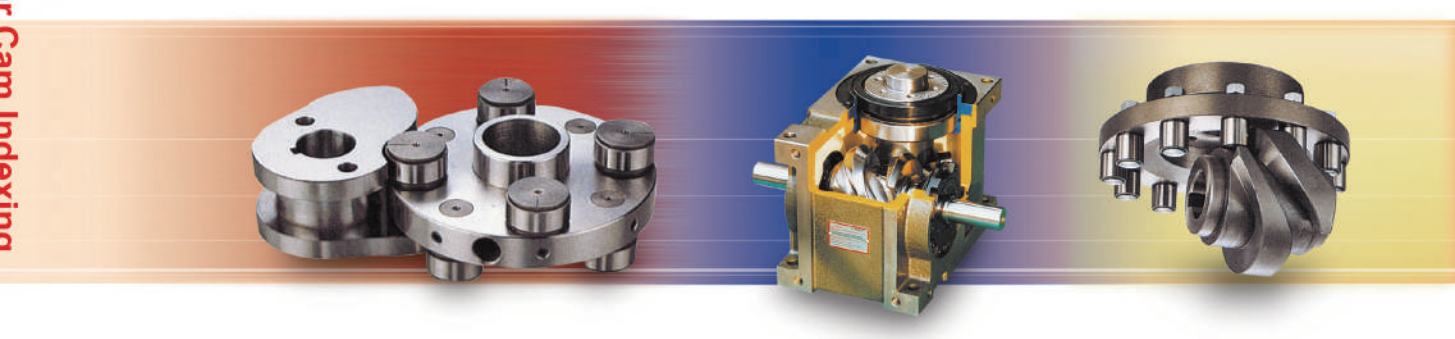
高速精密間歇分割器

TAN TZU®
Indexing Drives

高速精密
間歇分割器

- Parallel Cam Indexing
- Roller Gear Cam Indexing
- Barrel Cam Indexing



尊嚴

帶著一顆善良的心，
健康的人文，有責任的態度生活，
努力讓自己成為一個有德行的人

ISO 9001

IT'S VERY WELL MADE IN TAIWAN

Roller Gear Cam Indexing

TAN TZU Indexing Drives

2013

Contents

Stringent Quality

Hardness testing machine

Mitutoyo Three-dimensional measurement instrument

Mitutoyo Roundness measuring instrument

Agilent Laser measurement system

Using the world's largest manufacturer Agilent laser interferometer laser dynamic calibrator, In the world's highest standard of 0.4ppm precision standard, Accuracy calibration measurement and numerical analysis, and strict monitoring during the entire workpiece manufacturing processes, improve workpiece yield, maintain the Tan Tzu product at high precision, high accuracy, and excellent performance of high efficiency.

Features

1. Simple mechanism:
Composed of only a cam and turret; no unnecessary parts, while providing any intermittent motion needed.

2. Positive driving mechanism:
Even at the moment of indexing or dwell, the follower is secured in place within the prescribed position, thereby eliminating the need for any locking elements.

3. Smooth motion:
As the turret is designed to rotate continuously in any position (regardless of angle, speed and/or acceleration) the driving motion is smooth and free of vibration and noise.

4.High indexing accuracy:
TAN TZU's specially designed cam follower within the index drive ensures heavy load capability while maintaining high indexing accuracy and high torque. The indexing accuracy of the standard models is ±30 seconds. However, models providing higher indexing accuracy are available upon request.

5. High speed performance:
Backlash is completely eliminated by applying a preload to the tapered-rib of the precision machined cam and the cam follower, resulting in reliable high speed operation. Fully controlled acceleration minimizes shock due to load or vibration.

6. A variety of models available:
Our standard models available vary accordingly:
- Eleven types for the number of stops
- Five types for indexing angles
- Seventeen types for housings

7. Motion curves:
Modified trapezoid curve, modified sine curve, modified constant velocity curve and RBS curve are available corresponding to required applications.

8. Unique installation:
Unlike other indexing mechanisms, TAN TZU index Drives are compact and thus can be installed at various angles.

9. Maintenance-free construction:
Aside from oil replacement, no maintenance is required for up to 10,000 hours.

Mechanism & Stucture

TAN TZU index Drives are so designed that the globoidal cam installed in the input shaft mates with the turret fixed to the output shaft as shown in Fig. 1.The cam follower which is radially embedded in the circumferential surface of the turret comes into linear contact with the tapered rib of the cam to their respective wall surfaces.

When the input shaft is rotated, the cam follower rotates the turret following a given displacement curve while rolling along the wall surface of the rib. In the area where the rib is parallel with the end surface of the cam, that is , in the stationary range, the follower turns on its axis, but the turret itself does not rotate.

The tapered rib always comes into contact with two or three cam followers so that the revolution of the input shaft may be evenly transmitted of the output shaft.

If there is backlash between the cam surface of the tapered rib and cam follower may sometimes damage.

This backlash can be completely removed by rotating the eccentric flange supporting the input shaft and shortening the distance between the input shaft and the output shaft. In other words, the backlash can be eliminated by adjusting the distance between the shafts. Also the rigidity of the indexing drive can be enhanced by adjusting the preload appropriately within the elastic region of the cam follower and cam.

Its structure and function are the most outstanding features of this combination of globoidal cam and cam follower, making it capable of high speed operation.

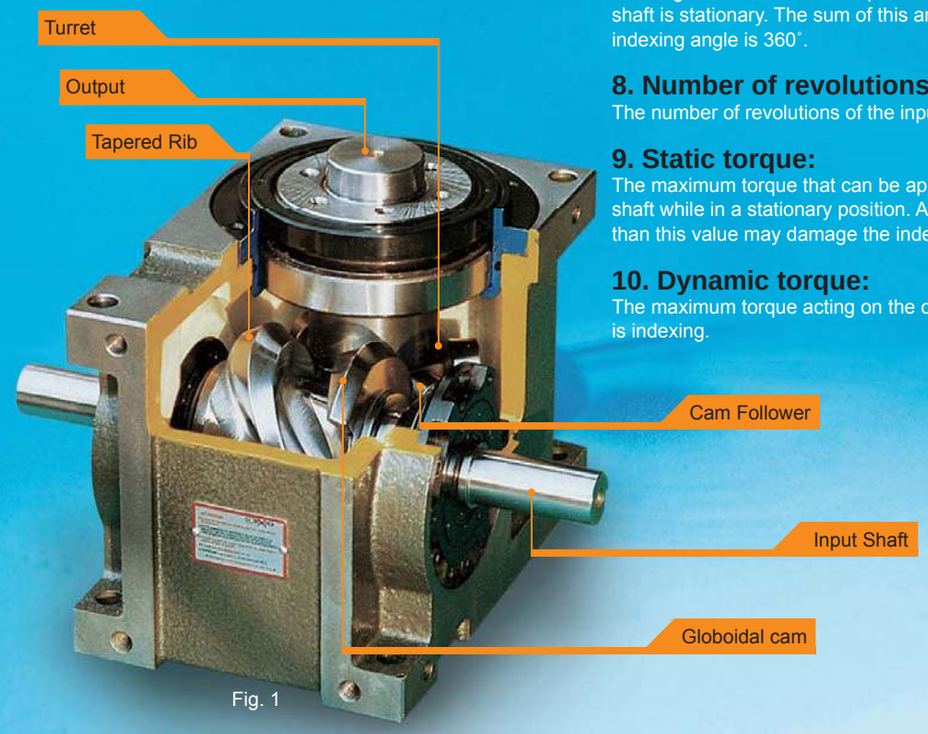


Fig. 1

Terms & Definitions

1. Globoidal cam:
A cam in which a groove is cut into the surface of a drum-shaped solid body and fixed to the input shaft.

2. Tapered rib:
The tapered rib is located on the circumference of the globoidal cam, between the cam grooves, coming into linear contact with the circumference of the cam follower.

3. Cam follower:
This precision-designed cam follower use a needle bearing developed by TAN TZU and designed to withstand heavy loads.

4. Turret:
Attached to the output shaft while the followers are radially embedded in the turret. It's accuracy is the most important factor in the production of TAN TZU index drives.

5. Number of stations:
The number of stations per revolution of the output shaft.

6. Indexing angle (Cam indexing angle):
The angles of rotation of the input shaft required to perform an index motion once. The greater the angle, the smoother the motion.

7. Dwell angle:
The angle of rotation of the input shaft when the output shaft is stationary. The sum of this angle and the indexing angle is 360°.

8. Number of revolutions:
The number of revolutions of the input shaft.

9. Static torque:
The maximum torque that can be applied to the output shaft while in a stationary position. Applying torque more than this value may damage the index drive.

10. Dynamic torque:
The maximum torque acting on the output shaft while it is indexing.

Motion Diagram

There are countless curves connecting two points in space.

This is also true of the motion diagrams used for index drives, where there are innumerable curves connecting the starting point with the ending point. However, when designing a motion in indexing, it is necessary to use a curves as smooth as possible. To this end, vibration, noise and rigidity of materials should be taken into account. Also load and speed should be considered.

After all factors are taken into consideration, curves emphasizing the characteristics of the speed, acceleration and jerk are usually used. Acceleration, especially has a particularly important affect upon the indexing accuracy and the life of the cam follower. The displacement curve represents the relationship between the displacement (time, angle of rotation etc.) of the input shaft and the displacement of the output shaft as shown in Fig. 2. Here the axis of the abscissa indicates the displacement of the input shaft and the ordinate axis indicates the displacement of the output shaft.

The motion diagram are classified as follows:

1. **Discontinuous curve**
2. **Double stationary symmetric curve**
3. **Double stationary asymmetric curve**
4. **Single stationary curve**
5. **Non-stationary curve**

The discontinuous curve (1) includes the constant velocity curve and the constant acceleration curve. These curves are not desirable because speed and acceleration are discontinued, causing great shock.

The double stationary symmetric curve (2) includes the cycloidal curve and the modified trapezoid curve. As these curves are continuous with respect to speed and acceleration, they are desirable. Moreover, even if the rotating direction of the input shaft is reversed, the same motion can be obtained.

The double stationary asymmetric curve (3) includes the asymmetric cycloidal curve and the asymmetric trapezoid curve. These curves are suitable for high speed rotation because the deceleration range is longer than the acceleration range in order to control the amount of vibration in the deceleration range. The single stationary curve (4) includes the double chord curve and the single chord curve. They are used when a stationary condition is needed on one side only. The non-stationary curve (5) includes the non-stationary modified curve and the single chord curve. The curves are non-stationary on both sides.

The curves (4) and (5) are used for the oscillation motion. In this case, speed and acceleration should be continued.

Displacement Curve

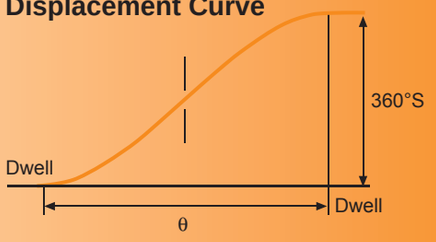


Fig. 2

Acceleration Diagram
(Modified Trpezoid)

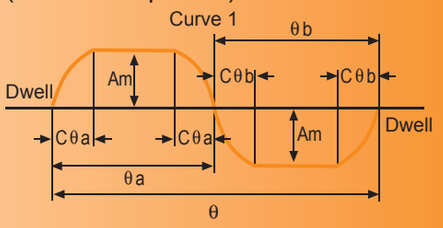


Fig. 3

$\theta a = \theta b = \frac{\theta}{2}$ C = 0.25

Acceleration Diagram
(Modified Sine)

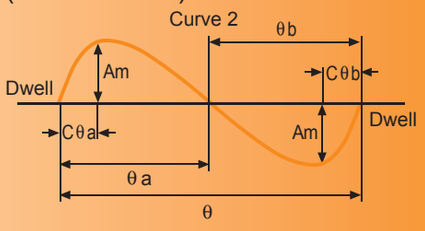


Fig. 4

$\theta a = \theta b = \frac{\theta}{2}$ C = 0.25

When selecting a cam curve, it is necessary to consider the following characteristic values:

Vm → Maximum velocity
Am → Maximum acceleration
Jm → Maximum jerk
(AxV)m/Am → Maximum cam-shaft torque coefficient

If Vmis large, a great force will be exerted at the time of a sudden stop so a smaller Vm is usually preferred. Particularly if a load is heavy, it is necessary to select a curve with a smaller Vm. In addition, Vm is closely related to the size of a cam. Therefore, the size of a cam should be reduced accordingly if the curve has a small Vm. Also, Vm never becomes smaller than 1.

In the case of a cam with a curve with a large Am, the maximum allowable load becomes small. So when it is driven at a high speed, it is necessary to select a curve with a small Am. In this case,, the Am is never smaller than 4. Jm is related to a vibration and so a smaller Jm is preferable.

The standard curves for TAN TZU Index Drive consists of the following 4 types:

Modified Trapezoid Curve:
For high speeds and light loads → Fig.3

Modified Sine Curve:
For middle/high speeds and medium loads → Fig.4

Modified Constant Velocity Curve:
For low speeds and heavy loads → Fig.5

RBS Curve(TAN TZU rational B Spline):
For vibration control → Fig.6

Special curves other than the above are available upon request.

Acceleration Diagram
(Modified Const. Velocity)

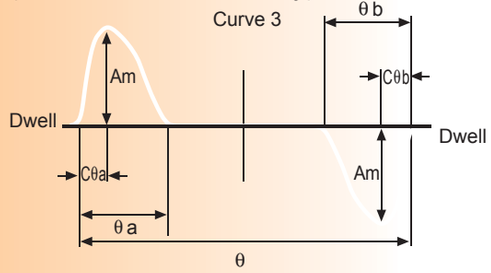


Fig. 5

$\theta a = \theta b = \frac{\theta}{4}$ C = 0.25

Acceleration Diagram
RBS

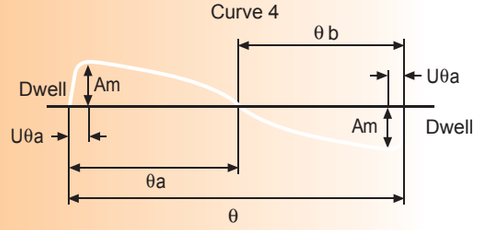
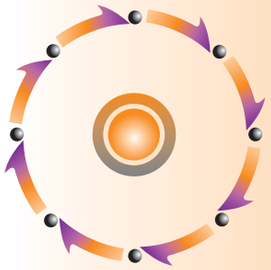


Fig. 6

$\theta a = \theta b = \frac{\theta}{2}$

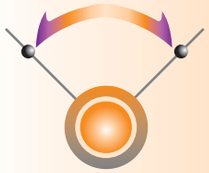
Overview

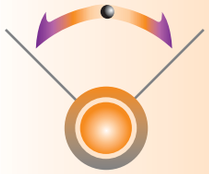


Indexing Drives

- The indexing drives operate intermittently as follows:

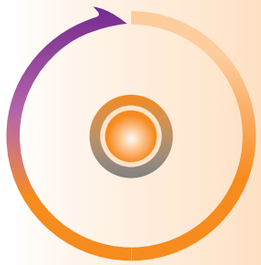
  Dwell→AEIndex→AEDwell→AEindex.
- Dwell: Output shaft stops rotating and cam follower touches the straight part of taper rib of roller gear cam.
- Index: Output shaft rotates and cam follower touches the curve part of taper rib of roller gear cam.
- Usually, the indexing drives dwells for a moment after input shaft rotates once and then output shaft indexes once.
- After output shaft rotates, the indexing drives dwell. At this moment, the operators can decide the locations of the indexed products and start to work on processing, assembling and examining.
- The rotary table on the output shaft can be used as the central driving power of the automatic rotary machinery.
- While the sprocket or pulley is installed on the output shaft, the chain/belt-driven conveyer shall drive intermittently the in-line automatic machinery.





Oscillating Drives

- When oscillating drives are in operation, the rotary input shaft with equal speed will make the output shaft rotate forward and backward.
- Besides rotating forward and backward, the rotation central point and the rotation angle degree can be set to some extent.
- Because there are two cam followers carrying one continuously operating taper rib, the sub-pressure generated from cam and the cam followers shall contribute to a good rotation and avoid backlash problems.
- While an oscillating arm is installed on the output shaft and a roller in the front of the oscillating drives, the device can be guided to move forward straight and used as a transporting equipment.
- If the oscillating drive is designed as an intermittent index equipment to rotate while indexing or dwelling, the stability and velocity of the machinery shall be increased.

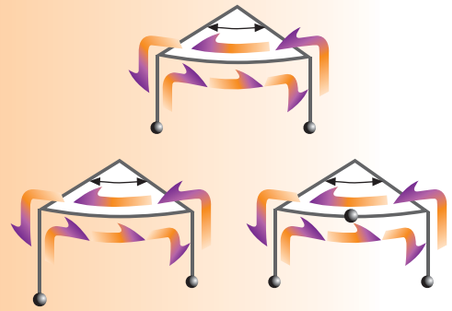


Roller Drives

- Roller drives is a kind of gear-down engine, providing stable rotation, no backlash and excellent torque.
- Because the roller gear cam and the cam follower match each other while rotating, the machinery can operate efficiently.
- In addition to as a gear-down machine, it can be also used as a device to determine the final position while indexing table.

Oscilate Handler

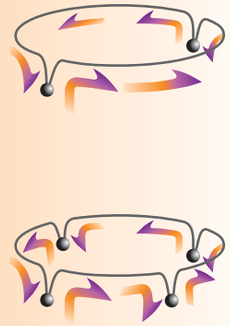
- When oscillating drives are in operation, the rotary input shaft with equal speed shall make the output shaft rotate forward and backward and lift in two dimensions.
- The output shaft can be set to stop at the central point of rotation path while oscillating. The rotary angle degree and lifting capacity can be also set.
- Oscillate handler, applying stereoscopic cams, can provide correct timing. Overlap of rotating and lifting and timing can be set.
- The oscillate handler can make a transportation from conveyor to operation table.



Index Handler

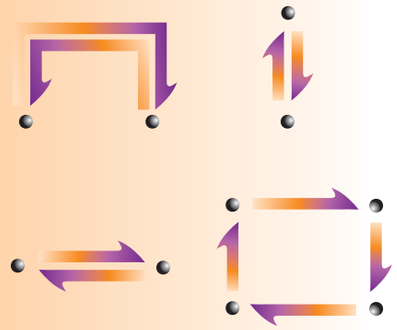
- Index handler can rotate and lift in two dimension intermittently. The operation procedures are as follows:

  Dwell→AELift→AEIndex→AELift→AEDwell
- Output shaft can be set to stop at the central point of rotation path while indexing intermittently. The rotary angle degree and lifting capacity can be also set.
- Index handler, applying stereoscopic cams, can provide correct timing. Overlap of rotating and lifting and timing can be set.
- Index handler can be used as a conveyer that can move along with the indexing direction and make other actions while transporting.



Parts Handler

- Parts handler is a device for linear/2-d linear handling.
- Since parts handler has two sets of roller gear cams, timing can be set independently to make two-dimension actions.
- Because parts handler can work easily with other equipment at the same time, it can handle the parts to the table by going with the speed of conveyor.



Assembly Notices

Selection of Models

Each unit has its own limitations of torque load. Calculate the torque load with the formula in our catalog and choose the most suitable model. If you have any question on choosing machine models, please contact us.

Installing Input Shaft and Output Shaft

- **Fixing Method**

  Fixing methods for the driven units, such as coupling, pulley, sprocket wheel and round table, are also follows:

  1. Fixing spanner
  2. Fixing key
  3. Fixing flange

  No clearance between keys shall be noticed while using keys. Working with ratio fixing shown as the figure shall be more efficient.

- **Input Shaft Driving**

  If the input shaft does not rotate smoothly, the torque will be over-loaded and the machinery will rock and make noise and then break down.

  The gear-down engine is connected with spiral gear-down engine with small backlash or supiroido gear-down engine. Timing belt is used for the driving of gear-down engine.

Overload Protection Unit

To avoid accident and unit damage, it is necessary to install the overload protection unit. Please set the torque of the unit to a proper value and install the unit in the back of the output shaft.

Maintenance

Change the lubricant for the first time after the unit operates for 500~1000 hours (2~4mouths). Afterward, you can change it once or twice a year. Lubricant shall be getting less effective regardless of using conditions. Please change it regularly according to the instructions.

Fig. 7

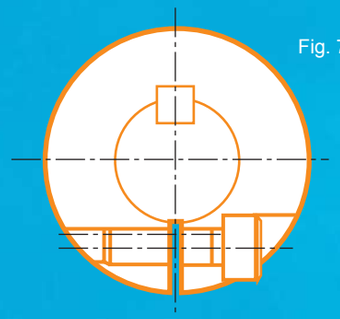


Figure: Ratio Fixing

Screws fastening works with drive torque. Please keep the screws elastic.

Overload Protective Devuce Torque Limiter

The accidents which damage machine and jeopardize human life in the plant are often caused by relying on human attention alone and lacking safety policy.

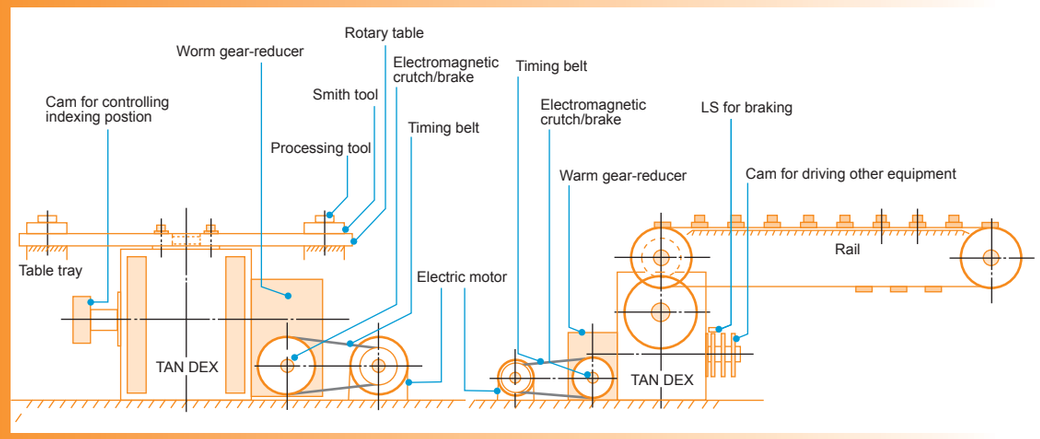
Torque limiter is often regarded as ”Insurance Product”; it can protect the machine from overload caused by some reasons. The installation of this protective device can keep the machine in normal operation rather than decrease the performance or produce clearance.

