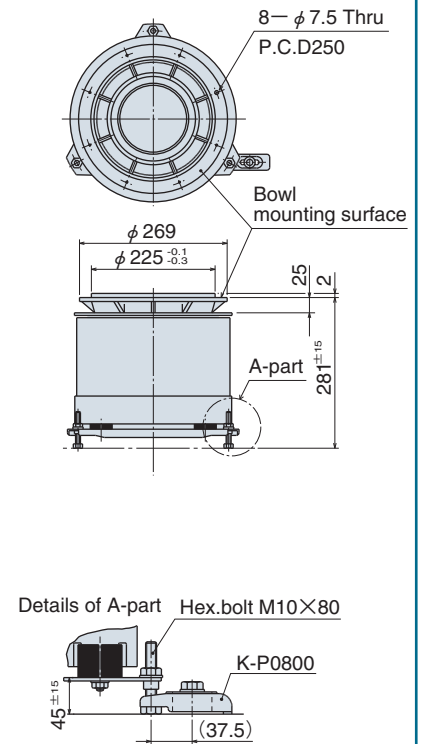
K-N25^RAH₂¹



K-N25^RAT₂¹



K-N25^RAF₂¹



Model and size	Part number	Rated voltage (V)	Rated current (A)	Applicable controller ^①	Applicable leaf spring	Leaf spring angle (θ°)	Vibration frequency cycles/min	Mass (kg)	Remarks
N25·A ^②	K-N25 ^R AM1	100	3.6	K-ECF25 K-ECL25 K-ECH45	K-PLS2-86 X 20	15°	90-130	44	basic type
	K-N25 ^R AM2	200	1.8					48	w/ aux. hopper in the bowl
	K-N25 ^R AH1	100	3.6					45	w/ isolated bottom
	K-N25 ^R AH2	200	1.8					45	w/ bowl mounting flange
	K-N25 ^R AT1	100	3.6						
	K-N25 ^R AT2	200	1.8						
	K-N25 ^R AF1	100	3.6						
	K-N25 ^R AF2	200	1.8						

① The applicable controllers in the list above are typical ones. For other applicable controllers, refer to the standard series combination table in page 46.
② 25.A will be supplied with three height adjusting bolts (M10 X 80) and three clamps (K-P0800).

Bowl feeder dimensions and specifications

This product doesn't correspond to the overseas standard of anything.

N32

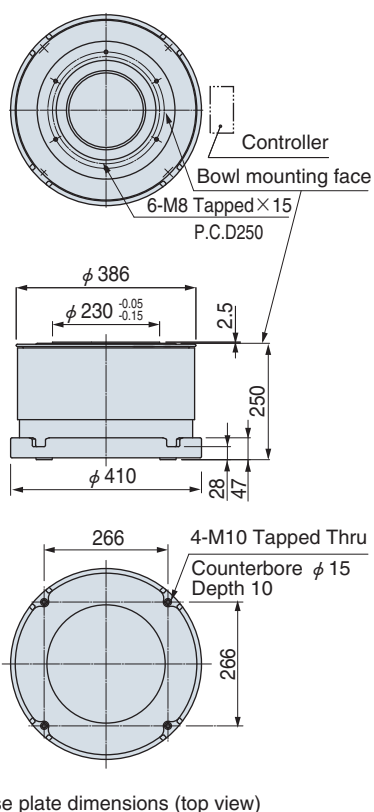
NTN parts feeder

N series

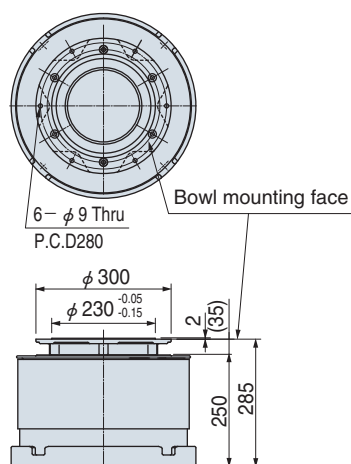
K-N 32 R 2 M 2

Voltage and drive system (2: Full wave, 4: Half wave)
 Bowl mounting type
 Design revision code
 Supplying direction (R: clockwise, L: counterclockwise)
 Size
 Model

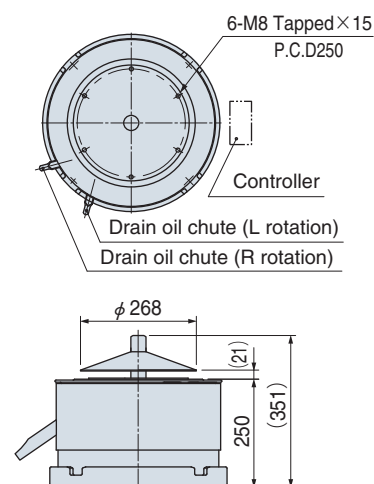
K-N32 ^R2M ²₄



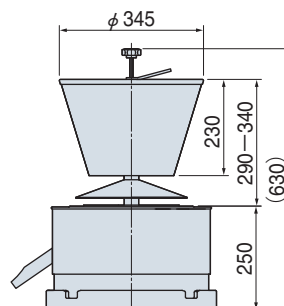
K-N32 ^R2F ²₄



K-N32 ^R2T ²₄



K-N32 ^R2H ²₄



Model and size	Part number	Rated voltage (V)	Rated current (A)	Applicable controller ^①	Applicable leaf spring	Leaf spring angle (°)	Vibration frequency (Hz)	Mass (kg)	Remarks
N32	K-N32 ^R 2M2	200	2.8	K-ECH45	K-PLS2-116×40	15°	90-130 or 45-65	68	basic type
	K-N32 ^R 2M4		3.5		K-PLS2-116×20			76	w/ aux. hopper in the bowl
	K-N32 ^R 2H2		2.8		K-PLS2-116×40				
	K-N32 ^R 2H4		3.5		K-PLS2-116×20			72	w/ isolated bottom
	K-N32 ^R 2T2		2.8		K-PLS2-116×40				
	K-N32 ^R 2T4		3.5		K-PLS2-116×20			69	w/ bowl mounting flange
	K-N32 ^R 2F2		2.8		K-PLS2-116×40				
	K-N32 ^R 2F4		3.5		K-PLS2-116×20				

① The applicable controllers in the list above are typical ones. For other applicable controllers, refer to the standard series combination table in page 47 to 48.

Bowl feeder dimensions and specifications

This product doesn't correspond to the overseas standard of anything.

N32 • A

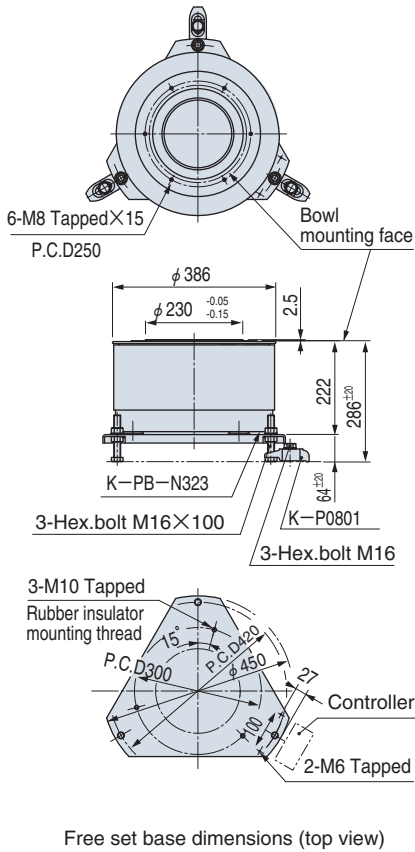
NTN parts feeder

N series

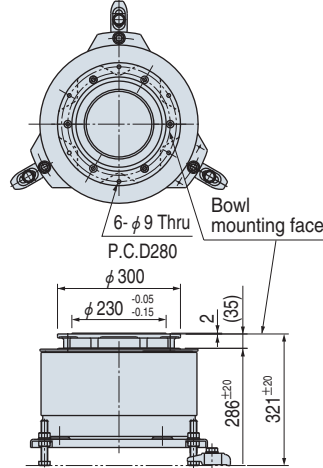
K- N 32 R A M 2

- Voltage and drive system (2: Full wave, 4: Half wave)
- Bowl mounting type
- Design revision code
- Supplying direction (R: clockwise, L: counterclockwise)
- Size
- Model

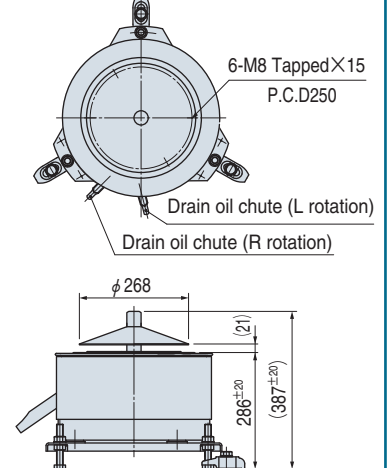
K-N32^RAM²₄



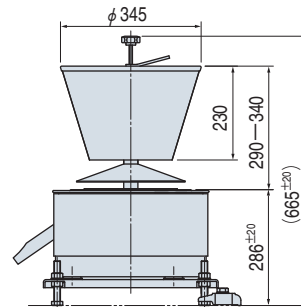
K-N32^RAF²₄



K-N32^RAT²₄



K-N32^RAH²₄



Model and size	Part number	Rated voltage (V)	Rated current (A)	Applicable controller ^①	Applicable leaf spring	Leaf spring angle (θ°)	Vibration frequency (Hz)	Mass (kg)	Remarks	
N32 · A ^②	K-N32 ^R AM2	200	2.8	K-ECH45	K-PLS2-116×40	15°	90—130 or 45—65	64	w/ free set base	basic type
	K-N32 ^R AM4		3.5		K-PLS2-116×20			72		w/ aux. hopper in the bowl
	K-N32 ^R AH2		2.8		K-PLS2-116×40			68		w/ isolated bottom
	K-N32 ^R AH4		3.5		K-PLS2-116×20					
	K-N32 ^R AT2		2.8		K-PLS2-116×40					
	K-N32 ^R AT4		3.5		K-PLS2-116×20			65		w/ bowl mounting flange
	K-N32 ^R AF2		2.8		K-PLS2-116×40					
	K-N32 ^R AF4		3.5		K-PLS2-116×20					

- ① The applicable controllers in the list above are typical ones. For other applicable controllers, refer to the standard series combination table in page 47 to 48.
 ② N32.A will be supplied with three height adjusting bolts (M16X100) and three clamps (K-P0801).

Specifications and dimensions of bowl feeder

This product doesn't correspond to the overseas standard of anything.

N40

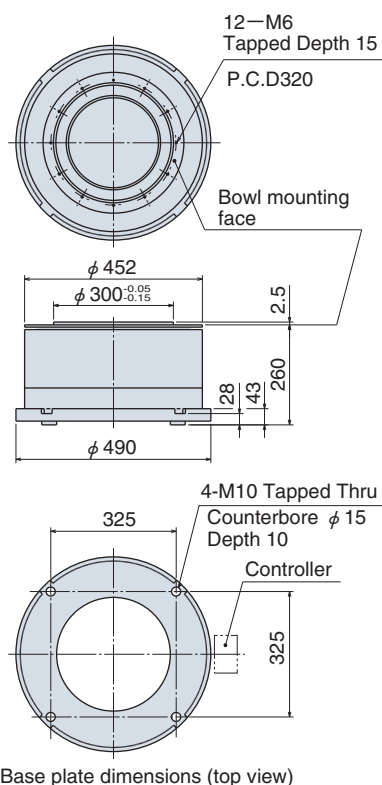
NTN parts feeder

N series

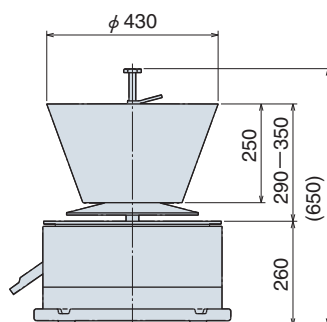
K-N40R1M2

Voltage and drive system (2: Full wave, 4: Half wave)
Bowl mounting type
Design revision code
Supplying direction (R: clockwise, L: counterclockwise)
Size
Model

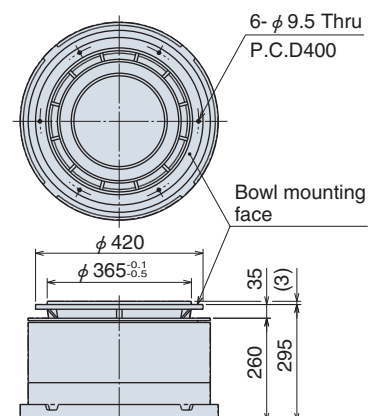
K-N40^R_LM²₄



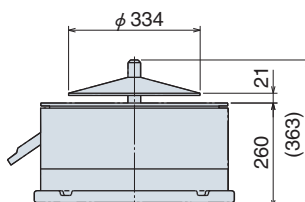
K-N40^R_LH²₄



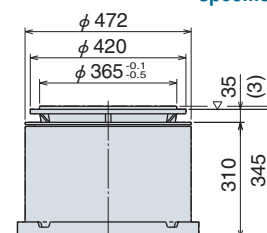
K-N40^R_LF²₄



K-N40^R_LT²₄



K-N40^R_L1F⁴ Wide amplitude specifications



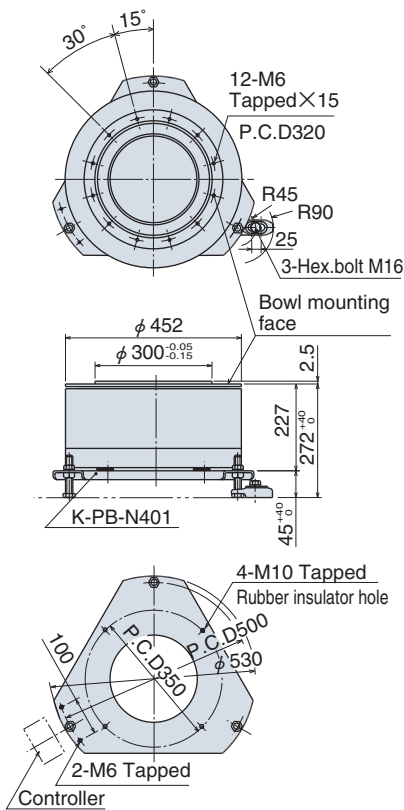
Model and size	Part number	Rated voltage (V)	Rated current (A)	Applicable controller ^①	Applicable leaf spring	Leaf spring angle (°)	Vibration frequency (Hz)	Mass (kg)	Remarks
N40	K-N40 ^R M2	200	2.8	K-ECH45	K-PLS2-86×20	15°	90—130 or 45—65	90	basic type
	K-N40 ^R M4		3.5		K-PLS2-116×20			98	w/ aux. hopper in the bowl
	K-N40 ^R H2		2.8		K-PLS2-86×20			94	w/ isolated bottom
	K-N40 ^R H4		3.5		K-PLS2-116×20			93	w/ bowl mounting flange
	K-N40 ^R T2		2.8		K-PLS2-86×20				
	K-N40 ^R T4		3.5		K-PLS2-116×20				
	K-N40 ^R F2		2.8		K-PLS2-86×20				
	K-N40 ^R F4		3.5		K-PLS2-116×20				
N40·1	K-N40 ^R 1M4	200	3.5	K-ECH45	K-PLS2-150×30	15°	45—65	110	basic type
	K-N40 ^R 1H4							118	w/ aux. hopper in the bowl
	K-N40 ^R 1T4							114	w/ isolated bottom
	K-N40 ^R 1F4							113	w/ bowl mounting flange

① The applicable controllers in the list above are typical ones. For other applicable controllers, refer to the standard series combination table in page 49 to 51.

K - N 40 R A M 2

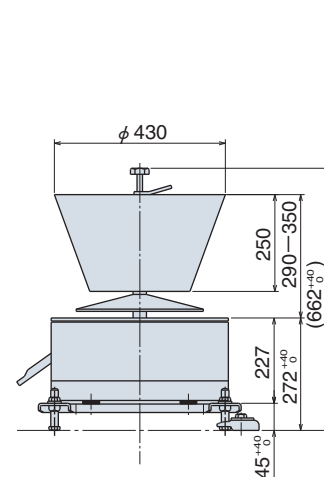
- Voltage and drive system (2: Full wave, 4: Half wave)
- Bowl mounting type
- Design revision code
- Supplying direction (R: clockwise, L: counterclockwise)
- Size
- Model

K-N40^RAM²₄

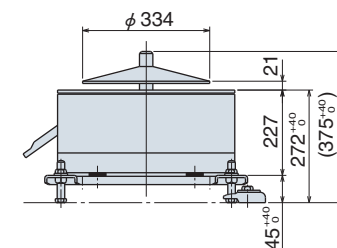


Free set base dimensions (top view)

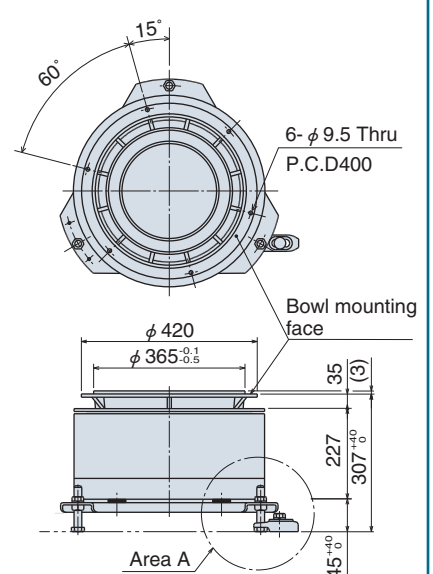
K-N40^RAH²₄



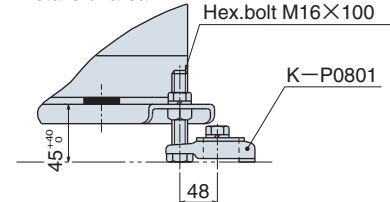
K-N40^RAT²₄



K-N40^RAF²₄



Details of area A



Model and size	Part number	Rated voltage (V)	Rated current (A)	Applicable controller ^①	Applicable leaf spring	Leaf spring angle (°)	Vibration frequency (Hz)	Mass (kg)	Remarks	
N40·A ^②	K-N40 ^R AM2	200	2.8	K-ECH45	K-PLS2-86×20	15°	90—130 or 45—65	90	w/ free set base	basic type
	K-N40 ^R AM4		3.5		K-PLS2-116×20			98		w/ aux. hopper in the bowl
	K-N40 ^R AH2		2.8		K-PLS2-86×20			94		w/ isolated bottom
	K-N40 ^R AH4		3.5		K-PLS2-116×20			92		w/ bowl mounting flange
	K-N40 ^R AT2		2.8		K-PLS2-86×20					
	K-N40 ^R AT4		3.5		K-PLS2-116×20					
	K-N40 ^R AF2		2.5		K-PLS2-86×20					
	K-N40 ^R AF4		3.5		K-PLS2-116×20					

① The applicable controllers in the list above are typical ones. For other applicable controllers, refer to the standard series combination table in page 49 to 50.

② 40.A will be supplied with three height adjusting bolts (M16×100) and three clamps (K-P0801).

Specifications and dimensions of bowl feeder

This product doesn't correspond to the overseas standard of anything.

G50

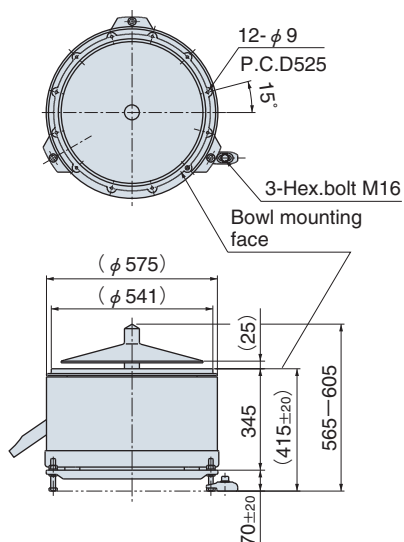
NTN parts feeder

G series

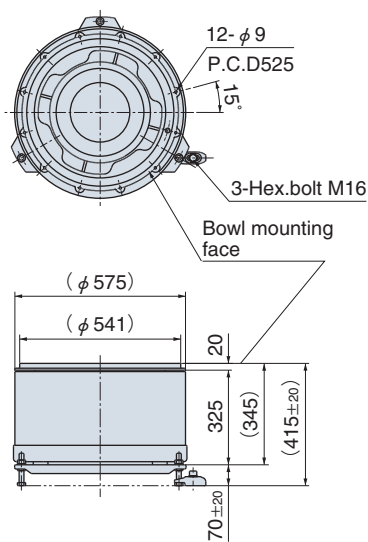
K-G50^R1T4

Voltage and drive system
Bowl mounting type
Design revision code
Supplying direction (R: clockwise, L: counterclockwise)
Size
Model

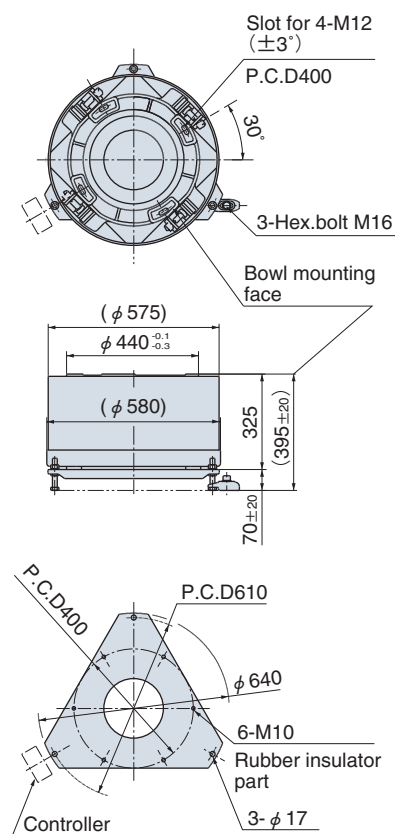
K-G50^R1T4



K-G50^R1G4



K-G50^R1M4



Free set base dimensions (top view)

Model and size	Part number	Rated voltage (V)	Rated current (A)	Applicable controller ^①	Applicable leaf spring	Leaf spring angle (°)	Vibration frequency (Hz)	Mass (kg)	Remarks
G50 ^②	K-G50 ^R 1T4	200	4	K-ECH45	K-PLS2-180×40	20°	45-65	220	w/ isolated bottom and drain oil chute
	K-G50 ^R 1G4							190	w/ mounting adapter
	K-G50 ^R 1M4							185	basic type (w/o isolated bottom and adapter)

① The applicable controllers in the list above are typical ones. For other applicable controllers, refer to the standard series combination table in page 52.

② G50 will be supplied with three height adjusting bolts (M16×100) and three clamps (K-P0801).

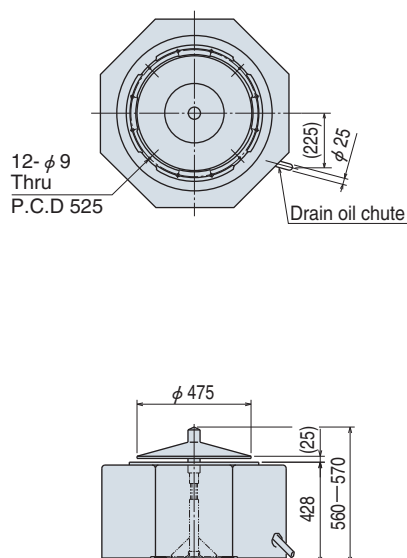
NTN parts feeder

G series

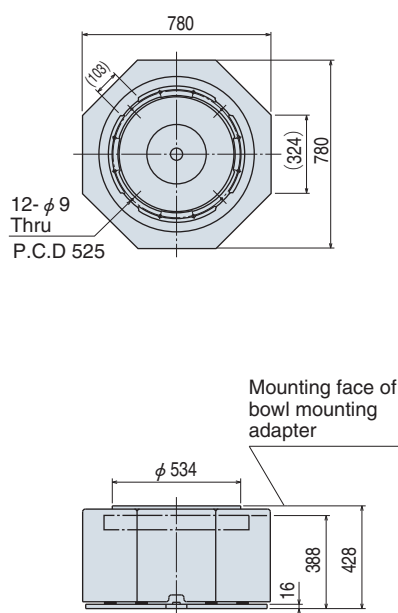
K-G63R2T4

- Voltage and drive system
- Bowl mounting type
- Design revision code
- Supplying direction (R: clockwise, L: counterclockwise)
- Size
- Model

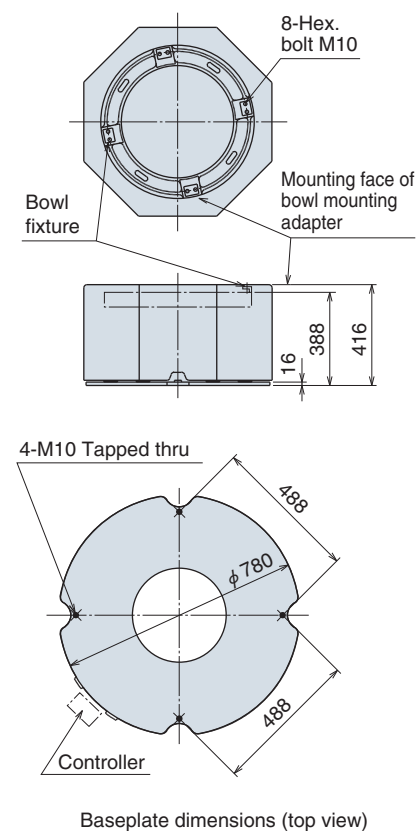
K-G63^R2T4



K-G63^R2G4



K-G63^R2M4



Model and size	Part number	Rated voltage (V)	Rated current (A)	Applicable controller	Applicable leaf spring	Leaf spring angle (°)	Vibration frequency (Hz)	Mass (kg)	Remarks
G63·2	K-G63 ^R 2T4	200	10	K-ECK96	K-PLS2-250×70	20°	45—65	400	w/ isolated bottom and drain oil chute
	K-G63 ^R 2G4							370	w/ mounting adapter
	K-G63 ^R 2M4							360	basic type (w/o isolated bottom and adapter)

Bowl dimensions and specifications

This product doesn't correspond to the overseas standard of anything.