Purpose

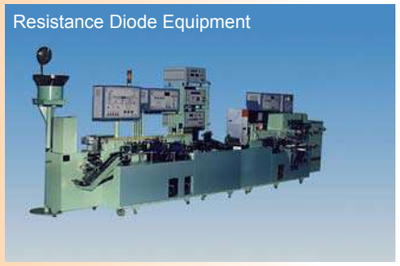
TAN DEX

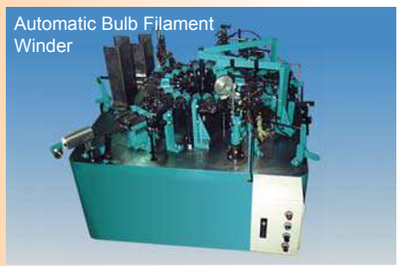
This device can used for automatic combination machine, working machine, metal-processing machinery, conveyor step drives, FMS-related equipment, packaging machine, food machine, printing machinery, automatic examining machine, press feed unit, and the intermittent indexing machine used in other industries.

Basic Examples



Examples





Precision

The Size of Table

To install a table on the output shaft, the size of table shall be based on the permitted output torque load for the Torque Te.

While high precision is required, the Torque Te shall be 2-3 times larger than the permitted output torque load; therefore, the twist of the output shaft needs to be reduced.

The table's maximum diameter shall be 5 times less than the nominal dimension.

Table 6. Maximum Diameter(mm) for the General Tables

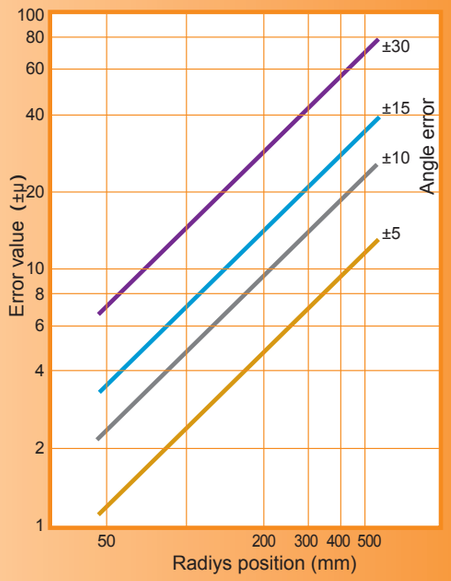
45	60	70	80	100	110	140	180	250
225	300	350	400	500	550	700	900	1250

Index Precision

TAN DEX index precision is dedicated by angle and guaranteed to be ±30" for general grade and ±15" for precision grade. Please notice that offset shall influence the index precision while the table is installed on the output shaft.

When a table is used, the index error for the jig's radius shall be there will be no backlash problems.

Relationship Between Angle Error and Radius Error



Index Procedures

Moving ▼

There are at least two cam followers matching roller gear cam continuously while indexing, so cam follower can keep on operating.

Stopping ◀

While the straight part of the taper rib match two cam followers, the position of roller gear is determined. The roller gear is then locked.

Ciroculating Index

Starting ◀

The cam roller gear cam will make cam follower work while starting to index. Besides, if two cam followers are preloaded, there will be no backlash problems.

Lubricant & Maintenance

Lubricant

It is very important to pay special attention to the lubricant oil because an incorrect selection can deteriorate the accuracy and shorten the life of precision index drives.

The additives to the lubricant oil are made up of various chemical compounds and their contents differ from maker to maker, so avoid mixing of different kinds even if they are designated for the same usage.

Initical fill and replacement

The lubricant deterioration affects the accuracy and wear resistance of the index drives. Especially, slug, dust or water mixing-in causes hardening and adhesion within the parts of the bearings, cam or cam followers. Fill fresh oil after wiping around the oil cap.

Periodic lubricant replacement

Frist : at 1000 hrs. of operation after initiated.
After then: at every 3000 hrs. of operation.
Note : Even if the operation hours do not reach the above, the replacement is required at least once a year.

Maintenance

The backlash in the input drive system causes vibration and noise which affects the accuracy and expected life. Chains and flexible couplings, especially, gain backlash and wear because they become loose after a relative short period of use.

An axial alignment in the shaft connections is also important. When fastening connected portions, carry out without leaving any looseness. The overload on the cam followers through the output shaft should be eliminated, sometimes leading to the follower's breakage. Therefore, we supply a safety device to free from those failures.

Whenever abnormal noises are heard, it could mean damage to the follower, stop the operation and check for the cause.

Every 5000 hrs. of operation, a check is required. In the dwell range of the index drive, if backlash is observed, replace the follower.

Operations without any lubricant leads directly to damage. Check the level. Conversely, be careful of too much lubricant, causing an abnormal temperature raise or oil leakage.

Lubricants may deteriorate regardless of the amount of use. Replace periodically; at least once a year.

With the unit specified for a high speed drive, check for any looseness in the connection between index drive shafts and other torque mediators.

Table 1. Viscosity of Lubricant Oil

Cam Shaft Speed N(rpm)	0-20	20-100	100-200	200-300	300-400	>400
Viscosity cst/40°c	>680	680-460	460-320	320-220	220-150	150-68

Note 1. In the case where the speed of input shaft is not fixed, obtain the viscosity by the use of either following: Geometric average speed that is√Nmax. x Nmin. or the speed of the high frequency in use.

Note 2. When the speed is just on the boundary where the viscosity should be changed, select the higher one in each range.

Table 2. Recommended Lubricant for Use

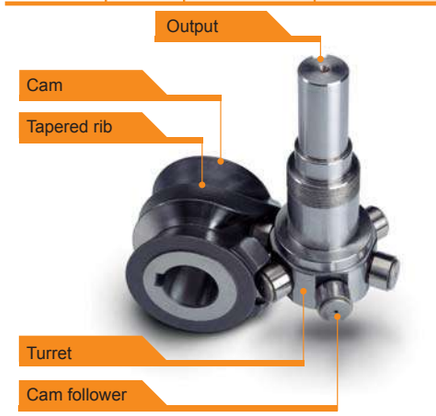
Viscosity cst/37C	Supplier		
	Esso Standard	Shell	Mobil
>680	Spartan EP680	Shell omala Oil 81	Mobilgear 636
680-460	Spartan EP460	Mobilgear 77	Mobilgear 634/633
460-320	Spartan EP320	Mobilgear 75	Mobilgear 632
320-220	Spartan EP220	Mobilgear 71	Mobilgear 630
220-150	Spartan EP150	Mobilgear 69	Mobilgear 629
150-68	Spartan EP68	Mobilgear 68	Mobilgear 626

Model Code

R - 080 F 08 120 2 R S3 W 1 X 01

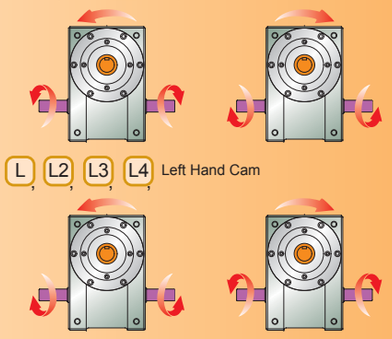
a b c d d2 e f g h i j k

a Model	b Size	c Type	d1 Number of Stops (S)	d2 Index Period (θ h)	e Motion Curve	f Hand of Cam
R Roller Gear Index Unit	080 80D 80mm	F Type	08 8 stop	120 120°	2 MS Curve	R 1 Dwell Right Hand Cam
	Center distance 25/32/38 45/60/63 70/80/83 100/110 125/140/ 180/250	S Shaft Type F Flange Type T Table Type A Ultrathin Table Type H Oscillating Handler Type are available	Number of stops of the Indexing Drive	Cam rotation period (during which the output moves.) 90°/120° 150°/180° 210°/240° 270°/300°	1, 2 3, 4 Are available	1Dwell 2Dwell 3Dwell 4Dwell Right Hand Cam R R2 R3 R4 Left Hand Cam L L2 L3 L4 Either a right hand cam or a left cam can be ordered as standard. Multi index (more than one index per cycle) are also available as standard.



1 MT (Modified Trapezoid)
2 MS (Modified Sine)
3 MCV50 (Modified Constant Velocity50)
4 RBS (Rational B-Splines)

R, R2, R3, R4 Right Hand Cam



L, L2, L3, L4 Left Hand Cam

Optional Order

A. Hollow Output (which is available on sizes 45D through 250D)

Hollow output is used to connect the electrical cables and pneumatic tubing.

Advise required hole diameter.

If none is specified, solid output will be supplied.

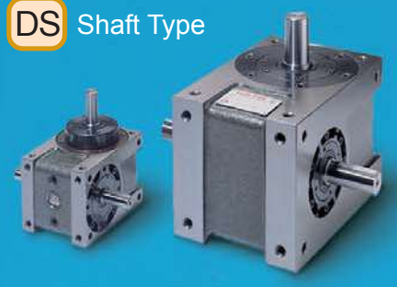
How To Order

• Mounting holes supplied on surfaces V and W come automatically. Upon request, the mounting holes can be placed on the surfaces R, S, T and U.

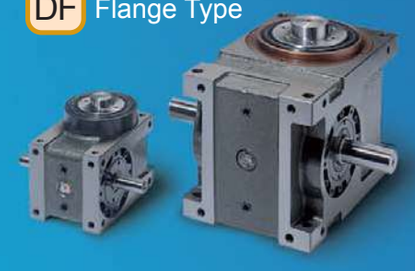
• Model code shows the assembly of cam and turret, together with output, input, tapped hole surface and mounting position.

• Completion of the model code is necessary when placing an order. Either right hand cam or left hand cam can be ordered as standard. Also, four (4) types of motion curves (MT, MS, MCV50, RBS) can be ordered as standard.

DS Shaft Type

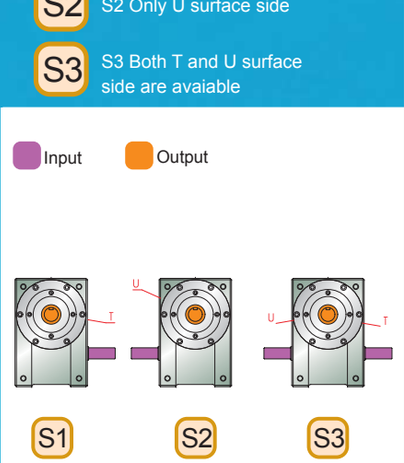


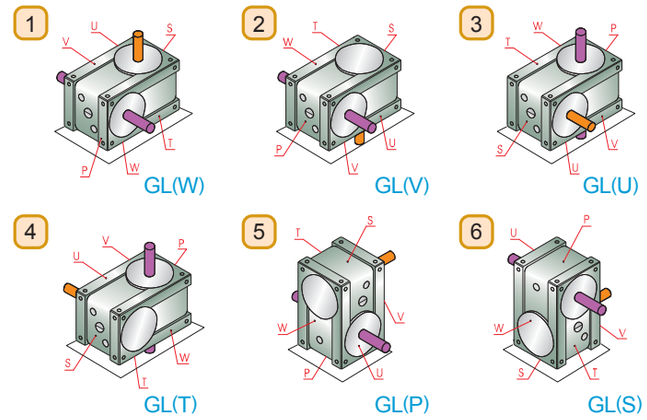
DF Flange Type



g Input Shaft Projection	h Mounting Holes	i Mounting Position	j Special Instructions	k Special Instructions
S3 Both T and U surface	W	1	X	01
S1 S1 Only T surface side S2 S2 Only U surface side S3 S3 Both T and U surface side are avaiable	On 6 surfaces of the main housing body with six fixing holes for mounting screws，" W" shows the style of installation pattern . • Code A for all surfaces.	Mounting position as shown below.	Include the symbol "X" in case of special instructions. □ Standard (No symbols) X Special Instructions	Customer-specific coding

Input Output





DT Table Type

DA Ultrathin Table Type

Calculation for Selecting Models

a4	: Backlash factor	Ps	: Peak motor power
Am	: Max. non-dimensional acceleration	Q m	: Max. cam shaft torque coefficient
Amax	: Max. acceleration (m . s^{-2})	R	: Follower pitch radius (m)
C	: Acceleration coefficient (C≧1)	r	: Speed ratio
D	: Diameter of gyration (m)	S	: No. of station
E	: Energy of gyrator (kgf . m . rpm^2)	T c	: Cam shaft torque (kgf . m)
E o	: Energy of gyrator (kgf . m . rad^2)	T d	: Start/stop torque (kgf . m)
E e	: Energy of a body for linear motion (kgf . m . s^{-2})	T f	: Friction torque (kgf . m)
F	: Centrifugal force (kgf)	T i	: Inertia torque (kgf . m)
G	: Weight (kgf)	T t	: Total torque required for output shaft (kgf . m)
GD^2	: Inertia moment (kgf . m^2)	T w	: Work torque (kgf . m)
g	: Gravity acceleration (m . s^{-2})	T x	: Cam shaft friction torque (kgf . m)
I	: Polar moment of inertia (kgf . m . s^2)	Ve	: Linear velocity (m . s^{-1})
K	: Radius of gyration (m)	Vm	: Max. non-dimensional velocity
K e	: Equivalent radius of gyration for output shaft (m)	Vmax	: Max. linear velocity (m . s^{-1})
L f	: Lift factor	W	: Weight (kg)
L h	: Expected life (hr)	α	: Functional angle (deg)
M	: Mass (kg)	θ	: Index period (deg)
N	: Cam shaft speed (rpm)	μ	: Coefficient of friction
N o	: Initial cam shaft speed (rpm)	Ω	: Angular velocity (rad . s^{-1})
P	: Stroke (m)	Ω	: Angular acceleration (rad . s^{-2})
Pa	: Average motor power (kw)		

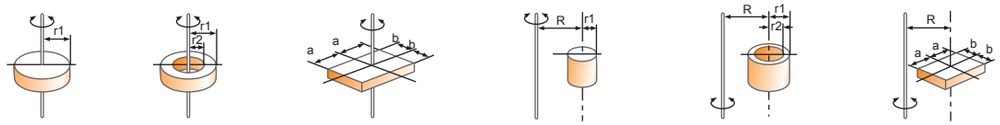
Table 3. Life Factor Lf and Expected Life Lh

Lh(hr)	Lf	Lh(hr)	Lf	Lh(hr)	Lf	Lh(hr)	Lf
2000	0.617	10000	1.00	26000	1.33	60000	1.71
3000	0.697	12000	1.06	28000	1.36	65000	1.75
4000	0.760	14000	1.11	30000	1.39	70000	1.79
5000	0.812	16000	1.15	35000	1.46	75000	1.83
6000	0.858	18000	1.19	40000	1.52	80000	1.87
7000	0.899	20000	1.23	45000	1.57	90000	1.93
8000	0.935	22000	1.27	50000	1.62	100000	2.00
9000	0.969	24000	1.30	55000	1.67		

Table 4. Specifications of Motion Curve

Motion Curve	Modified Trapezoid	Modified Sine	Modified const. Velocity	RBS
Code	1	2	3	4
V m	2.00	1.76	1.28	1.68
A m	+/-4.89	+/-5.53	+/-8.01	+/-4.64
Q m	+/-1.655	+/-0.987	+/-0.715	+/-0.987
(AxV)m	+/-8.09	+/-5.46	+/-5.73	+/-4.4

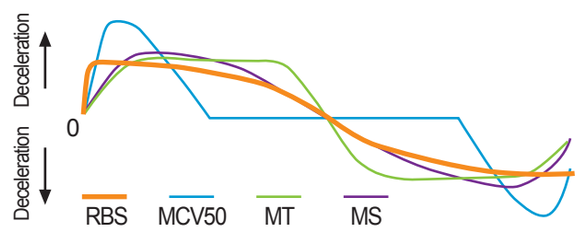
Table 5. Radius of Gyration K



K^2	$\frac{r_1^2}{2}$	$\frac{r_1^2+r_2^2}{2}$	$\frac{a^2+b^2}{3}$	$\frac{r_1^2}{2}+R^2$	$\frac{r_1^2+r_2^2}{2}+R^2$	$\frac{a^2+b^2}{3}+R^2$

Acceleration Features

As plotted in the right-hand side figure, the unique RBS cam curve for the Tan Tzu index has the lowest pack acceleration and deceleration values. It shows the features of wearing resistance and anti-vibration for high-speed applications.



Input & Output Data

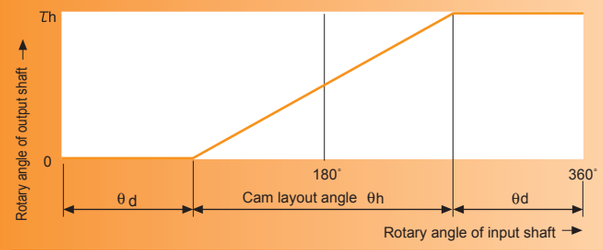
MODEL	DS.DF TYPE															
Number of stops	2	3	4	5	6	8	10	12	16	20	24	30	32	36	40	48
Size 25D	○	○	○	○	○	○	○	○								
32D	○	○	○	○	○	○	○	○								
38D	○	○	○	○	○	○	○	○								
45D	○	○	○	○	○	○	○	○	※	※	※	●	☆	●	☆	☆
60D	○	○	○	○	○	○	○	○	※	※	※	●	☆	●	☆	☆
70D	○	○	○	○	○	○	○	○	※	※	※	●	☆	●	☆	☆
80D	○	○	○	○	○	○	○	○	○	※	※	※	※	※	☆	●
83D	○	○	○	○	○	○	○	○	○	※	※	※	※	※	☆	●
100D	○	○	○	○	○	○	○	○	○	※	※	※	※	※	☆	●
110D	○	○	○	○	○	○	○	○	○	※	※	※	※	※	☆	●
140D	○	○	○	○	○	○	○	○	○	○	○	※	※	※	※	●
180D	○	○	○	○	○	○	○	○	○	○	○	※	※	※	※	●
250D	○	○	○	○	○	○	○	○	○	○	○	※	※	※	※	●

MODEL	DT.DA TYPE															
Number of stops	4	5	6	8	10	12	15	16	20	24	30	32	40	48	60	72
Size 70D	○	○	○	○	○	○	○	○	※	※	※	※	☆	●	☆	
80D	○	○	○	○	○	○	○	○	※	※	※	※	☆	●	☆	
90D	○	○	○	○	○	○	○	○	※	※	※	※	☆	●	☆	
110D	○	○	○	○	○	○	○	○	※	※	※	※	☆	●	☆	
140D	○	○	○	○	○	○	○	○	※	※	※	※	※	●	☆	☆
150D	○	○	○	○	○	○	○	○	※	※	※	※	※	●	☆	☆
180D	○	○	○	○	○	○	○	○	○	○	※	※	※	※	●	●
190D	○	○	○	○	○	○	○	○	○	○	※	※	※	※	●	●
210D	○	○	○	○	○	○	○	○	○	○	※	※	※	※	●	●
230D	○	○	○	○	○	○	○	○	○	○	※	※	※	※	●	●
250D	○	○	○	○	○	○	○	○	○	○	※	※	※	※	●	●
330D	○	○	○	○	○	○	○	○	○	○	※	※	※	※	●	●
350D	○	○	○	○	○	○	○	○	○	○	※	※	※	※	●	●
438D	○	○	○	○	○	○	○	○	○	○	※	※	※	※	●	●
450D	○	○	○	○	○	○	○	○	○	○	※	※	※	※	●	●

○ 1 DWELL ※ 2 DWELL ● 3 DWELL ☆ 4 DWELL

Time Table

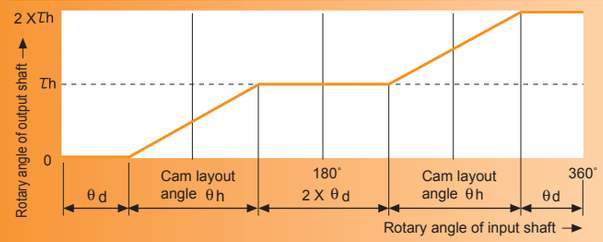
2 . 3 . 4 . 6 . 8 . 12 stops



Rotary angle of output shaft $\tau h = \frac{360^\circ}{\text{Stop value}}$

Angle of Cam's Straight Part $\theta d = \frac{360^\circ - \theta h}{2}$

16 - 48 stops



Rotary angle of output shaft $\tau h = \frac{360^\circ}{\text{Stop value}}$

Angle of Cam's Straight Part $\theta d = \frac{360^\circ - (2X\,\theta h)}{4}$

Shaft Model

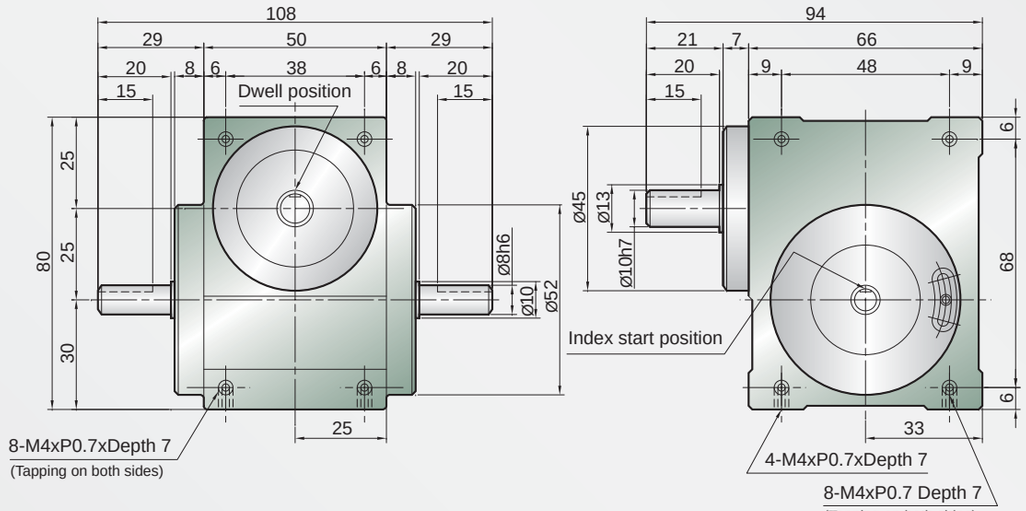
TAN TZU Index Drives are classified into the following six types with the configurations of the output portions:

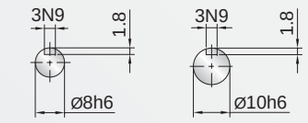
- Shaft Model
- Paradex Model
- Ultrathin Table Model
- Flange Models
- Table Models
- Sway model

DS 25DS, 32DS, 38DS, 45DS, 60DS, 70DS, 80DS, 83DS,100DS, 110DS, 140DS, 180DS

This is one of our conventional products.
We provide it with a selection of either straight or tapered shafts.
It is easy to use and install.