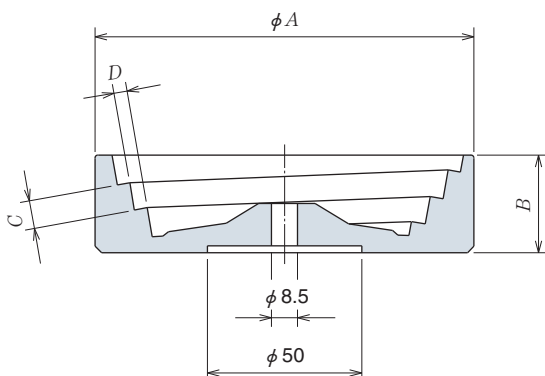
NTN parts feeder

Cascade bowl (1)

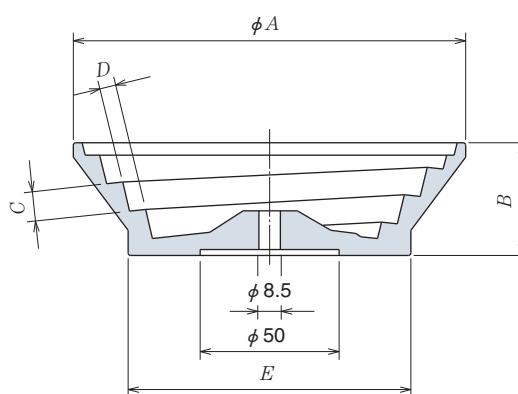
K- B 10 R C 14 01

Bowl suffix
Bowl outer dia.
Bowl type (C: cascade, D: dish, Z: straight wall, K: cone)
Supply direction (R: clockwise, L: counterclockwise)
Size
Bowl type code

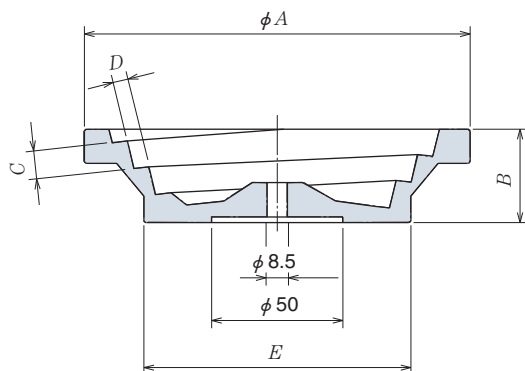
K-B10^{RC}C1201



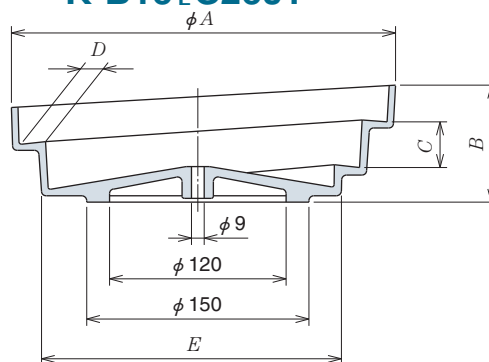
K-B10^{RC}C1401



K-B10^{RC}C1403,1501,1502,1701
K-B14^{RC}C1801,2001



K-B16RC2101
K-B16^{RC}C2301
K-B16^{RC}C2601



Specifications Part number	Dimensions (mm)					Turns	Material	Mass (kg)	Standard capacity (ℓ)	Applicable unit, remarks	
	A	B	C	D	E						
K-B10 ^{RC} C1201 ①	120	30	8.8	4.0	120	3.0	Al alloy	0.47	0.07	K10	
K-B10 ^{RC} C1401 ①②	140	40	11.0	6.0	100	3.0	Al alloy	0.38	0.10		
K-B10 ^{RC} C1403 ①②	145	35	11.0	6.0	100	3.0	Al alloy	0.48	0.10		
K-B10 ^{RC} C1501 ①	150	34	9.3	4.3	116	3.0	Al alloy	0.55	0.09		
K-B10 ^{RC} C1502 ①②	150	34	9.2	3.2	116	3.0	Al alloy	0.52	0.09		2-tracks
K-B10 ^{RC} C1701 ①②	175	40	13.6	7.8	138	2.3	Al alloy	1.00	0.12		
K-B14 ^{RC} C1801 ①	188	32	12.0	6.0	120	1.5	Al alloy	1.20	0.15	HF14	For high-frequency
K-B14 ^{RC} C2001 ①	200	65	18.0	10.0	120	3.0	Al alloy	1.80	0.22	K14	
K-B16RC2101 ②	225	56	18.0	4.3	170	2.0	Al casting	1.10	0.22	K16	2-tracks
K-B16 ^{RC} C2301	230	80	20.0	11.0	162	3.0	Al casting	0.90	0.30		
K-B16 ^{RC} C2601	260	77	30.0	19.0	202	1.5	Al casting	1.70	0.40		

① The Al alloy bowl is precision machined.

② Part Nos. C1401, C1403, C1502, C1701 and C2101 are manufactured on special order.

This product doesn't correspond to the overseas standard of anything.

NTN parts feeder

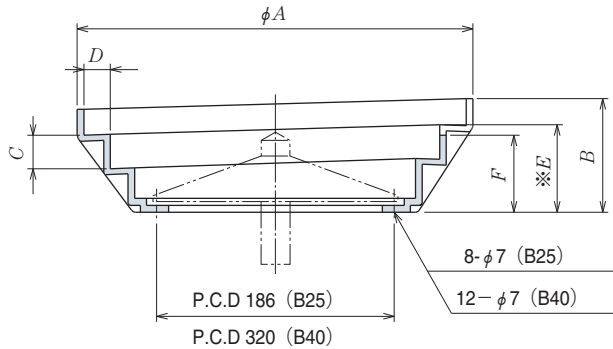
Cascade bowl (2)

K-B 25 R C D 39 1

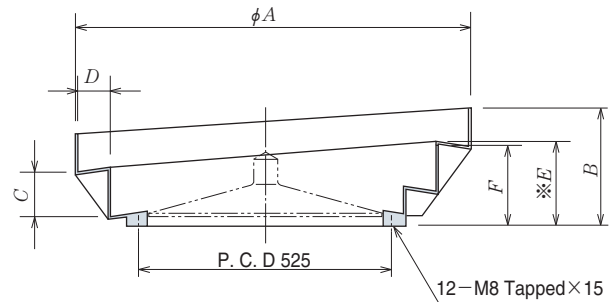
Design revision code
Bowl outer dia. (rounded off to cm)
Bowl bottom type (D: no-bottom (isolated bottom type), F: integrated bottom, B: w/ fixed bottom)
Bowl type (C: cascade, D: dish, Z: straight wall, K: cone)
Supply direction (R: clockwise, L: counterclockwise)
Size
Bowl unit code

K-B25^RCD...

K-B40^RCD...

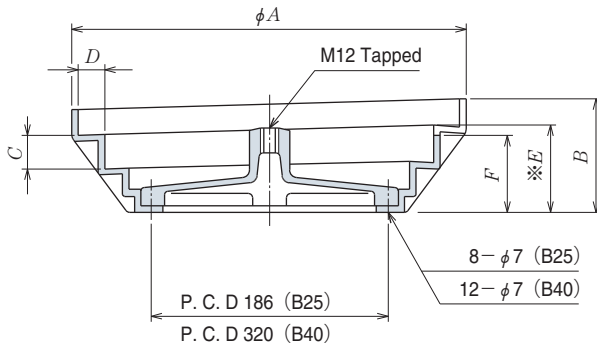


K-B63^RCD83

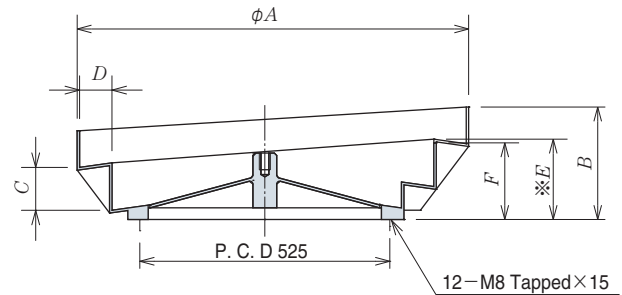


K-B25^RCB...

K-B40^RCB...



K-B63^RCB83



※Height of outlet

Specifications Part number	Dimensions (mm)						Turns	Material	Mass (kg)	Approx. capacity up to the first step (ℓ)	Applicable unit, remarks	
	A	B	C	D	E	F						
K-B25 ^R C ^B 33	330	105	32	20	82	73	2.0	Al casting	1.6	1.5	N25	Steep steps
K-B25 ^R C ^B 39	396	129	40	32	98	89	2.0	Al casting	2.5	2.5		
K-B25 ^R C ^B 391	396	151	40	67 ^①	32	121	92	2.0	Al casting	2.5		
K-B40 ^R C ^B 54	540	162	50	32	120	111	2.0	Al casting	4.5	5	N40	Steep steps
K-B40 ^R C ^B 64	640	203	64	50	148	139	2.0	Al casting	10.0	9		
K-B40 ^R C ^B 641	640	241	64	112 ^①	50	186	141	2.0	Al casting	10.0		
K-B63 ^R C ^B 83 ^②	830	230	90	68	160	140	1.5	Al casting	22.0	20		G50, G63

① The lead of the last turn of the track.

② The part number above is without the urethane.

③ Part No. C 83 is manufactured on special order.

Bowl specifications and dimensions

This product doesn't correspond to the overseas standard of anything.

NTN parts feeder

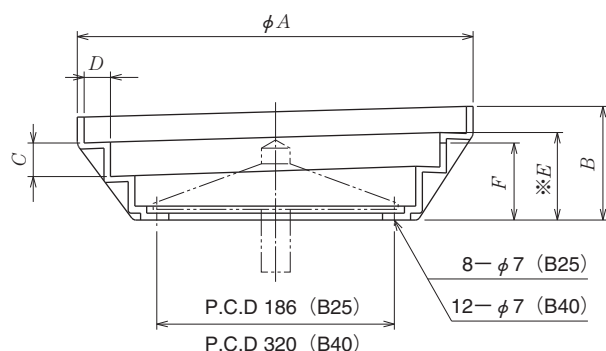
Cascade bowl (3)

K- B 25 R S D 39 1

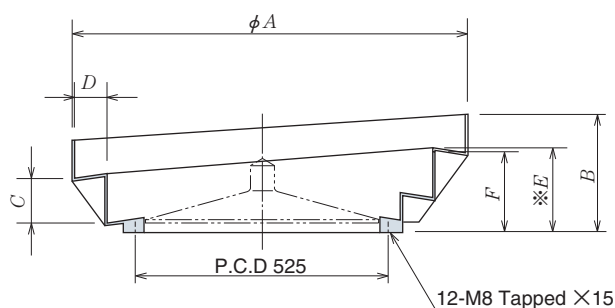
Design revision code
Bowl outer dia. (to nearest cm)
Bowl bottom type (D: no-bottom (isolated bottom), F: integrated bottom, B: w/ fixed bottom)
Bowl type (C: cascade, D: dish, Z: straight wall, K: cone, S: stainless steel cascade)
Supply direction (R: clockwise, L: counterclockwise)
Size
Bowl Code

K-B25^RSD...

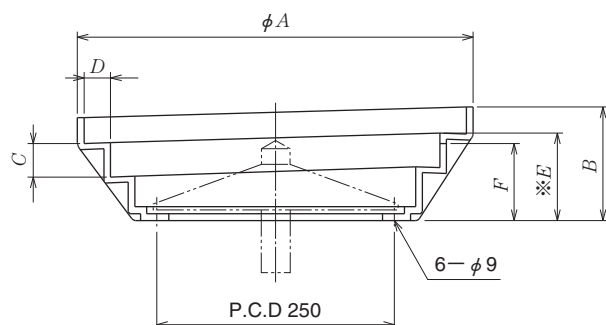
K-B40^RSD...



K-B63^RSD83



K-B32^RSD491



※Height of outlet

Specifications Part number	Dimensions (mm)						Turns	Material	Mass (kg)	Approx. capacity up to the first step (ℓ)	Applicable unit, remarks		
	A	B	C	D	E	F							
K-B25 ^R SD39	390	137	40	32	99	—	2.0	SUS	4.3	2.5	N25	Steep steps	
K-B25 ^R SD391	390	157	40	67 ^①	32	119	97	2.0	SUS	4.4			2.5
K-B32 ^R SD491	496	182	55	36	136	127	2.0	SUS	10.2	3.2	N32		
K-B40 ^R SD54	538	168	50	32	121	—	2.0	SUS	10.0	5	N40	Steep steps	
K-B40 ^R SD58	582	217	60	87 ^①	40	161	137	2.0	SUS	12.0			7
K-B40 ^R SD64	636	210	64	50	149	—	2.0	SUS	14.0	9			
K-B40 ^R SD641 ^②	636	246	64	112 ^①	50	185	146	2.0	SUS	15.2			9
K-B63 ^R SD83 ^②	828	227	90	68	160	—	1.5	SUS	30.1	20	G63		

① The lead of the last turn of the track.

② Part Nos. SD641 and SD83 are manufactured on special order.

This product doesn't correspond to the overseas standard of anything.

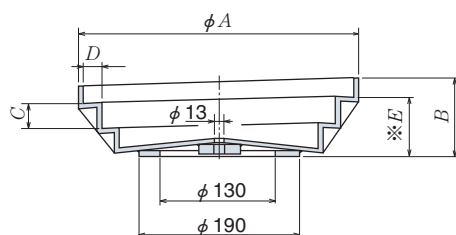
NTN parts feeder

Cascade bowl (4)

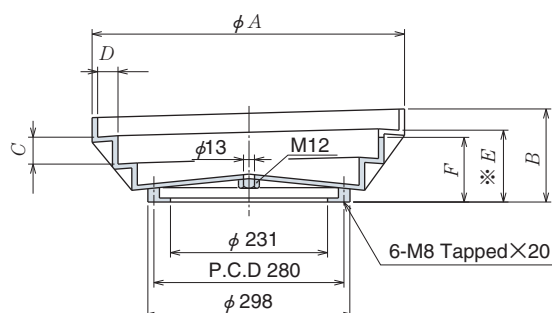
K- B 25 R S F 39 1

Design revision code
Bowl outer dia. (to nearest cm)
Bowl bottom type (D: no-bottom (isolated bottom type), F: integrated bottom, B: w/ fixed bottom)
Bowl type (C: cascade, D: dish, Z: straight wall, K: cone, S: stainless steel cascade)
Supply direction (R: clockwise, L: counterclockwise)
Size
Bowl code

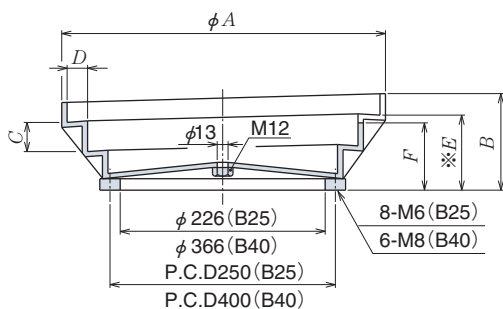
K-B20^RS3201



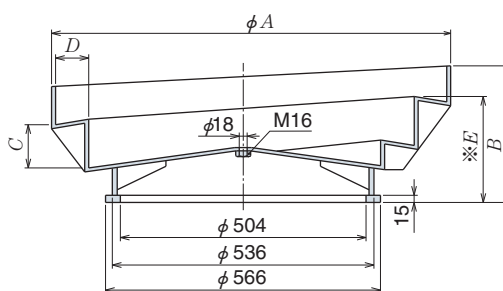
K-B32^RSF491



K-B25^RSF...
K-B40^RSF...



K-B63^RSF83



※Height of outlet

Specifications Part number	Dimensions (mm)						Turns	Material	Mass (kg)	Approx. capacity up to the first step (ℓ)	Applicable unit, remarks		
	A	B	C	D	E	F							
K-B20 ^R S3201	320	108	34	25	73	—	2.0	SUS	3.1	1.3	K20		
K-B25 ^R SF39	390	131	40	32	93	—	2.0	SUS	4.7	2.5	N25	Steep steps	
K-B25 ^R SF391	390	151	40	67 ^①	32	113	91	2.0	SUS	4.8			2.5
K-B32 ^R SF491	496	150	47	36	106	—	2.0	SUS	12.0	3.2	N32		
K-B40 ^R SF54	538	165	50	32	118	—	2.0	SUS	12.5	5	N40	Steep steps	
K-B40 ^R SF58	582	212	60	87 ^①	40	156	132	2.0	SUS	14.5			7
K-B40 ^R SF64	636	207	64	50	146	—	2.0	SUS	16.0	9			
K-B40 ^R SF641	636	243	64	112 ^①	50	182	135	2.0	SUS	17.0		9	Steep steps
K-B63 ^R SF83	828	277	90	68	210	—	1.5	SUS	42.1	20	G63		

① The lead of the last turn of the track.

② Part Nos. SF641 and SF83 are manufactured on special order.

Bowl specifications and dimensions

This product doesn't correspond to the overseas standard of anything.

NTN parts feeder

Straight wall bowl (1)

K- B 25 R Z F 30 1

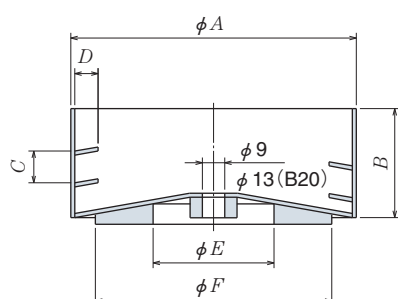
Design revision code
Bowl outer dia. (to nearest cm)
Bowl bottom (D: no-bottom (isolated bottom type),
F: integrated bottom, B: w/ fixed bottom)
Bowl type (C: cascade, D: dish, Z: straight wall, K: cone)
Supply direction (R: clockwise, L: counter-clockwise)
Size
Bowl size code

K-B10^RZ1201

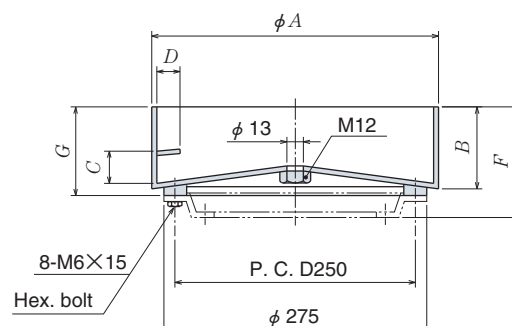
K-B14^RZ2001

K-B16^RZ...

K-B20^RZ...

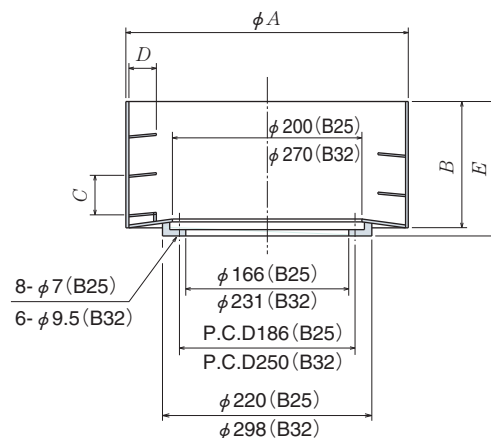
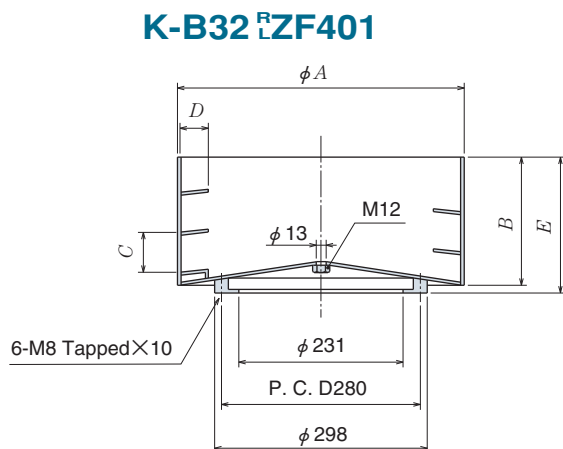


K-B25^RZF...



K-B25^RZD...

K-B32^RZD401



Specifications Part number	Dimensions (mm)							Turns	Material	Mass (kg)	Standard capacity (ℓ)	Applicable unit, remarks	
	A	B	C	D	E	F	G						
K-B10 ^R Z1201	120	45	13	10	50	100	—	2.0	SUS	(0.7)	0.07	K10	
K-B14 ^R Z2001	200	55	23	20	80	130	—	1.5	SUS	1.6	0.35	K14	
K-B16 ^R Z2301	234	65	28	20	80	150	—	1.5	SUS	2.2	0.45	K16	
K-B16 ^R Z2302 ^①	234	55	20	15	80	150	—	2.0		2.0	0.40		
K-B16 ^R Z2501	250	65	30	20	80	150	—	1.5	SUS	2.3	0.60	K20	
K-B20 ^R Z2801	280	75	33	25	130	190	—	1.5		3.1	1.20		
K-B20 ^R Z3003	300	85	36	25	130	200	—	1.5	SUS	3.9	1.70	K25	
K-B25 ^R Z ^P 30 ^①	304	85	36	25	95	116	91	1.5		4.8	1.80		
K-B25 ^R Z ^P 301 ^①	304	85	30	20	95	116	91	2.0	SUS	4.9	1.60	N25	Low lead, 2-tracks
K-B25 ^R Z ^P 302 ^①	304	110	36	25	120	141	116	2.0		5.4	1.80		Standard lead, 2-tracks
K-B25 ^R Z ^P 35	354	100	42	30	106	128	103	1.5		6.0	2.80		
K-B25 ^R Z ^P 351 ^①	354	100	35	30	106	128	103	2.0		6.1	2.20		Low lead, 2-tracks
K-B25 ^R Z ^P 352	354	125	42	30	131	153	128	2.0		6.7	2.80		Standard lead, 2-tracks
K-B25 ^R ZD354 ^①	354	135	42	30	141	—	—	2.5		6.2	2.80		Standard lead, 2.5-tracks
K-B32 ^R ZD401	400	140	48	40	148	—	—	2.0	SUS	10.0	4.00	N32	
K-B32 ^R ZF401					143								

① Part Nos. Z2302, Z^P30, Z^P301, Z^P302, Z^P351 and ZD354 are manufactured on special order.

This product doesn't correspond to the overseas standard of anything.

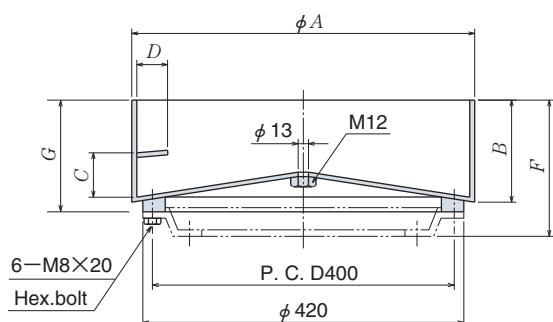
NTN parts feeder

Straight wall bowl (2)

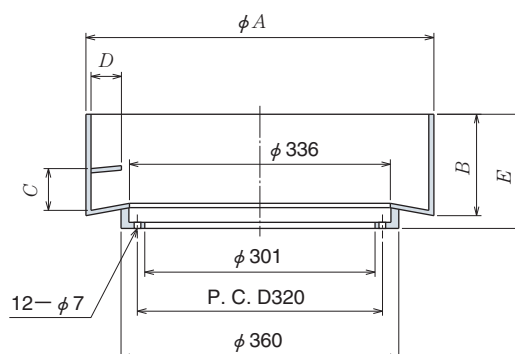
K-B 40 R Z F 45 2

Design revision code
Bowl outer dia. (to nearest cm)
Bowl bottom (D: no-bottom (isolated bottom type),
F: integrated bottom, B: w/fixed bottom)
Bowl type (C: cascade, D: dish, Z: straight wall, K: cone)
Supply direction (R: clockwise, L: counterclockwise)
Size
Bowl code

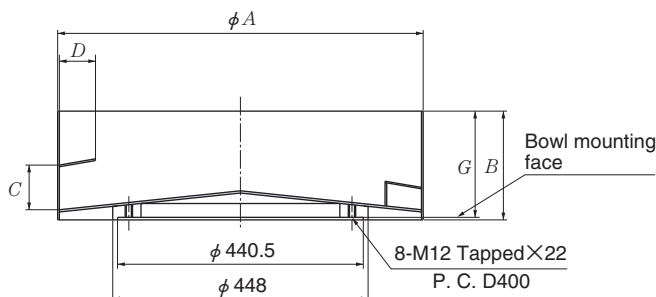
K-B40^RZF...



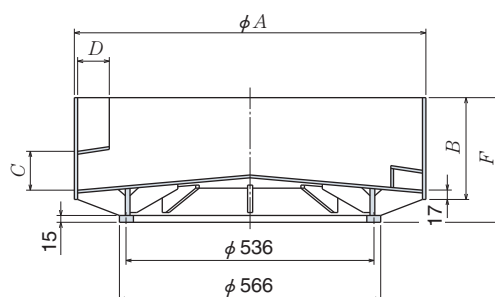
K-B40^RZD...



K-B50^RZF651



K-B63^RZF75



Specifications Part number	Dimensions (mm)							Turns	Material	Mass (kg)	Standard capacity (ℓ)	Applicable unit, remarks	
	A	B	C	D	E	F	G						
K-B40 ^R Z ^P 45	454	130	56	40	139	175	140	1.5	SUS	12.0	5.0	N40	Low lead, 2-tracks Standard lead, 2-tracks
K-B40 ^R ZF451 ^①	454	130	46	40	—	175	140	2.0	SUS	12.2	4.0		
K-B40 ^R ZF452 ^①	454	160	56	40	—	205	170	2.0	SUS	13.0	5.0		
K-B40 ^R Z ^P 50	504	140	62	45	145	182	147	1.5	SUS	13.0	7.0		
K-B40 ^R ZF501 ^①	504	140	52	45	—	182	147	2.0	SUS	13.2	6.0		
K-B40 ^R ZF502 ^①	504	175	62	45	—	217	182	2.0	SUS	14.0	7.0		
K-B40 ^R ZD503 ^①	504	195	62	45	200	—	—	2.5	SUS	13.0	7.0		
K-B40 ^R ZF55	554	150	68	50	—	188	153	1.5	SUS	14.0	10.0		
K-B40 ^R ZF60 ^①	604	170	74	55	—	204	169	1.5	SUS	16.0	13.0		
K-B50 ^R ZF651 ^①	655	193	80	65	—	—	190	1.5	SUS	30.0	17.0	G50	
K-B63 ^R ZF75 ^①	755	220	85	70	—	270	—	1.5	SUS	48.0	25.0	G63	

① Part Nos. ZF451, ZF452, ZF501, ZF502, ZD503, ZF60, ZF651 and ZF75 are manufactured on special order.

Bowl specifications and dimensions

This product doesn't correspond to the overseas standard of anything.

NTN parts feeder

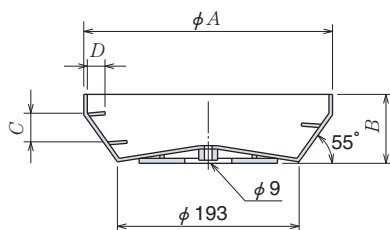
Cone bowl

Manufactured only on special order.

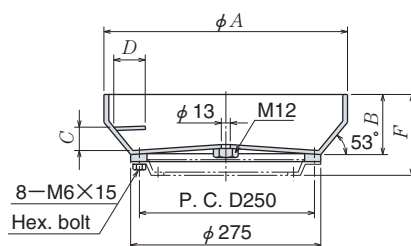
K- B 25 R K D 35

Bowl outer dia. (to nearest cm)
Bowl bottom (D: no-bottom (isolated bottom type),
F: integrated bottom, B: w/ fixed bottom)
Bowl type (C: cascade, D: dish,
Z: straight wall, K: cone)
Supply direction (R: clockwise, L: counterclockwise)
Size
Bowl code

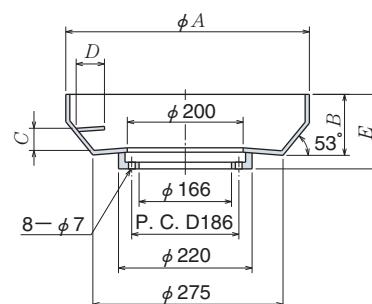
K-B16^①K2601



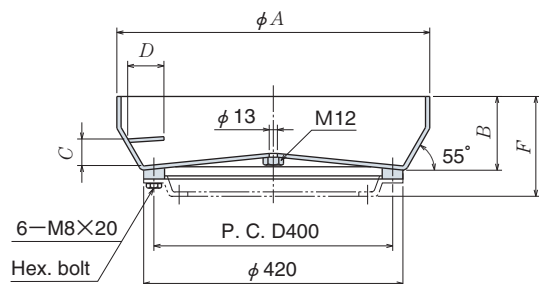
K-B25^①KF35



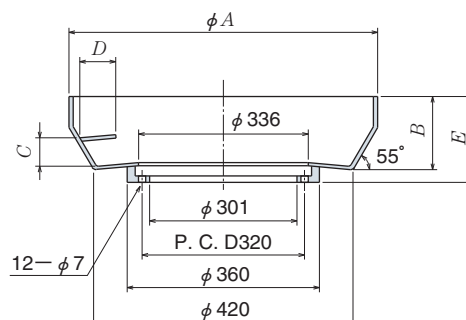
K-B25^①KD35



K-B40^①KF55



K-B40^①KD55



Specifications Part number	Dimensions (mm)						Turns	Material	Mass (kg)	Standard capacity (ℓ)	Applicable unit, remarks
	A	B	C	D	E	F					
K-B16 ^① K2601	260	75	30	20	—	—	1.5	SUS	2.0	0.6	K16
K-B25 ^① KF35	355	90	40	30	—	123	1.5	SUS	4.5	1.5	N25・F
K-B25 ^① KD35	355	90	40	30	102	—	1.5	SUS	2.5	1.5	N25
K-B40 ^① KF55	555	135	50	35	—	182	1.5	SUS	10.0	5.0	N40・F
K-B40 ^① KD55	555	135	50	35	146	—	1.5	SUS	7.0	5.0	N40

① Manufactured only on special order.

This product doesn't correspond to the overseas standard of anything.

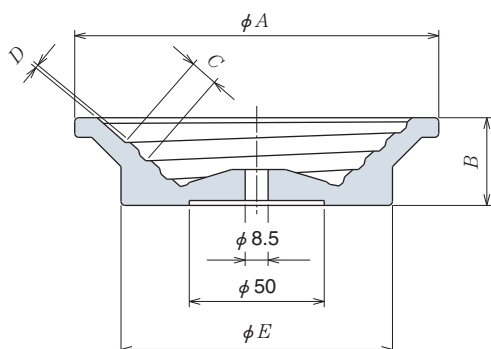
NTN parts feeder

Dish bowl

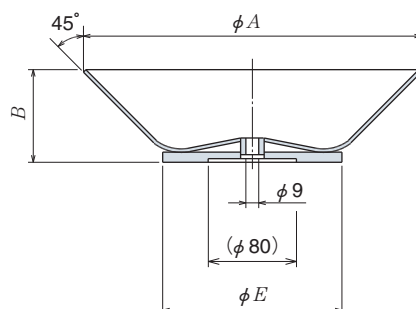
K- B 40 □ D F 64 1

Design revision code
Bowl outer dia. (to nearest cm)
Bowl bottom (D: no-bottom (isolated bottom type),
F: integrated bottom, B: w/ fixed bottom)
Bowl type (C: cascade, D: dish, Z: straight wall, K: cone)
Supply direction (R: clockwise, L: counterclockwise)
Size
Bowl code

K-B10 □D1301,1402,1701

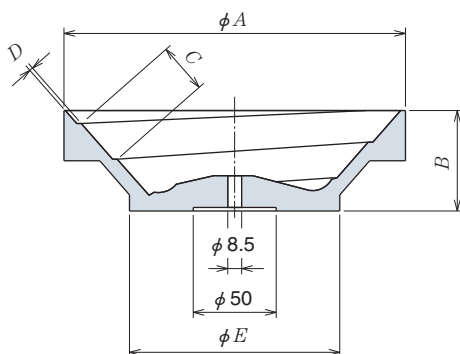


K-B16D2801



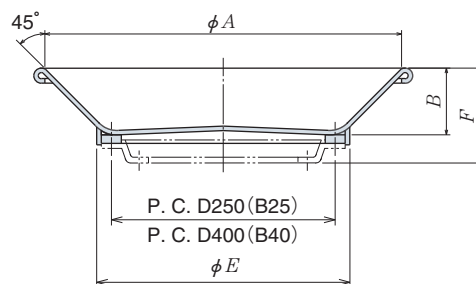
K-B10 □D2001

K-B14 □D2002



K-B25DF42

K-B40DF64,641



Specifications Part number	Dimensions (mm)						Turns	Material	Mass (kg)	Standard capacity (ℓ)	Applicable unit, remarks
	A	B	C	D	E	F					
K-B10 □D1301 ①	134	32	10	1.0	100	—	3.0	Al alloy	0.44	0.06	K10
K-B10 □D1402 ①②	148	38	12	1.0	110	—	2.7	Al alloy	0.49	0.08	
K-B10 □D1701 ①②	178	60	14	3.7	100	—	5.0	Al alloy	0.84	0.20	
K-B10 □D2001 ①②	204	60	30	1.5	124	—	2.1	Al alloy	1.3	0.20	
K-B14 □D2002 ①	204	60	31	1.5	127	—	2.0	Al alloy	1.5	0.20	K14
K-B16D2801	280	71	—	—	150	—	—	SUS	1.7	0.35	K16
K-B25DF42 ②	420	80	—	—	281	113	—	SUS	4.0	1.20	N25・F
K-B40DF64 ②	640	97	—	—	446	142	—	SUS	13.0	3.50	N40・F
K-B40DF641 ②	640	150	—	—	466	195	—	SUS	18.0	5.00	

① Aluminum alloy bowl is precision machined.

Since the standard stainless steel dish bowl does not have any tracks, the R/L code is not required.

② Part Nos. D1402, D1701, D2001, D2901, DF42, DF64 and DF641 are manufactured on special order.

Dimensions and specifications of linear feeders

This product doesn't correspond to the overseas standard of anything.

S05,08,10

NTN parts feeder

S series

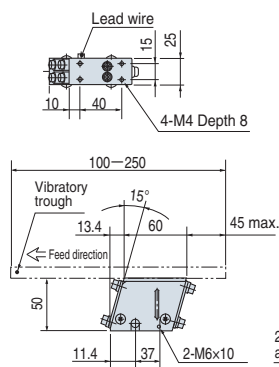
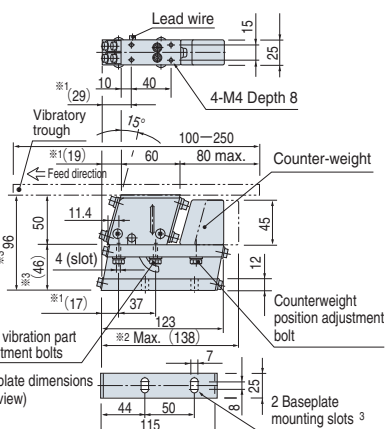
K- S 10 B 1

- Voltage and drive system

- Design revision code

– Size

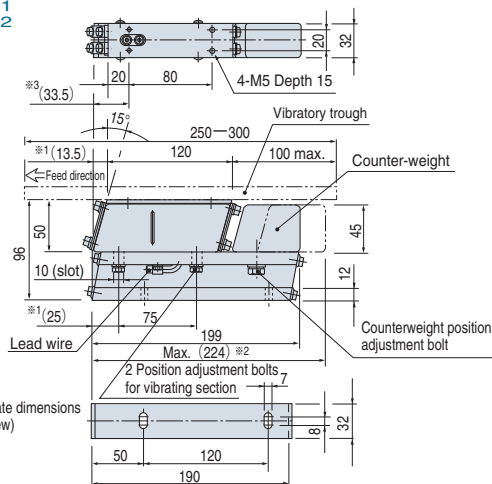
- Model

K-S05A ¹/₂K-S051¹₂

※1: This dimension can be adjusted 2 mm along the feed direction by loosening and retightening the two position adjustment bolts securing the vibrating section.

※2: This dimension can be adjusted with the counterweight position adjustment bolt.

※3: The height of the new design is 4 mm less than that of the conventional optional adjusted mount (K-UH001). Regarding the two baseplate mounting slots, the position of the downstream slot relative to the chute mounting screws (4-M4) remains unchanged while the position of the upstream side slot in the new design differs from that of the conventional mount (K-UH001).

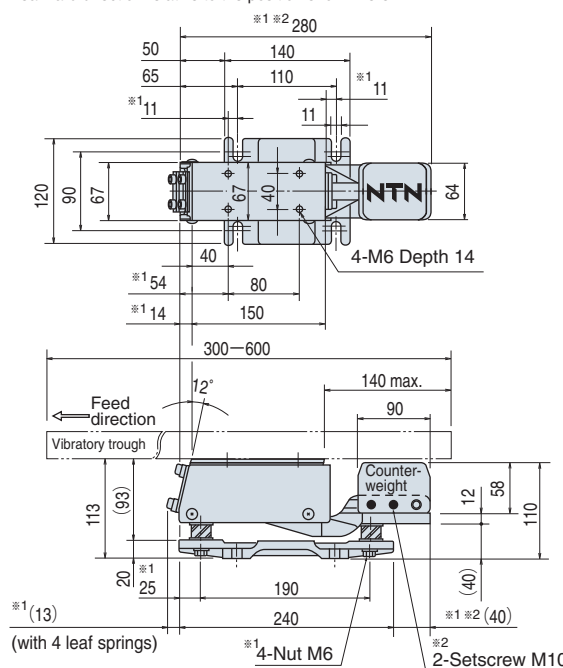
K-S082 ¹/₂

※1: This dimension can be adjusted 2 mm along the feed direction by loosening and retightening the two position adjustment bolts securing the vibrating section.
 ※2: This dimension can be adjusted with the counterweight position adjustment bolt.

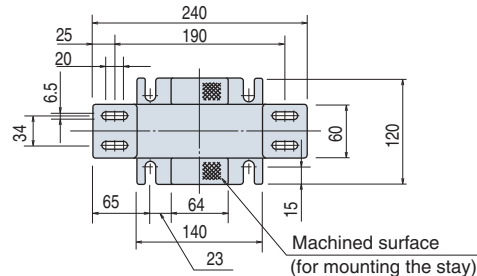
K-S10B¹₂, S10C¹₂

※1 Loosening the four M6 nuts allows dimension ※1 to be adjusted up to 10 mm in the feed direction.

※2 Loosening the two M10 setscrews allows the counterweight to be adjusted. It can be moved up to 20 mm in the forward direction and up to 30 mm in the rearward direction relative to the position shown here.



Baseplate dimensions (top view)



※Use of vibratory trough mount (K-T101) is recommended.

Model, size	Part number	Rated voltage (V)	Rated current (A)	Applicable controller ^①	Applicable leaf spring	Leaf spring angle (°)	Vibration frequency (Hz)	Vibratory trough		Mass (kg)	Remarks		
								Length (mm)	Mass (kg)				
S05	K-S0511	100	0.10	K-ECF25 K-ECR25	K-PLS2-35×5	15°	90—130	250	0.4	1.3	Insulated type		
	K-S0512	200	0.05							0.4	Fixed type		
	K-S05A1	100	0.10										
	K-S05A2	200	0.05										
S08	K-S0821	100	0.20		K-PLS4-40×6	12°		600	300	1.2	2.4	Insulated type	
	K-S0822	200	0.10										
S10	K-S10B1	100	0.40		K-PLS4-40×6				12°	600	2.5:50Hz 2.0:60Hz	7	w/ baseplate
	K-S10B2	200	0.20										5.5
	K-S10C1	100	0.40										
	K-S10C2	200	0.20										

① The applicable controllers in the list above are typical ones. For other applicable controllers, refer to the standard series combination list.

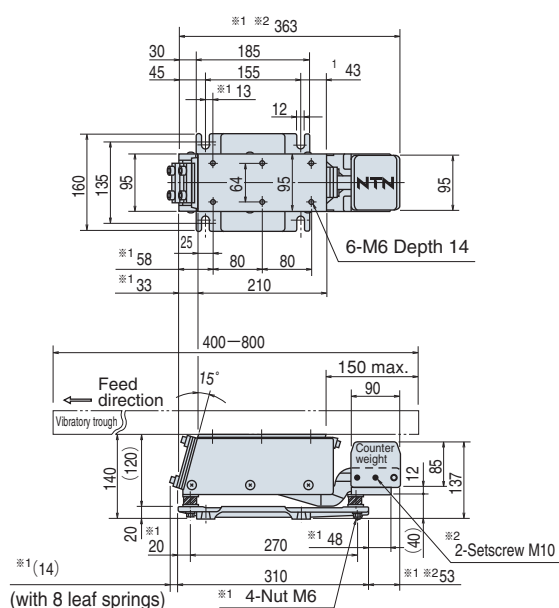
NTN parts feeder

S series

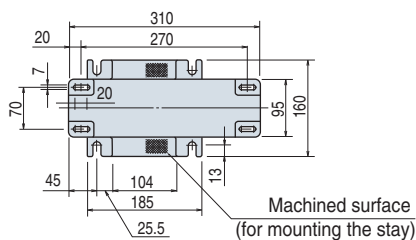
K-S 20 C 2

— Voltage and drive system
— Design revision code
— Size
— Model

K-S20B $\frac{1}{2}$, S20C $\frac{1}{2}$



Base plate dimensions (top view)

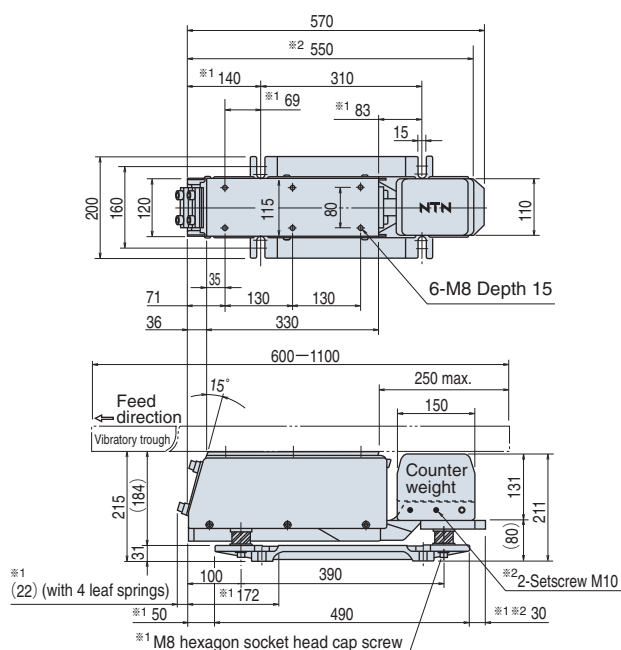


※1 Loosening the four M6 nuts allows dimension ※1 to be adjusted up to 10 mm in the feed direction.

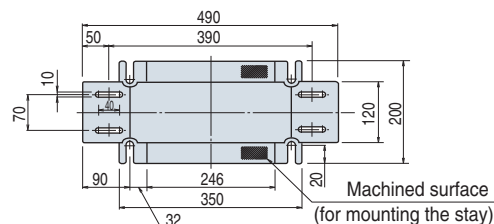
※2 Loosening the two M10 setscrews allows the counterweight to be adjusted. It can be moved up to 10 mm in the forward direction and up to 30 mm in the rearward direction relative to the position shown here.

※Use of a vibratory trough mount (K-T201...for S20, K-T301...for S30) is recommended.

K-S30B4, S30C4



Base plate dimensions (top view)



※1 Loosening the four M8 hex. bolts allows dimension ※1 to be adjusted up to 20 mm in the feed direction.

※2 Loosening the two M10 setscrews allows the counterweight to be adjusted. It can be moved up to 10 mm in the forward direction and up to 65 mm in the rearward direction relative to the position shown here.

Model, size	Part number	Rated voltage (V)	Rated current (A)	Applicable controller ^①	Applicable leaf spring	Leaf spring angle (°)	Vibration frequency (Hz)	Vibratory trough		Mass (kg)	Remarks
								Length (mm)	Mass (kg)		
S20	K-S20B1	100	1.0	K-ECF25 K-ECR25	K-PLS4-70×12	15°	90—130	800	5.0:(50Hz) 3.5:(60Hz)	14	w/ baseplate
	K-S20B2	200	0.5							11.5	w/o baseplate
	K-S20C1	100	1.0								
	K-S20C2	200	0.5								
S30	K-S30B4	200	0.9		K-PLS4-86×15		45—65	1100	15:(60Hz)	41	w/ baseplate
	K-S30C4									33	w/o baseplate

① The applicable controllers in the list above are typical ones. For other applicable controllers, refer to the standard series combination list.

This product doesn't correspond to the overseas standard of anything.

HS05,07,L20

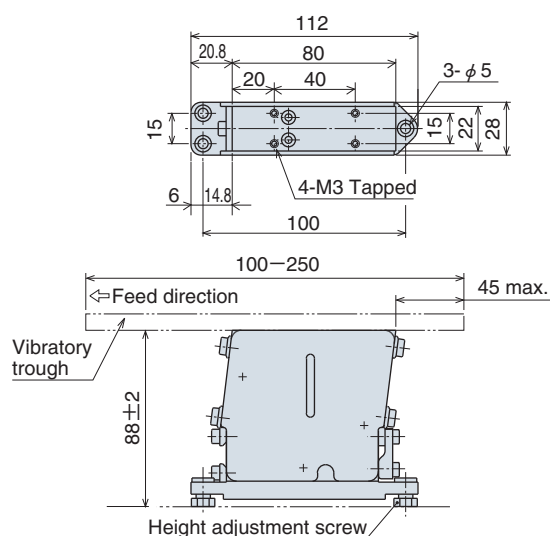
NTN parts feeder

HS series L type

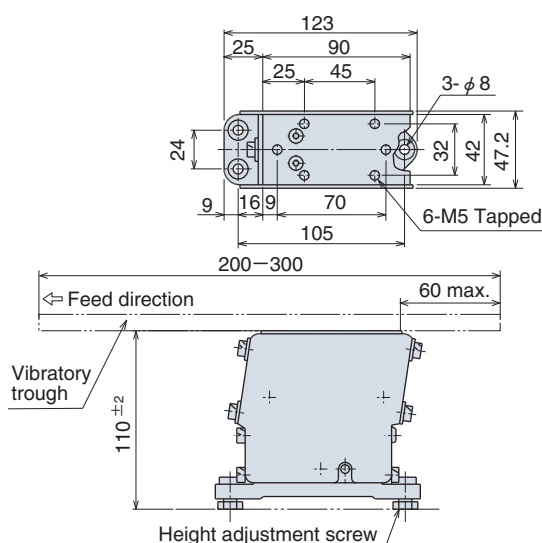
K- HS 05 2 1

— Voltage and drive system
— Design revision code
— Size
— Model

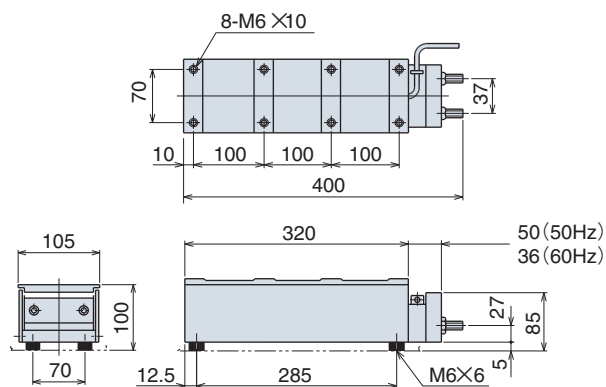
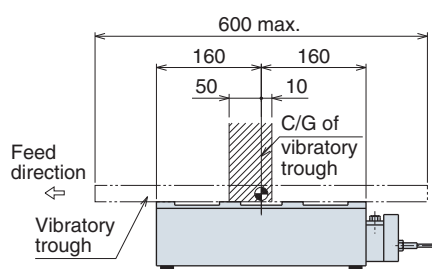
K-HS0521 (high-frequency)



K-HS0711 (high-frequency)



K-L201



Model, size	Part number	Rated voltage (V)	Rated current (A)	Applicable controller ^①	Applicable leaf spring	Leaf spring angle (°)	Vibration frequency (Hz)	Vibratory trough Length (mm) Mass (kg)	Mass (kg)	Remarks
HS05	K-HS0521	100	0.16	K-ECF25 K-ECR25	K-PLS2-35×9	—	200 —300	250 0.3	1.1	w/ isolation mount using leaf springs
HS07	K-HS0711	100	0.5		K-PLS4-40×6	10°		300 0.6	2.5	
L20	K-L201	100	1.0		K-PLS2-67×15	0°	90 —130	5.0: (50Hz) 4.0: (60Hz)	8.0	Rubber insulator
	K-L202	200	0.5							

① The applicable controllers in the list above are typical examples. For other applicable controllers, refer to the standard series combination table.

This product doesn't correspond to the overseas standard of anything.

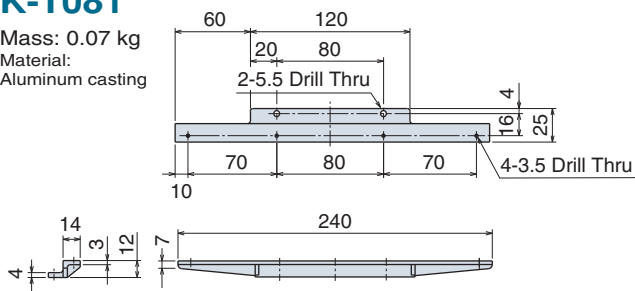
Vibratory trough mount

K- T 10 1

- Vibratory trough type
- Size
- Vibratory trough code

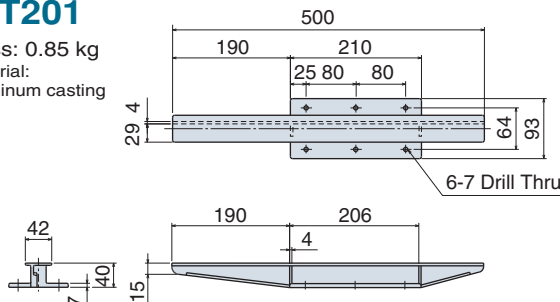
K-T081

Mass: 0.07 kg
Material:
Aluminum casting



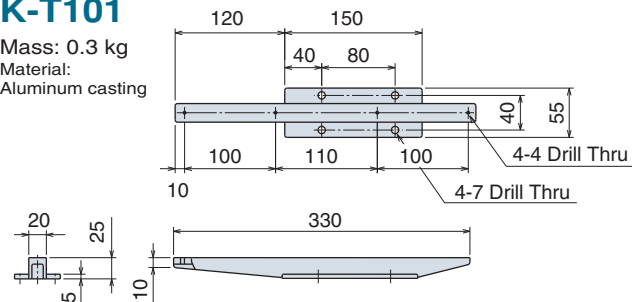
K-T201

Mass: 0.85 kg
Material:
Aluminum casting



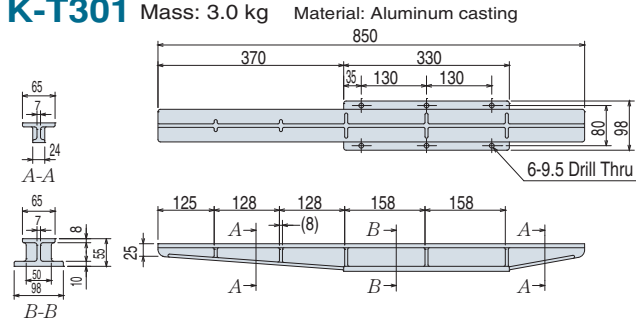
K-T101

Mass: 0.3 kg
Material:
Aluminum casting



K-T301

Mass: 3.0 kg Material: Aluminum casting

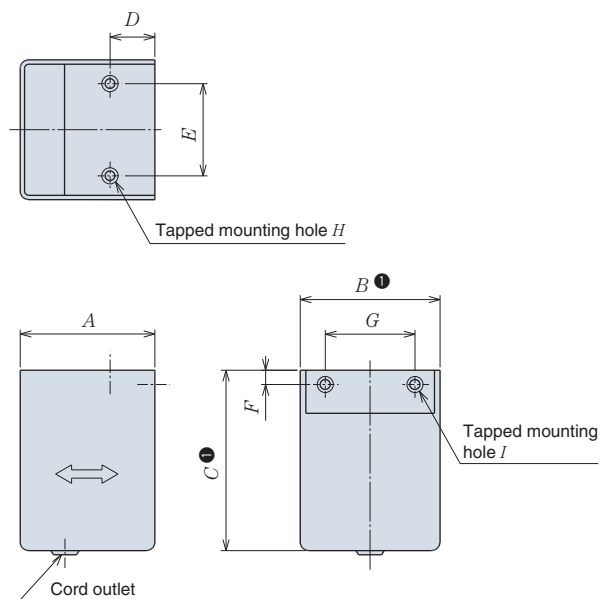


Auxiliary vibrator

K- M 05 1

- Voltage/drive system
- Size
- Type code

An auxiliary vibrator, to be installed on the back of the vibratory trough, generates minute vibrations to help those pieces that are prone to jam on the vibratory trough to feed smoothly. The auxiliary vibrator is also handy for various other vibration applications.



Part number	Specifications									Approx. mass of vibratory trough (kg)	Applicable controller	Rated voltage (V)	Rated current (A)
	Dimensions (mm)												
	A	B ①	C ①	D	E	F	G	H	I				
K-M05¹₂	72	68	93	27	22	—	—	2-M6×10	—	1.2	K-EGA57	200	0.2 (0.4)
K-M10¹₂	90	92	120	30	60	9	60	2-M8×15	2-M8×15	3.7		(100)	0.5 (1.0)

① Does not include dimensions of cover mounting screws.

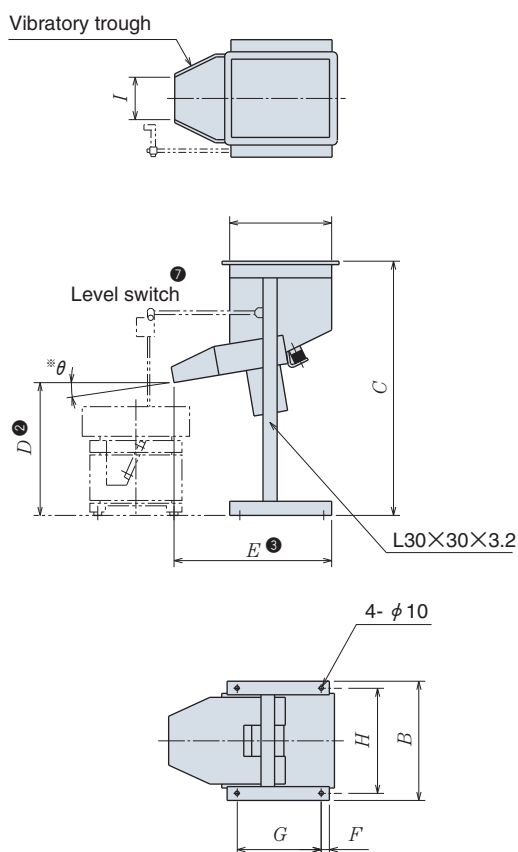
NTN parts feeder

Detached hopper

K-V 01 S 4

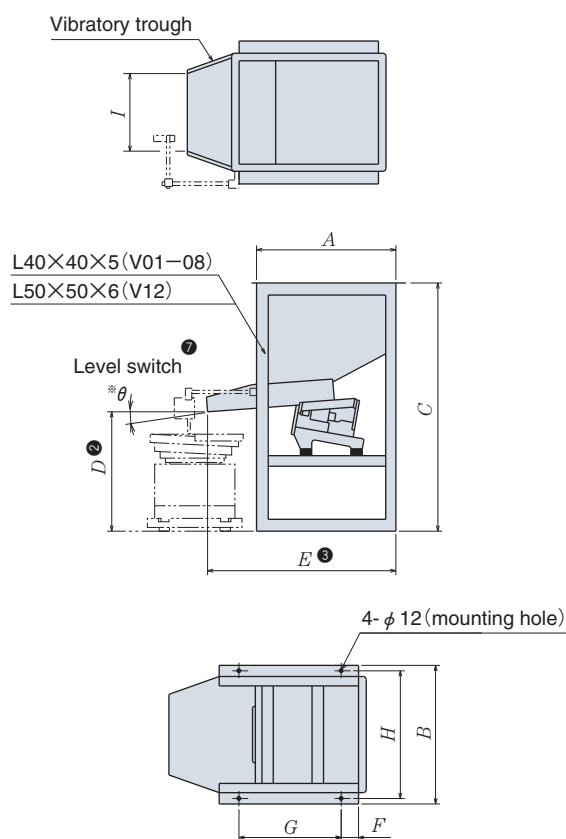
Voltage and drive system ①
Tank material (S: stainless steel)
Storage capacity
Type code

K-V7S2³₄



※The tilt angle of the vibratory trough is adjustable within the range 0° to 10°.