25DS



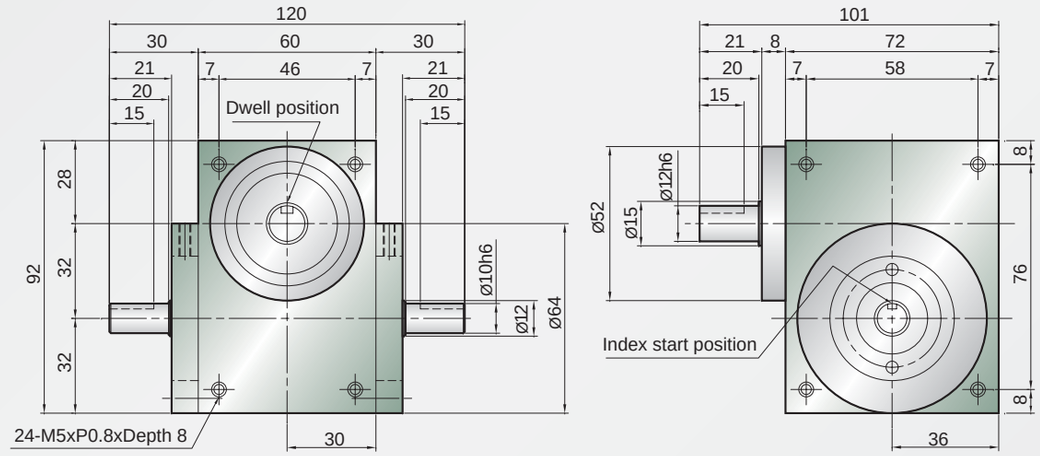


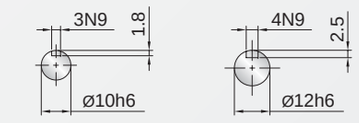
Item	Sym-bol	Unit	Value
Allowable thrust load on output shaft	C1	kgf	15
Allowable radial load on output shaft	C2	kgf	20
Allowable torque on output shaft	Ts	kgf-m	Refer torque table
Allowable thrust load on input shaft	C3	kgf	15
Max. repetitive bending force on input shaft	C4	kgf	20
Max. repetitive torque on input shaft	C5	kgf-m	2
GD^2 of input shaft (Note1)	C6	$kgf\text{-}m^2$	9.6×10^{-5}
Indexing accuracy		sec.	±90
Weight		kg	1.0

Notes
1) GD^2 of input shaft is a value in dwell range.

2) Value of C1 to C5 are those obtained for safety factor=2.

32DS



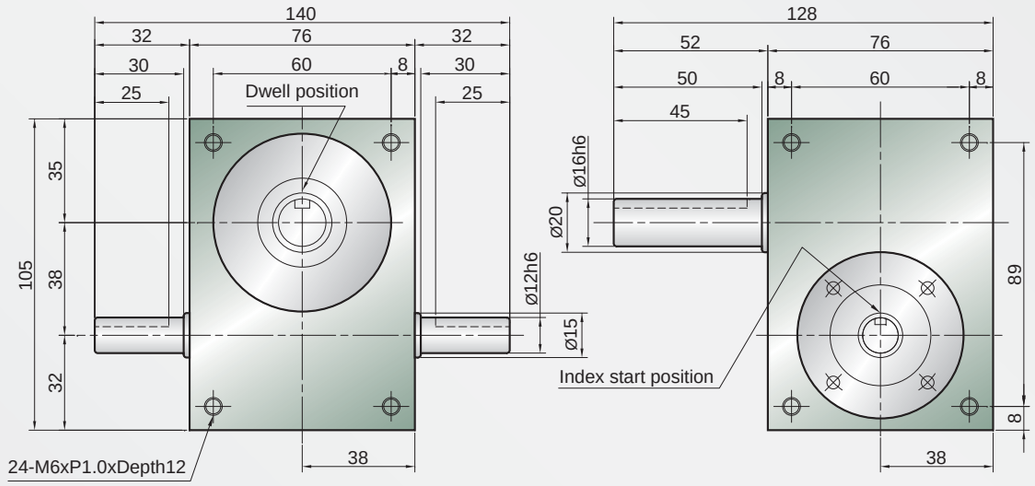


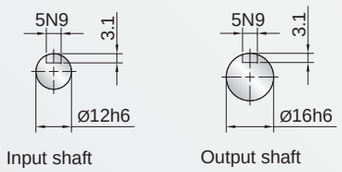
Item	Sym-bol	Unit	Value
Allowable thrust load on output shaft	C1	kgf	20
Allowable radial load on output shaft	C2	kgf	30
Allowable torque on output shaft	Ts	kgf-m	Refer torque table
Allowable thrust load on input shaft	C3	kgf	18
Max. repetitive bending force on input shaft	C4	kgf	20
Max. repetitive torque on input shaft	C5	kgf-m	3
GD^2 of input shaft (Note1)	C6	$kgf\text{-}m^2$	3×10^{-5}
Indexing accuracy		sec.	±90
Weight		kg	1.4

Notes
1) GD^2 of input shaft is a value in dwell range.

2) Value of C1 to C5 are those obtained for safety factor=2.

38DS



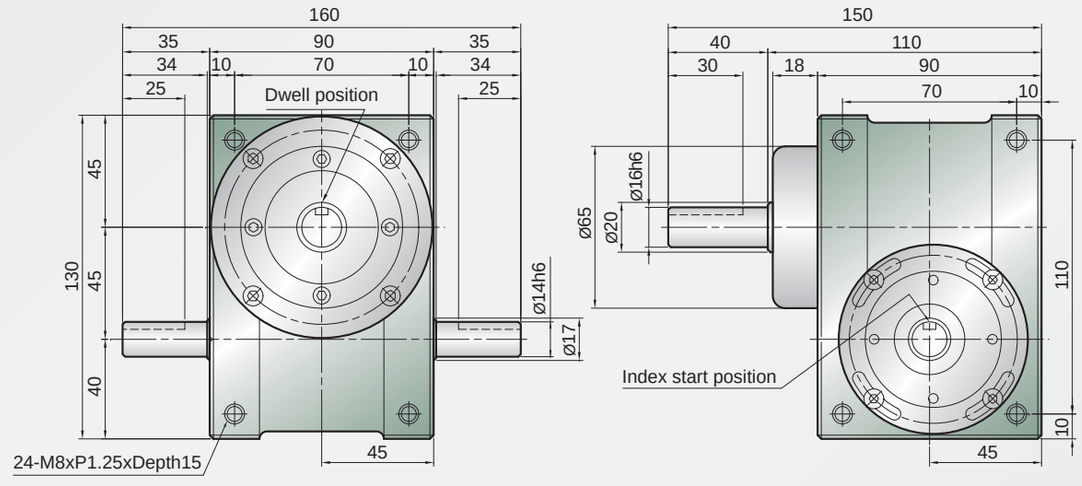


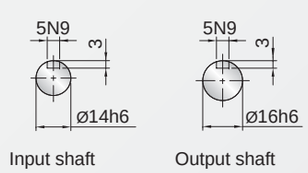
Item	Sym-bol	Unit	Value
Allowable thrust load on output shaft	C1	kgf	40
Allowable radial load on output shaft	C2	kgf	45
Allowable torque on output shaft	Ts	kgf-m	Refer torque table
Allowable thrust load on input shaft	C3	kgf	35
Max. repetitive bending force on input shaft	C4	kgf	35
Max. repetitive torque on input shaft	C5	kgf-m	2.5
GD^2 of input shaft (Note1)	C6	$kgf\text{-}m^2$	6.6×10^{-4}
Indexing accuracy		sec.	±72
Weight		kg	4

Notes
1) GD^2 of input shaft is a value in dwell range.

2) Value of C1 to C5 are those obtained for safety factor=2.

45DS



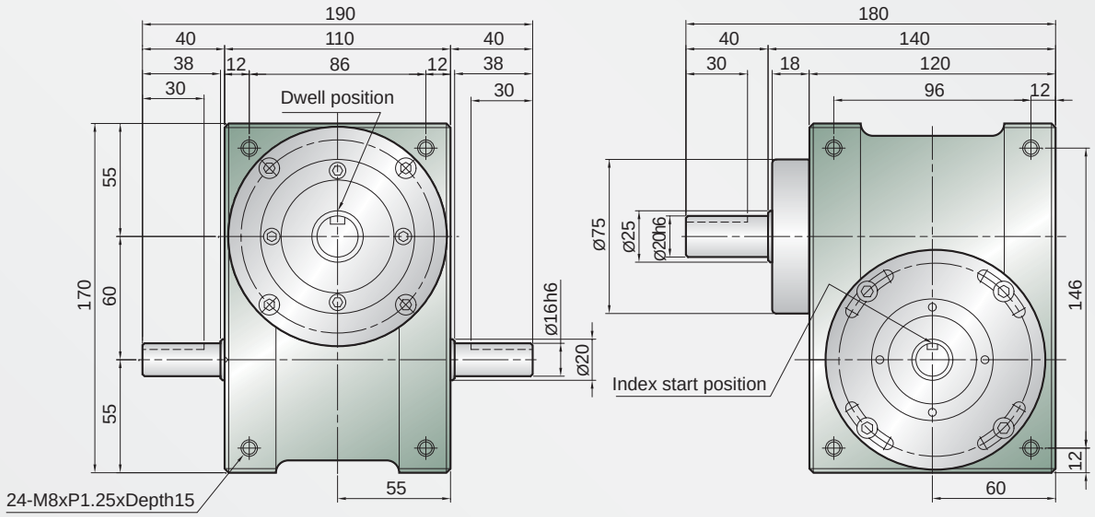


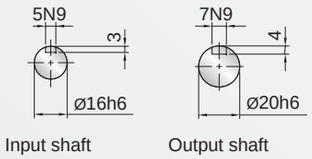
Item	Sym-bol	Unit	Value
Allowable thrust load on output shaft	C1	kgf	80
Allowable radial load on output shaft	C2	kgf	72.5
Allowable torque on output shaft	Ts	kgf-m	Refer torque table
Allowable thrust load on input shaft	C3	kgf	85
Max. repetitive bending force on input shaft	C4	kgf	75
Max. repetitive torque on input shaft	C5	kgf-m	4
GD^2 of input shaft (Note1)	C6	$kgf\text{-}m^2$	3.2×10^{-4}
Indexing accuracy		sec.	±60
Weight		kg	7

Notes
1) GD^2 of input shaft is a value in dwell range.

2) Value of C1 to C5 are those obtained for safety factor=2.

60DS



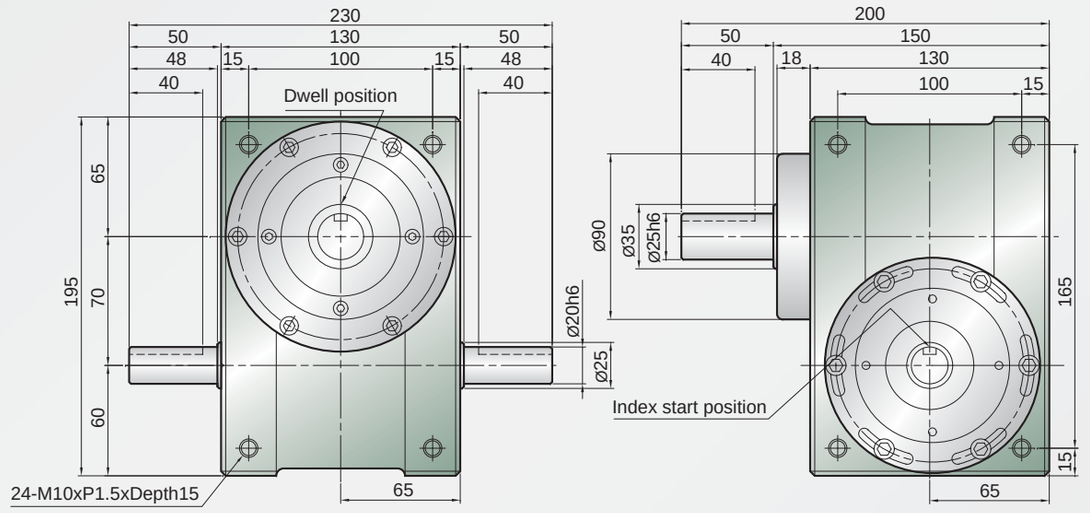


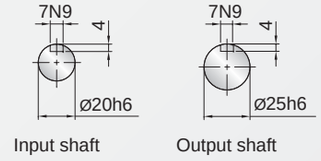
Item	Sym-bol	Unit	Value
Allowable thrust load on output shaft	C1	kgf	180
Allowable radial load on output shaft	C2	kgf	150
Allowable torque on output shaft	Ts	kgf-m	Refer torque table
Allowable thrust load on input shaft	C3	kgf	100
Max. repetitive bending force on input shaft	C4	kgf	95
Max. repetitive torque on input shaft	C5	kgf-m	6
GD^2 of input shaft (Note1)	C6	kgf-m^2	1.9 x 10^{-3}
Indexing accuracy		sec.	±45
Weight		kg	13

Notes
1) GD^2 of input shaft is a value in dwell range.

2) Value of C1 to C5 are those obtained for safety factor=2.

70DS



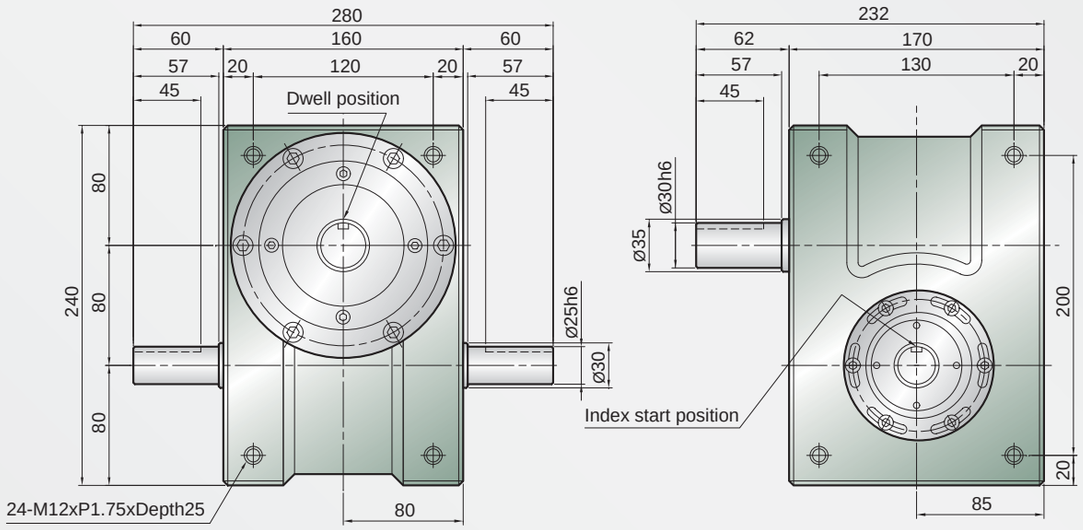


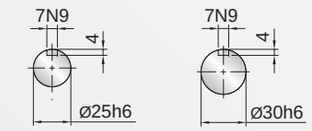
Item	Sym-bol	Unit	Value
Allowable thrust load on output shaft	C1	kgf	220
Allowable radial load on output shaft	C2	kgf	220
Allowable torque on output shaft	Ts	kgf-m	Refer torque table
Allowable thrust load on input shaft	C3	kgf	150
Max. repetitive bending force on input shaft	C4	kgf	110
Max. repetitive torque on input shaft	C5	kgf-m	9.5
GD^2 of input shaft (Note1)	C6	kgf-m^2	6 x 10^{-3}
Indexing accuracy		sec.	±30
Weight		kg	18

Notes
1) GD^2 of input shaft is a value in dwell range.

2) Value of C1 to C5 are those obtained for safety factor=2.

80DS





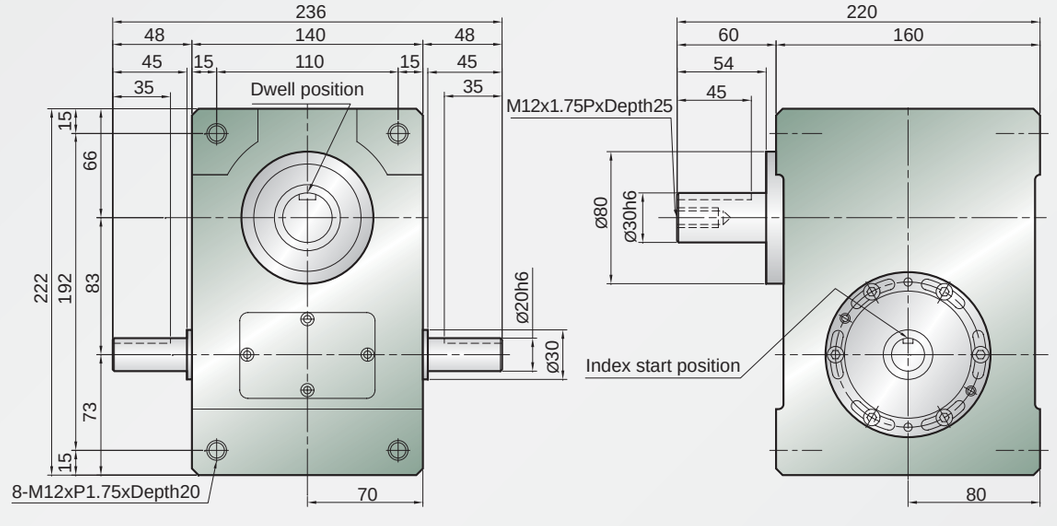
Input shaft Output shaft

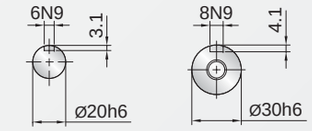
Item	Sym-bol	Unit	Value
Allowable thrust load on output shaft	C1	kgf	220
Allowable radial load on output shaft	C2	kgf	220
Allowable torque on output shaft	Ts	kgf-m	Refer torque table
Allowable thrust load on input shaft	C3	kgf	210
Max. repetitive bending force on input shaft	C4	kgf	190
Max. repetitive torque on input shaft	C5	kgf-m	18.5
GD^2 of input shaft (Note1)	C6	kgf-m^2	9 x 10^{-3}
Indexing accuracy		sec.	±30
Weight		kg	32

Notes
1) GD^2 of input shaft is a value in dwell range.

2) Value of C1 to C5 are those obtained for safety factor=2.

83DS





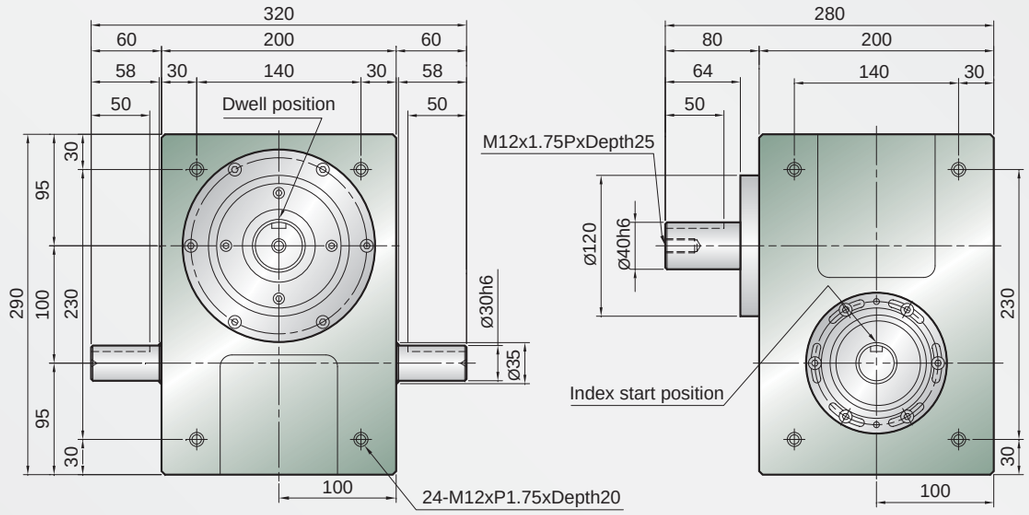
Input shaft Output shaft

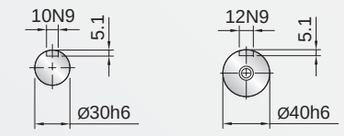
Item	Sym-bol	Unit	Value
Allowable thrust load on output shaft	C1	kgf	330
Allowable radial load on output shaft	C2	kgf	420
Allowable torque on output shaft	Ts	kgf-m	Refer torque table
Allowable thrust load on input shaft	C3	kgf	350
Max. repetitive bending force on input shaft	C4	kgf	260
Max. repetitive torque on input shaft	C5	kgf-m	25
GD^2 of input shaft (Note1)	C6	kgf-m^2	9 x 10^{-3}
Indexing accuracy		sec.	±30
Weight		kg	26.5

Notes
1) GD^2 of input shaft is a value in dwell range.

2) Value of C1 to C5 are those obtained for safety factor=2.

100DS





Input shaft

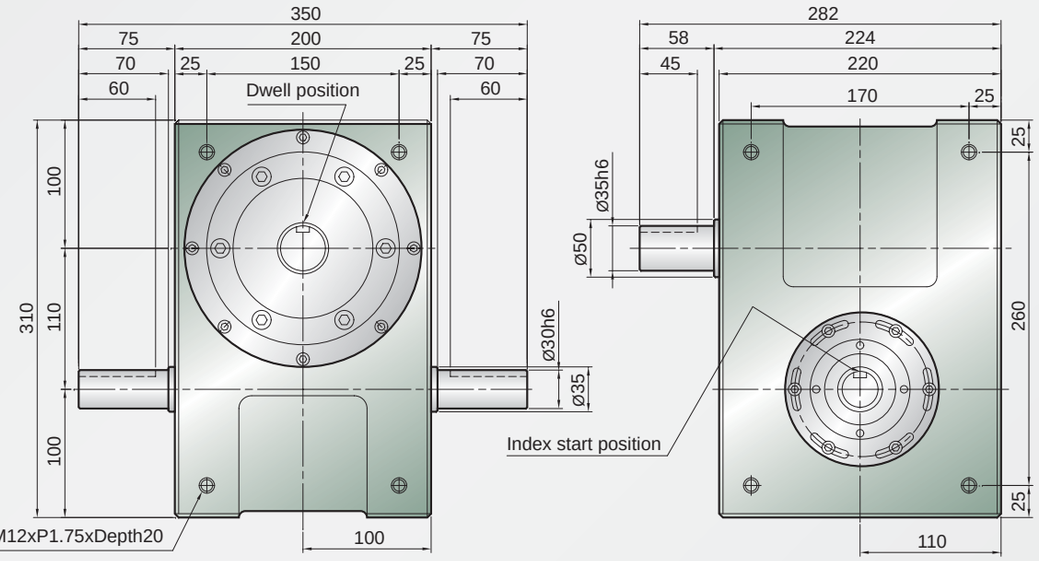
Output shaft

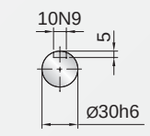
Item	Sym-bol	Unit	Value
Allowable thrust load on output shaft	C1	kgf	400
Allowable radial load on output shaft	C2	kgf	450
Allowable torque on output shaft	Ts	kgf-m	Refer torque table
Allowable thrust load on input shaft	C3	kgf	300
Max. repetitive bending force on input shaft	C4	kgf	220
Max. repetitive torque on input shaft	C5	kgf-m	26
GD^2 of input shaft (Note1)	C6	kgf-m^2	4 x 10^{-3}
Indexing accuracy		sec.	±30
Weight		kg	50

Notes
1) GD^2 of input shaft is a value in dwell range.

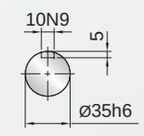
2) Value of C1 to C5 are those obtained for safety factor=2.

110DS





Input shaft



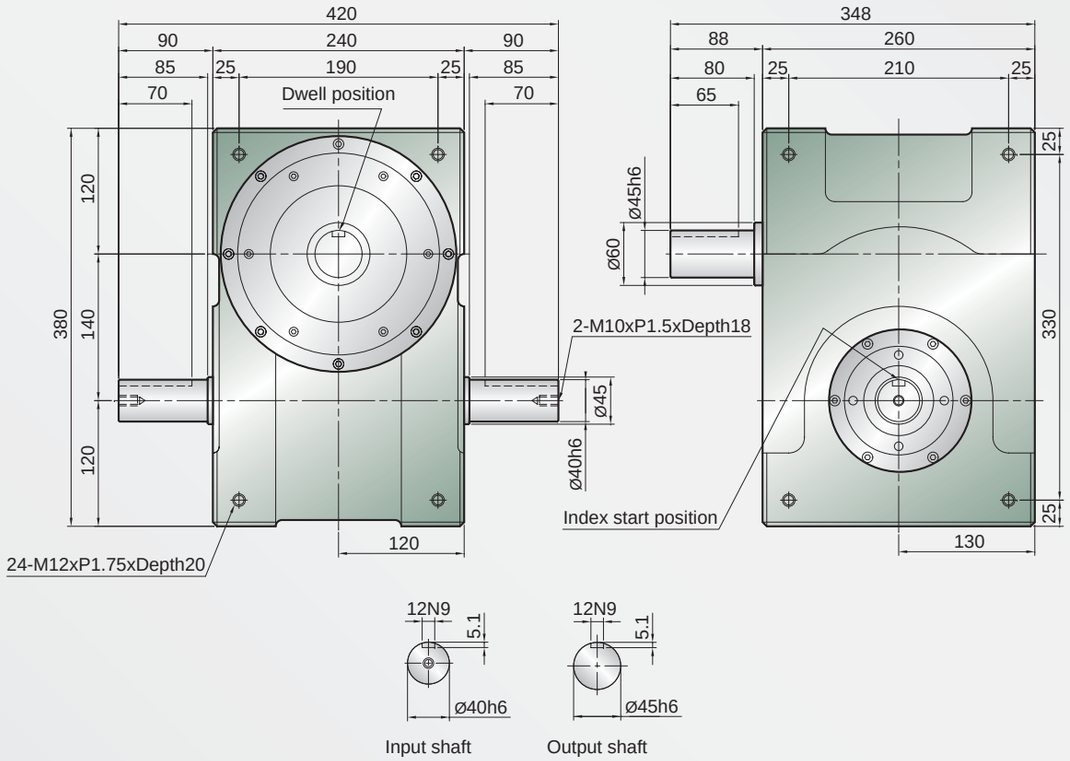
Output shaft

Item	Sym-bol	Unit	Value
Allowable thrust load on output shaft	C1	kgf	500
Allowable radial load on output shaft	C2	kgf	550
Allowable torque on output shaft	Ts	kgf-m	Refer torque table
Allowable thrust load on input shaft	C3	kgf	360
Max. repetitive bending force on input shaft	C4	kgf	290
Max. repetitive torque on input shaft	C5	kgf-m	32
GD^2 of input shaft (Note1)	C6	kgf-m^2	2.8 x 10^{-2}
Indexing accuracy		sec.	±30
Weight		kg	65

Notes
1) GD^2 of input shaft is a value in dwell range.

2) Value of C1 to C5 are those obtained for safety factor=2.

140DS

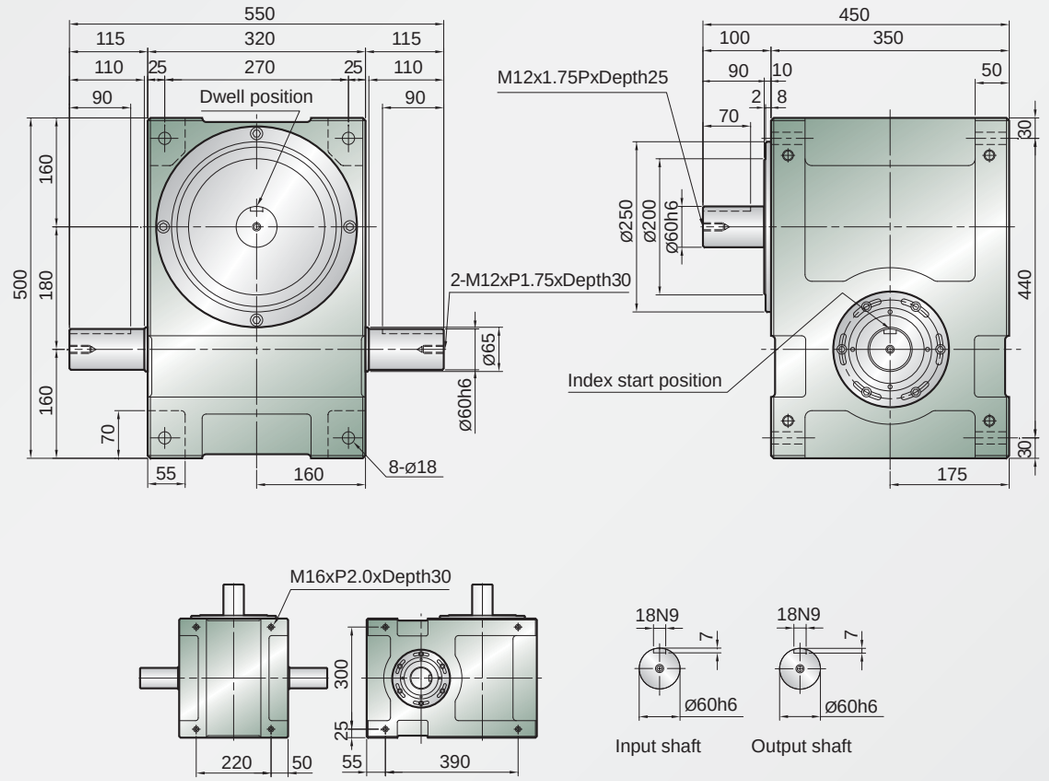


Item	Sym-bol	Unit	Value
Allowable thrust load on output shaft	C1	kgf	730
Allowable radial load on output shaft	C2	kgf	860
Allowable torque on output shaft	Ts	kgf-m	Refer torque table
Allowable thrust load on input shaft	C3	kgf	440
Max. repetitive bending force on input shaft	C4	kgf	560
Max. repetitive torque on input shaft	C5	kgf-m	75
GD^2 of input shaft (Note1)	C6	kgf-m^2	0.11
Indexing accuracy		sec.	±30
Weight		kg	90

Notes
1) GD^2 of input shaft is a value in dwell range.

2) Value of C1 to C5 are those obtained for safety factor=2.

180DS

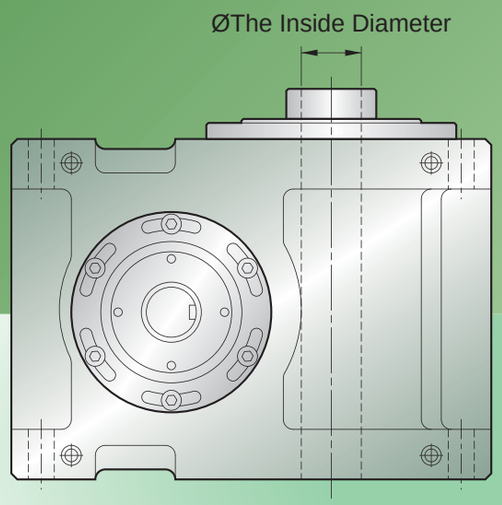


Item	Sym-bol	Unit	Value
Allowable thrust load on output shaft	C1	kgf	1200
Allowable radial load on output shaft	C2	kgf	1500
Allowable torque on output shaft	Ts	kgf-m	Refer torque table
Allowable thrust load on input shaft	C3	kgf	590
Max. repetitive bending force on input shaft	C4	kgf	1045
Max. repetitive torque on input shaft	C5	kgf-m	147
GD^2 of input shaft (Note1)	C6	kgf-m^2	0.39
Indexing accuracy		sec.	±30
Weight		kg	220

Notes
1) GD^2 of input shaft is a value in dwell range.

2) Value of C1 to C5 are those obtained for safety factor=2.

Flange Model



Flange Model- hollow size chart

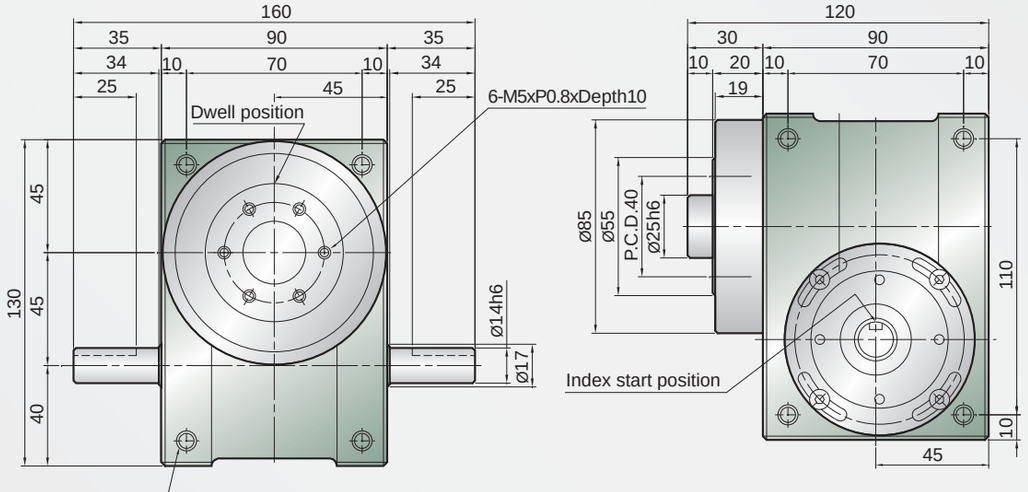
Model Specifications	45F	60F	70F	80F	110F	140F	180F	250F
The Inside Diameter (mm)	ø8	ø17	ø20	ø30	ø40	ø52	ø60	ø80

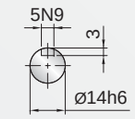
※If not specified hollow, the output shaft is solid.(Standard)

DF 45DF, 60DF, 70DF, 80DF, 110DF, 140DF, 180DF, 250DF

This type, we have researched and developed for a long time which has high rigidity and various connections to tables, gears, sprockets and the other peripherals placed onto the output shaft face where in the center a hollow is provided to enable the connection with a foreign shaft as well.
In addition, the well-designed housings of this ensure an easy handling installation.
Ever sensitive to the users' needs, we can assure that our index drives will satisfy those engaged in the assembly work.

45DF





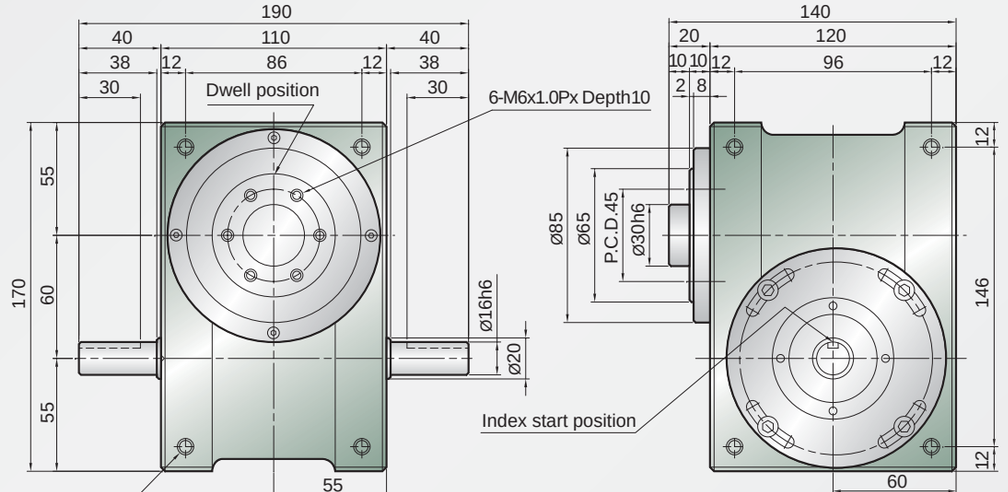
Input shaft

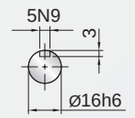
Item	Sym-bol	Unit	Value
Allowable thrust load on output shaft	C1	kgf	130
Allowable radial load on output shaft	C2	kgf	140
Allowable torque on output shaft	Ts	kgf-m	Refer torque table
Allowable thrust load on input shaft	C3	kgf	85
Max. repetitive bending force on input shaft	C4	kgf	110
Max. repetitive torque on input shaft	C5	kgf-m	4
GD^2 of input shaft (Note1)	C6	kgf-m^2	3.2 x 10^{-4}
Indexing accuracy		sec.	±60
Weight		kg	7

Notes
1) GD^2 of input shaft is a value in dwell range.

2) Value of C1 to C5 are those obtained for safety factor=2.

60DF





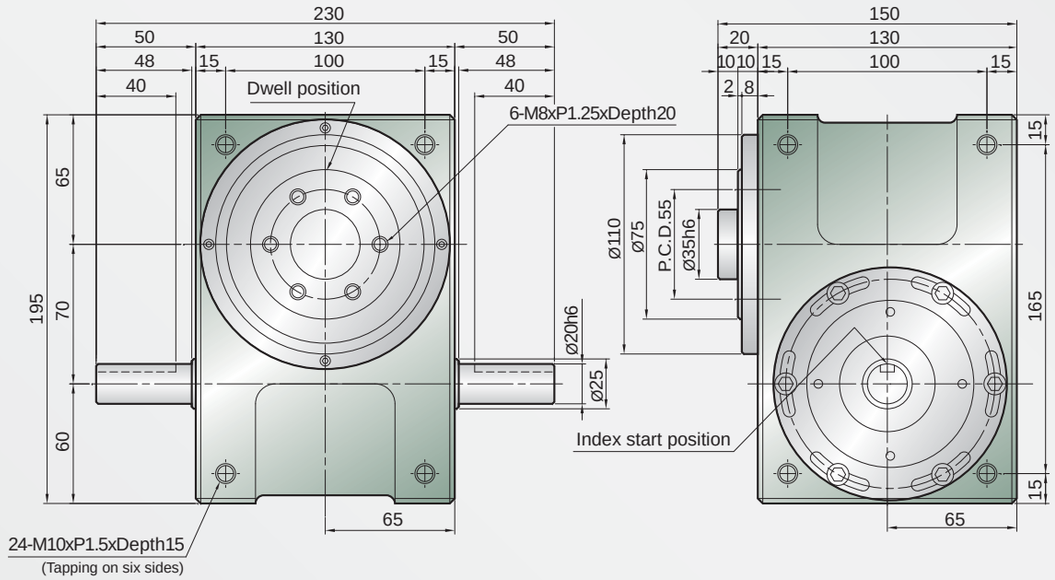
Input shaft

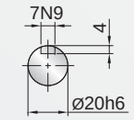
Item	Sym-bol	Unit	Value
Allowable thrust load on output shaft	C1	kgf	140
Allowable radial load on output shaft	C2	kgf	142
Allowable torque on output shaft	Ts	kgf-m	Refer torque table
Allowable thrust load on input shaft	C3	kgf	100
Max. repetitive bending force on input shaft	C4	kgf	150
Max. repetitive torque on input shaft	C5	kgf-m	6
GD^2 of input shaft (Note1)	C6	kgf-m^2	1.9 x 10^{-3}
Indexing accuracy		sec.	±45
Weight		kg	13

Notes
1) GD^2 of input shaft is a value in dwell range.

2) Value of C1 to C5 are those obtained for safety factor=2.

70DF





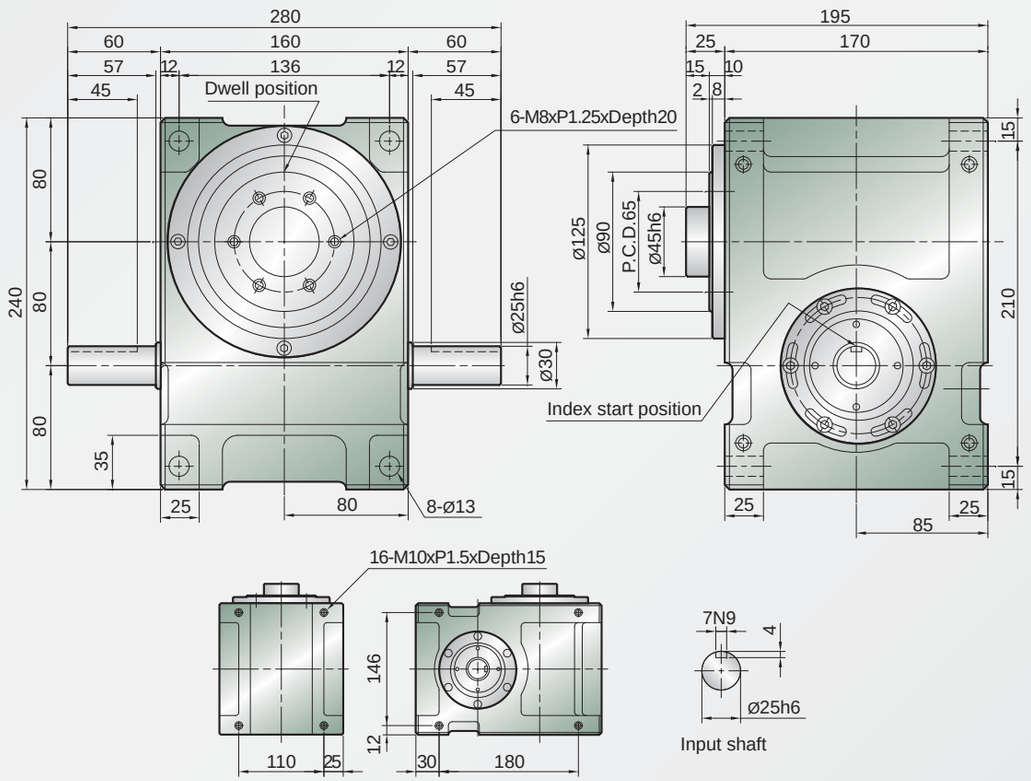
Input shaft

Item	Sym-bol	Unit	Value
Allowable thrust load on output shaft	C1	kgf	220
Allowable radial load on output shaft	C2	kgf	300
Allowable torque on output shaft	Ts	kgf-m	Refer torque table
Allowable thrust load on input shaft	C3	kgf	150
Max. repetitive bending force on input shaft	C4	kgf	110
Max. repetitive torque on input shaft	C5	kgf-m	9.5
GD^2 of input shaft (Note1)	C6	kgf-m^2	6 x 10^{-3}
Indexing accuracy		sec.	±30
Weight		kg	18

Notes
1) GD^2 of input shaft is a value in dwell range.

2) Value of C1 to C5 are those obtained for safety factor=2.

80DF



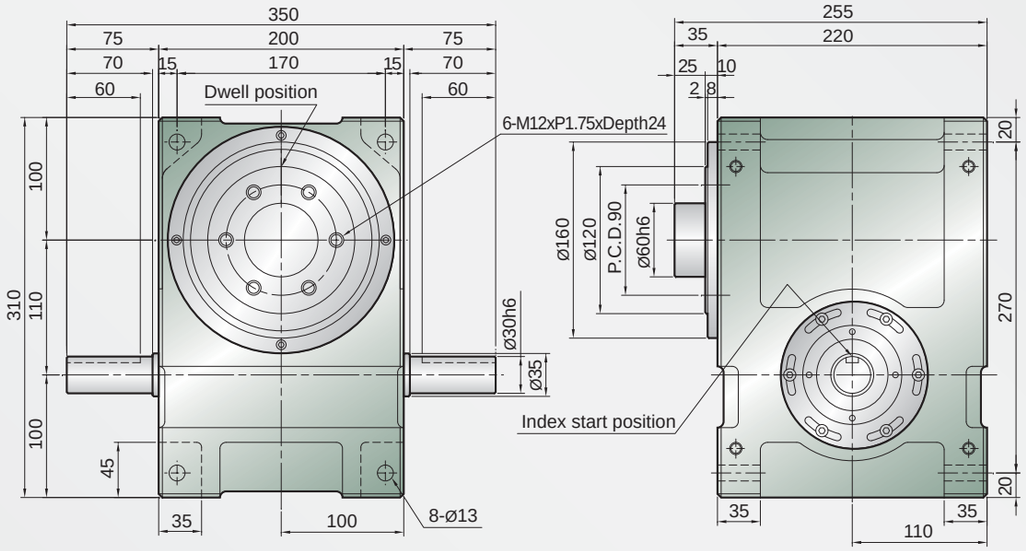
Input shaft

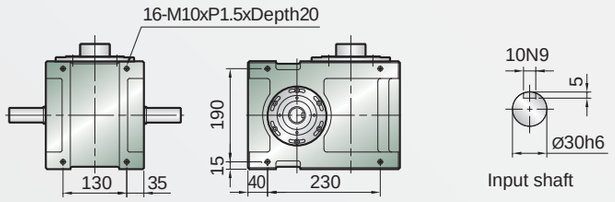
Item	Sym-bol	Unit	Value
Allowable thrust load on output shaft	C1	kgf	330
Allowable radial load on output shaft	C2	kgf	420
Allowable torque on output shaft	Ts	kgf-m	Refer torque table
Allowable thrust load on input shaft	C3	kgf	350
Max. repetitive bending force on input shaft	C4	kgf	260
Max. repetitive torque on input shaft	C5	kgf-m	25
GD^2 of input shaft (Note1)	C6	kgf-m^2	9 x 10^{-3}
Indexing accuracy		sec.	±30
Weight		kg	32

Notes
1) GD^2 of input shaft is a value in dwell range.