K-V01S³₄-V12S4



※The tilt angle of the vibratory trough is adjustable within the range 0° to 10° (V03, 04, 06, 08) or 5° to 15° (V01, 12).

Specifications	Dimensions (mm)									Tank capacity (ℓ)	Max.work input mass (kg)	Approx. mass (kg)	Rated voltage (V)	Rated current (A)	Tank material	Vibratory trough material
Part number	A	B	C	D ②	E ③	F	G	H	I							
K-V7S2 ³ ₄	220	260	514	286	333	20	180	240	100	7	20	12	200 (100)	0.2(0.4)	SUS④	Al ④ casting (as cast)
K-V01S ³ ₄	350	385	735	435	542	40	270	350	185	15	50	55				
K-V03S ³ ₄	400	435	735	418	570	50	300	400	225	30	100	65				
K-V03S1 ³ ₄	400	435	735	417	670	50	300	400	225	30	100	70				
K-V04S ³ ₄ ⑤	400	435	860	418	570	50	300	400	225	45	100	68				
K-V04S1 ³ ₄ ⑤	400	435	860	417	670	50	300	400	225	45	100	73				
K-V06S ³ ₄	500	505	1 017	574	721	50	400	470	270	60	120	80				
K-V06S1 ³ ₄	500	505	1 017	574	771	50	400	470	270	60	120	85				
K-V08S ³ ₄ ⑤	500	505	1 127	574	721	50	400	470	270	80	120	84				
K-V08S1 ³ ₄ ⑤	500	505	1 127	574	771	50	400	470	270	80	120	90				
K-V12S4 ⑤	640	635	1 186	596	852	70	500	590	380	120	120	200	200	2.0		

① The code "4" of the voltage/drive system in the part number means 200 V, full wave, and "3" means 100 V, half wave. The 100 V variants of V03 through V08 are available by special order.

② The dimension D is corresponds to the vibratory trough set to horizontal position.

③ The dimension E will vary according to the adjusted angle of the vibratory trough. The quoted dimension is the minimum value.

④ Polyurethane-coated tanks and vibratory troughs are available upon request.

⑤ Part Nos. V04, V08 and V12 are manufactured on special order.

⑥ Applicable controllers: K-EGA57, variable voltage variable frequency small controller (installed separately)

⑦ Level switch sold separately.

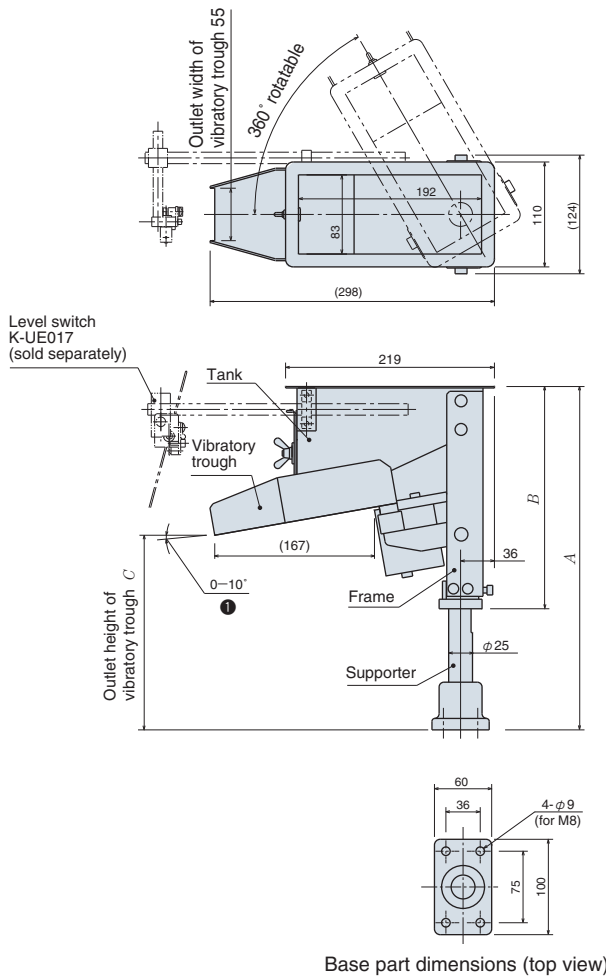
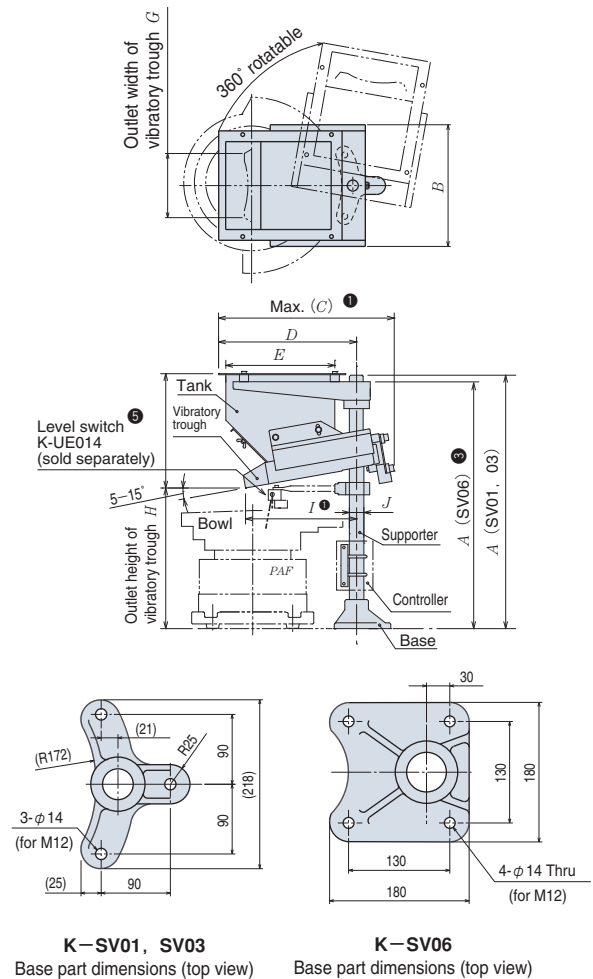
NTN parts feeder

Space-saving hopper

K-SV 01 S 4

Voltage/drive system ※1
Tank material (S: stainless steel)
Storage capacity
Type code

K-SV1S4, SV3S4


K-SV01S³₄—SV06S4


Part number	Dimensions (mm)			Tank capacity (ℓ)	Max. work input mass (kg)	Mass (kg)	Rated voltage (V)	Rated current (mA)	Tank material	Vibratory trough material	Applicable controller (variable frequency)
	A	B	C ①								
K-SV1S4	310—400	233	155—245	1.5	6	5.6	200	80	SUS ^②	SUS ^②	K-ECF25 K-ECL25
K-SV3S4	400—490	323		3	8	6.5					

Part number	Dimensions (mm)										Tank capacity (ℓ)	Max. work input mass (kg)	Mass (kg)	Rated voltage (V)	Rated current (A)	Tank material	Vibratory trough material
	A	B	C ①	D	E	F ①	G	H ①	I ①	J							
K-SV01S3	760	340	500	380	300	315	180	335	305	φ 40	15	40	34	100	1.7	SUS ^②	SUS ^②
K-SV01S4														200	0.9		
K-SV03S3	810	390	600	480	400	365	218	465	315	φ 40	30	80	40	100	1.7		
K-SV03S4														200	0.9		
K-SV06S4	905—975	510	720	585	480	430	270	520—590	445	φ 50	60	160	68	200	1.5		

- ① The dimensions in the diagram correspond to a vibratory trough tilt angle of 10°.
 ② Polyurethane-coated tanks and vibratory troughs are available upon request.
 ③ The stay of Model SV06 does not protrude from the top of the frame.
 ④ Applicable controllers: K-ECF25, K-ECR25 (cannot be installed to the support section)
 ⑤ Level switch sold separately.

Isolated bottom / Auxiliary hopper in the bowl / Fixed bottom

This product doesn't correspond to the overseas standard of anything.

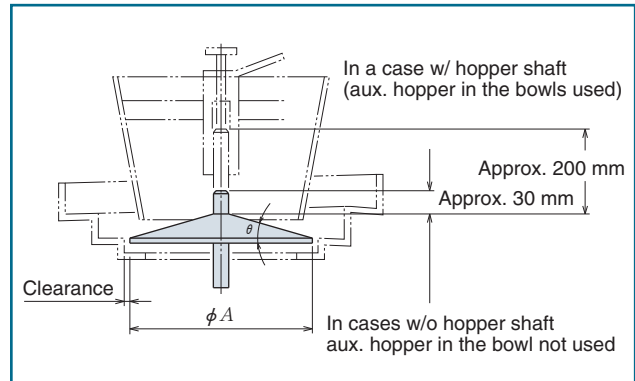
Isolated bottom

K-PS-25 L

Length of shaft ①
Size
Isolated bottom code

An isolated bottom means a bottom that is vibrationally isolated forming the central, bottom section of the cascade bowl. Although these bottoms rotate as pieces in the bowl are rotated, they have a vibration-free construction. As a result, noise is kept very low, the rate of damaged parts fed is reduced, and feed speed is more stable. The adoption of various damping materials, such as laminated damping steel sheet, has resulted in a dramatic drop in noise level for hoppers loaded with parts.

If a hopper with a particularly narrow clearance is required, please consult NTN Engineering.



Specifications	A (mm)	Bottom angle θ°	Standard clearance (mm)	Applicable unit	Standard material
Part number					
K-PS-25 ^S	198.5	15°	1.6	N25	Stainless steel w/ damping material
K-PS-32 ^S	268	20°	2.0	N32	
K-PS-40 ^S	334	15°	2.0	N40	Mild steel w/ stainless steel lamination
K-PS-63S	475		4.0	G50/G63	Al casting

① S : short shaft, L : long shaft (for aux. hopper in the bowl)

Auxiliary hopper in the bowl

K-H25

Size
Aux. hopper code

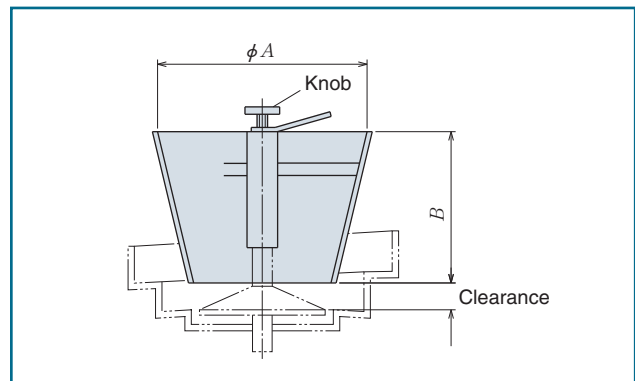
An auxiliary hopper in the bowl is a small hopper for storing parts for feeding; it can be fitted in the bowl using the shaft of the isolated bottom.

This helps to make the feeding system more compact, since extra bench or floor space is not required, unlike conventional separate hoppers.

The run-off of parts fed can be adjusted by turning the upper knob to adjust the lower clearance.

Note that the auxiliary hopper is not suitable for parts that can be easily tangled or that do not slide well.

For such work pieces, use the NTN hopper series.



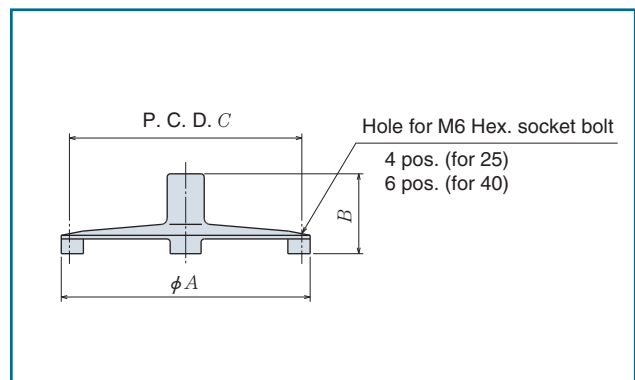
Specifications	Dimensions (mm)		Applicable unit	Standard material	Approx. capacity (ℓ)
Part number	A	B			
K-H25	300	200	N25	SUS	7
K-H32	340	230	N32		12
K-H40	430	250	N40		20

Fixed bottom

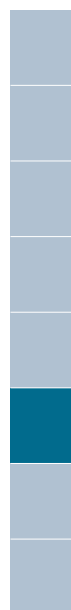
K-PBB-25

Size
Fixed bottom code

If an isolated bottom cannot be used together with a bottomless bowl, use a fixed bottom. The handling quality of the fixed bottom is the same as that of integrated bottom bowls.



Specifications	Dimensions (mm)			Applicable unit	Standard material
Part number	A	B	C		
K-PBB-25	200	64	186	N25	Polyurethane-coated Al casting
K-PBB-40	336	74	320	N40	



Controller dimensions and specifications

This product doesn't correspond to the overseas standard of anything.

NTN parts feeder

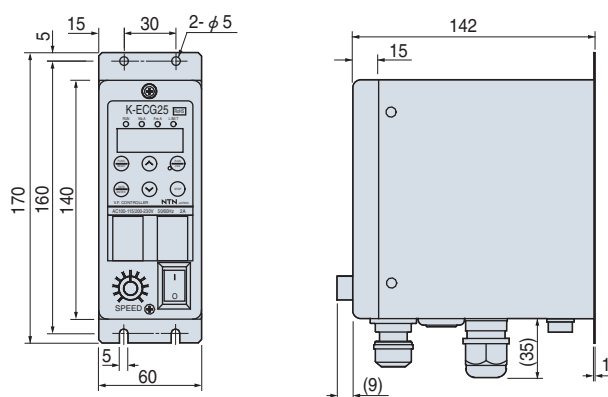
Small variable frequency controller

K- E CF 2 5

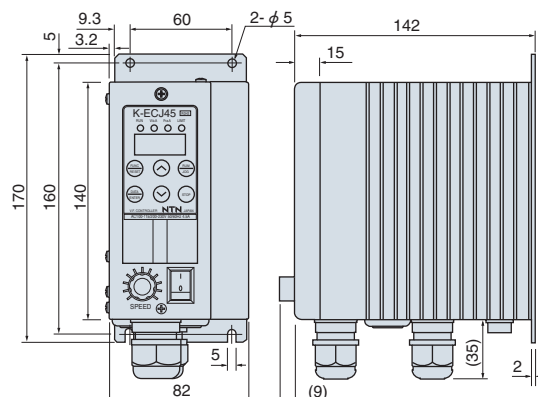
— Voltage and drive system
— Control capacity
— Control function (application)
— Controller code

Standard type, Multifunction type

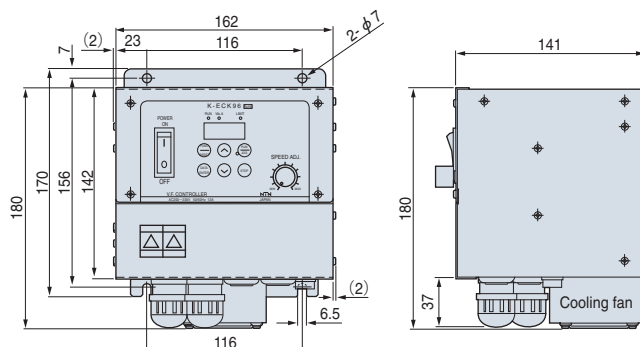
K-ECF25, K-ECG25



K-ECH45, K-ECJ45

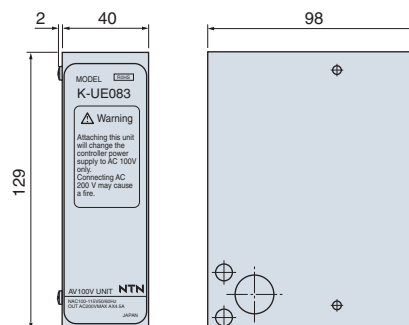


K-ECK96



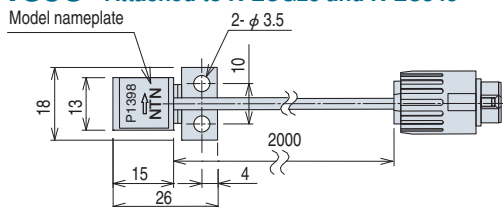
The separate vibration sensor (K-P1398) is required when using the constant amplitude function.

K-UE083

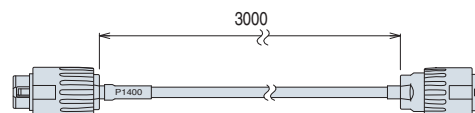


There is no attachment hole as the controller is fixed from the side.

K-P1398 Attached to K-ECG25 and K-ECJ45



K-P1400 (extension cable)



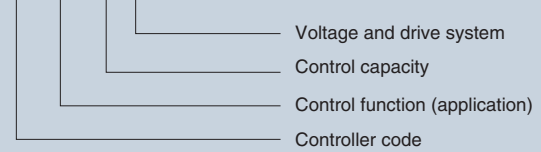
Part number	Control functions	Control capacity (A)	Supply voltage (V)	Applicable drive unit
K-ECF25	External control + ON/OFF control with sensor + operation instructions	2A	100/200V	K10—K16, K20 (200V), K25 (200V) S-series, V-series (200V)
K-ECG25	External control + ON-OFF control with sensor + operation instructions + resonance point tracing and constant amplitude			
K-ECH45	External control + ON/OFF control with sensor + operation instructions	4.5A	100/200V	N32, N40, G50 · 1, K20 (100V), N25 (100V), V-series (100V)
K-ECJ45	External control + ON-OFF control with sensor + operation instructions + resonance point tracing and constant amplitude			
K-ECK96	External control + ON-OFF control with sensor + operation instructions + (constant amplitude)	12A	200V	G63
K-UE083	Boosting from 100 V—200 V	4.5A	100V	K-ECF25, K-ECG25, K-ECH45, K-ECJ45

This product doesn't correspond to the overseas standard of anything.

NTN parts feeder

Small variable frequency controller

K- E CF 2 5



Small variable frequency controller

Features

• Reduced size and extended functions

Drastic miniaturization and weight saving realized

Convenient functions added to those of conventional machines such as multiple-speed control, short work alarm, air blow control and jog operation

• Constant amplitude and resonance point tracing functions provided

Constant amplitude and resonance point tracing functions realized through feedback control using vibration sensors

Part number		K-ECF25	K-ECH45	K-ECG25	K-ECJ45	K-ECK96
Power supply	Rated voltage	Single-phase 100—115 V AC/200—230 V AC ±10%				Single-phase AC/200 to 230 V ±10%
	Frequency	50/60 Hz common				
Output	Voltage	Single-phase AC 0—100 / 0—200 V (1 V units), switches automatically to suit the power supply voltage ❶				0—200V
	Frequency	30—500 Hz (in 0.1 Hz increment)				30—200Hz
	Rated current	2.0A	4.5A	2.0A	4.5A	12.0A
	Drive system	Sine wave PWM				
	Service power supply	DC 24V, 200mA				DC 24V, 100mA
Control		Microcomputer based				
External control input		1 point (NPN/PNP transistor control available, inversion of signal available)				
Software start / stop		Yes (0.0—5.0 sec each variable) ❷				
Constant voltage function		Output voltage remains within 3% in the event of a 10% variation in supply voltage. ❸				
Constant amplitude function		No		Yes ❹		
Resonance point tracing function		No		Yes ❹		No
Sensor input		2 points (for NPN open collector), inversion of signal available				Single
ON/OFF delay time		2 points each (ON: 0.0—60.0 sec variable, OFF: 0.0—30.0 sec variable)				Single for each
Control output	Relay contact	1a×2(AC250V/0.1A)	Run signal: 1 point, fault signal: 1 point			
	Tr signal	1a×4(DC 30V/0.1A)	Solenoid valve control: 3 points, alarm: 1 point)			1ax1
Other functions		Panel lock, panel control and data monitoring according to 7-segment LED				
Operating temperature range		0—40°C				
Protection		Overload, short circuit and F-V curve				
Accessories		No		Vibration sensor (K-P1398), 1 piece		❺
Mass		About 1.1 kg	About 1.7 kg	About 1.2 kg	About 1.7 kg	About 3.5 kg

① In the event of 200 V output for 100 V AC input, a booster unit (optional) is required separately.

② Minimum setting time indicated is 0.0 sec. But, the minimum operating time on the soft timer is about 50 msec.

③ This applies when the output voltage is set to a value within the range of 30 to 80 V (100 V) or 60 to 170 V (200 V).

④ Application is disapproved or operational restriction may be imposed depending on the applicable vibratory drive unit or operating conditions.

⑤ The ECK96 vibration sensor is optional.

Booster unit

Features

This booster unit exclusive for small controller series products is so designed as to drive 200 V AC load on a 100 V AC power supply.

Part number	K-UE083 ①
Power supply	Input voltage range, frequency
	Single-phase 100–115 V AC (-5 to +10%), 50–60 Hz 10%
Output	Output voltage, rated current
	280 V DC (Input voltage 100 V AC, under no load ②), 4.5 A

① This unit is exclusively for the Variable Voltage Variable Frequency Small Controller. Always purchase it as a pair with a controller, as it cannot be attached later.

This model comes with booster unit, so for details, contact NTN Engineering

② When rated load is connected to ECH45/ECJ45, the maximum output voltage of the controller is about 190 V.

This product doesn't correspond to the overseas standard of anything.

NTN parts feeder

General purpose variable frequency controller

K- E CL 2 5

Voltage and drive system
Control capacity
Control function (application)
Controller code

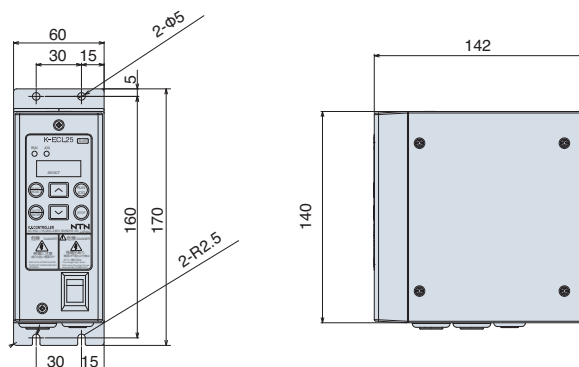
Features

Compact, lightweight, low price

Achieves a lightweight and compact size with the use of a resin case.

Lower priced achieved by narrowing down functions to the bare minimum. Use the existing ECF25/ECG25 if short work alarm, air blow control and constant amplitude function are required.

**K-ECR25
K-ECL25**



Part number	Control functions	Control capacity (A)	Supply voltage (V)	Applicable drive unit
K-ECR25	External control + operation instructions	2	100/200	HF10・14, K10-K16, K20 (200V) N25 (200V), S・HS-series, V・SV-series (200V), L20
K-ECL25	External control + ON-OFF control with sensor + operation instructions			

Part number		K-ECR25	K-ECL25
Power supply	Rated voltage	Single-phase, 100-115 / 200-230 V AC, $\pm 10\%$	
	Frequency	50/60 Hz common	
Output	Voltage	Single-phase AC 0-100 / 0-200 V (1 V units), switches automatically to suit the power supply voltage	
	Frequency	30-500 Hz (in 0.1 Hz increment)	
	Rated current (Drive system)	2.0A (Sine wave PWM)	
	Service power supply	No	DC 24V, 250mA
Control		Microcomputer based	
External control input		1 point (NPN/PNP transistor control available, inversion of signal available)	
Constant voltage function		Output voltage remains within 3% in the event of a 10% variation in supply voltage. ①	
Sensor input		No	1 points (for NPN open collector), inversion of signal available
ON/OFF delay time		No	1 points each (ON: 0.0-60.0 sec variable, OFF: 0.0-30.0 sec variable)
Control output		1a (Run signal: 1 point) Relay contact (AC250V/0.1A)	
Other functions		Panel lock, panel control and data monitoring according to 7-segment LED	
Operating temperature range		0-40°C	
Protection		Software start / stop ②, Overload, short circuit and F-V curve	
Mass		About 0.7 kg	

① This applies when the output voltage is set to a value within the range of 30 to 80 V (100 V) or 60 to 170 V (200 V).

② Minimum setting time indicated is 0.0 sec. But, the minimum operating time on the soft timer is about 50 msec.

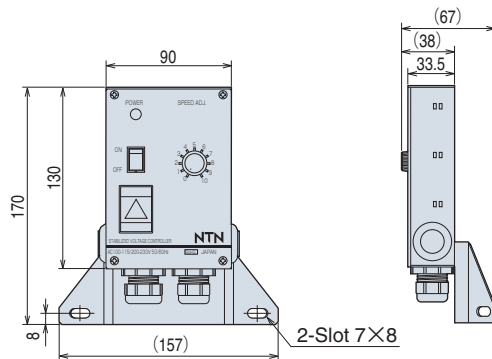
NTN parts feeder

Constant voltage controller

K - E G A 5 7

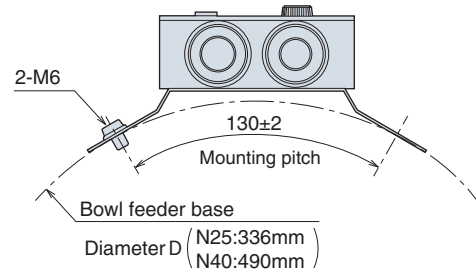
Voltage, drive system
Control capacity
Control function (application)
Controller code

K-EGA17, K-EGA57

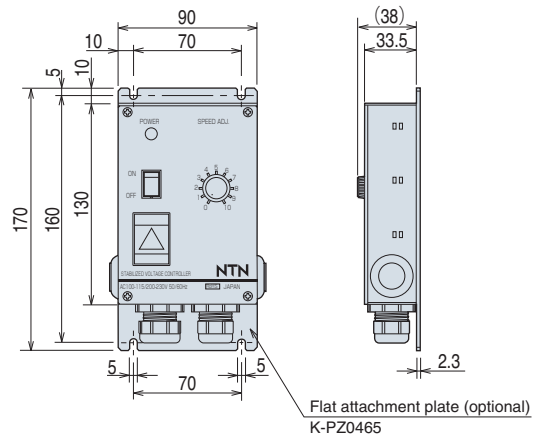


Mounting dimensions

View of standard attachment foot from the bottom

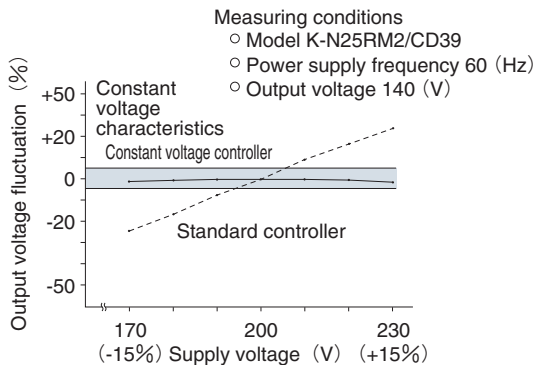


※Flat attachment foot (optional: K-PZ0465)



Flat attachment plate used to replace standard attachment plate. Secured with 4x M4 screws.

Rated voltage characteristics



Model	K-EGA17	K-EGA57
Power supply	Single-phase, 100–115 / 200–230V AC, ±10%	
Frequency	50 Hz/60 Hz switch-selectable	
Output	Single-phase AC 0–95 / 0–190 V max ^① (linked to switching between power supply voltage. The lower value and upper value differ depending the usage conditions.)	
Voltage		
Rated current	0.3A	5.0A
Drive system	Full wave / half wave switch-selectable	
Software start / stop	Possible (variable in eight increments of 0.1–1 second)	
Constant voltage function	±3% or less of output voltage fluctuation against ±10% of supply voltage fluctuation ^②	
Operating temperature range	0–40°C ^③	
Mass	Approx. 0.5 kg	

^① There may be differences in measured values depending on measuring instruments, because output voltage is adjusted via a phase control technique.

^② The values of the constant voltage characteristics are based on an output voltage set from 30 V to 85 V (for 100 V power supply) or from 60 V to 170 V (for 200 V power supply).

^③ Do not use the controller in the presence of corrosive gas or in a very dusty environment; or where substances such as water, oil, and solvents capable of damaging the electrical components, resins, or sheet metal can contact the controller.

Part number	Control function ^①	Control capacity (A)	Applicable unit
K-EGA17	External contro + ION/OFF control with level switch	0.3	S05, S08
K-EGA57		5.0	K-series, N-series, G50 · 1, S-series, L20, V-series, SV-series

^① For details of control functions, refer to page 41. For details, contact NTN Engineering.

This product doesn't correspond to the overseas standard of anything.

NTN parts feeder

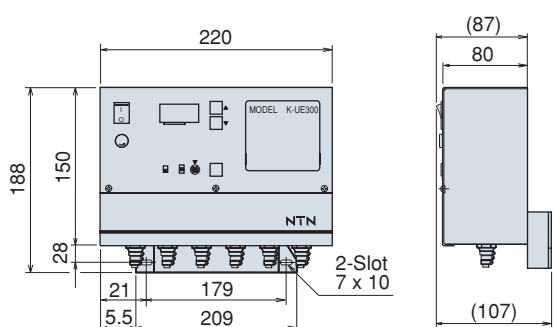
I/O controller unit

K-UE300

Unit number
Unit code
Semi-standard unit

The I/O control unit contains a program package that enables parts sorting and multi-lane parts feed in the bowl by means of sensors. It also controls the sorting mechanism at the exit. Thus, even an inexperienced operator can control the feeder system by specifying only a program number and defining a timer setting.

K-UE300



Part number	K-UE300
Power supply voltage	AC 100 – 115V / 200 – 230V
Frequency	50/60Hz
Number of points	8 points
Input current	4.8 mA max. (per point)
Service power supply	DC24V 500mA
Number of points	Transistor output 7 points (for DC) Photo MOS relay output 3 points (common to AC and DC) Total 10 points (Because the same signal is redundantly fed at 2 points of the above 10 points.)
Output current	Transistor, 0.2A/point Photo MOS relay, 0.1A/point
Rated voltage	Transistor, 24V DC Photo MOS relay, 230V AC/DC
Number of allowable settings	10 settings (per program)
Duration of setting	0.1 – 99.9 sec.
Allowable number of settings	Resident programs, 10 Free programs, 9 ①
Operating temperature range	0 – 40°C
Mass	2.5kg

① A "free program" is a programmable area in which a user can freely create a parts feed program. Note, however, that the user must purchase an optional programming tool for this purpose.

Program examples

A 3-point work sorting (with synchronize sensor)

Outline of function
Sorting of work pieces is controlled at up to three points according to the signals from a synchronize sensor + judgment sensor.

Basic ○ : standard feature
△ : possible with additional wiring
× : not permitted

Timing chart

X2 (Work identify 1)
X1 (Synchronize 1)
Y0 (SOL 1)
X7 (Work detect)
Y6 (RUN command)
Y4 (No work signal)

• Y0 turns ON when both X2 and X1 turn ON (to eject a reject).
• X3, X4, Y1, T2, and X5, X6, Y2 and T3 operate in a manner identical to Y0.

B Escapement control (work request signal + work take-up signal)

Outline of function
The escapement is triggered according to a work request signal. The escapement is reset when a work take-up signal is detected.

Basic ○ : standard feature
△ : possible with additional wiring
× : not permitted

Timing chart

X1 (Escapement work detect)
X4 (Work request signal)
X5 (Work take-up signal)
Y0, Y1 (cylinder, bidirectional SOL)
Y2 (READY)
X6 (Work detect)
Y6 (RUN command)
Y4 (No work signal)

• The cylinder (bidirectional SOL) starts a forward motion after [T1] seconds have elapsed after X1 is turned ON and the X4 turns ON.
• The cylinder returns to its origin [T2] seconds after the X5 turns ON.

C 2-lane air-overflow control

G Escapement control (work request signal)

D 5-lane air-overflow control

H Escapement control (2-lane sorting)

E 2-point work sorting (with synchronize sensor)

J Escapement control for test (continuous RUN)

F 4-point work sorting

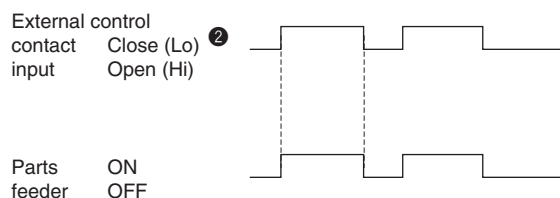
K Escapement control for test (manual reset)

※*For detailed information about control, contact NTN Engineering.

Control functions and timing chart

External control

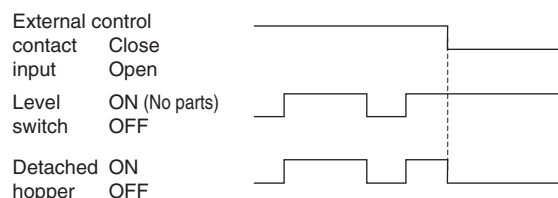
Timing chart



- The parts feeder is turned ON/OFF with an external signal.

External control+ON/OFF control with level switch

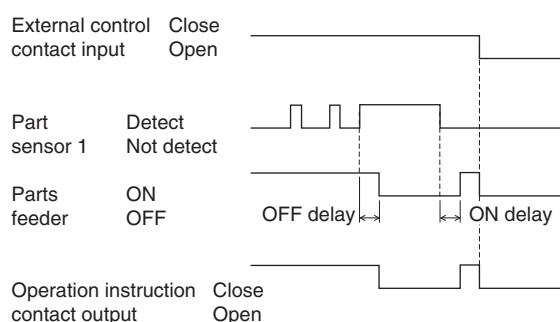
Timing chart



- Detached hopper is automatically turned ON/OFF by the level switch which detects the quantity of any pieces in the parts feeder bowl.

External control+ON/OFF control with sensor +operation instruction

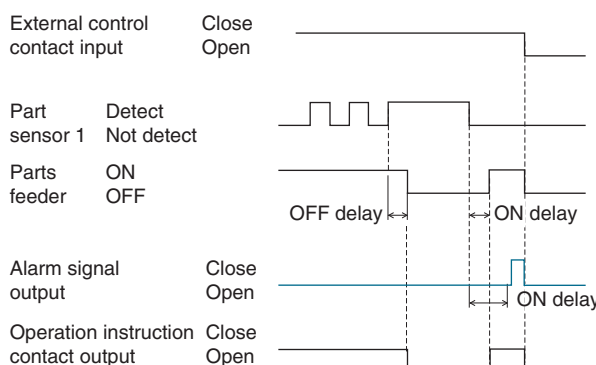
Timing chart



- Parts feeder is turned OFF if the sensor does not detect any pieces during a predetermined time period. (Built-in ON/OFF delay timer)

External control+ON/OFF control with sensor +no-work alarm+operation instruction

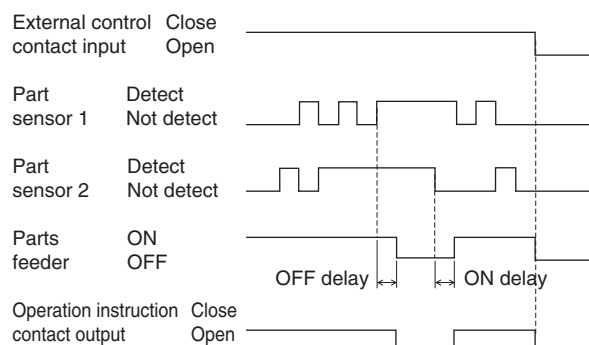
Timing chart



- If the sensor has failed to detect any parts for a predetermined duration (max. 60 sec.), the contact signal is output for alarm.

External control+ON/OFF control+logic circuit with 2 sensors+operation instruction

Timing chart



- Parts feeder is turned OFF if neither sensors detect any pieces, or when either sensor no longer detects any pieces. (Built-in ON/OFF delay timer)

- 1 Use a relay contact to open the external control input for the EGA. Use an open collector transistor to control other controllers. The input logic can be reversed for variable frequency controllers other than SMD controllers.
- Note: Choose a relay with a minimum applicable load that does not exceed 1 V and 1 mA and with a minimum permissible contact voltage of 250 V to control the EGA mode. If the leakage current is 100μA or less, a MOSFET relay for alternating open/close can also be used for control.
- 2 The controller settings vary depending on whether the Variable Voltage Variable Frequency Small Controller is turned ON with a closed contact (Low) or open contact (High).
- 3 Assumes that work sensor 1 and 2 operates on the controller service power supply. For details, refer to the specifications of the controller service power supply. Use an NPN open collector output sensor. The input logic of the sensor signal can be reversed at the controller side.
- 4 The run instruction output is a signal for controlling standalone hoppers. It can also be used as a run signal for controllers.
- 5 When using an external transformer, calculate its capacity using the formula below.

$$\text{Full wave: } \left(\frac{\text{parts feeder}}{\text{supply voltage}} \right) \times \left(\frac{\text{parts feeder}}{\text{rated current}} \right) \leq \text{transformer capacity}$$

$$\text{Half wave: } \left(\frac{\text{parts feeder}}{\text{supply voltage}} \right) \times \left(\frac{\text{parts feeder}}{\text{rated current}} \right) \times 2 \leq \text{transformer capacity}$$

Note: For details, refer to the controller manual or contact NTN Engineering.

Ordering parts feeders



Part number categories and notation

■ Part number categories

NTN parts feeders can be designated and ordered using any of the three part number categories given below.

- 1) Unit part number: Units, such as vibratory drive units, bowls, and controllers (pages 9 through 41), and special-purpose parts feeders (pages 56 through 63).
- 2) Combination part numbers: Combinations of units as described in the standard series combination lists (pages 44 through 55).
- 3) Component part numbers: Specific parts such as leaf springs, mounting brackets, and optional parts (pages 64 through 72).

■ Part number notation

- 1) Unit part number notation
 - Simply write the unit part number of the vibratory driving unit, bowl, or controller, etc. that you wish to order.
- 2) Combination item number notation
 - As shown in the standard series combination lists (pages 44 to 55):
 - ☐ Specify a part number (blue characters in the table) after K-, and connect them with slash marks (/) in the order of K- I (vibratory drive unit) / II (bowls) .
 - ☐ Possible combinations are: K- I / II only.
 - ☐ Combination such as K- I / III, K- II / II, K- II / III are not acceptable. If such a combination is required, itemize the unit part numbers.
 - Controllers cannot be included in a combination part number, so order separately specifying unit part numbers.
 - An optional part cannot be included in a combination part number. Instead, order separately specifying its component number.
- 3) Component part number notation
 - When ordering a component, such as a spring or stay mounting part, order by component number (pages 64 through 72).

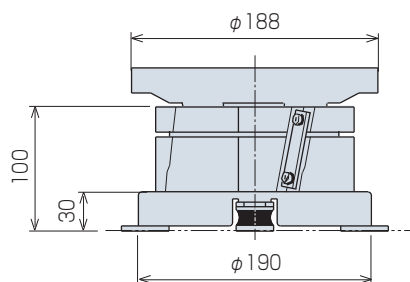
Notes for ordering parts feeders

- NTN parts feeder series can be optimized for a specific application by combining various units. The combination of the three standard unit types—the vibratory drive units, bowls (vibratory trough mount), and controllers—provides for many different variations, allowing users to select the optimum configuration for aligning and feeding.
- Functions can be further expanded by incorporating peripheral accessories, such as auxiliary weights.
- Any combination of units not identified by blue lines may pose certain technical problems. If such a combination is required, consult NTN Engineering for guidance. To purchase such a combination, units must be ordered individually. Remember however, that NTN cannot guarantee the performance and proper functioning of such combinations.

Standard Series Combination Table

HF10,14,16

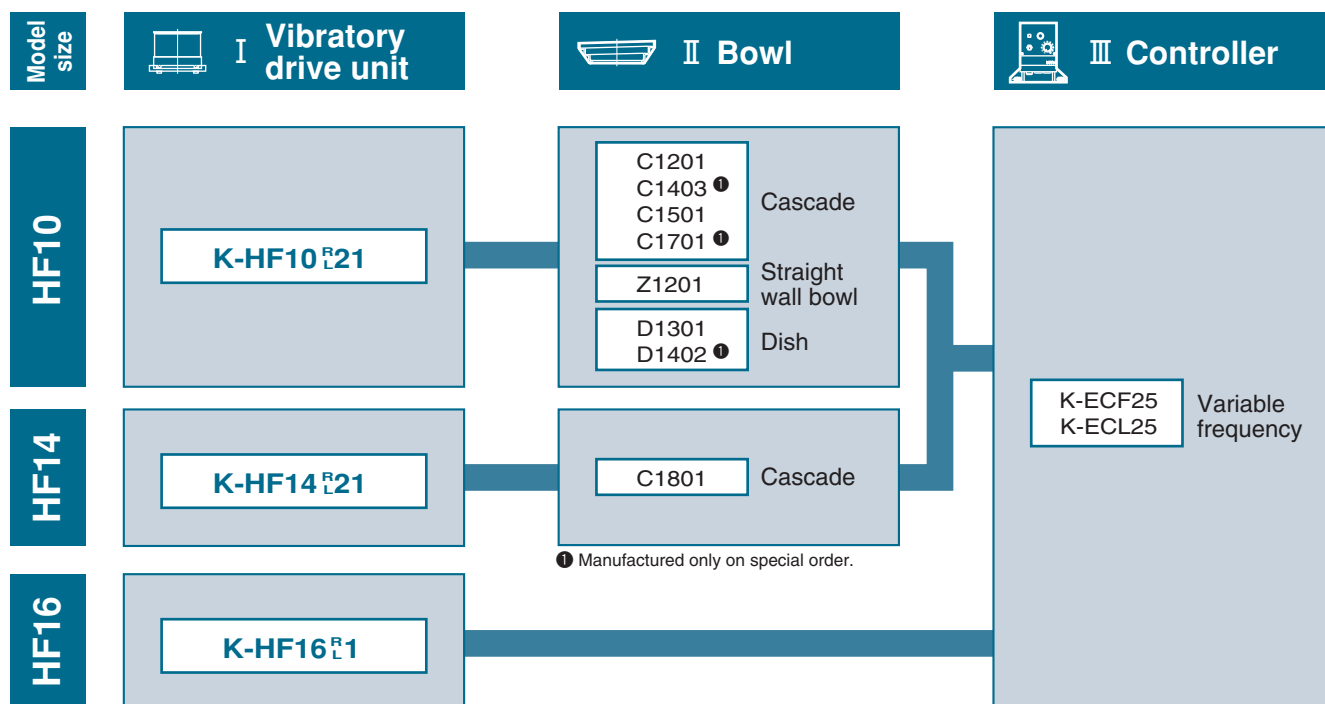
(High-frequency bowl feeder)



- Any combinations of units identified by blue lines are available for order.
- Any combinations of units not identified by blue lines may pose certain technical problems. If such a combination is required, consult NTN Engineering for technical advice.

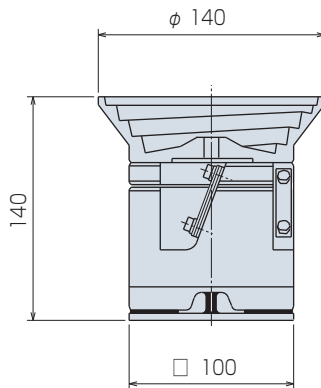
Examples of combination part numbers

I Vibratory drive unit					II Bowl		
K	HF	14	R	21	/	C	1801
Drive unit model	Unit size	Supply direction	Voltage and drive system	Design revision code	Bowl type	Bowl outer dia.	Bowl suffix



Standard Series Combination Table

K10,14,16,20



- Any combinations of units identified by blue lines are available for order.
- Any combinations of units not identified by blue lines may pose certain technical problems. If such a combination is required, consult NTN Engineering for technical advice.

Examples of combination part number

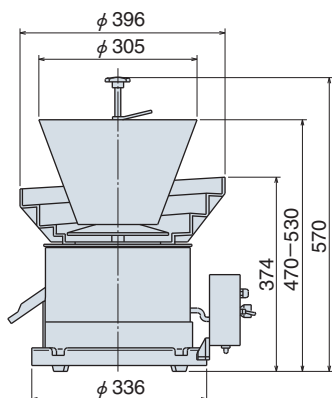
I Vibratory drive unit				II Bowl		
K-K	10	R	1	C	14	01
Drive unit model	Unit size	Supply direction	Voltage and drive type	Bowl type	Bowl outer dia.	Bowl suffix

Model size	I Vibratory drive unit	II Bowl	III Controller
K10	K-K10 ^{R1} _{L2} Standard	C1201 C1401^① C1501 C1502^① Z1201 D1301 D1402^① Cascade Straight wall Dish	K-EGA57 Constant voltage
K14	K-K14 ^{R1} _{L2}	C2001 Z2001 D2002 Cascade Straight wall Dish	K-ECF25 K-ECG25 K-ECL25 Variable frequency
K16	K-K16 ^{R4} _{L2}	C2301 C2601 Z2301 Z2302^① Z2501 K2601^① D2801 Cascade Straight wall Cone Dish	K-EGA57 Constant voltage
K20	K-K20^{R1}_{L1} K-K20^{R1}_{L4}	S3201 Z2801^① Z3003^① Cascade Straight wall	K-ECF25 K-ECG25 K-ECL25 K-ECH45 K-ECJ45 Variable frequency

① Manufactured only on special order.

Standard Series Combination Table

N25



- Any combinations of units identified by blue lines are available for order.
- Any combinations of units not identified by blue lines may pose certain technical problems. If such a combination is required, consult NTN Engineering for technical advice.

Examples of combination part number

I Vibratory drive unit					II Bowl		
K	N 25	R	A H 2	2	/ C D 39		
Drive unit model	Unit size	Supply direction	Design revision code	Voltage and drive system	Bowl type	Bowl bottom type	Design revision code

※ Designs revision code A means free set base.

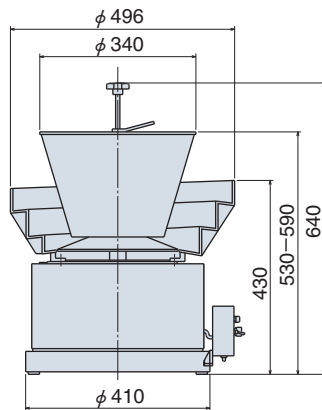
Model size	I Vibratory drive unit	II Bowl	III Controller
N25-H	K-N25^RLH₁² K-N25^RLAH₁² w/ Aux. hopper in the bowl	CD33 CD39 CD391 Cascade SD39 SD391 Stainless steel cascade ZD30^① ZD301^① ZD302^① ZD35 ZD351^① ZD352 Straight wall KD35 Cone	K-EGA57 Constant voltage K-ECF25 K-ECG25 K-ECL25 K-ECH45 K-ECJ45 Variable frequency
N25-T	K-N25^RLT₁² K-N25^RLAT₁² w/ Isolated bottom		
N25-F	K-N25^RLF₁² K-N25^RLAF₁² w/ Flange	SF39 SF391 Stainless steel cascade Integrated bottom ZF30^① ZF301^① ZF302^① ZF35 ZF351^① ZF352 Straight wall KF35^① Cone DF42 Dish	
N25-M	K-N25^RLM₁² K-N25^RLAM₁² Basic type	CB33 CB39 CB391 w/ Fixed bottom Cascade	

① Manufactured only on special order.

Standard Series Combination Table

N32 (Full wave)

- Any combinations of units identified by blue lines are available for order.
- Any combinations of units not identified by blue lines may pose certain technical problems. If such a combination is required, consult NTN Engineering for technical advice.



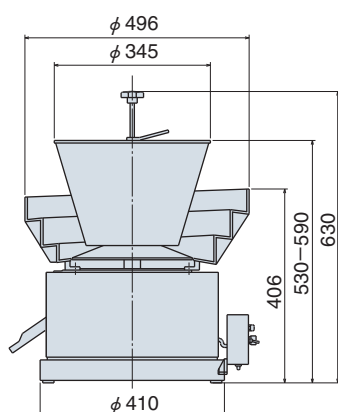
Examples of combination part numbers

I Vibratory drive unit					II Bowl			
K-N	32	R 2	H 2	/	S	D	49	1
Drive unit model	Unit size	Supply direction	Design revision code	Bowl mounting type	Voltage and drive system	Bowl bottom type	Bowl outer dia.	Design revision code

Model size	I Vibratory drive unit	II Bowl	III Controller
N32-H (Full wave)	K-N32^R2H2 K-N32^RAH2 w/ Aux. hopper in the bowl	SD491 Stainless steel cascade	K-EGA57 Constant voltage K-ECH45 K-ECJ45 Variable frequency
N32-T (Full wave)	K-N32^R2T2 K-N32^RAT2 w/ Isolated bottom	ZD401 Straight wall	
N32-F (Full wave)	K-N32^R2F2 K-N32^RAF2 w/ Flange	SF491 Stainless steel cascade Integrated bottom ZF401 Straight wall Integrated bottom	
N32-M (Full wave)	K-N32^R2M2 K-N32^RAM2 Basic type		

Standard Series Combination Table

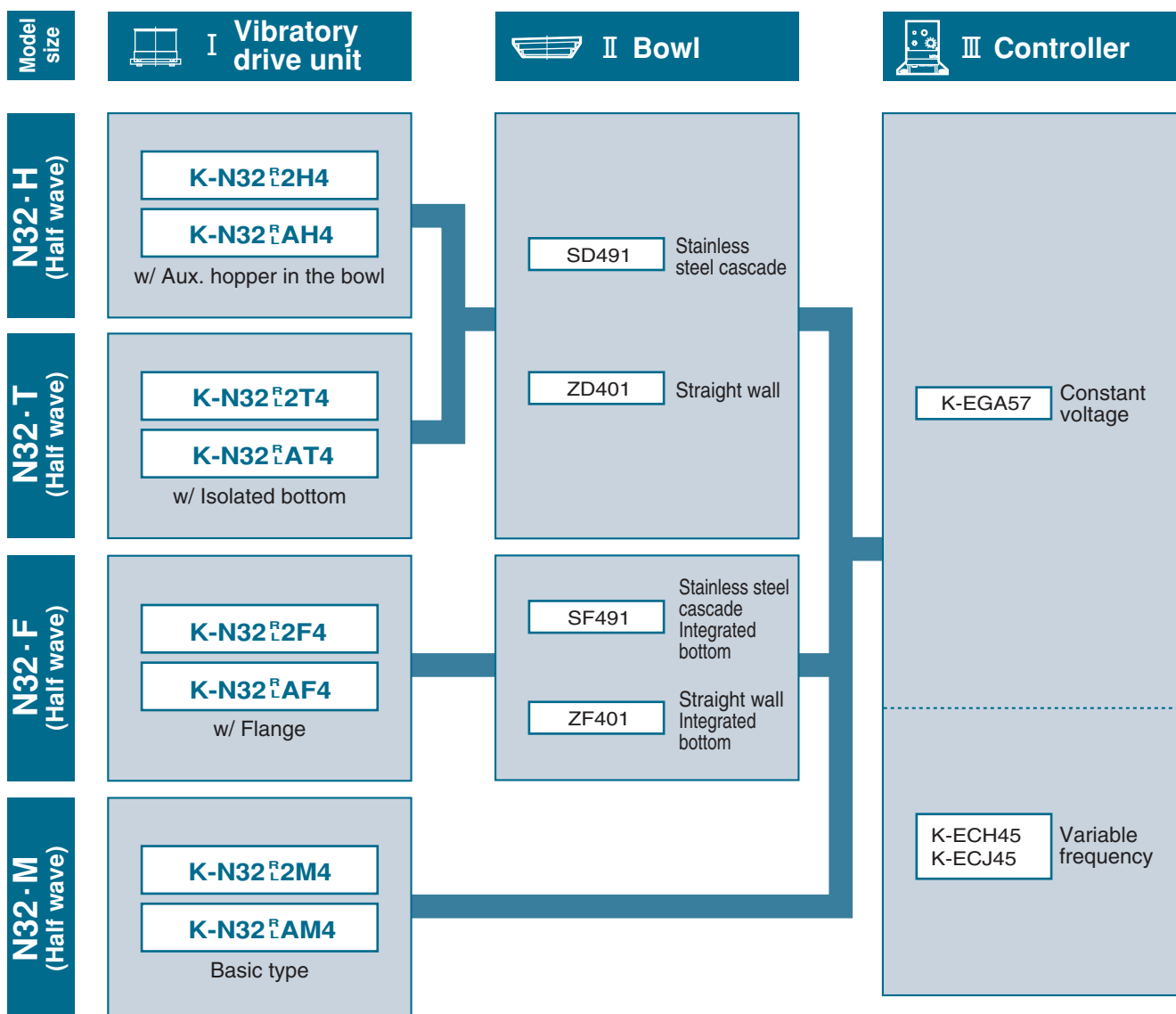
N32 (Half wave)



- Any combinations of units identified by blue lines are available for order.
- Any combinations of units not identified by blue lines may pose certain technical problems. If such a combination is required, consult NTN Engineering for technical advice.