2) Value of C1 to C5 are those obtained for safety factor=2.

110DF



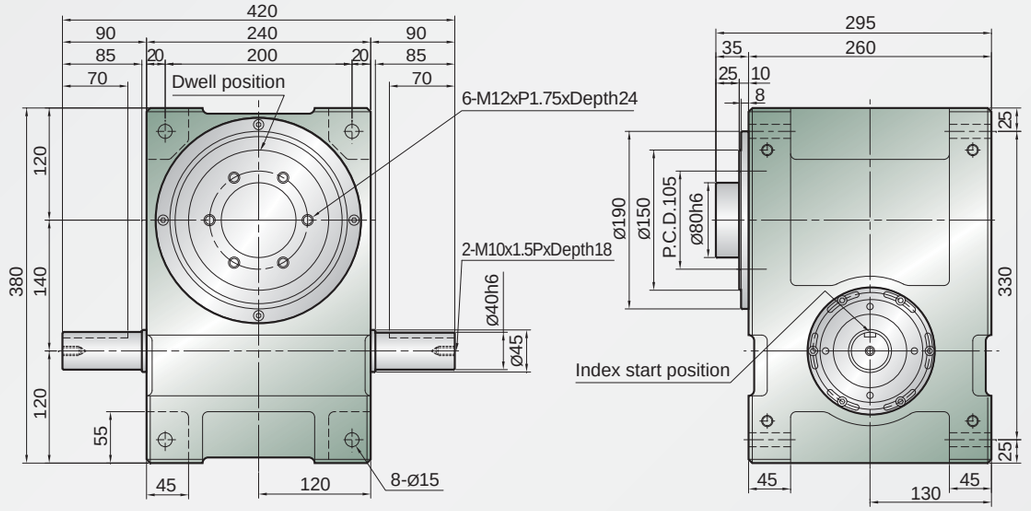


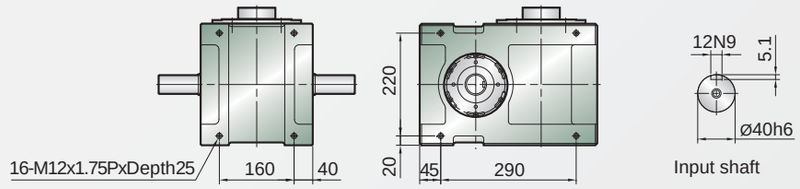
Item	Sym-bol	Unit	Value
Allowable thrust load on output shaft	C1	kgf	560
Allowable radial load on output shaft	C2	kgf	700
Allowable torque on output shaft	Ts	kgf-m	Refer torque table
Allowable thrust load on input shaft	C3	kgf	480
Max. repetitive bending force on input shaft	C4	kgf	415
Max. repetitive torque on input shaft	C5	kgf-m	40
GD^2 of input shaft (Note1)	C6	kgf-m^2	2.8 x 10^{-2}
Indexing accuracy		sec.	±30
Weight		kg	65

Notes
1) GD^2 of input shaft is a value in dwell range.

2) Value of C1 to C5 are those obtained for safety factor=2.

140DF



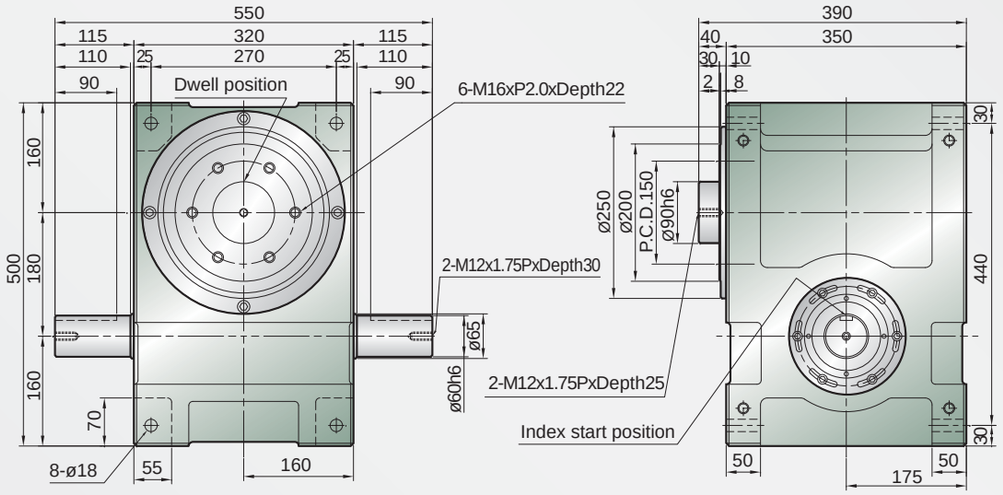


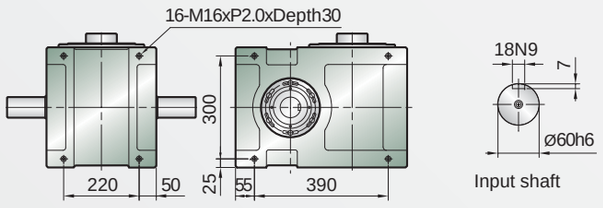
Item	Sym-bol	Unit	Value
Allowable thrust load on output shaft	C1	kgf	760
Allowable radial load on output shaft	C2	kgf	1000
Allowable torque on output shaft	Ts	kgf-m	Refer torque table
Allowable thrust load on input shaft	C3	kgf	550
Max. repetitive bending force on input shaft	C4	kgf	710
Max. repetitive torque on input shaft	C5	kgf-m	100
GD^2 of input shaft (Note1)	C6	kgf-m^2	0.11
Indexing accuracy		sec.	±30
Weight		kg	90

Notes
1) GD^2 of input shaft is a value in dwell range.

2) Value of C1 to C5 are those obtained for safety factor=2.

180DF





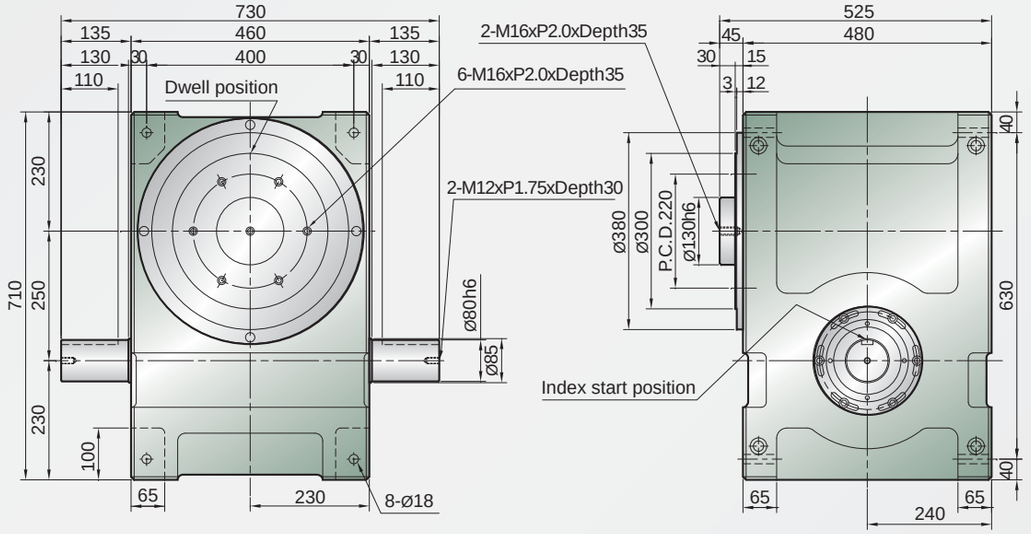
Input shaft

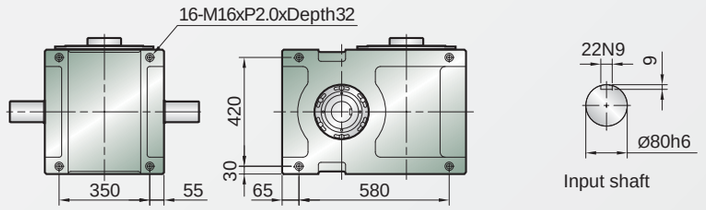
180DS	Item	Sym-bol	Unit	Value
	Allowable thrust load on output shaft	C1	kgf	1200
	Allowable radial load on output shaft	C2	kgf	1500
	Allowable torque on output shaft	Ts	kgf-m	Refer torque table
	Allowable thrust load on input shaft	C3	kgf	1100
	Max. repetitive bending force on input shaft	C4	kgf	1960
	Max. repetitive torque on input shaft	C5	kgf-m	340
	GD^2 of input shaft (Note1)	C6	kgf-m^2	0.39
	Indexing accuracy		sec.	±30
	Weight		kg	220

Notes
1) GD^2 of input shaft is a value in dwell range.

2) Value of C1 to C5 are those obtained for safety factor=2.

250DF





Input shaft

250DS	Item	Sym-bol	Unit	Value
	Allowable thrust load on output shaft	C1	kgf	3200
	Allowable radial load on output shaft	C2	kgf	4150
	Allowable torque on output shaft	Ts	kgf-m	Refer torque table
	Allowable thrust load on input shaft	C3	kgf	1550
	Max. repetitive bending force on input shaft	C4	kgf	3800
	Max. repetitive torque on input shaft	C5	kgf-m	780
	GD^2 of input shaft (Note1)	C6	kgf-m^2	1.98
	Indexing accuracy		sec.	±30
	Weight		kg	685

Notes
1) GD^2 of input shaft is a value in dwell range.

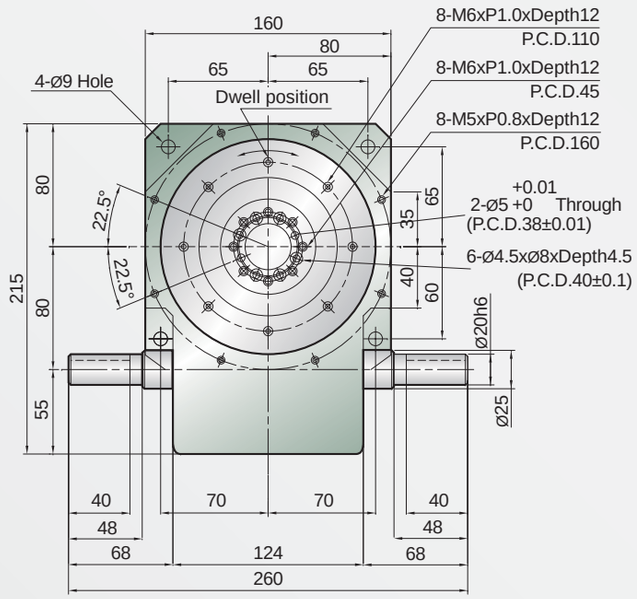
2) Value of C1 to C5 are those obtained for safety factor=2.

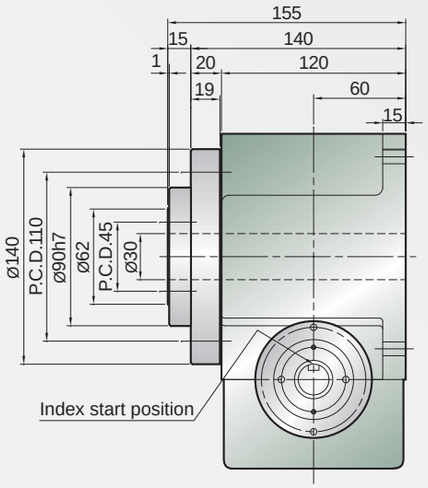
Table Model

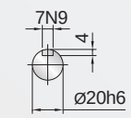
DT 80DT, 110DT, 140DT, 180DT, 210DT, 250DT,

This is one of the fully-developed table type index drives, which has high rigidity because of the adoption of a wider and lower table in whose center a tough hollow shaft is employed. This housing is so designed than an attachment can be installed on its sides, therefore, it is most suitable to rotary automatic assemblers, transfer machines and automatic wrappers.

80DT







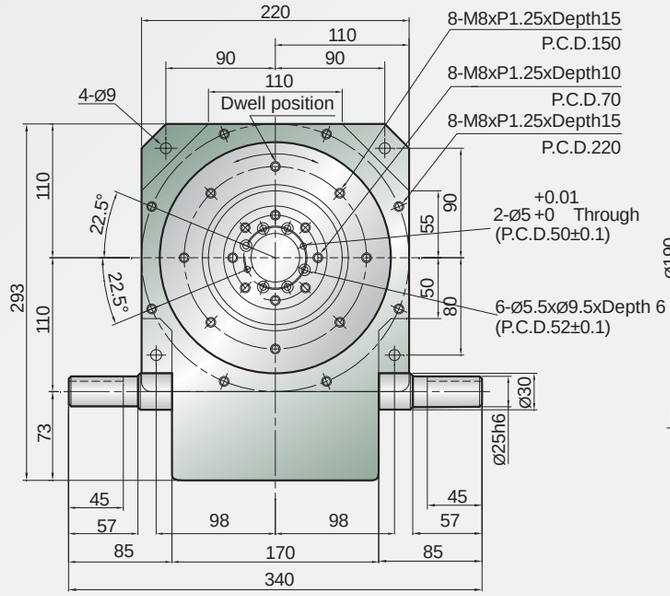
Input shaft

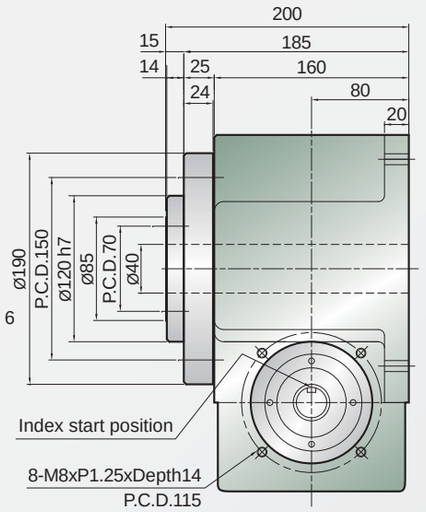
Item	Sym-bol	Unit	Value
Allowable thrust load on output shaft	C1	kgf	520
Allowable radial load on output shaft	C2	kgf	220
Allowable torque on output shaft	Ts	kgf-m	Refer torque table
Allowable thrust load on input shaft	C3	kgf	220
Max. repetitive bending force on input shaft	C4	kgf	160
Max. repetitive torque on input shaft	C5	kgf-m	9.5
GD^2 of input shaft (Note1)	C6	kgf-m^2	0.03
Indexing accuracy		sec.	±30
Weight		kg	20

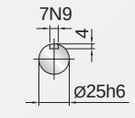
Notes
1) GD^2 of input shaft is a value in dwell range.

2) Value of C1 to C5 are those obtained for safety factor=2.

110DT







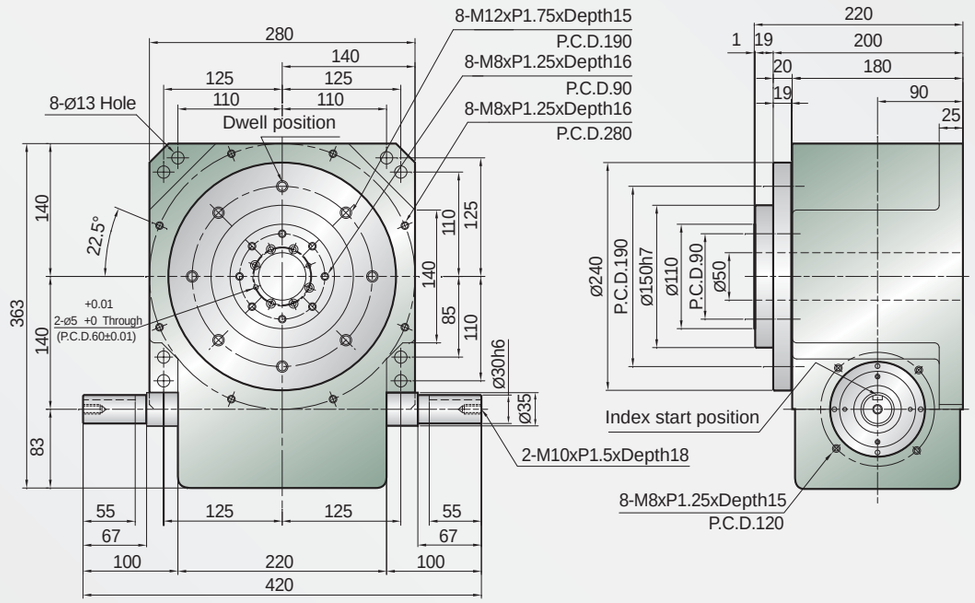
Input shaft

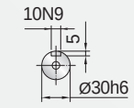
Item	Sym-bol	Unit	Value
Allowable thrust load on output shaft	C1	kgf	860
Allowable radial load on output shaft	C2	kgf	420
Allowable torque on output shaft	Ts	kgf-m	Refer torque table
Allowable thrust load on input shaft	C3	kgf	300
Max. repetitive bending force on input shaft	C4	kgf	250
Max. repetitive torque on input shaft	C5	kgf-m	25
GD^2 of input shaft (Note1)	C6	kgf-m^2	0.01
Indexing accuracy		sec.	±30
Weight		kg	50

Notes
1) GD^2 of input shaft is a value in dwell range.

2) Value of C1 to C5 are those obtained for safety factor=2.

140DT





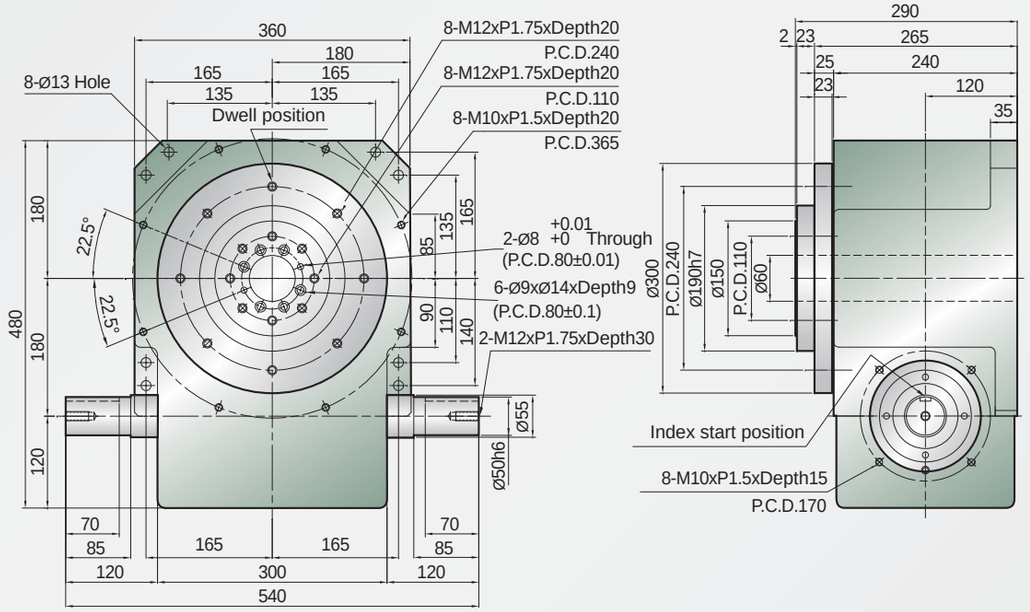
Input shaft

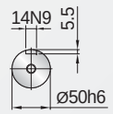
Item	Sym-bol	Unit	Value
Allowable thrust load on output shaft	C1	kgf	1050
Allowable radial load on output shaft	C2	kgf	720
Allowable torque on output shaft	Ts	kgf-m	Refer torque table
Allowable thrust load on input shaft	C3	kgf	500
Max. repetitive bending force on input shaft	C4	kgf	350
Max. repetitive torque on input shaft	C5	kgf-m	53
GD^2 of input shaft (Note1)	C6	kgf-m^2	0.07
Indexing accuracy		sec.	±30
Weight		kg	85

Notes
1) GD^2 of input shaft is a value in dwell range.

2) Value of C1 to C5 are those obtained for safety factor=2.