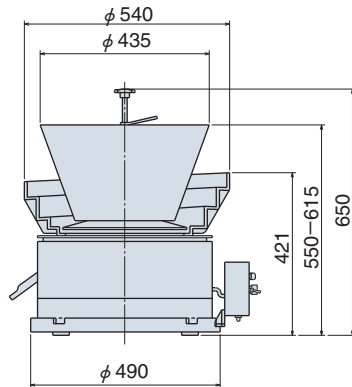
Examples of combination part numbers

I Vibratory drive unit					II Bowl			
K-	N	32	R	2 H 4	/	S	D	49 1
	Drive unit model	Unit size	Supply direction	Bowl mounting type		Bowl type	Bowl bottom type	Design revision code



Standard Series Combination Table

N40 (Full wave)

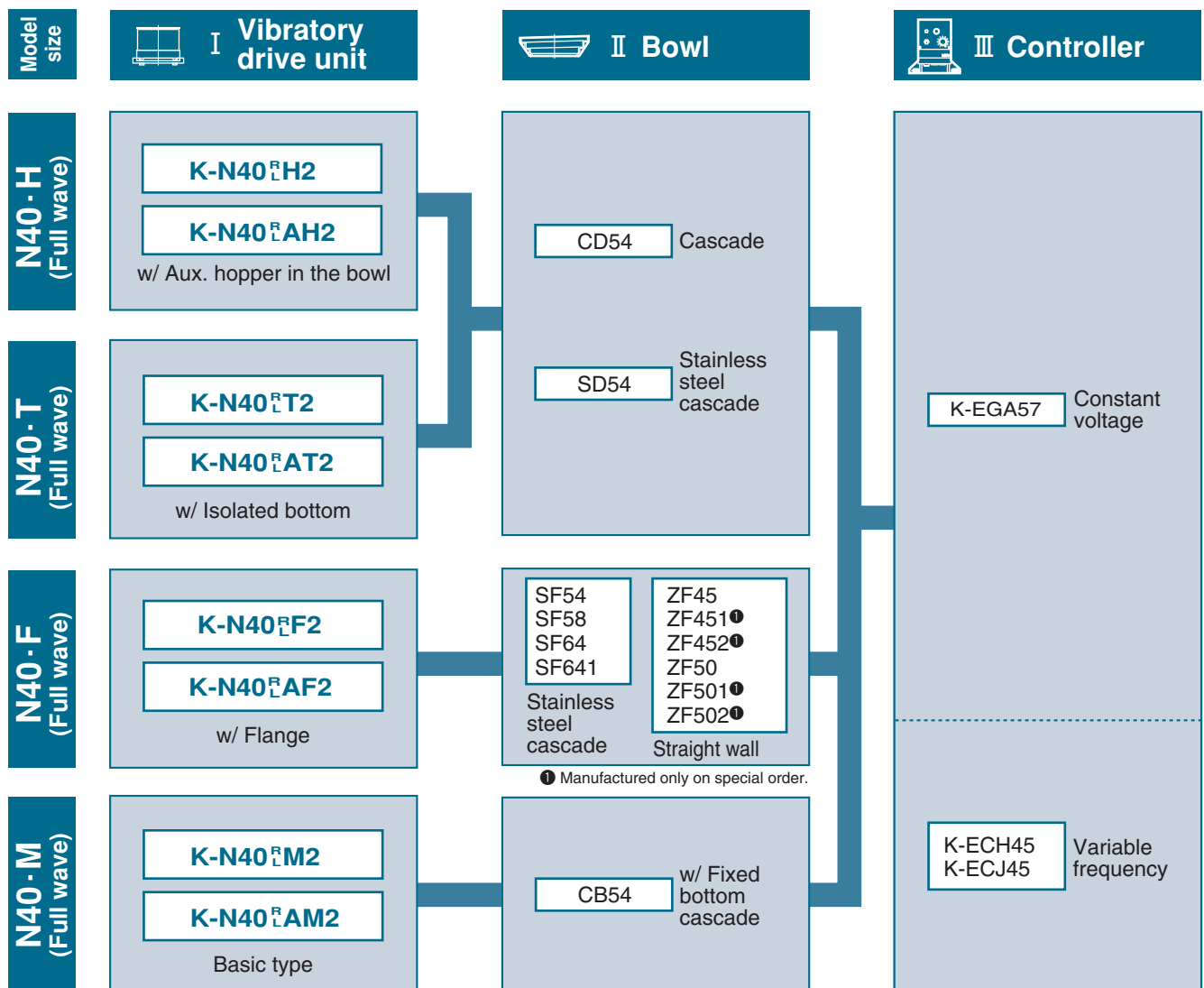


- Any combinations of units identified by blue lines are available for order.
- Any combinations of units not identified by blue lines may pose certain technical problems. If such a combination is required, consult NTN Engineering for technical advice.

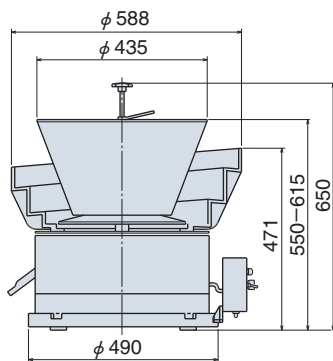
Examples of combination part numbers

I Vibratory drive unit					II Bowl			
K	N	40	R	H 2	/	C	D	54
Drive unit model	Unit size	Supply direction※	Bowl mounting type	Voltage and drive system		Bowl type	Bowl bottom type	Bowl outer dia.
								Design revision code

※Design revision code A means free set base.



N40 (Half wave)

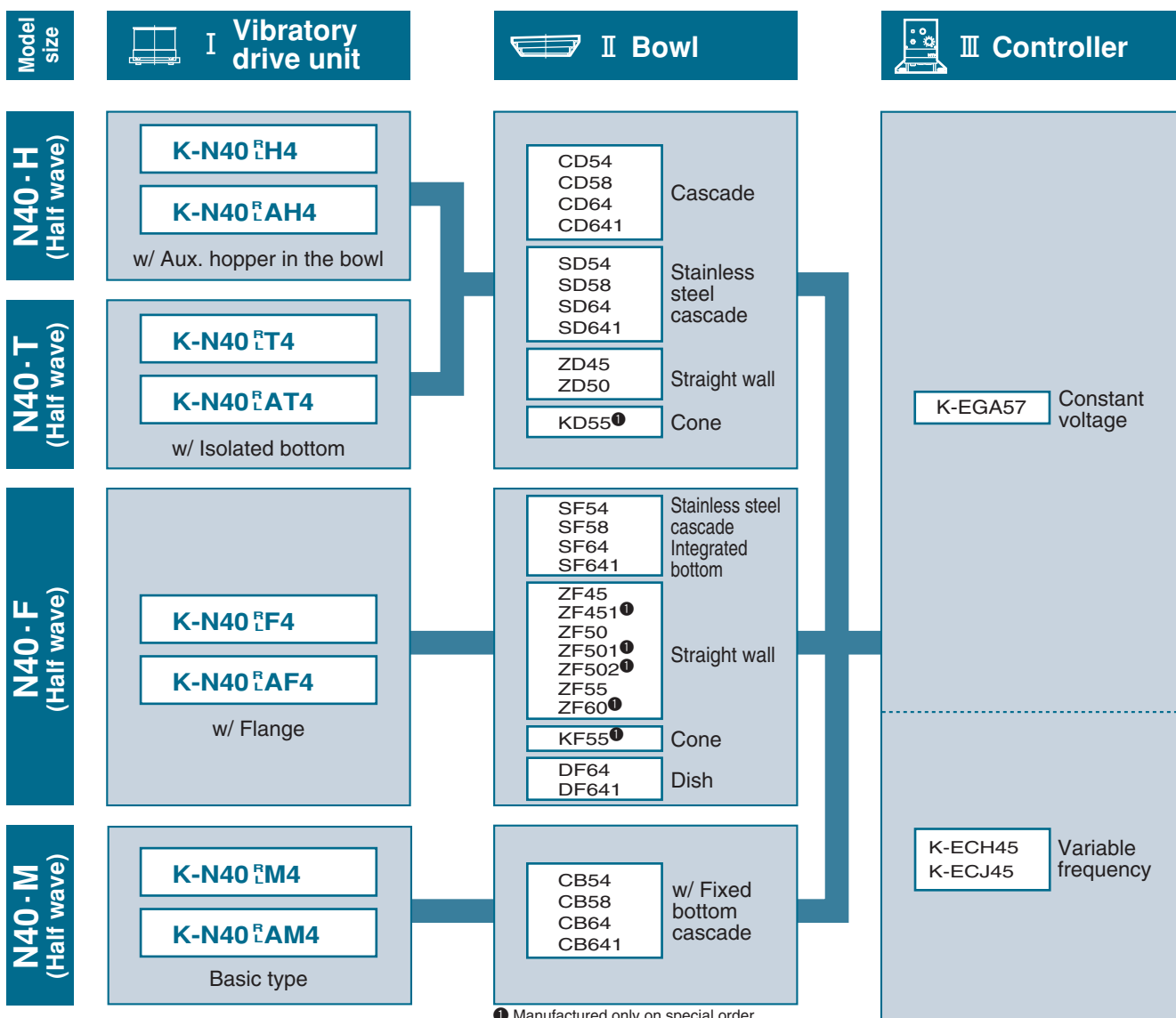


- Any combinations of units identified by blue lines are available for order.
- Any combinations of units not identified by blue lines may pose certain technical problems. If such a combination is required, consult **NTN Engineering** for technical advice.

■ Examples of combination part numbers

I						II				
Vibratory drive unit						Bowl				
K-	N	40	R		H	4	C	D	58	
	— Unit size		— Supply direction			— Bowl bottom type		— Design revision code		
	— Drive unit model		— Bowl mounting type			— Bowl outer dia.		— Design revision code		
			— Design revision code ※							

※Design revision code A means free set base.

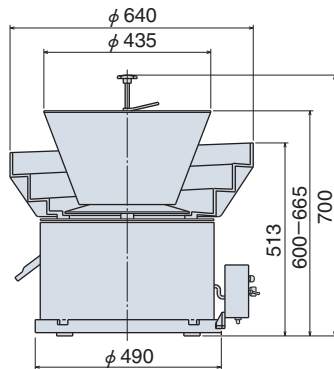


① Manufactured only on special order.

Standard Series Combination Table

N40 • 1

N40 type applicable to large amplitude



- Any combinations of units identified by blue lines are available for order.
- Any combinations of units not identified by blue lines may pose certain technical problems. If such a combination is required, consult NTN Engineering for technical advice.

Examples of combination part numbers

I					II						
Vibratory drive unit					Bowl						
K-	N	40	R	1	H	4	/	C	D	64	
	Drive unit model		Unit size	Supplying direction	Design revision code	Bowl mounting type	Voltage and drive system	Bowl type	Bowl bottom type	Bowl outer dia.	Design revision code

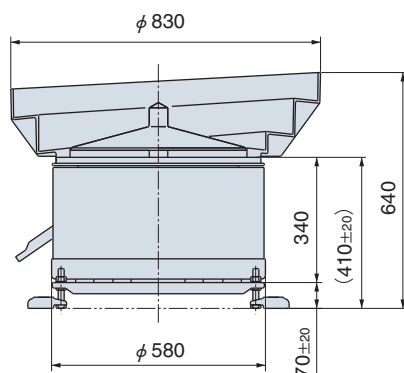
Model size	I Vibratory drive unit	II Bowl	III Controller
N40-1H	K-N40^①1H4 w/ Aux. hopper in the bowl	CD54 CD58 CD64 CD641 Cascade SD54 SD58 SD64 SD641 Stainless steel cascade ZD45 ZD50 Straight wall KD55^① Cone	K-EGA57 Constant voltage
N40-1T	K-N40^①1T4 w/ Isolated bottom		
N40-1F	K-N40^①1F4 w/ Flange	SF54 SF58 SF64 SF641 Stainless steel cascade Integrated bottom ZF45 ZF451^① ZF50 ZF501^① ZF502^① ZF55 ZF60^① Straight wall KF55^① Cone DF64 DF641 Dish	
N40-1M	K-N40^①1M4 Basic type	CB54 CB58 CB64 CB641 w/ Fixed bottom cascade	

① Manufactured only on special order

① Manufactured only on special order.

Standard Series Combination Table

G50



- Any combinations of units identified by blue lines are available for order.
- Any combinations of units not identified by blue lines may pose certain technical problems. If such a combination is required, consult NTN Engineering for technical advice.

Examples of combination part numbers

I Vibratory drive unit					II Bowl			
K	G	50	R	1 T 4	C	D	83	
Drive unit model	Unit size	Supply direction	Design revision code	Voltage and drive system	Bowl type	Bowl bottom type	Bowl outer dia.	Design revision code

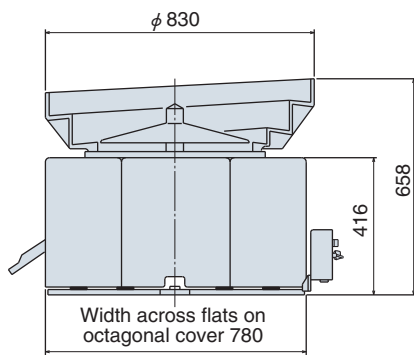
Model size	I Vibratory drive unit	II Bowl	III Controller
G50 - T	K-G50^R1T4 w/ Isolated bottom	CD83 Cascade	K-EGA57 Constant voltage K-ECH45 K-ECJ45 Variable frequency
G50 - G	K-G50^R1G4 w/ Adapter	CB83 w/ Fixed bottom cascade	
G50 - M	K-G50^R1M4 Basic type	ZF651^① Straight wall	

① Manufactured only on special order.

Standard Series Combination Table

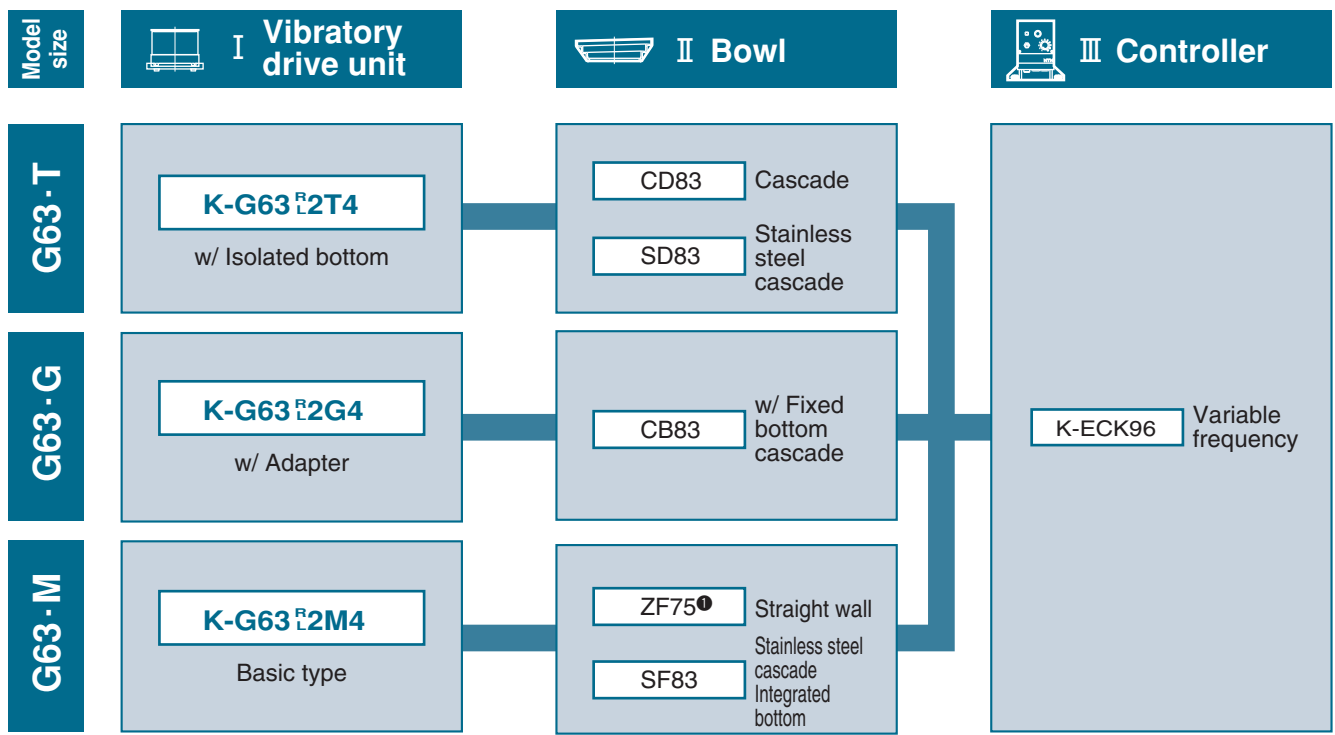
G63

- Any combinations of units identified by blue lines are available for order.
- Any combinations of units not identified by blue lines may pose certain technical problems. If such a combination is required, consult NTN Engineering for technical advice.



Examples of combination part numbers

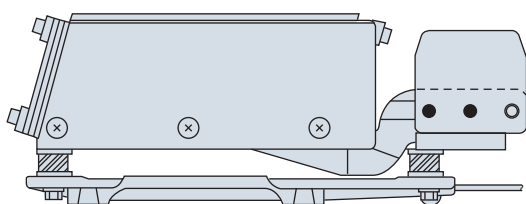
I Vibratory drive unit					II Bowl		
K-G	63	R	2	T 4	/	C	D 83
Drive unit model	Unit size	Supply direction	Design revision code	Voltage and drive system		Bowl type	Bowl bottom type
							Design revision code



1 Manufactured only on special order.

Standard Series Combination Table

S05, S08, S10 S20, S30, L20



- Any combinations of units identified by blue lines are available for order.
- Any combinations of units not identified by blue lines may pose certain technical problems. If such a combination is required, consult NTN Engineering for technical advice.

Examples of combination part numbers

I Vibratory drive unit				II Vibratory trough mount	
K-S	10	C	1	1	
Drive unit model	Unit size	Design revision code	Voltage and drive system	Vibratory trough mount type	

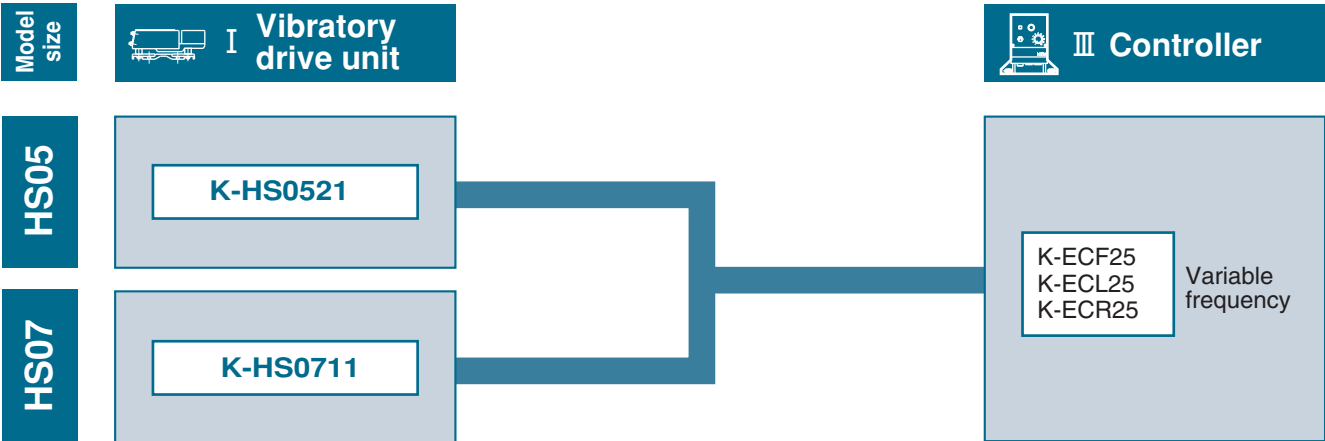
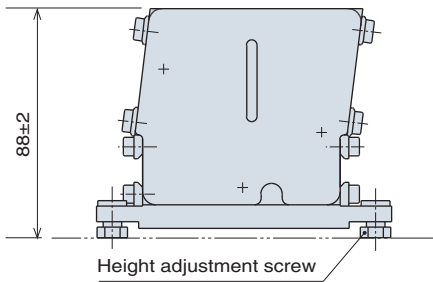
※ Design revision code A means no base plate.

Model size	I Vibratory drive unit	II Vibratory trough mount	III Controller
S05	K-S051¹₂ K-S05A¹₂		K-EGA17 Constant voltage
S08	K-S082¹₂	1	K-ECF25 K-ECG25 K-ECL25 K-ECR25 Variable frequency
S10	K-S10B¹₂ K-S10C¹₂	1	K-EGA57 Constant voltage
S20	K-S20B¹₂ K-S20C¹₂	1	
S30	K-S30B4 K-S30C4	1	K-ECF25 K-ECG25 K-ECL25 K-ECR25 Variable frequency
L20	K-L20¹₂		

Standard Series Combination Table

HS05,07
(High-frequency linear feeder)

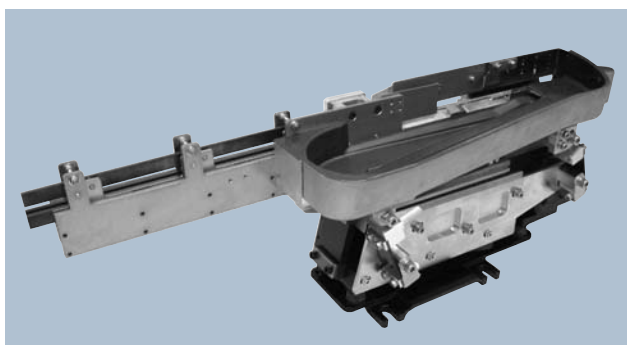
- Any combinations of units identified by blue lines are available for order.
- Any combinations of units not identified by blue lines may pose certain technical problems. If such a combination is required, consult NTN Engineering for technical advice.



This product doesn't correspond to the overseas standard of anything.

Monodrive 2-Way Feeder™

This revolutionary two-way feeder comprises only one linear feeder. It is capable of storing, aligning/orienting, and feeding parts.



Features

- 1. One linear feeder drives two chutes in different directions - one for the aligning/orienting side and one for the returning side.**
This novel return feeder comprises a conventional linear feeder and an innovative leaf spring unit mounted above the linear feeder. The linear feeder and leaf spring unit generate mutually counteracting vibrations in two different planes in order to align/orient and feed parts. (Patent pending)
- 2. Compact, light and energy-efficient**
Compared to bowl feeder designs, this liner aligning/orienting parts feeder is simpler, more compact, and requires roughly half the installation space. Furthermore, since one linear feeder can store, align/orient and feed parts, the entire production system can be made lighter and more energy-efficient.
- 3. This simplified design is the ideal choice for multi-product, small-lot production.**
The simplified construction ensures easier maintenance. This unique feeder handles a diversity of parts types and can be fitted with a chute suitable for a particular part type.

Applications and compatible work pieces

- Handles a diversity of parts types ranging from miniature to medium-sized.
- Accommodates machine parts, electronic components, plastic parts, and the like.

Specifications

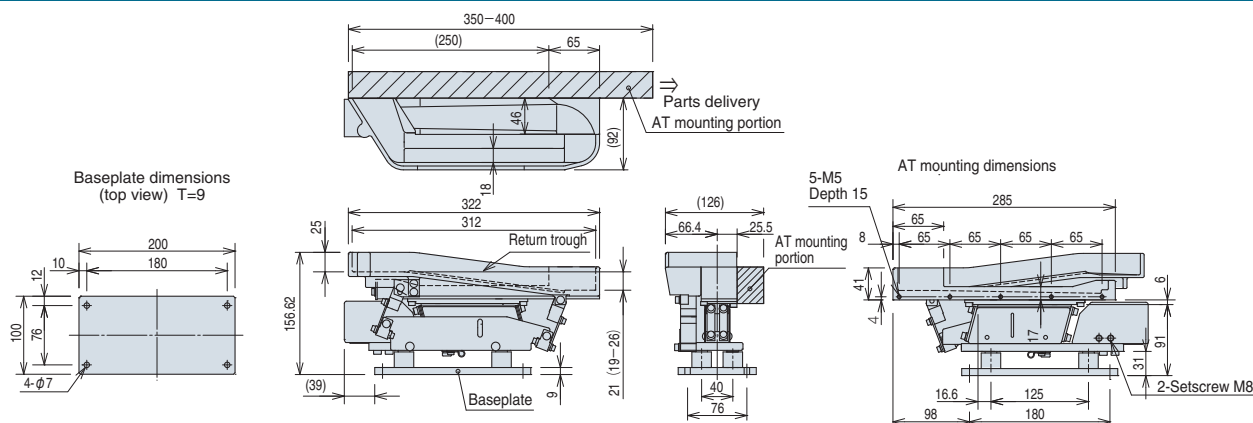
Model	Part No. ❶	Power supply (V/A)	Applicable leaf spring	Inclination angle of return trough (possible range)	Mounted chute ❷		Maximum volume of work pieces loaded (ℓ) (Max. on solo basis)	Applicable controller	Mass (kg).
					Length (mm)	Mass (kg)			
MD08	K-MD08 ^R _{L2}	100/0.15 200/0.08	K-PLS2-35×5 K-PLS4-37×5	Standard: 7.5° (7–9°)	350–400	1.2	0.1	K-ECF 25	6.0
MD10	K-MD10 ^R _L B ¹ ₂	100/0.4 200/0.2	K-PLS4-40×6 K-PLS4-41×7	Standard: 7.5° (±1°)	450–600	2	0.3		10.5
	K-MD10 ^R _C 2								9.0
MD20	K-MD20 ^R _L B ¹ ₂	100/1.0 200/0.5	K-PLS4-70×12 K-PLS4-62×12		550–800	5	0.7		19.0
	K-MD20 ^R _C 2								15.5
MD30	K-MD30 ^R _L B4	200/0.9	K-PLS4-86×15 K-PLS4-100×20		850–1100	15	1.6		54.0
	K-MD30 ^R _C 4							46.0	

❶ Two main feeder body types are available: R (clockwise) and L (counterclockwise). Also, feeder models are available with a baseplate (identified by suffix B) and without a baseplate (identified by suffix C).

② The mass of the mounted chute is the mass value of a chute that can be added.

Structure and dimensions

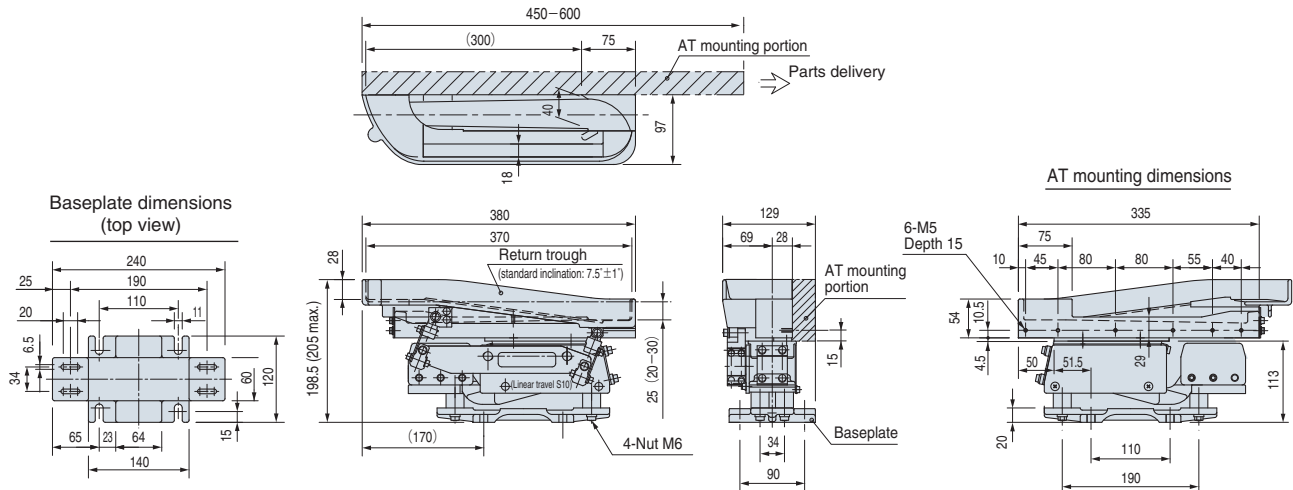
K-MD08^R_{L2} (with baseplate)



Structure and dimensions

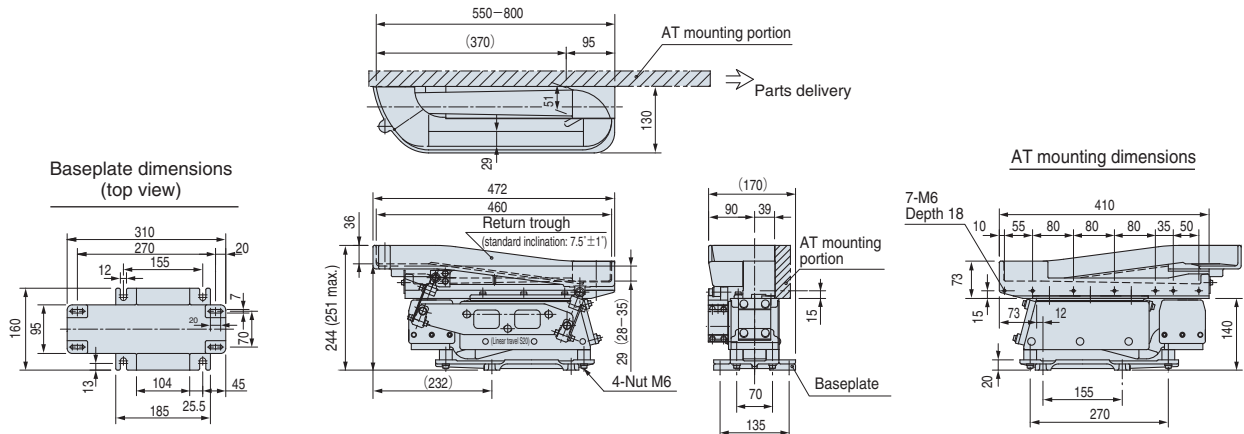
K-MD10^R_LB₂¹ (with baseplate)

K-MD10^R_LC₂¹ (without baseplate)



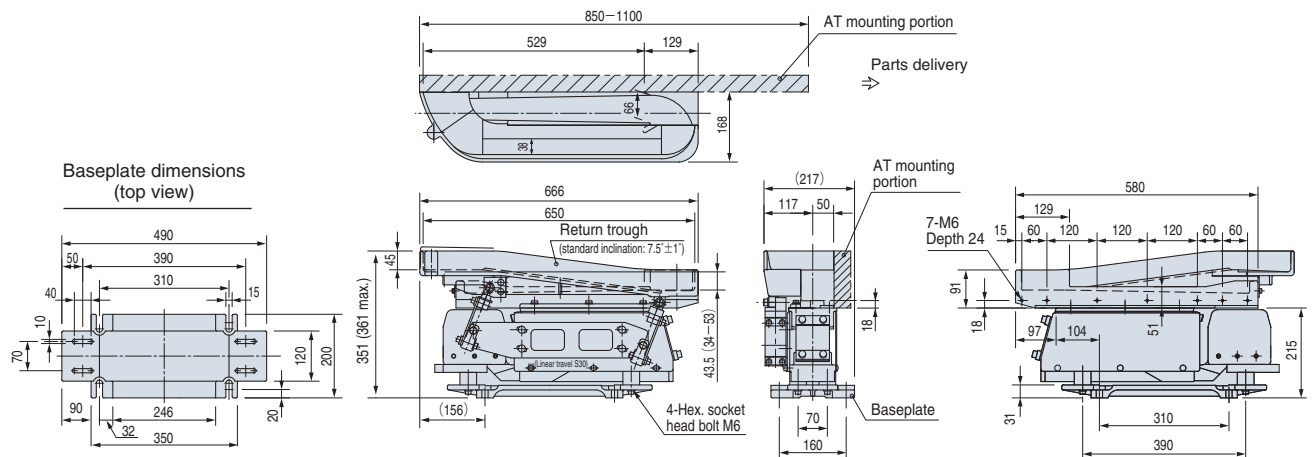
K-MD20^R_LB₂¹ (with baseplate)

K-MD20^R_LC₂¹ (without baseplate)



K-MD30^R_LB4 (with baseplate)

K-MD30^R_LC4 (without baseplate)



For specific dimensions of a linear feeder, see the specifications/dimensions page in this catalog.

This product doesn't correspond to the overseas standard of anything.

Crossdrive Feeder

Horizontal elliptic oscillation for high-speed feeding and low-noise operation!

Features

High-speed feeding and low-noise operation

Achieves high-speed feeding and low-noise operation by adjusting the amplitude and phase. Feed speed: Max 20 m/min

Stable parts feeding

Smooth feeding with minimal jumping by adjusting the amplitude and phase.

Compact

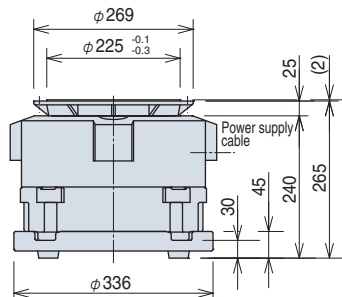
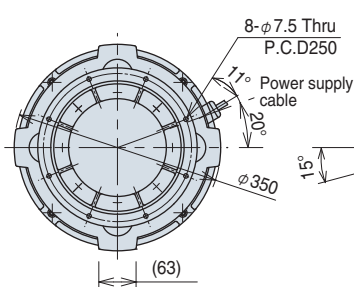
Horizontal leaf spring structure enables replacement of existing equipment.

K- XD 25 F 2

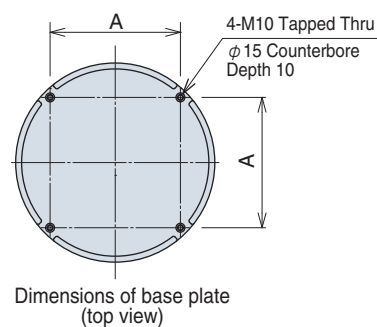
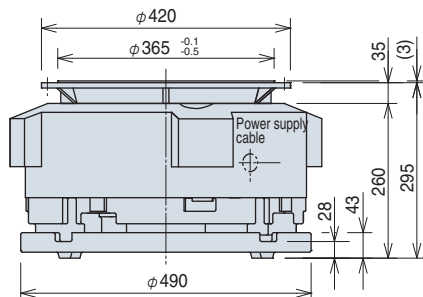
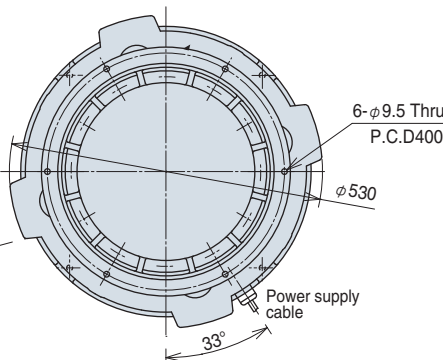
Voltage and drive system
Bowl mounting type
Unit size
Model



K-XD25F2



K-XD40F2



Dimensions of base plate (top view)

Part number	K-XD25F2	K-XD40F2
Dimensions		
A	220	325

Model and size		XD25	XD40
Part No.		K-XD25F2	K-XD40F2
Voltage (V)		200	
Current (A)	Horizontal	1.3	3.2
	Vertical	1.0	1.5
Drive section outside diameter (mm)		φ311 (max. φ350)	φ475 (max. φ530)
Drive section height (mm)		240	260
Drive section mass (kg)		62	146
Vibration frequency (Hz)		70–110	
Maximum amplitude (mm) (Circumference of upper vibrating body)	Horizontal (With lightweight bowl mounted)	2.0 (103Hz or more)	2.0 (95Hz or more)
	Vertical	0.2	0.2
Mounted bowl mass (mass of bowl + parts kg)		7–14	14–28
Applicable bowl (mass kg)		K-B25R(L)ZF301 (4.9) K-B25R(L)ZF351 (6.1)	K-B40R(L)ZF453 (15.5)

Crossdrive Feeder Controller

K-E DA 4 6

Voltage Voltage and drive system
 Control capacity
 Control function (application)
 Controller code

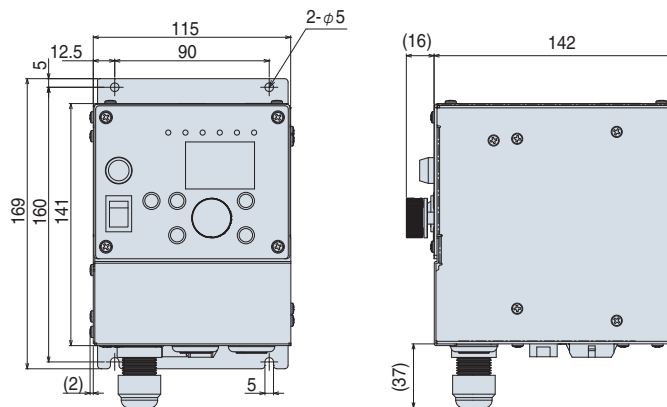
Features

Crossdrive (XD) Feeder Controller

Dedicated controller for the crossdrive feeder that achieves high-speed feeding using elliptic oscillation.

Adjust complex elliptic oscillation easily.

K-EDA46



Part number	Control functions	Control capacity (A)	Supply voltage (V)	Applicable drive unit
K-EDA46	External control + ON/OFF control with sensor + operation instructions	4+2A	200V	XD25, XD40

Part number		K-EDA46
Power supply	Rated voltage	Single-phase 200–230 V AC $\pm 10\%$
	Frequency	50/60 Hz common
Output	Voltage	Single-phase AC 0–200 V (1 V units)
	Frequency	30.0–200.0 Hz (in 0.1 Hz increment)
	Rated current (Drive system)	4+2A (Sine wave PWM)
	Service power supply	DC24V, 150mA
Control		Microcomputer based
External control input		1 point (NPN/PNP transistor control available, inversion of signal available)
Constant voltage function		Output voltage remains within 3% in the event of a 10% variation in supply voltage. ①
Sensor input		1 point (for NPN/PNP open collector), inversion of signal available
ON/OFF delay time		1 points each (ON: 0.0–60.0 sec variable, OFF: 0.0–30.0 sec variable)
Control output	Relay contact (AC250V/0.1A)	1x2 (Run signal: 1 point, fault signal: 1 point)
	Tr signal (DC 30V/0.05A)	1x3 (Solenoid valve control: 2 points, alarm: 1 point)
Other functions		Panel lock, panel control, overload and data monitoring according to 7-segment LED
Operating temperature range		0–40°C
Protection		Software start / stop ②, overload, short circuit and F-V curve
Mass		About 2.0 kg

① This applies when the output voltage is set to a value within the range 60 to 170 V.

② Minimum setting time indicated is 0.0 sec. But, the minimum operating time on the soft timer is about 50 msec.

Globalized parts feeder series

Features



1. Globalized products for use outside Japan

These products have acquired NRTL certification from the U.S.A. (which also conforms to the corresponding Canadian certification through the U.S.A.-Canada reciprocal-certification system). Providing comprehensive support for exports to the North American region.

2. A diverse product line

NTN globalized products feature a wide-ranging product line encompassing bowl feeders, linear feeders and standalone auxiliary hoppers.

Table of globalized products (as of October 2012)

		Globalized product part No.	Part No. of product dedicated to Japanese market
Bowl feeder	K16	K-K16R (L) Y2	K-K16R (L) 32
		K-N25R (L) ZM2	K-N25R (L) M2
		K-N25R (L) ZF2	K-N25R (L) F2
		K-N25R (L) ZT2	K-N25R (L) T2
	N25	K-N25R (L) ZH2	K-N25R (L) H2
		K-N25R (L) YM2	K-N25R (L) AM2
		K-N25R (L) YF2	K-N25R (L) AF2
		K-N25R (L) YT2	K-N25R (L) AT2
		K-N25R (L) YH2	K-N25R (L) AH2
		K-N25R (L) WM4	K-N25R (L) 1M4
		K-N25R (L) WF4	K-N25R (L) 1F4
		K-N25R (L) WT4	K-N25R (L) 1T4
		K-N25R (L) WH4	K-N25R (L) 1H4
	N40	K-N40R (L) ZM2	K-N40R (L) M2
		K-N40R (L) ZT2	K-N40R (L) T2
		K-N40R (L) ZH2	K-N40R (L) H2
		K-N40R (L) ZM4	K-N40R (L) M4
		K-N40R (L) ZF4	K-N40R (L) F4
		K-N40R (L) ZT4	K-N40R (L) T4
		K-N40R (L) ZH4	K-N40R (L) H4
		K-N40R (L) YM2	K-N40R (L) AM2
		K-N40R (L) YT2	K-N40R (L) AT2
		K-N40R (L) YH2	K-N40R (L) AH2
		K-N40R (L) YM4	K-N40R (L) AM4
		K-N40R (L) YF4	K-N40R (L) AF4
		K-N40R (L) YT4	K-N40R (L) AT4
		K-N40R (L) YH4	K-N40R (L) AH4

		Globalized product part No.	Part No. of product dedicated to Japanese market
Bowl feeder	N40 • 1	K-N40R (L) WM4	K-N40R (L) 1M4
		K-N40R (L) WF4	K-N40R (L) 1F4
		K-N40R (L) WT4	K-N40R (L) 1T4
		K-N40R (L) WH4	K-N40R (L) 1H4
Linear feeder	G50 • 1	K-G50R (L) ZM4	K-G50R (L) 1M4
		K-G50R (L) ZG4	K-G50R (L) 1G4
		K-G50R (L) ZT4	K-G50R (L) 1T4
	S10	K-S10Z2	K-S10B2
		K-S10Y2	K-S10C2
	S20	K-S20Z2	K-S20B2
		K-S20Y2	K-S20C2
		K-S20W4	K-S20B (half wave specifications)
		K-S20V4	K-S20C (half wave specifications)
	S30	K-S30Z4	K-S30B4
		K-S30Y4	K-S30C4
Hopper	V01	K-V01SZ4	K-V01S4
	V03	K-V03SZ4	K-V03S4
	V06	K-V06SZ4	K-V06S4

Notes

1. The specifications for vibratory driving units for globalized products (rated voltage, current, leaf spring, mass, external dimensions, mounting dimensions, etc.) are the same as those of units intended for the Japanese market. For the specifications of a particular globalized product, see the specifications for the part No. intended for the Japanese market.

2. For applicable controllers, see page 61.

Notes

1. Controllers and vibratory driving units are tested in combination as a set (particularly for the EMC test). Conformity with CE marking and NRTL certification becomes invalid if the NTN globalized product is combined with an NTN product intended for the Japanese market or with a product from another manufacturer.
2. Post-processed products including bowls, tooling (aligning/orienting mechanisms) and the like are outside the scope of NTN's responsibility. A client who intends to export such products is responsible for undertaking the review and submitting a self-declaration for these products.

Important: Conformity with CE marking and NRTL certification can be rendered invalid if the NTN globalized product is used in certain environments. For further information, contact NTN Engineering.
The products listed on this page do not conform to the RoHS Directives.

Globalized controllers

Features



1. Globalization

These products conform to European CE marking and have acquired NRTL certification from the U.S.A. (which also conforms to the corresponding Canadian certification through the U.S.A.-Canada reciprocal-certification system).

2. Microcomputer control variable frequency function

The voltage and the frequency are digitally displayed. This allows easy setting and reproduction of optimum amplitude.

3. Constant voltage function

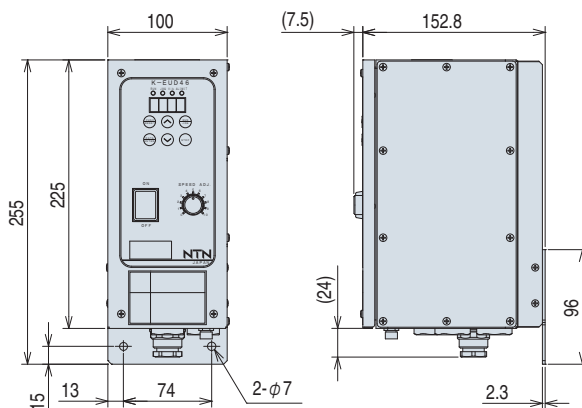
To ensure stable feeding of parts, the output voltage is maintained at a constant level even when the supply voltage fluctuates.

4. Constant amplitude function (Option)

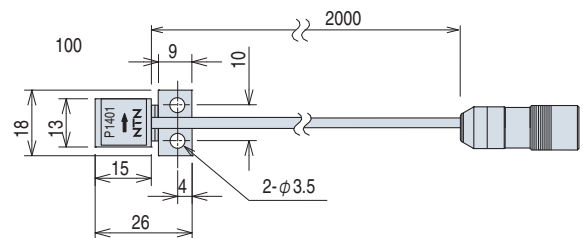
With addition of the optional vibration sensor (K-P1401), constant amplitude functions of the products can be used for highly accurate and stable feed of work pieces.

Globalized controllers

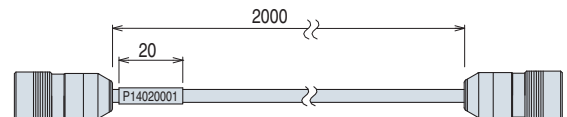
K-EUD46



Vibration sensor K-P1401 (optional)



Extension cable K-P1402 (optional)



Part No.	Control functions	Control capacity	Applicable parts feeders
K-EUD46	External control + synchronized operation (+ constant amplitude control ①)	4.0A	All models of NTN globalized parts feeders (See page 60.)

① For using the constant amplitude function, the optional vibration sensor K-P1401 is required.
For details about control functions and applicable parts feeders, contact NTN Engineering.

Model	K-EUD46
Supply voltage and frequency	Single-phase, 200–230 V AC $\pm 10\%$, 50/60 Hz
Input current (inrush current)	5 A (70 Ap max., first 1 cycle)
Control-drive system	Microcomputer control sine wave PWM method
Control capacity	Max. 4 A (effective value, continuous operation)
Soft start function	Available (variable time setting)
Constant voltage function	Output voltage remains within 3% in the event of a 10% variation in supply voltage. ①
Constant amplitude function (optional)	Amplitude variation remains within 3% under a 10% variation in supply voltage or work piece mass. ②
External control input	The parts feeder can be started or stopped with an external signal (polarized). Control with a PNP transistor is also possible.
Sensor input	Both NPN/PNP sensors can be used with a selector switch.
Operation signal output	This signal is output to an external device to signal that auto operation is in progress (relay contact).
Mass	About 3.5 kg

① When the output voltage is set from 60 to 170 V.

② This is a representative value obtained when the output voltage setting falls in the range of 100 to 170 V. Note that the constant amplitude performance can vary depending on the adjustment of the spring on the feeder.

Caution: The environment of use may mean the product is not applicable. For details, contact NTN Engineering.

This product is to be used in an environment with an industrial power supply. Do not connect it to ordinary power supplies such as residential products.
When combining with oscillating body including the body of a global correspondence series, it isn't possible to include in a target product of a RoHS order.

This product doesn't correspond to the overseas standard of anything.

Spring Untangling Feeder

The spring untangling feeder, compact and self-contained, can reliably feed springs, simultaneously untangling coil springs that often become entangled.



Features

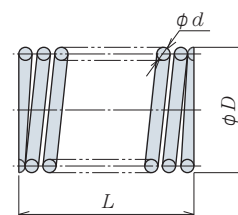
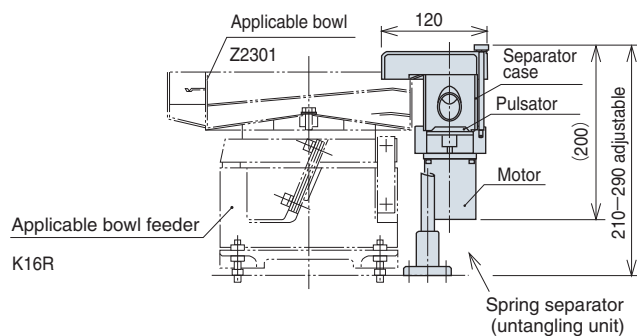
1. Effective spring untangling

The mechanical actions of rotor blades (pulsator) allows simultaneous untangling of virtually any kind of springs.

2. Compact construction

Compact, externally mounted spring untangling mechanism. Can be installed in confined spaces.

K16



Model, size	Part number	Rated voltage (V)	Rated current (A)	Vibration speed (Hz)	Mass (kg)	Applicable bowl	Applicable controller	Applicable works (mm)		
								ϕD	ϕd	L (max.)
(K16)	K-UP500	100	0.2	100/120	2.5	K-B16 Z2301	K-UE040 K-ECF25 ①	2-5	0.15-0.5	18
	K-UP501	200	0.1							

Remark 1) Bowl attachments are estimated separately.

2) To accurately determine if particular springs can be reliably untangled, a confidence test using actual work pieces is necessary.

3) The sorting function operates pneumatically except for certain types of work pieces.

① Always attach the special motor control unit (K-UE040). For details, contact NTN Engineering.

Note 1: The applicable controllers K-UE040 and K-ECF25 are both required.

Flexible feeder

Adoption of the Z spring in place of the standard spring on NTN parts feeder can provide optimum vibratory characteristics that are ideally suited to the physical properties of specific product parts and further expanded applications.

The Z springs are fully compatible with the vibratory drive units in the list below. Thus, the standard springs in your parts feeder can be replaced with the Z springs without any change in spring setting dimensions.

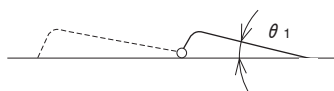
To set the feeder for a high speed application, fit the spacer on the upper end of the Z spring fitting part, as shown in Fig.1.

When feeding oil-contaminated pieces, or when parts feeding is sluggish due to a steep track slope, reverse the Z springs, and fit the spacer at the lower end of the Z spring fitting part as shown in Fig.3.

In this manner, any of three kinds of vibratory angles including the standard angle can be selected.

• For high-speed feeding

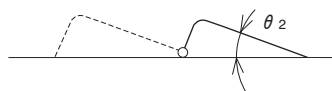
Feeding state



If the parts feeder can be adjusted to a lower spring setting angle, the jump stroke of the parts fed will be smaller, and consequently, feeding can be made smoother and faster.

• (Standard)

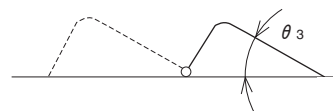
Feeding state



If the parts feeder is adjusted for a standard spring setting angle, its behavior will be intermediate between high-speed feeding and grade feeding. This setting will be suitable for virtually any standard product.

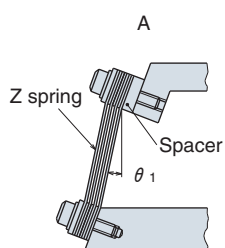
• For grade feeding

Feeding state



If the parts feeder is adjusted for a larger spring setting angle, the friction between the parts fed and the feeding surface will be greater. Consequently, grading will tend to be more stable, even at low speed.

Fig.1



B

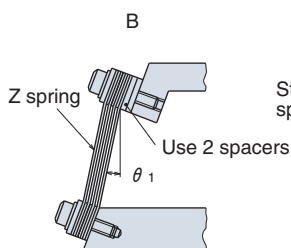


Fig.2

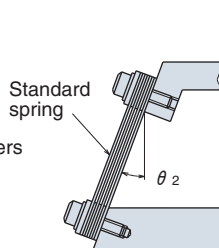
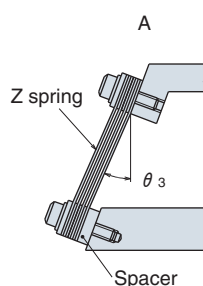
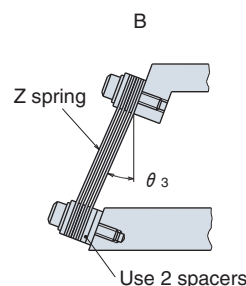


Fig.3



B



Model and size of parts feeder	Spring setting angle (°)			Part number of Z spring	Part number of spacer	Standard number per unit.	
	θ₁	(θ₂)	θ₃			Z spring (pcs.)	Spacer (pcs.)
K14	12	(20)	28	K-PLS2-50×9-1	K-P0430	20	4
K16	15	(22)	29	K-PLS2-67×12-2	K-P0427	20	4
N25	8	(15)	22	K-PLS2-86×20-1	K-P0426	18	3
N40(Full wave)	8	(15)	22	K-PLS2-86×20-1	K-P0426	24	4
K20(Half wave) ※2	※1	(15)	25	K-PLS2-116×20-2	K-P0408, K-P0426	9	3 Each
N40(Half wave) ※2	※1	(15)	25	K-PLS2-116×20-2	K-P0408, K-P0426	24	4 Each
G63 ※3	13	(20)	27	K-PLS2-250×70-1	K-P0423	16	16
S20	13	(20)	27	K-PLS4-70×12-1	K-P0411	16	2
S30	9	(15)	21	K-PLS4-86×15-1	K-P0431	10	2

※1 High-speed type (θ=5) of K20(Half wave) and N40 (Half wave) are unavailable.

※2 For K20(Half wave) and N40 (Half wave), fit two spacers of different thickness on the Z spring fitting part shown in Fig.1B and 3B.

※3 For G63, fit two spacers of same thickness on the Z spring fitting as shown in Fig.1B and 3B.

This product doesn't correspond to the overseas standard of anything.