180DT





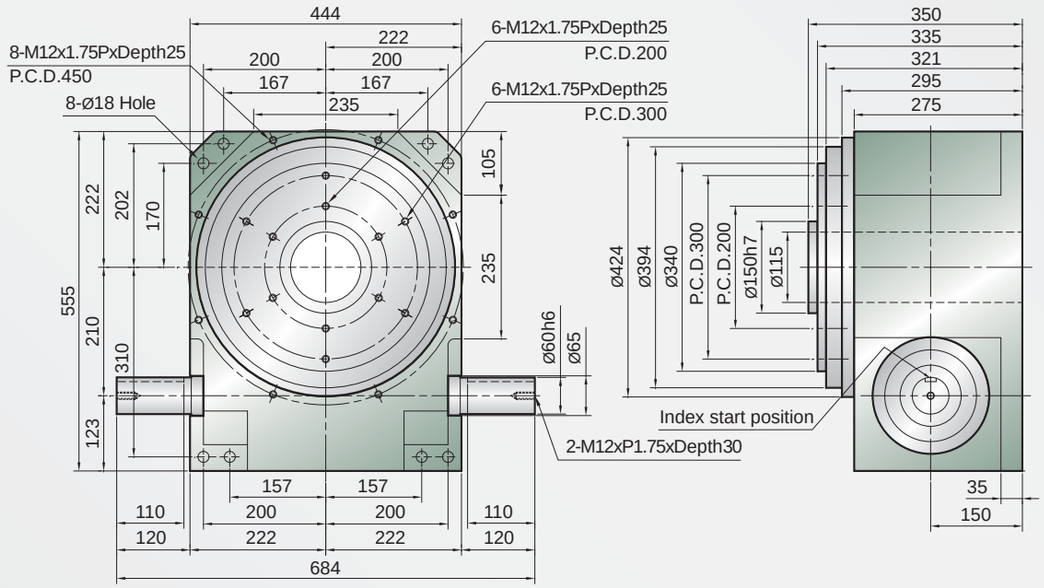
Input shaft

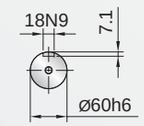
Item	Sym-bol	Unit	Value
Allowable thrust load on output shaft	C1	kgf	1500
Allowable radial load on output shaft	C2	kgf	1100
Allowable torque on output shaft	Ts	kgf-m	Refer torque table
Allowable thrust load on input shaft	C3	kgf	1200
Max. repetitive bending force on input shaft	C4	kgf	960
Max. repetitive torque on input shaft	C5	kgf-m	220
GD^2 of input shaft (Note1)	C6	kgf-m^2	0.23
Indexing accuracy		sec.	±30
Weight		kg	190

Notes
1) GD^2 of input shaft is a value in dwell range.

2) Value of C1 to C5 are those obtained for safety factor=2.

210DT





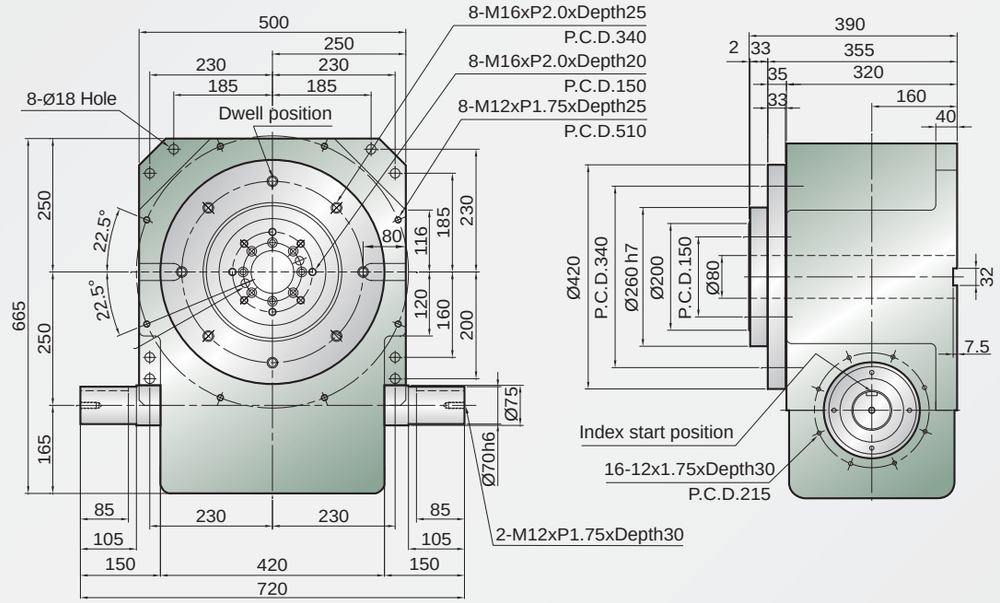
Input shaft

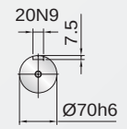
Item	Sym-bol	Unit	Value
Allowable thrust load on output shaft	C1	kgf	1950
Allowable radial load on output shaft	C2	kgf	1520
Allowable torque on output shaft	Ts	kgf-m	Refer torque table
Allowable thrust load on input shaft	C3	kgf	1570
Max. repetitive bending force on input shaft	C4	kgf	1130
Max. repetitive torque on input shaft	C5	kgf-m	460
GD^2 of input shaft (Note1)	C6	kgf-m^2	0.62
Indexing accuracy		sec.	±30
Weight		kg	450

Notes
1) GD^2 of input shaft is a value in dwell range.

2) Value of C1 to C5 are those obtained for safety factor=2.

250DT





Input shaft

Item	Sym-bol	Unit	Value
Allowable thrust load on output shaft	C1	kgf	2500
Allowable radial load on output shaft	C2	kgf	1800
Allowable torque on output shaft	Ts	kgf-m	Refer torque table
Allowable thrust load on input shaft	C3	kgf	1900
Max. repetitive bending force on input shaft	C4	kgf	2250
Max. repetitive torque on input shaft	C5	kgf-m	670
GD^2 of input shaft (Note1)	C6	kgf-m^2	0.86
Indexing accuracy		sec.	±30
Weight		kg	500

Notes
1) GD^2 of input shaft is a value in dwell range.

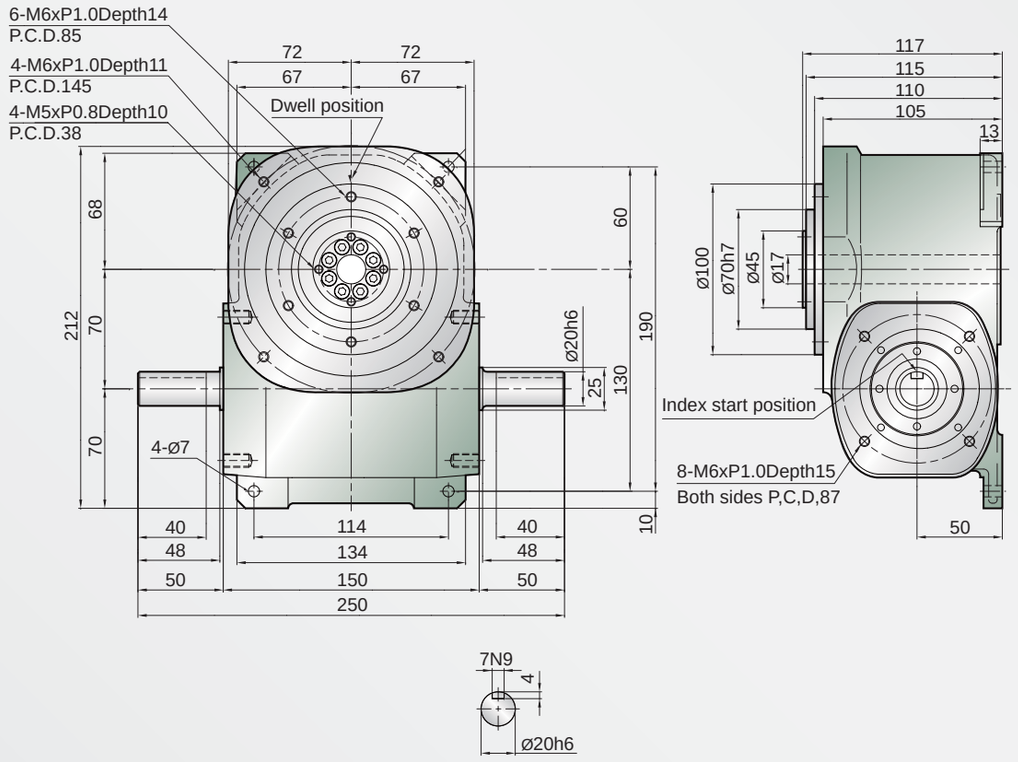
2) Value of C1 to C5 are those obtained for safety factor=2.

Ultrathin Table Model

DA 70DA, 90DA, 110DA, 150DA, 190DA, 230DA,

The properties of the series are the same as the table model. It could be endured the heavy axial and radial load. The necessary equipment would be assembled directly to the flange and large diameter hollow shaft of the output of the series. Electric wire and pipe from the power source could be passed through the hollow shaft. The series are widely applied in automation apparatus and industrial machinery to work the intermittent motion.

70DA



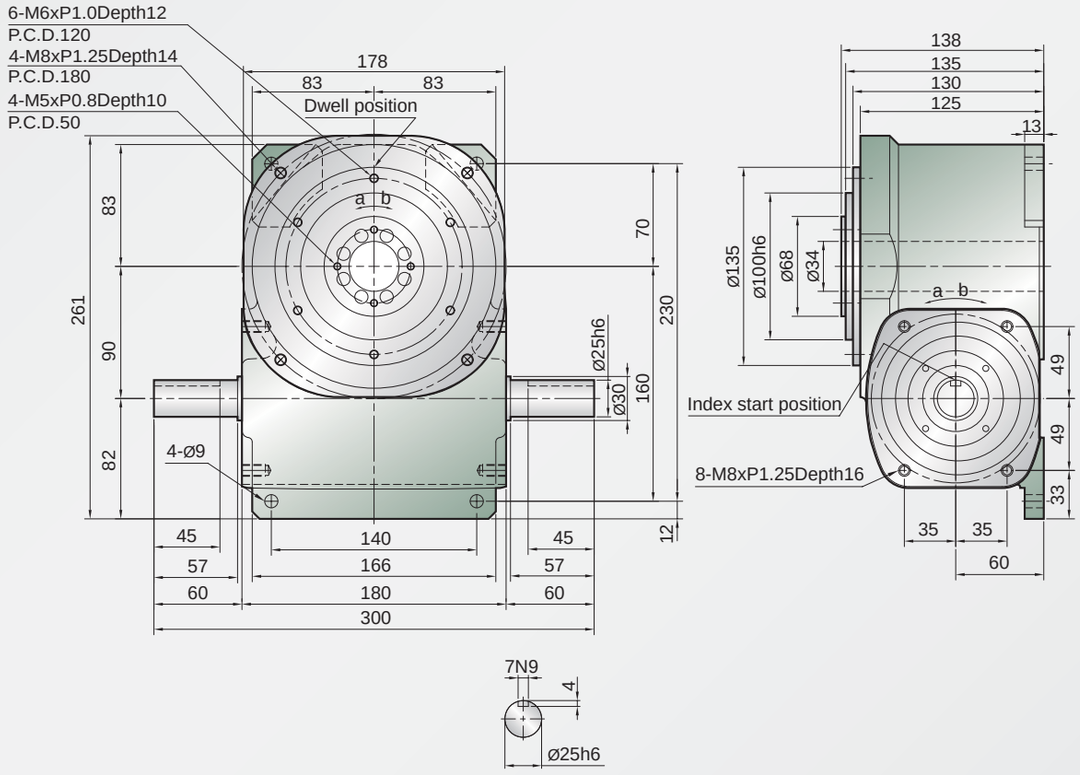
Input shaft

Item	Sym-bol	Unit	Value
Allowable thrust load on output shaft	C1	kgf	316
Allowable radial load on output shaft	C2	kgf	142
Allowable torque on output shaft	Ts	kgf-m	Refer torque table
Allowable thrust load on input shaft	C3	kgf	190
Max. repetitive bending force on input shaft	C4	kgf	163
Max. repetitive torque on input shaft	C5	kgf-m	9.5
GD^2 of input shaft (Note1)	C6	kgf-m^2	1.9 x 10^{-3}
Indexing accuracy		sec.	±30
Weight		kg	15

Notes
1) GD^2 of input shaft is a value in dwell range.

2) Value of C1 to C5 are those obtained for safety factor=2.

90DA



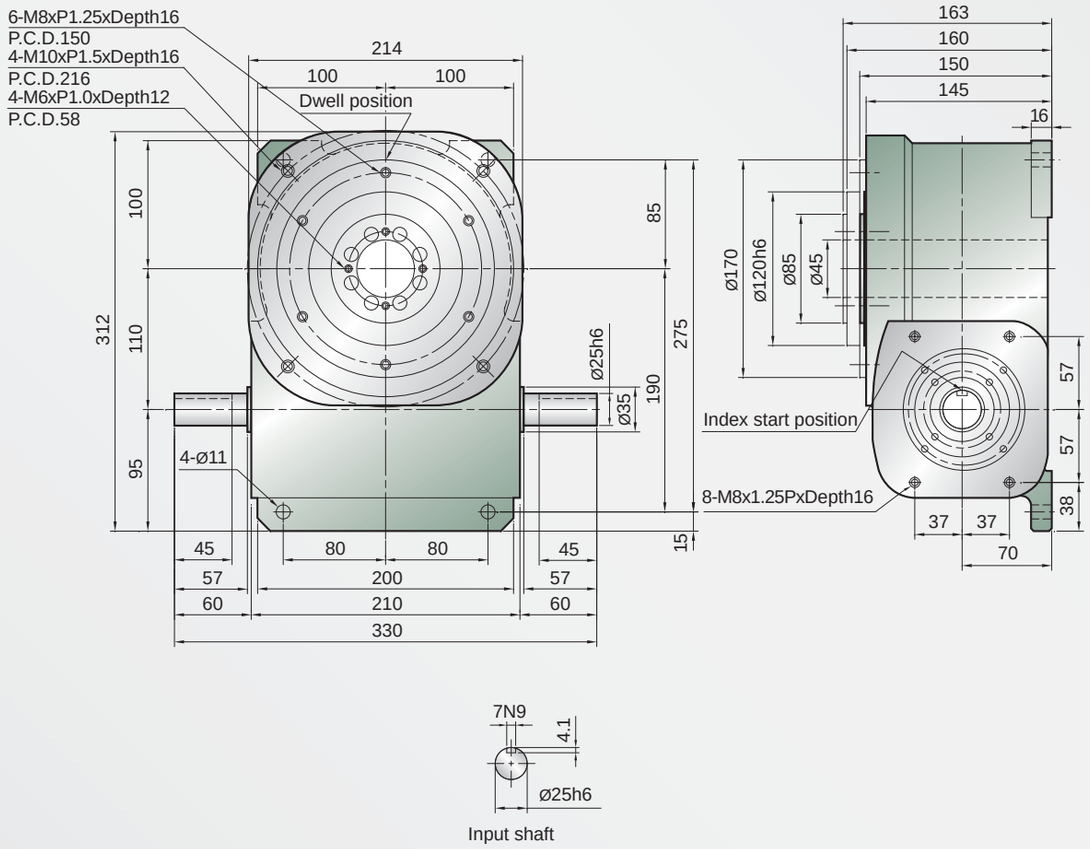
Input shaft

Item	Sym-bol	Unit	Value
Allowable thrust load on output shaft	C1	kgf	500
Allowable radial load on output shaft	C2	kgf	210
Allowable torque on output shaft	Ts	kgf-m	Refer torque table
Allowable thrust load on input shaft	C3	kgf	260
Max. repetitive bending force on input shaft	C4	kgf	260
Max. repetitive torque on input shaft	C5	kgf-m	25
GD^2 of input shaft (Note1)	C6	kgf-m^2	2.5 x 10^{-3}
Indexing accuracy		sec.	±30
Weight		kg	28

Notes
1) GD^2 of input shaft is a value in dwell range.

2) Value of C1 to C5 are those obtained for safety factor=2.

110DA

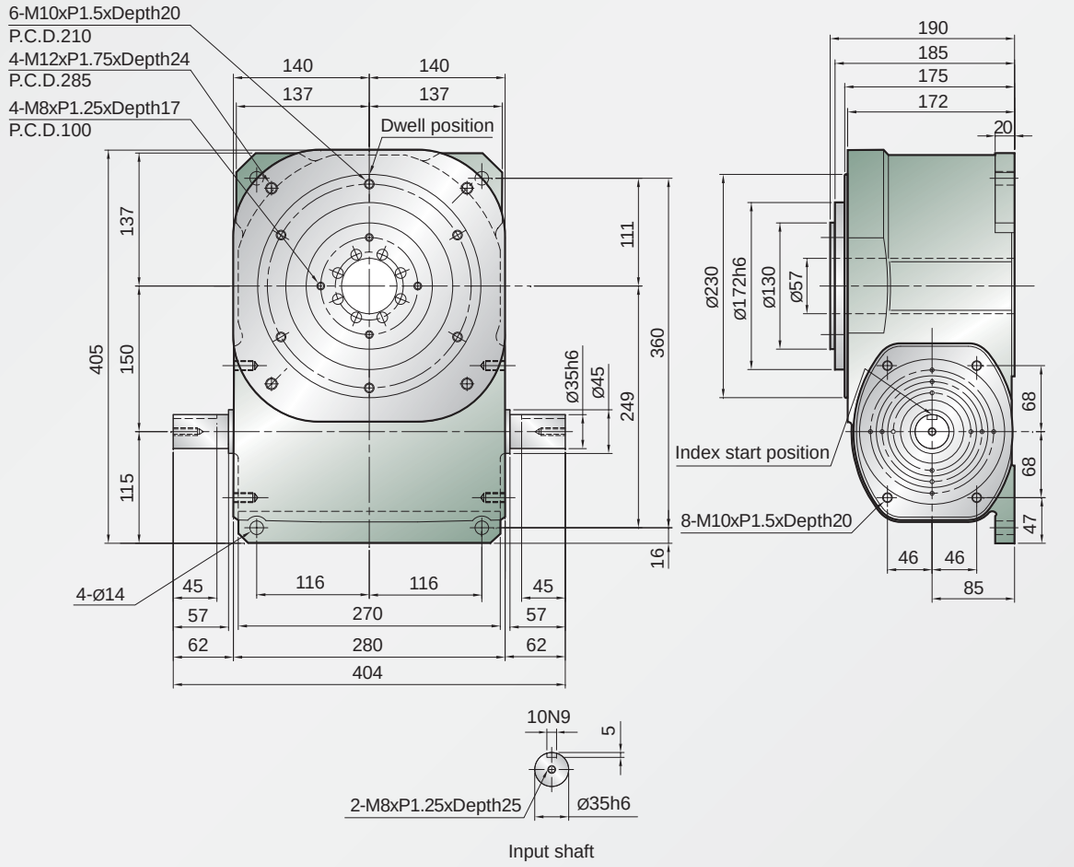


Item	Sym-bol	Unit	Value
Allowable thrust load on output shaft	C1	kgf	700
Allowable radial load on output shaft	C2	kgf	350
Allowable torque on output shaft	Ts	kgf-m	Refer torque table
Allowable thrust load on input shaft	C3	kgf	310
Max. repetitive bending force on input shaft	C4	kgf	360
Max. repetitive torque on input shaft	C5	kgf-m	30
GD^2 of input shaft (Note1)	C6	kgf-m^2	6.0 x 10^{-3}
Indexing accuracy		sec.	±30
Weight		kg	42

Notes
1) GD^2 of input shaft is a value in dwell range.

2) Value of C1 to C5 are those obtained for safety factor=2.

150DA

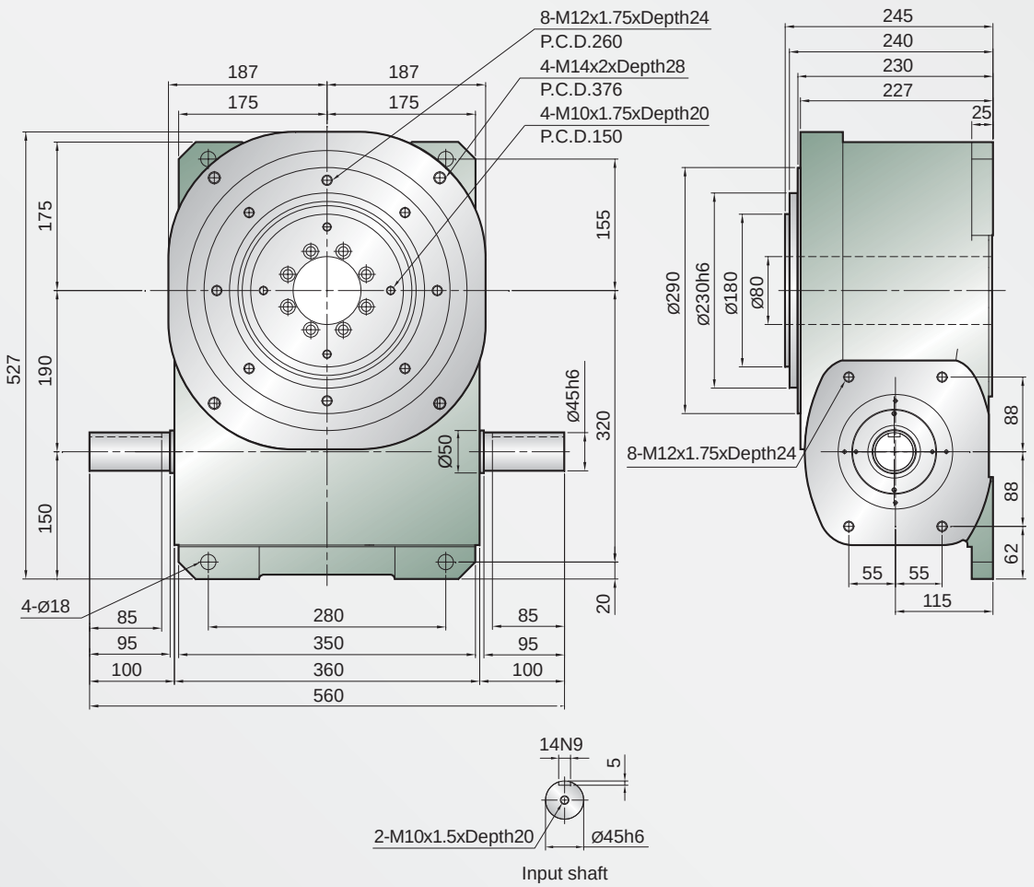


Item	Sym-bol	Unit	Value
Allowable thrust load on output shaft	C1	kgf	1200
Allowable radial load on output shaft	C2	kgf	700
Allowable torque on output shaft	Ts	kgf-m	Refer torque table
Allowable thrust load on input shaft	C3	kgf	410
Max. repetitive bending force on input shaft	C4	kgf	410
Max. repetitive torque on input shaft	C5	kgf-m	40
GD^2 of input shaft (Note1)	C6	kgf-m^2	0.02
Indexing accuracy		sec.	±30
Weight		kg	86

Notes
1) GD^2 of input shaft is a value in dwell range.

2) Value of C1 to C5 are those obtained for safety factor=2.