NTN parts feeder

Leaf spring, vibration isolating leaf spring

K- PLS 2 - 86 × 20

Thickness (mm×10)
Spring hole pitch
Number of spring holes
Leaf spring code

Leaf spring

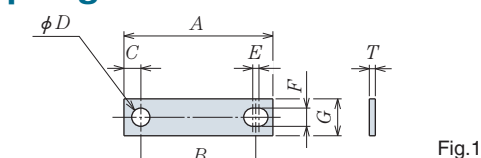


Fig.1

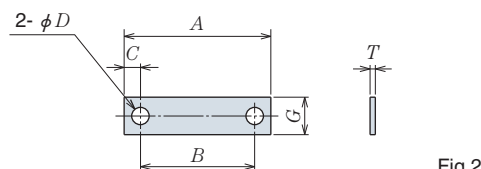


Fig.2

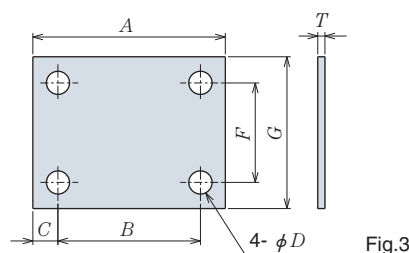
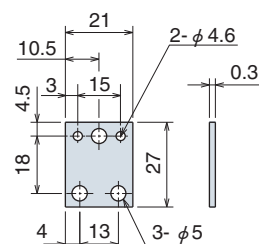


Fig.3

Vibration isolating leaf spring

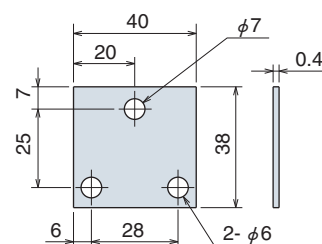
For HS05

K-PLS5-18×3-1



For HS07

K-PLS3-25×4



Part number	Fig.	Dimensions (mm)								Applicable unit
		A	B	C	D	E	F	G	T	
K-PLS4-32×3.5	3	25	14	5.5	5.5	—	32	44	0.35	Rubber insulator for S051 and S082
K-PLS2-35×5	1	46	35	5	5.1	2	5.2	10	0.5	K10, S051, S05A, S082
K-PLS2-35×9									0.9	HS05
K-PLS2-35×12									1.2	HF10
K-PLS2-50×7									0.7	K14
K-PLS2-50×9	2	64	50	7	8	—	—	14	0.9	K14
K-PLS2-50×20					7	—	—	14	2.0	HF14
K-PLS2-67×12-1					10	—	—	20	1.2	K16
K-PLS2-67×15					9	—	—	20	1.5	L20
K-PLS2-67×23					10	—	—	20	2.3	HF16
K-PLS2-86×15		106	86	10	12.2	—	—	35	1.5	V01, SV01, SV03
K-PLS2-86×20									2.0	N25, N40 (Full wave)
K-PLS2-116×20									2.0	N32, N40 (Half wave)
K-PLS2-116×35-1									3.5	K20 (Full wave)
K-PLS2-116×40					12.2	—	—	35	4.0	N32 (Full wave)
K-PLS2-150×25		136	116	10	13.5				2.5	N40 · 1
K-PLS2-150×30					12.2				3.0	N40 · 1
K-PLS2-180×40					14.2				4.0	G50 · 1
K-PLS2-250×60					19				6.0	G63
K-PLS2-250×70					21				7.0	G63
K-PLS4-40×6	3	54	40	7	7	—	28	42	0.6	S10, HS07
K-PLS4-70×9									0.9	V72
K-PLS4-70×12									1.2	S20, M05
K-PLS4-86×15									1.5	S30, M10, SV06
K-PLS4-85×16		115	85	15	13	—	120	150	1.6	V01, V03, V04
K-PLS4-85×16-1									1.6	V06, V08
K-PLS4-125×30									3.0	V12
K-PLS4-125×30									3.0	V12

NTN parts feeder

Magnet

K- PMG - 2 1 3

Number of bundled pieces
Voltage (1: For 100 V, 2: For 200 V)
Magnet size
Magnet code

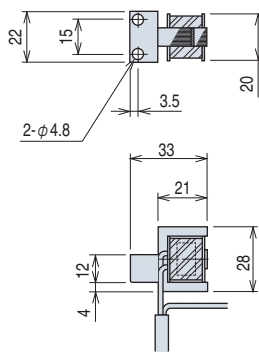


Fig.1

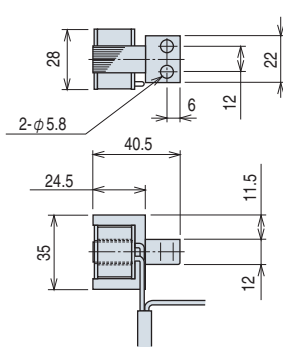


Fig.2

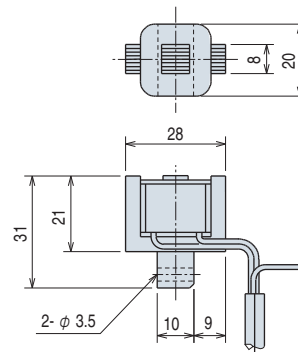


Fig.3

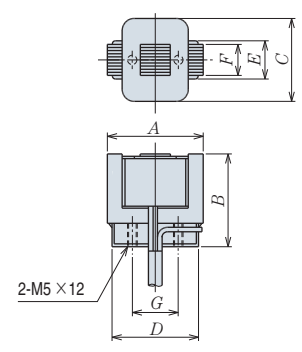


Fig.4

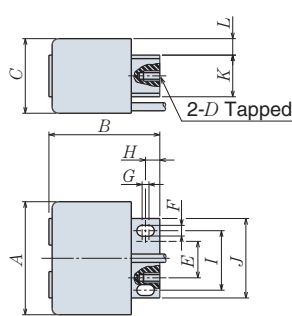


Fig.5

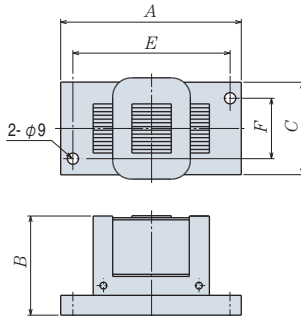


Fig.6

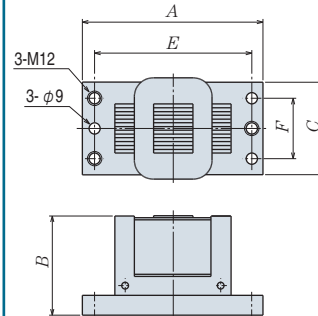


Fig.7

Part number	Fig.	Dimensions (mm)											Dimensions (mm)	Mass (kg)
		A	B	C	D	E	F	G	H	I	J	K		
K-PMG-011-5	1	—	—	—	—	—	—	—	—	—	—	—	S0511, S05A1	0.1
K-PMG-021-2		—	—	—	—	—	—	—	—	—	—	—	S0512, S05A2	0.1
K-PMG-017-3		—	—	—	—	—	—	—	—	—	—	—	S0821	0.2
K-PMG-027	2	—	—	—	—	—	—	—	—	—	—	—	S0822	0.2
K-PMG-011-4		—	—	—	—	—	—	—	—	—	—	—	HS05	0.1
K-PMG-017-1	4	41	39	31.5	36	16	13	20	M5×12	—	—	—	HS07	0.3
K-PMG-017-2		41	39	31.5	36	16	13	20	M5×12	—	—	—	HF14	0.4
K-PMG-027-1		41	39	31.5	36	16	13	20	M5×12	—	—	—	SV1, SV3	0.3
K-PMG-217-2		54	48	40.5	48	25	20.5	28	M6×12	—	—	—	HF16	1.0
K-PMG-1 $\frac{1}{2}$ 1-1	5	58	50	43	—	—	6.5	0	6	24	36	16	K10, S10, M05, V71	0.4
K-PMG-2 $\frac{1}{2}$ 1		78	75	48	—	—	7	4	10	37	54	22	S20, L20, M10, SV01, SV03	1.0
K-PMG-2 $\frac{1}{2}$ 1-1		78	75	48	M6×12	22	7	4	10	37	54	22	K14	0.9
K-PMG-2 $\frac{1}{2}$ 3		78	75	48	—	—	7	4	10	37	54	22	N25 3 pcs. bundled	3.0
K-PMG-311-1		90	87	60	—	—	8.5	5	11	44	66	33	V01—V08	1.7
K-PMG-321		90	87	60	—	—	8.5	5	11	44	66	33	S30, V01—V12, SV06	1.9
K-PMG-311-3		90	87	60	M6×13	28	8.5	5	11	44	66	33	K16	1.5
K-PMG-321-4		90	87	60	M6×13	28	8.5	5	11	44	66	33	K16	1.7
K-PMG-323		90	87	60	—	28	8.5	5	11	44	66	33	N32-2, half wave, 3 pcs. bundled	5.7
K-PMG-323-1		90	87	60	—	28	8.5	5	11	44	66	33	N32-2, full wave, 3 pcs. bundled	5.7
K-PMG-324		90	87	60	—	—	8.5	5	11	44	66	33	N40, N40-1 (4 pcs. bundled)	7.5
K-PMG-411-1	6	110	70	75	—	80	56	—	—	—	—	—	K20 100V, full wave	2.3
K-PMG-411-2													K20 100V, half wave	2.4
K-PMG-421-1													K20 200V, full wave	2.3
K-PMG-421-2													K20 200V, half wave	2.4
K-PMG-521	7	144	82	75	—	128	60	—	—	—	—	—	G63 · 2	4.5
K-PMG-521-1													G50 · 1	4.3

This product doesn't correspond to the overseas standard of anything.

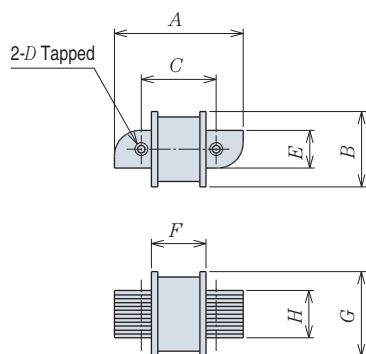
NTN parts feeder

F-shape magnet, rubber insulator, armature

K - PIR - 40

Rubber insulator
outer dia.
Rubber insulator
code

F-shape magnet



Rubber insulator

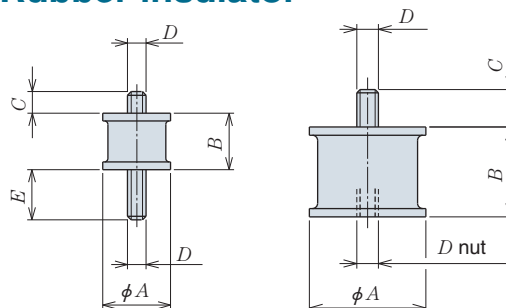


Fig.1

Fig.2

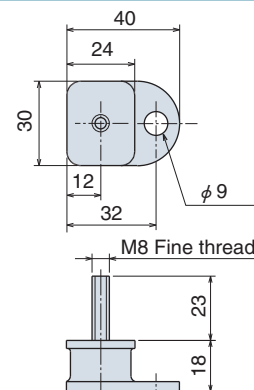


Fig.3

Part number	Dimensions (mm)								Applicable unit
	A	B	C	D	E	F	G	H	
K-PMG-119-1	58	34	34	M4	16.6	24	39	22	HF10

Part number	Fig.	Dimensions (mm)					Applicable unit
		A	B	C	D	E	
K-PIR-15	1	15	15	15	M5	15	K14
K-PIR-25	1	25	20	8	M6	18	K16, S10, S20, V72, SV01, SV03, SV1, SV3
K-PIR-302	3	—	—	—	—	—	HF10, HF14, HF16
K-PIR-40	2	40	30	13	M8	—	N25, S30, V01—V08, K20
K-PIR-50	2	50	40	17	M10	—	N32, N40, N40*1, G50, G63*2, V12

Armature

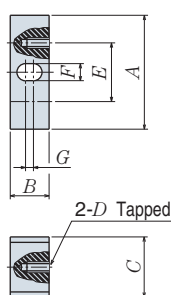


Fig.1

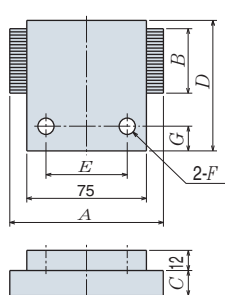


Fig.2

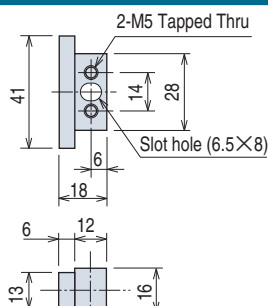


Fig.3

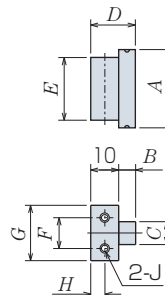


Fig.4

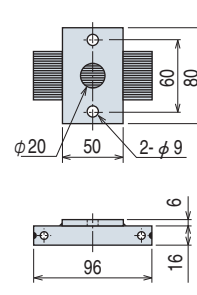


Fig.5

Part number	Fig.	Dimensions (mm)									Applicable magnet	Applicable unit
		A	B	C	D	E	F	G	H	I		
K-P0300	1	36	16	16	—	—	6.5	4	—	—	K-PMG-1 $\frac{1}{2}$ 1-1	K10, S10, M05, V71
K-P0301		54	20	22	—	—	7	4	—	—	K-PMG-2 $\frac{1}{2}$ $\frac{1}{2}$ $\frac{1}{2}$	N25, S20, L20, M10, SV01, SV03
K-P0302		66	22	33	—	—	8.5	5	—	—	K-PMG-311-1	N32, N40, S30, V01—V12, SV06
											K-PMG-321	
K-P0303		54	20	22	M5×10	30	7	4	—	—	K-PMG-2 $\frac{1}{2}$ 1-1	K14
K-P0317		66	22	33	M6×13	34	8.5	5	—	—	K-PMG-311-3, K-PMG-321-4	K16
K-P0310	2	105	60	17.5	100	40	φ 12	15	—	—	K-PMG-521	G63·2
K-P0311	3	—	—	—	—	—	—	—	—	—	K-PMG-017- $\frac{1}{2}$	HF14, HS07, SV1, SV3
K-P0320	4	20.5	9	54	21	25	26	42	6	M6×15	K-PMG-217-2	HF16
K-P0315	4	28	4	8	13	22	11	20	3	M3×12	K-PMG-011-3	HS05
K-P0314	2	105	60	17.5	70	40	M10	35	—	—	K-PMG-521-1	G50·1
K-P0321	5	—	—	—	—	—	—	—	—	—	K-PMG-411- $\frac{1}{2}$, K-PMG-421- $\frac{1}{2}$	K20
K-P0318	—	—	—	—	—	—	—	—	—	—	K-PMG-011-5, K-PMG-021-2	S05
K-P0319	—	—	—	—	—	—	—	—	—	—	K-PMG-017-3, K-PMG-027	S08

Dimensions of parts feeder peripherals

Bowl mounting flange																																																		
K-P0100 For N25 Material; Aluminum P.C.D250 $\phi 225^{+0}_{-0.15}$ 8-7.5 Drill Thru $\phi 165^{+0.15}_{-0.05}$ 25	K-P0129 For N32 Material; Aluminum $\phi 300$ P.C.D280 $\phi 230^{-0.05}_{-0.15}$ 6-9 Drill Thru 35 $\phi 230^{+0.3}_{+0.1}$	K-P0101 For N40 Material; Aluminum P.C.D400 $\phi 365^{+0}_{-0.5}$ 6-9.5 Drill Thru 35 $\phi 300^{+0.5}_{+0.1}$																																																
Bowl center fixture																																																		
K-UT001 For B25 Material; Aluminum (SS400) (SUS303) K-PZ0243 K-PZ0242 K-PZ0244 K-PZ0245	K-UT002 Manufactured only on special order. For B40 Material; Aluminum (SS400) (SUS303) K-PZ0228 K-PZ0227 K-PZ0241 K-PZ0226 K-PZ0238																																																	
Fixed type mount																																																		
For S10, 20 Material; SS400 4-$\phi 9$ $B \pm 1$ C $A \pm 1$ D 4-M10 Nut 4 4 H <table><tr><th>Component part number</th><th>H</th><th>A</th><th>B</th><th>C</th><th>D</th><th>Unit (mm) Applicable to</th></tr><tr><td>K-PZ9513</td><td>100</td><td>110</td><td>90</td><td>120</td><td>140</td><td>S10</td></tr><tr><td>K-PZ9514</td><td>150</td><td>110</td><td>90</td><td>120</td><td>140</td><td>S10</td></tr><tr><td>K-PZ9515</td><td>200</td><td>110</td><td>90</td><td>120</td><td>140</td><td>S10</td></tr><tr><td>K-PZ9516</td><td>70</td><td>155</td><td>135</td><td>160</td><td>185</td><td>S20</td></tr><tr><td>K-PZ9517</td><td>110</td><td>155</td><td>135</td><td>160</td><td>185</td><td>S20</td></tr><tr><td>K-PZ9518</td><td>150</td><td>155</td><td>135</td><td>160</td><td>185</td><td>S20</td></tr></table>	Component part number	H	A	B	C	D	Unit (mm) Applicable to	K-PZ9513	100	110	90	120	140	S10	K-PZ9514	150	110	90	120	140	S10	K-PZ9515	200	110	90	120	140	S10	K-PZ9516	70	155	135	160	185	S20	K-PZ9517	110	155	135	160	185	S20	K-PZ9518	150	155	135	160	185	S20	K-PZ0530 For S30 Material; FC200 310 11 70 40 350 160 200 4-M12 15 15 150
Component part number	H	A	B	C	D	Unit (mm) Applicable to																																												
K-PZ9513	100	110	90	120	140	S10																																												
K-PZ9514	150	110	90	120	140	S10																																												
K-PZ9515	200	110	90	120	140	S10																																												
K-PZ9516	70	155	135	160	185	S20																																												
K-PZ9517	110	155	135	160	185	S20																																												
K-PZ9518	150	155	135	160	185	S20																																												

Dimensions of parts feeder peripherals

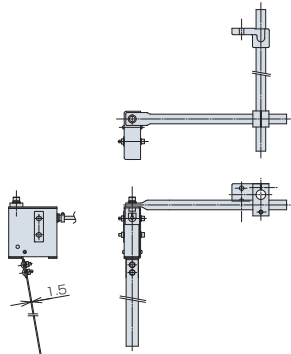
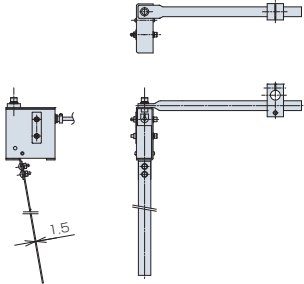
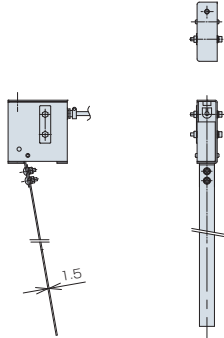
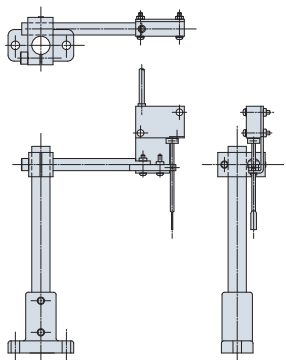
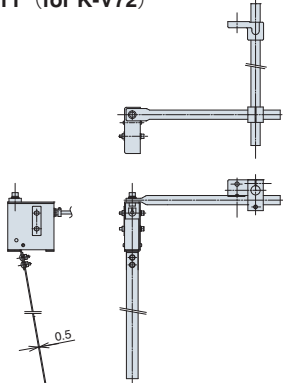
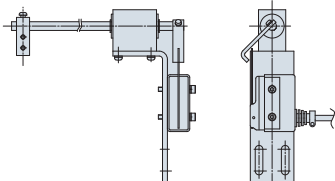
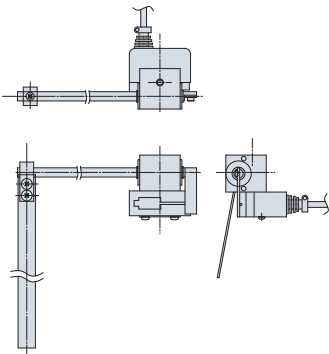
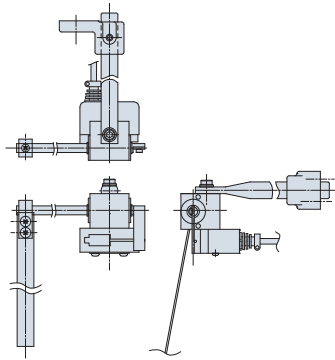
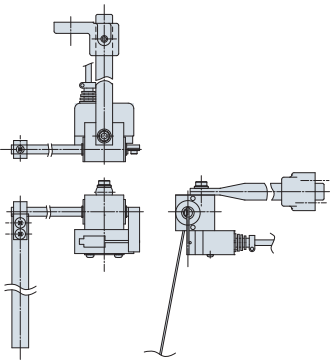
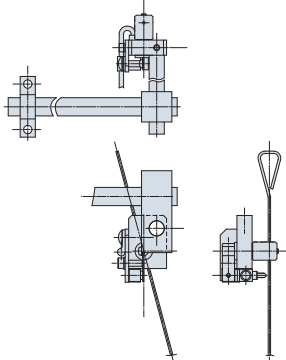
This product doesn't correspond to the overseas standard of anything.

Stay mounting parts		
K-PZ0501 For N25 Material; FC200	K-PZ0568 For N32 Material; FC200	K-PZ0511 For N40 Material; FC200
Stay mounting parts		
K-P1153 For φ 15 Material; Aluminum	K-P1152 For φ 15 Material; FC200	K-PZ0509 For φ 15 Material; ZDC2
Stay mounting parts		
K-PZ0503 For φ 20 Material; FC200	K-PZ0504 For φ 20 Material; FC200	K-PZ0505 For φ 20 Material; FC200

Clamps		
K-P0800 For N25 Material; FCD50 Top view dimensions: 11, 22, 30, 11, 25, 25, 75, 85. Side view dimensions: 7, 8, 2, 19, 21.	K-P0801 For N32, N40, G50 Material; FCD50 Top view dimensions: 17, 25, 30, 17, 40, 90, 105. Side view dimensions: 10, 9, 2, 27, 30, 18.	K-PZ0510 For standard round base Material; FCD50 Top view dimensions: 21, 43, 30, 11, 35, 110, 120. Side view dimensions: 23, 18, 12, 43, 92, 10, 5, 12.

Dimensions of parts feeder peripherals

This product doesn't correspond to the overseas standard of anything.

Level switch		
K-UE001 (K-V01 — V12) 	K-UE002 (K-V01 — V12) 	K-UE003 (K-V01 — V12) 
K-UE010 (Ultra-light hydraulic) 	K-UE011 (for K-V72) 	K-UE012 (For auxiliary hopper) 
K-UE014 (K-SV01 — SV06) 	K-UE015 (K-SV01, K-SV03) 	K-UE016 (K-SV06) 
K-UE017 (K-SV1, K-SV3) 		

Controller options	
Vibration sensor for small variable frequency controller K-P1398	Vibration sensor for small variable frequency controller Extension cable K-P1400
Round base fixture for small variable frequency controller K-PZ0466	Power supply cable for small variable frequency controller K-P1403 (1.5m) K-P1404 (2.0m) *Can also be used for K-EDA46
Vibration sensor for globalized controllers K-P1401	Vibration sensor for globalized controllers Extension cable K-P1402

Light grip and Sunline belt Part Nos.

This product doesn't correspond to the overseas standard of anything.

Light grip and Sunline belt Part Nos.

Cascade bowl

	Applicable bowl	Light grip Part No.	Sunline belt Part No.
B16	B16RC2601	K-PZ0335	K-PZ0351
	B16LC2601	K-PZ0336	K-PZ0352
B20	B20RS3201	K-PZ8516	K-PZ8515
	B20LS3201	K-PZ8518	K-PZ8517
B25	B25RC ^D _B 33	K-PZ0200	K-PZ0353
	B25LC ^D _B 33	K-PZ0201	K-PZ0354
	B25RC ^D _B 39	K-PZ0202	K-PZ0355
	B25RC ^D _B 391	K-PZ0202	K-PZ0355
	B25LC ^D _B 39	K-PZ0203	K-PZ0356
	B25LC ^D _B 391	K-PZ0203	K-PZ0356
	B25RSD39	K-PZ0202	K-PZ0355
	B25RSD391	K-PZ0202	K-PZ0355
	B25LSD39	K-PZ0203	K-PZ0356
	B25LSD391	K-PZ0203	K-PZ0356
B32	B32RSD491	K-PZ8500	K-PZ8504
	B32LSD491	K-PZ8502	K-PZ8506
	B32RSF491	K-PZ8501	K-PZ8505
	B32LSF491	K-PZ8503	K-PZ8507
B40	B40RC ^D _B 54	K-PZ0204	K-PZ0357
	B40LC ^D _B 54	K-PZ0205	K-PZ0358
	B40RC ^D _B 58	K-PZ0206	K-PZ0359
	B40LC ^D _B 58	K-PZ0207	K-PZ0360
	B40RC ^D _B 64	K-PZ0208	K-PZ0361
	B40RC ^D _B 641	K-PZ0208	K-PZ0361
	B40LC ^D _B 64	K-PZ0209	K-PZ0362
	B40LC ^D _B 641	K-PZ0209	K-PZ0362
	B40RSD54	K-PZ0204	K-PZ0357
	B40LSD54	K-PZ0205	K-PZ0358
	B40RSD58	K-PZ0206	K-PZ0359
	B40LSD58	K-PZ0207	K-PZ0360
	B40RSD64	K-PZ0208	K-PZ0361
	B40RSD641	K-PZ0208	K-PZ0361
	B40LSD64	K-PZ0209	K-PZ0362
	B40LSD641	K-PZ0209	K-PZ0362
	B63RC ^D _B 83	K-PZ0337	K-PZ0363
	B63LC ^D _B 83	K-PZ0338	K-PZ0364
B63	B63RSD83	K-PZ0337	K-PZ0363
	B63LSD83	K-PZ0338	K-PZ0364

Straight wall bowl

Upper stage: For bowl bottom
Lower stage: For bowl track

	Applicable bowl	Light grip Part No.	Sunline belt Part No.
B14	B14RZ2001	K-PZ0348 K-PZ0349	K-PZ0365 K-PZ0366
	B14LZ2001	K-PZ0350 K-PZ0349	K-PZ0367 K-PZ0366
B16	B16RZ2301	K-PZ0296 K-PZ0297	K-PZ0368 K-PZ0369
	B16LZ2301	K-PZ0298 K-PZ0297	K-PZ0370 K-PZ0369
	B16RZ2302	K-PZ0246 K-PZ0247×2	K-PZ0371 K-PZ0372×2
	B16LZ2302	K-PZ0248 K-PZ0247×2	K-PZ0373 K-PZ0372×2
	B16RZ2501	K-PZ0299 K-PZ0300	K-PZ0374 K-PZ0375
	B16LZ2501	K-PZ0301 K-PZ0300	K-PZ0376 K-PZ0375
B20	B20RZ2801	K-PZ8519 K-PZ8520	K-PZ8522 K-PZ8523
	B20LZ2801	K-PZ8521 K-PZ8520	K-PZ8524 K-PZ8523
	B20RZ3003	K-PZ0302 K-PZ0303	K-PZ0377 K-PZ0378
	B20LZ3003	K-PZ0304 K-PZ0303	K-PZ0379 K-PZ0378
B25	B25RZ ^D _F 30	K-PZ0302 K-PZ0303	K-PZ0377 K-PZ0378
	B25LZ ^D _F 30	K-PZ0304 K-PZ0303	K-PZ0379 K-PZ0378
	B25RZ ^D _F 301	K-PZ0249 K-PZ0250×2	K-PZ0380 K-PZ0381×2
	B25LZ ^D _F 301	K-PZ0251 K-PZ0250×2	K-PZ0382 K-PZ0381×2
	B25RZ ^D _F 302	K-PZ0302 K-PZ0303×2	K-PZ0377 K-PZ0378×2
	B25LZ ^D _F 302	K-PZ0304 K-PZ0303×2	K-PZ0379 K-PZ0378×2
	B25RZ ^D _F 35	K-PZ0305 K-PZ0306	K-PZ0383 K-PZ0384
	B25LZ ^D _F 35	K-PZ0307 K-PZ0306	K-PZ0385 K-PZ0384
B32	B25RZ ^D _F 35 1/2	K-PZ0305 K-PZ0306×2	K-PZ0383 K-PZ0384×2
	B25LZ ^D _F 35 1/2	K-PZ0307 K-PZ0306×2	K-PZ0385 K-PZ0384×2
B32	B32RZ ^D _F 401	K-PZ8508 K-PZ8509	K-PZ8511 K-PZ8512
	B32LZ ^D _F 401	K-PZ8510 K-PZ8509	K-PZ8513 K-PZ8512
B40	B40RZ ^D _F 45	K-PZ0308 K-PZ0309	K-PZ0386 K-PZ0387
	B40LZ ^D _F 45	K-PZ0310 K-PZ0309	K-PZ0388 K-PZ0387
	B40RZF45 1/2	K-PZ0308 K-PZ0309×2	K-PZ0386 K-PZ0387×2
	B40LZF45 1/2	K-PZ0310 K-PZ0309×2	K-PZ0388 K-PZ0387×2
	B40RZ ^D _F 50	K-PZ0311 K-PZ0312	K-PZ0389 K-PZ0390
	B40LZ ^D _F 50	K-PZ0313 K-PZ0312	K-PZ0391 K-PZ0390
	B40RZ ^D _F 50 1/2	K-PZ0311 K-PZ0312	K-PZ0389 K-PZ0390
	B40LZ ^D _F 50 1/2	K-PZ0313 K-PZ0312	K-PZ0391 K-PZ0390
	B40RZF55	K-PZ0314 K-PZ0315×2	K-PZ0392 K-PZ0393×2
	B40LZF55	K-PZ0316 K-PZ0315×2	K-PZ0394 K-PZ0393×2
	B40RZF60	K-PZ0317 K-PZ0318×2	K-PZ0395 K-PZ0396×2
	B40LZF60	K-PZ0319 K-PZ0318×2	K-PZ0397 K-PZ0396×2