190DA



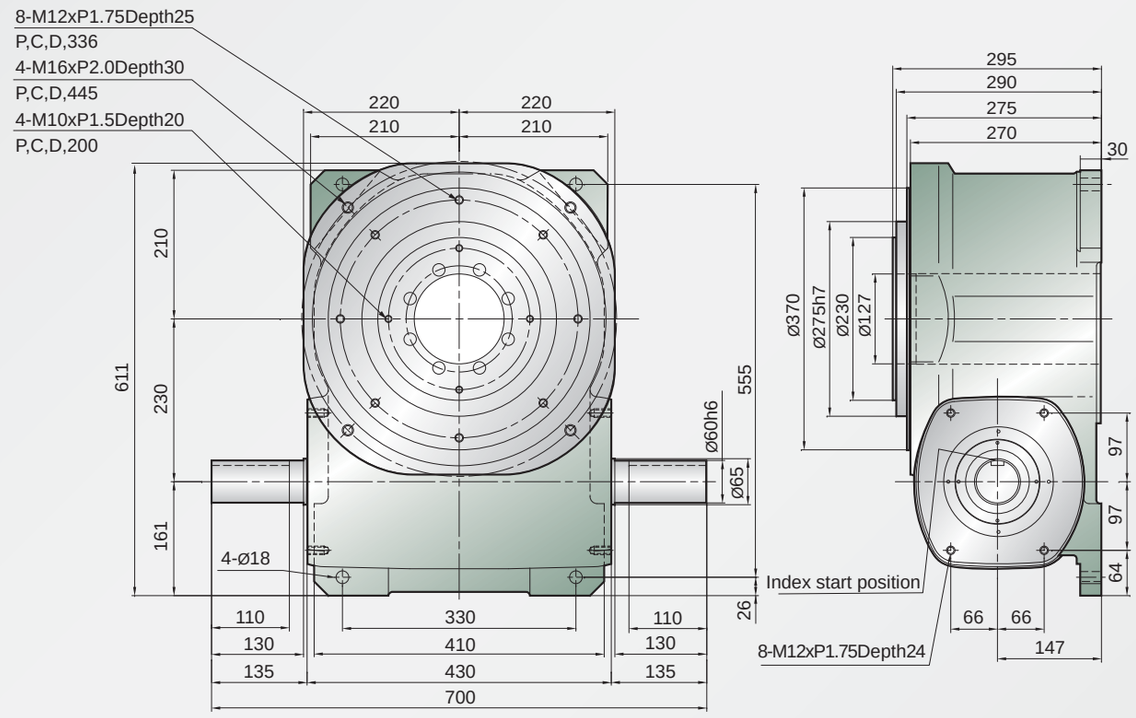
Input shaft

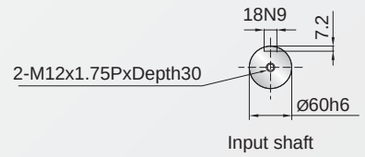
Item	Sym-bol	Unit	Value
Allowable thrust load on output shaft	C1	kgf	1838
Allowable radial load on output shaft	C2	kgf	918
Allowable torque on output shaft	Ts	kgf-m	Refer torque table
Allowable thrust load on input shaft	C3	kgf	510
Max. repetitive bending force on input shaft	C4	kgf	510
Max. repetitive torque on input shaft	C5	kgf-m	61
GD^2 of input shaft (Note1)	C6	kgf-m^2	0.105
Indexing accuracy		sec.	±30
Weight		kg	180

Notes
1) GD^2 of input shaft is a value in dwell range.

2) Value of C1 to C5 are those obtained for safety factor=2.

230DA





Input shaft

Item	Sym-bol	Unit	Value
Allowable thrust load on output shaft	C1	kgf	2800
Allowable radial load on output shaft	C2	kgf	1300
Allowable torque on output shaft	Ts	kgf-m	Refer torque table
Allowable thrust load on input shaft	C3	kgf	650
Max. repetitive bending force on input shaft	C4	kgf	650
Max. repetitive torque on input shaft	C5	kgf-m	80
GD^2 of input shaft (Note1)	C6	kgf-m^2	0.136
Indexing accuracy		sec.	±30
Weight		kg	285

Notes
1) GD^2 of input shaft is a value in dwell range.

2) Value of C1 to C5 are those obtained for safety factor=2.

Sway model

DH 45DH, 70DH, 80DH, 100DH

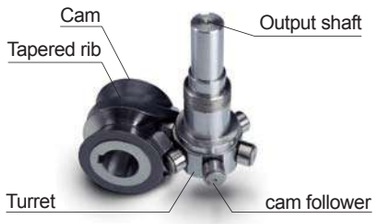
The oscillating, up and down gripping system contributes to close tight, high precision, and high-speed grasp convey, which in automation system provides a variety of multi-process capabilities. The H series designed as the synthesis mechanism for output shaft offers reciprocating motion, intermittent rotation, or rocking movement.

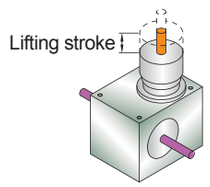
Model Code

R - 080 H 12N 40 S3 W 1 X AA

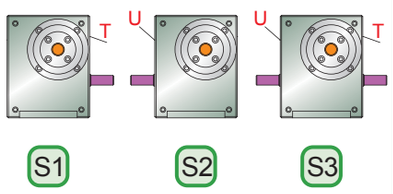
a b c d e f g h i j

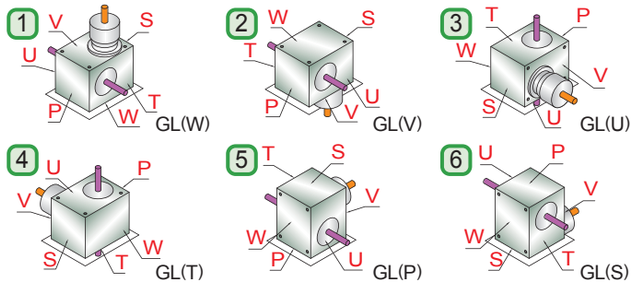
a Model	d Specification	c Type	d Number of stop or Rotation angle	e Cam motion profile
R cam follower	D80 80mm	H Type	12N 12 stop	40 lifting stroke
	Distance between output shaft and input shaft 45/70/80/100	H Lift oscillating type	Notes 1 : Number of Intermittent stop. 2.3.4.5.6.8.10.12 045 Notes 2 : Output shaft swing angle within 90°are available upon request.	Selection lifting stroke 45.70.80.100 Maximum stroke 40mm





g Input shaft assembling position	h Mounting screw holes on body surface	i Installation location	j Special Specifications	k Special Specifications
S3 Input shaft crossing plane T/U	W	1	X	AA
S1 Input shaft at plane T S2 Input shaft at plane U S3 Input shaft crossing plane T/U	Mounting holes on surfaces V and W come automatically. In addition, mounting holes on the other surfaces are available as standard.	Installation position shown in the following figure 1	1.The requirements as ordering extra special specifications 2.The requirements as split timing lift curve	Customer-specific coding





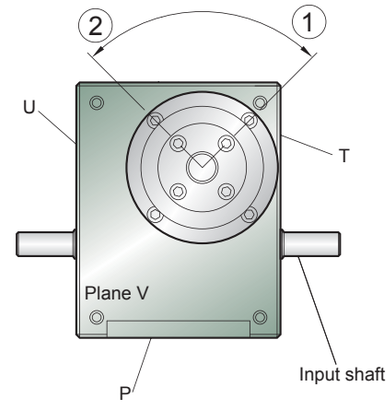
How to order

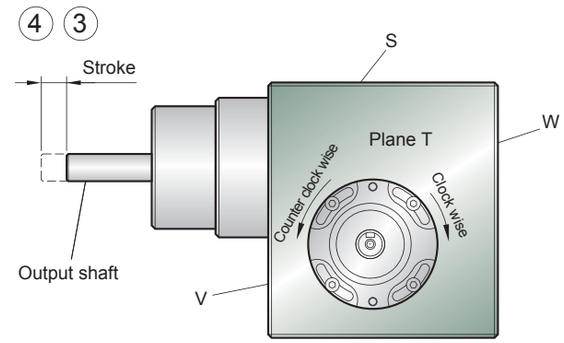
- Mounting screw holes on body surface shown 6 planes as V.W.P.S.T. and U, customers also need to specify the location of plane of the fixing surface.
- Code number indicates the input cam shaft, output shaft, and fixing position of screw holes.
- Be sure to attach the required model in the order when ordering either right-handed or left-handed cam, which has a certain purchase criteria. Similarly, the 4 types of motion profiles (MT, MS, MCV50, RBS) also has optional standard.

The requirements of split timing lift curve

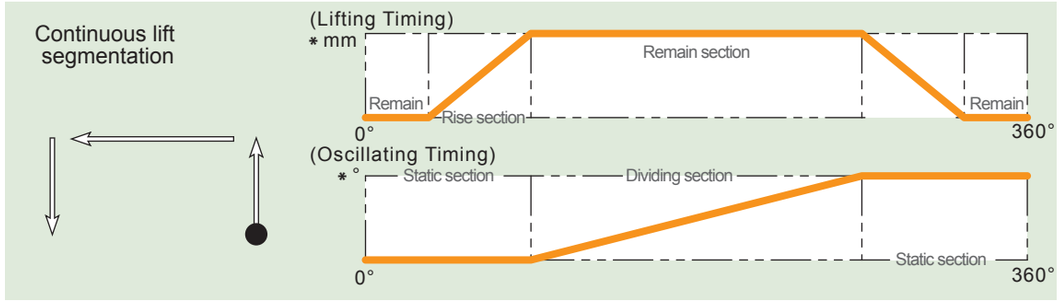
- Customers need offer a time curve, lifting travel, output /input shaft rotation direction or specified special parts, which available to the company's sales clerk or designers to do as soon as possible to select a correct application of specifications and recommendations to you.

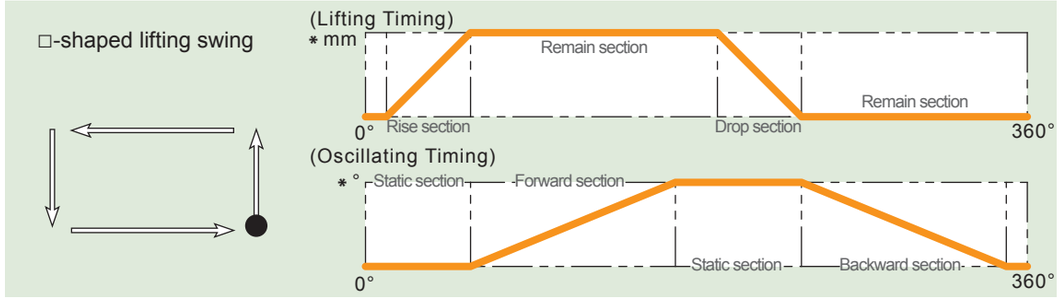
DH Lift oscillating type

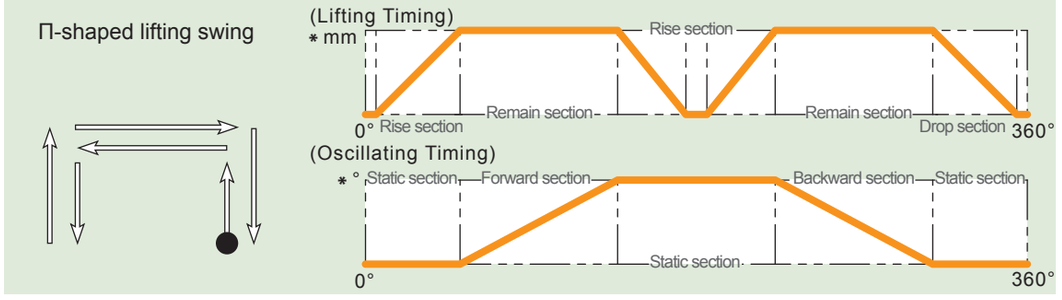




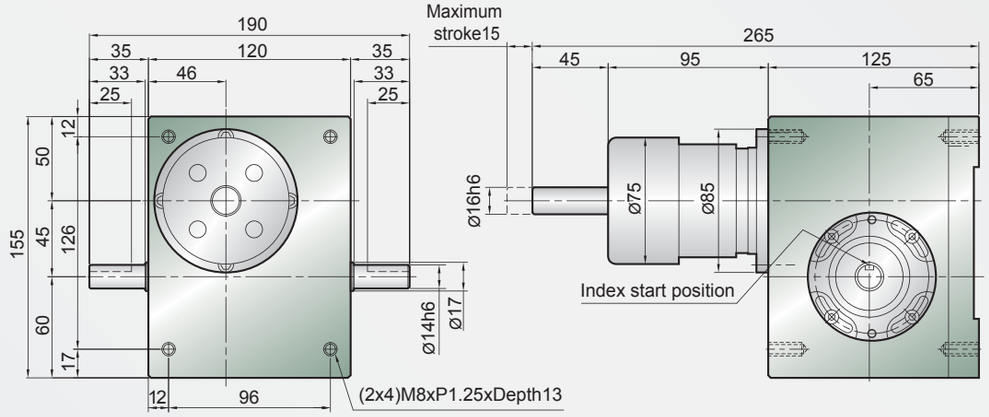
Graph Matrix Actuation curve timing chart

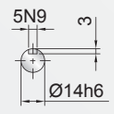






45DH





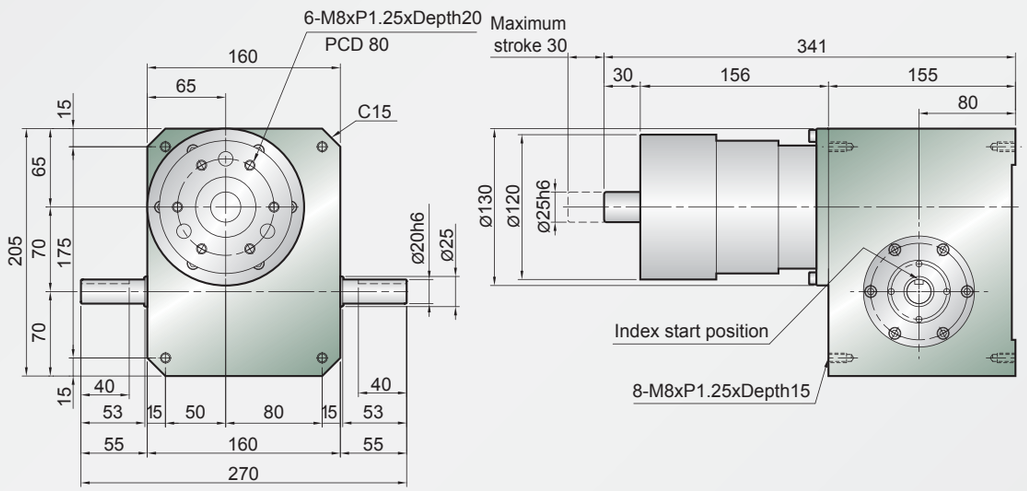
Input shaft

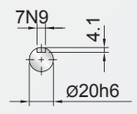
Item	Sym-bol	Unit	Value
Allowable thrust load on output shaft	C1	kgf	5
Allowable radial load on output shaft	C2	kgf	9
Allowable torque on output shaft	Ts	kgf-m	Refer torque table
Allowable thrust load on input shaft	C3	kgf	60
Max. repetitive bending force on input shaft	C4	kgf	45
Max. repetitive torque on input shaft	C5	kgf-m	3.8
GD^2 of input shaft (Note1)	C6	$kgf\text{-}m^2$	$3.9x\ 10^{-4}$
Indexing accuracy		sec.	±60
Weight		kg	15

Notes
1) GD^2 of input shaft is a value in dwell range.

2) Value of C1 to C5 are those obtained for safety factor=2.

70DH





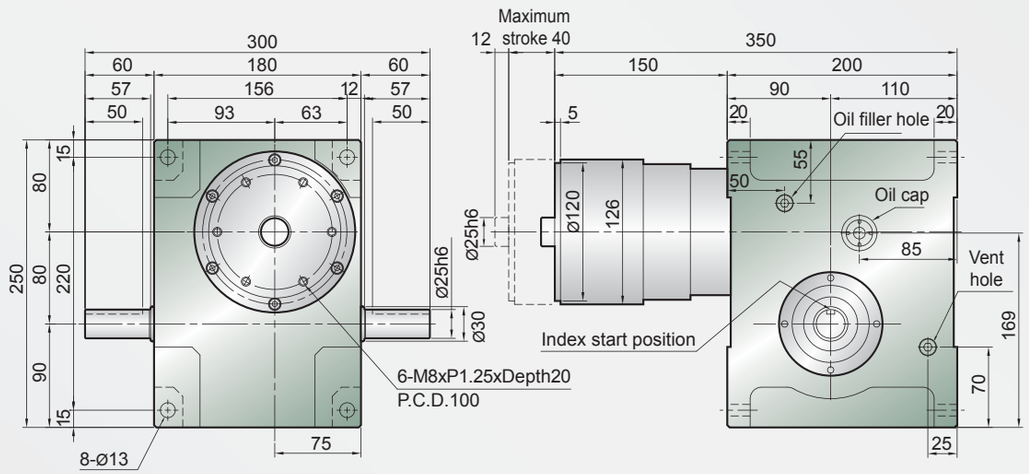
Input shaft

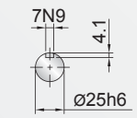
Item	Sym-bol	Unit	Value
Allowable thrust load on output shaft	C1	kgf	7
Allowable radial load on output shaft	C2	kgf	14
Allowable torque on output shaft	Ts	kgf-m	Refer torque table
Allowable thrust load on input shaft	C3	kgf	100
Max. repetitive bending force on input shaft	C4	kgf	95
Max. repetitive torque on input shaft	C5	kgf-m	6
GD^2 of input shaft (Note1)	C6	$kgf\text{-}m^2$	$1.2\ x\ 10^{-2}$
Indexing accuracy		sec.	±30
Weight		kg	22

Notes
1) GD^2 of input shaft is a value in dwell range.

2) Value of C1 to C5 are those obtained for safety factor=2.

80DH





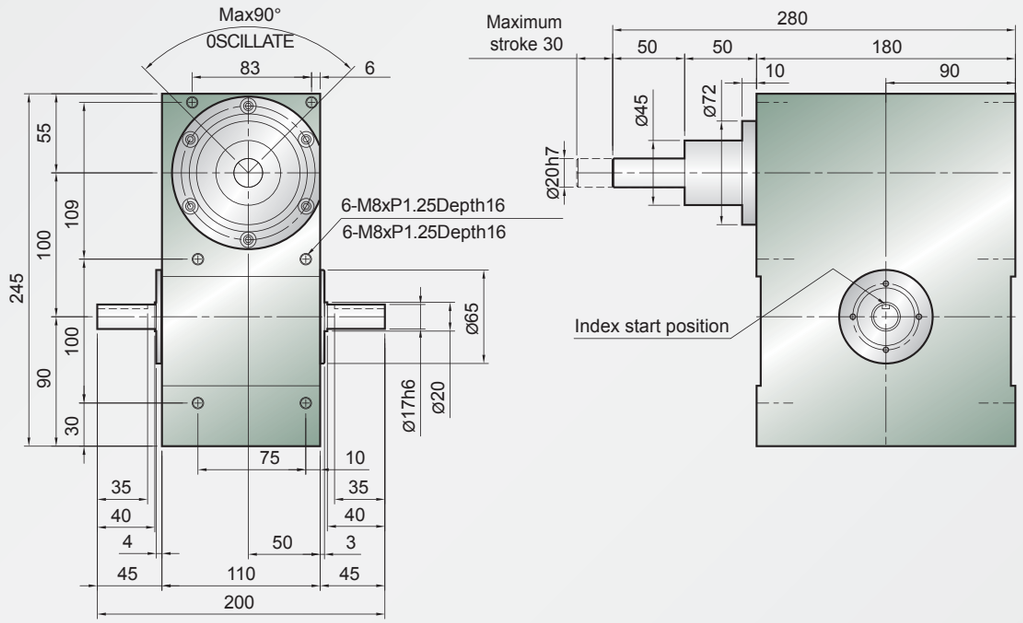
Input shaft

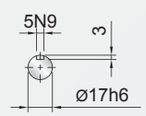
Item	Sym-bol	Unit	Value
Allowable thrust load on output shaft	C1	kgf	15
Allowable radial load on output shaft	C2	kgf	18
Allowable torque on output shaft	Ts	kgf-m	Refer torque table
Allowable thrust load on input shaft	C3	kgf	140
Max. repetitive bending force on input shaft	C4	kgf	190
Max. repetitive torque on input shaft	C5	kgf-m	9.5
GD^2 of input shaft (Note1)	C6	kgf-m^2	1.7 x 10^{-2}
Indexing accuracy		sec.	±30
Weight		kg	33

Notes
1) GD^2 of input shaft is a value in dwell range.

2) Value of C1 to C5 are those obtained for safety factor=2.

100DH





Input shaft

Item	Sym-bol	Unit	Value
Allowable thrust load on output shaft	C1	kgf	10.6
Allowable radial load on output shaft	C2	kgf	24.9
Allowable torque on output shaft	Ts	kgf-m	Refer torque table
Allowable thrust load on input shaft	C3	kgf	132
Max. repetitive bending force on input shaft	C4	kgf	105
Max. repetitive torque on input shaft	C5	kgf-m	10.8
GD^2 of input shaft (Note1)	C6	kgf-m^2	1.5 x 10^{-2}
Indexing accuracy		sec.	±30
Weight		kg	30

Notes
1) GD^2 of input shaft is a value in dwell range.

2) Value of C1 to C5 are those obtained for safety factor=2.

Calculation formula (examples)

Ex.(1) When applying the sub-table (Fig-1)

Select a suitable size and model of index unit and necessary power of drive motor in following data shown as Fig-1 are given.

Data

- Number of index stop : S=6
- Time ratio in move : Dwell for one rotation of cam
- Revolution of input shaft : N=80rpm
- Cam curve : Modified Sine curve
- Size of sub-table : ø300 x t20
- Weight of jig : 3 kg/set
- Weight of workpiece : 0.25kg/piece
- Jigsare fixed on P.C.D. ø200

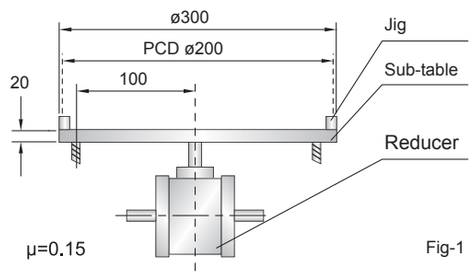


Fig-1

Solution

1 - 1 Number of index stop : S = 6

1 - 2 Time ratio in rotation/dwell 1 : 2, therefore : Index angle

$\theta h = 360^\circ \times \frac{1}{1+2} = 120^\circ$

1 - 3 Revolution of input shaft : N = 80 rpm

1 - 4 Cam curve as modified sine, therefore : Vm = 1.76, Am = 5.53, Qm = 0.99

1 - 5 Loading torque : Tt

(1) Inertia torque : Ti

(a) Weight of sub-table as W1, jig as W2, workpiece as W3 to be :

$W1 = \frac{\pi}{4} \times 30^2 \times 2 \times 7.8 \times \frac{1}{1000} = 11.026(kg)$

$W2 = 3 \times 6 = 18(kg)$

$W3 = 0.25 \times 6 = 1.5(kg)$

(b) Inertia moment of sub-table as I1, jig as I2, workpiece as I3 to be :

$I_1 = \frac{WR^2}{2G} = \frac{11.026 \times 0.15^2}{2 \times 9.8} = 0.0126(kg.m.s)^2$

$I_2 = \frac{WR^2}{G} = \frac{18 \times 0.1^2}{9.8} = 0.018(kg.m.s)^2$

$I_3 = \frac{WR^2}{G} = \frac{1.5 \times 0.1^2}{9.8} = 0.0015(kg.m.s)^2$

(c) Total inertia moment (I) to be :

$I = I_1 + I_2 + I_3 = 0.0126 + 0.018 + 0.0015 = 0.032(kg.m.s)^2$

(d) Output shaft biggest angular acceleration (α) to be :

$\alpha = Am \times \frac{2\pi}{S} \times (\frac{360}{\theta h} \times \frac{N}{60})^2$

$= 5.53 \times \frac{2\pi}{6} \times (\frac{360}{120} \times \frac{80}{60})^2$

$= 92.66 (rad/s)^2$

(e) Inertia torque (Ti) to be ;

$T_i = I \cdot \alpha = 0.032 \times 92.66 = 2.965 (kg.m)$

(2) Working torqu (Tw) to be ;

No work during indexing, therefore : Tw = 0

(3) Loading torque (Tt) from above to be ;

$Tt = T_i + Tw$

$= 2.965 + 0 = 2.965(kg.m)$

1 - 6 Actual loading torque : Te

Factor of safety load fc as fc = 1.5

$Te = Tt \cdot fc$

$= 2.965 \times 1.5 = 4.45(kg.m)$

1 - 7 Input shaft torque : Tc

Note : Loading torque against input shaft Tca is regarded as 0, therefore Tca = 0 therefore

$Tc = \frac{360}{\theta h.S} \cdot Qm \cdot Te + Tca$

$= \frac{360}{120x6} \times 0.99 \times 4.45$

$= 2.20(kg.m)$

1 - 8 Necessary power : P

$P = \frac{Tc.N}{716.\eta}$ (HP) or $P = \frac{Tc.N}{975.\eta}$ (kw)

if efficiency η = 60%, then

$P = \frac{2.20x80}{716x0.6} = 0.41(HP)$ or $P = \frac{2.20x80}{975x0.6} = 0.31(kw)$

In fact, this value is regarded as its peak, therefore 1/2 of this value shall be provided.

1 - 9 Selection for model of index unit.

From the above, revolution of input shaft as 80rpm and you can choose from the catalog whose output torque is higher than the calculated torque (Te), therefore, Te = 5.135(kg-m) leads to select RU-70DF as a result.

Calculation formula (examples)

EX.(2) When applying to drive a conveyor (Fig-2)

A index unit is applied to drive a conveyor with gear attached to output shaft of index unit and drive shaft of conveyor to reduce speed. Given data are as follows.

Data

- Traverse pitch on conveyor : 239mm
- Indexing cam angle : θh = 120°
- Driven 2 seconds for 1 cycle
- Reduction ratio : $i = \frac{180}{100} = (\frac{n}{m})$
- Cam curve : Modified Sine

Note Dc : pitch diameter of conveyor sprocket (cm)
Pc : traverse pitch on conveyor (cm)
I : velocity ratio

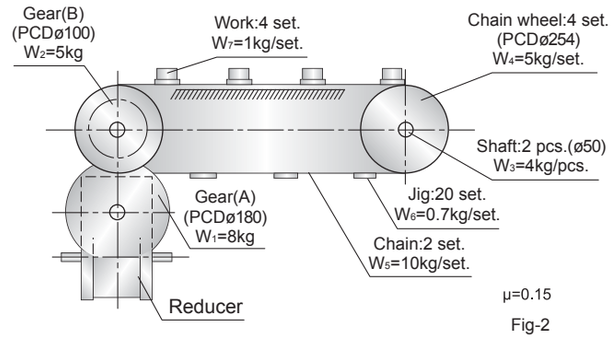


Fig-2

Solution

2 - 1 Number of index stop to be ;

$S = \frac{\pi Dc.i}{pc} = \frac{\pi x25.4x1.8}{23.9} = 6$

2 - 2 Revolution of input shaft to be provided 2 seconds as 1 cycle, therefore ;

$N = \frac{60}{2} = 30$ rpm

2 - 3 Cam curve as modified trapezoid, therefore ;

Vm = 1.76 · Am = 5.53 · Qm = 0.99

2 - 4 Loading torque : Tt

(1) Inertia torque (Ti) to be ;

(a) Weight of drive gear W1 = 8 kg, and p,c,d = ϕ 180, then inertia moment on drive gear (IA) ;

$IA = (I_1) = \frac{W1R^2}{2G} = \frac{8 \times 9^2}{2 \times 980} = 0.331(kg.cm.s)^2$

(b) Inertia moment on conveyor to be ;

1) Inertia moment on driven gear (I2) (regarded as donut shape) to be ;

$I_2 = \frac{W2(R^2+r^2)}{2G} = \frac{5(5^2+2.5^2)}{2 \times 980} = 0.08(kg.cm.s)^2$

2) Inertia moment of shaft (I3) to be ;

$I_3 = \frac{W3R^2}{2G} = \frac{4 \times 2.5^2}{2 \times 980} \times 2 = 0.026(kg.cm.s)^2$

3) Inertia moment of sprocket (I4)(regarded as donut shape) to be.

$I_4 = \frac{W4(R^2+r^2)}{G} = \frac{5(12.7^2+2.5^2)}{2 \times 980} \times 4 = 1.71(kg.cm.s)^2$

4) Inertia moment of chain (I5) to be ;

$I_5 = \frac{W5Re^2}{G} = \frac{10x12.7^2}{980} \times 2 = 3.29(kg.cm.s)^2$

5) Inertia moment of jig (I6) to be ;

$I_6 = \frac{W6Re^2}{G} = \frac{0.7 \times 12.7^2}{980} \times 10 = 2.3(kg.cm.s)^2$

6) Inertia moment of workpiece (I7) to be ;

$I_7 = \frac{W7Re^2}{G} = \frac{1 \times 12.7^2}{980} \times 4 = 0.65(kg.cm.s)^2$

7) Therefore, total inertia moment on conveyor side (IB) to be ;

$IB = I_2 + I_3 + I_4 + I_5 + I_6 + I_7$

$= 0.08 + 0.026 + 1.71 + 3.29 + 2.3 + 0.65$

$= 8.056(kg.cm.s)$

(c) Effective inertia moment on conveyor side (IBe) to be ;

$IBe = IB(\frac{n}{m})^2 = 8.056 \times (\frac{180}{100})^2 = 26.10(kg.cm.s^2)$

(d) Total inertia moment is sum of (a),(c), therefore ;

$I = IA + IBe = 0.331 + 26.10 = 26.43(kg.cm.s)^2$

(e) Output shaft biggest angular acceleration (α) to be ;

$\alpha = Am \frac{2\pi}{S} (\frac{360}{\theta h} \times \frac{N}{60})^2$

$= 5.53 \times \frac{2\pi}{6} (\frac{360}{120} \times \frac{30}{60})^2 = 13.02(rad\ s)^2$

(f) From the above, inertia torque (Ti) to be multiplication of (d),(e), therefore ;

$Ti = I \cdot \alpha = 26.43 \times 13.02 = 344.12(kg.cm)$

2 - 5 Friction torque : Tf

(a) Friction torque on conveyor side (Tf) to be ;

Frictional load shall be caused on sliding surface by 1/2 weight of chain and jig, and full weight of workpiece.

$Tf = \mu WR$

$= 0.15 \times (\frac{4}{2} + \frac{0.7x20}{2} + \frac{10x12}{2}) \times 12.7 = 36.19(kg.cm)$

(b) Effective friction torque on conveyor side (Tfe) to be ;

$Tfe = Tf(\frac{n}{m}) = 36.19 \times \frac{180}{100} = 65.14(kg.cm)$

2 - 6 Working torque (Tw) to be ;

No work during indexing, therefore ; Tw = 0

2 - 7 From the above, loading torque (Tt) to be ;

$Tt = Ti + Tf + Tw$

$= 344.12 + 65.14 + 0$

$= 409.26(kg.cm) = 4.09(kg.m)$

Notice : Be sure that all value is either (cm) or (m) to avoid mistake.

And Gravitational acceleration is ;

$G = 980(cm/s)^2 = 9.8(m/s)^2$

2 - 8 Provided the factor of safety load fc = 2, actual loading torque (Te) to be ;

$Te = Tt \cdot fc = 4.09 \times 2 = 8.18(kg.m)$

2 - 9 Input shaft torque (Tc) to be ;

$Tc = \frac{360}{S} \cdot \frac{1}{\theta h} \cdot Qm \cdot Te + Tca$

Note : Provided any torque against cam shaft Tca is regarded as 0

$Tc = \frac{360}{6} \times \frac{1}{120} \times 0.99 \times 8.18 + 0 = 4.05$

2 - 10 Necesssary power (P) to be ;

$P = \frac{Tc \cdot N}{716 \cdot \eta}$ (HP) or $P = \frac{Tc \cdot N}{975 \cdot \eta}$ (kw)

Provided efficiency η = 60% then ;

$P = \frac{40.5x30}{716x0.6} = 0.28(HP)$ or

$P = \frac{4.14x30}{975x0.6} = 0.212(kw)$

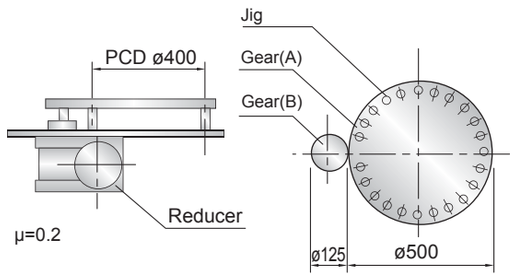
In fact, this value is regarded as its peak, therefore 1/2 of this value shall be provided.

2 - 11 Selecting for model of index unit.

From the above, revolution of input shaft as 30 rpm and you can choose from catalog whose output torque is higher than the calculated torque (Te).
Therefore, Te = 8.18(kg.m)leads to select RU-80ds as a result.

Calculation formula (examples)

EX.(3) Indexing Driven Rotating Table Type data shown as Fig-3 are given.



Data

- Number of index stop : S = 6
- Time ratio in move : Dwell for one rotation of cam
- Revolution of input shaft : N=80rpm
- Cam curve : Modified Sine curve
- A-Gear Diameter : 400
- A-Gear Weight : 25kg
- B-Gear Diameter : 100
- B-Gear Weight : 2kg
- Workpiece : 2kg/set
- Jig Weight : 3 kg/set
- Rotary table size : ø500 x 20t
- Jig Number : 24
- Coefficient of friction : 0.2
- Jig Pitch Circle Diameter : ø400
- Rotary table is held with its bottom sliding surface to support loaded weight.(effective radius R=200mm)
- Indexing Angle : 120°

Solution

1 - 1 Number of index stop : S = 6

1 - 2 Indexing Angle : 120°

1 - 3 Revolution of input shaft : N = 80 rpm

1 - 4 Cam curve as modified sine, therefore : Vm = 1.76, Am = 5.53, Qm = 0.99

1 - 5 Loading torque : Tt

(1) Inertia torque : Ti

(a) Weight of A-Gear as W2, Rotary table as W3, jig as W4, Workpiece as W5.

$W3 = \frac{\pi}{4} \times 50 \times 2 \times 7.8 \times \frac{1}{1000} = 30.63$ kg

W4 = 3 x 24 = 72 kg

W5 = 2 x 24 = 48 kg

(b) Inertia moment of B-Gear as I1, A-Gear as I2, Rotary table as I3, Jig as I4, Workpiece as I5 :

$I1 = \frac{WR^2}{2G} = \frac{2 \times 0.05^2}{2 \times 9.8} = 0.00025$ (kg.m.s)^2

$I2 = \frac{W2Re^2}{2G} = \frac{25 \times 0.2^2}{2 \times 9.8} = 0.051$ (kg.m.s)^2

$I3 = \frac{W3Re^2}{G} = \frac{30.63 \times 0.25^2}{9.8} = 0.098$ (kg.m.s)^2

$I4 = \frac{W4Re^2}{G} = \frac{72 \times 0.2^2}{9.8} = 0.294$ (kg.m.s)^2

$I5 = \frac{W5Re^2}{G} = \frac{48 \times 0.2^2}{9.8} = 0.20$ (kg.m.s)^2

(c) Total inertia moment (I) to be :

I = I1 +I2 +I3 +I4 +I5

= 0.00025 + 0.051 + 0.098 + 0.294 + 0.2 = 0.640 (kg.m.s)^2

(d) Output shaft biggest angular acceleration (α) to be :

$\alpha 1 = Am \times \frac{2\pi}{S} \times (\frac{360}{\theta h} \times \frac{N}{60})^2$

$= 5.53 \times \frac{2\pi}{6} \times (\frac{360}{120} \times \frac{80}{60})^2 = 92.66$ (rad/s)^2

$\alpha 2 = Am \times \frac{2\pi}{S1} \times (\frac{360}{\theta h} \times \frac{N}{60})^2$

$= 5.53 \times \frac{2\pi}{24} \times (\frac{360}{120} \times \frac{80}{60})^2 = 23.16$ (rad/s)^2

(e) Inertia torque (T i) to be :

T i 1 = I1 · α = 0.00025 x 92.66 = 0.051 (kg.m)

$Ti2 = (I2 + I3 + I4 + I5)(\frac{S}{S1})^2 \cdot \alpha 2 (\frac{S1}{S})$

$= (0.051 + 0.098 + 0.294 + 0.2)(\frac{6}{24})^2 \times 23.16 \times (\frac{24}{6})$

= 3.723 (kg.m)

T i = T i 1 + T i 2 = 0.051 + 3.723 = 3.77 (kg.m)

(2) Friction torque (T f) to be :

$Tf = \mu \cdot W \cdot R (\frac{S}{S1})$

$= 0.2 \times (25+30.63+72+48) \times 0.2 \times (\frac{24}{6}) = 1.76$ (kg.m)

(3) Working torque (T w) to be :

No work during indexing, therefore : T w = 0

(4) Loading torque (T t) from abore to be :

T t = T i + T f + T w = 3.77 + 1.76 + 0 = 5.53 (kg.m)

1 - 6 Actual loading torque : Te

Factor of safeey load fc as fc = 2

T e = T t · f c = 5.53 x 2 = 11.06 (kg.m)

1 - 7 Input shaft torque : Tc

Note : Loading torque against input shaft Tca is regarded as 0, therefore Tca = 0 therefore

$Tc = \frac{360}{\theta h.S} \cdot Qm \cdot Te + Tca$

$= \frac{360}{120 \times 6} \times 0.99 \times 11.06 = 5.47$ (kg.m)

1 - 8 Necessary power : P

$P = \frac{Tc \cdot N}{716 \cdot \eta}$(HP) or $P = \frac{Tc \cdot N}{975 \cdot \eta}$(kw)

if efficiency η =60%, then

$P = \frac{5.47x80}{716x0.6} = 1.02$(HP) or $P = \frac{5.47x80}{975x0.6} = 0.75$ (kw)

In fact, this value is regarded as its peak, therefore 1/2 of this value shall be provided.

1 - 9 Selection for model of index unit.

From the above, revolution of input shaft as 80 rpm and you can choose from the catalog whose output torque is higher than calculated torque (Te), therefore, Te =11.06(kg.m) leads to select RU-80DF as a result.

DS.DF TYPE

Stops S	Index period θ	Code	Static torque Ts (kgf-m)	Net dynamic torque to (kgf-m) Indexes per min.NN(rpm) 50	100	150	200	Bearing sleeve ø (mm)
2	150	25D	0.11	0.05	0.04	0.04	0.03	5
		32D	0.27	0.13	0.10	0.09	0.08	6
	180	25D	0.11	0.06	0.05	0.04	0.04	5
		32D	0.27	0.15	0.12	0.10	0.09	6
	210	25D	0.11	0.07	0.05	0.04	0.04	5
		32D	0.27	0.17	0.13	0.11	0.10	6
	240	25D	0.11	0.07	0.06	0.05	0.04	5
		32D	0.27	0.18	0.14	0.12	0.10	6
	270	25D	0.11	0.07	0.06	0.05	0.05	5
		32D	0.27	0.19	0.15	0.12	0.11	6
		38D	0.67	0.21	0.17	0.15	0.14	8
	300	25D	0.21	0.12	0.09	0.08	0.07	5
		32D	0.48	0.27	0.21	0.18	0.16	6
		38D	0.71	0.21	0.17	0.15	0.14	8
3	120	25D	0.11	0.60	0.50	0.39	0.35	5
		32D	0.27	0.15	0.11	0.09	0.08	6
	150	25D	0.11	0.69	0.52	0.45	0.40	5
		32D	0.27	0.17	0.13	0.11	0.09	6
	180	25D	0.11	0.08	0.07	0.05	0.04	5
		32D	0.27	0.19	0.14	0.12	0.11	6
		38D	0.67	0.25	0.20	0.18	0.16	8
	210	25D	0.21	0.12	0.09	0.08	0.07	5
		32D	0.48	0.27	0.21	0.18	0.16	6
		38D	0.73	0.26	0.21	0.19	0.17	8
	240	25D	0.21	0.14	0.10	0.09	0.08	5
		32D	0.48	0.30	0.23	0.20	0.18	6
		38D	0.96	0.33	0.27	0.24	0.22	8
	270	25D	0.21	0.14	0.11	0.10	0.09	5
		32D	0.76	0.50	0.38	0.33	0.29	6
		38D	1.04	0.34	0.28	0.25	0.22	8
4	90	25D	0.14	0.08	0.06	0.05	0.04	5
		32D	0.11	0.07	0.05	0.05	0.04	6
	120	38D	0.14	0.09	0.07	0.06	0.05	8
	150	25D	0.15	0.08	0.06	0.05	0.05	5
		32D	0.27	0.15	0.11	0.10	0.09	6
	180	25D	0.15	0.09	0.07	0.06	0.05	5
		32D	0.27	0.17	0.13	0.11	0.10	6
		38D	0.79	0.32	0.26	0.23	0.21	8
	210	25D	0.21	0.14	0.11	0.09	0.08	5
		32D	0.48	0.32	0.24	0.21	0.19	6
		38D	0.85	0.33	0.27	0.23	0.22	8
	240	25D	0.21	0.15	0.11	0.10	0.09	5
		32D	0.48	0.34	0.26	0.22	0.20	6
		38D	0.89	0.33	0.27	0.24	0.22	8
	270	25D	0.21	0.16	0.12	0.10	0.09	5
		32D	0.48	0.36	0.28	0.24	0.21	6
		38D	0.93	0.33	0.27	0.24	0.22	8
6	90	25D	0.11	0.07	0.06	0.05	0.04	5
		32D	0.28	0.18	0.14	0.12	0.11	6
		38D	0.67	0.34	0.27	0.24	0.22	10

Stops S	Index period θ	Code	Static torque Ts (kgf-m)	Net dynamic torque to (kgf-m) Indexes per min.NN(rpm) 50	100	150	200	Bearing sleeve ø (mm)
6	120	25D	0.29	0.18	0.13	0.11	0.10	5
		32D	0.76	0.45	0.34	0.30	0.26	6
		38D	0.96	0.45	0.36	0.32	0.30	10
	150	25D	0.38	0.26	0.20	0.17	0.15	5
		32D	0.76	0.51	0.39	0.33	0.30	6
		38D	1.10	0.48	0.39	0.34	0.32	10
	180	25D	0.38	0.28	0.21	0.18	0.16	5
		32D	0.76	0.55	0.42	0.36	0.32	6
		38D	1.89	0.78	0.63	0.56	0.51	10
	210	25D	0.38	0.30	0.23	0.19	0.14	5
		32D	0.76	0.59	0.45	0.38	0.34	6
		38D	2.00	0.79	0.64	0.57	0.52	10
	240	25D	0.38	0.31	0.24	0.20	0.18	5
		32D	0.75	0.61	0.47	0.40	0.36	6
		38D	2.09	0.79	0.64	0.57	0.52	10
	270	25D	0.38	0.31	0.24	0.20	0.19	5
		32D	0.75	0.63	0.48	0.41	0.37	6
		38D	2.15	0.78	0.64	0.56	0.52	10
8	90	25D	0.21	0.12	0.10	0.08	0.07	5
		32D	0.48	0.29	0.22	0.19	0.17	6
	120	25D	0.21	0.15	0.11	0.10	0.09	5
		32D	0.48	0.33	0.26	0.22	0.19	6
	150	25D	0.21	0.16	0.12	0.11	0.94	5
		32D	0.48	0.37	0.28	0.24	0.21	6
	180	25D	0.21	0.17	0.13	0.11	0.10	5
		32D	0.48	0.39	0.30	0.25	0.23	6
	210	25D	0.21	0.17	0.14	0.12	0.10	5
		32D	0.48	0.40	0.31	0.26	0.24	6
	240	25D	0.21	0.18	0.14	0.12	0.10	5
		32D	0.48	0.42	0.31	0.27	0.24	6
		38D	1.20	0.53	0.43	0.38	0.35	8
	270	25D	0.21	0.19	0.14	0.12	0.11	5
		32D	0.48	0.43	0.33	0.28	0.25	6
		38D	1.22	0.52	0.42	0.37	0.34	8
12	90	32D	0.18	0.13	0.10	0.09	0.08	6
		38D	0.25	0.16	0.13	0.11	0.10	6
	120	32D	0.18	0.15	0.11	0.10	0.09	5
		38D	1.05	0.60	0.49	0.43	0.40	6
	150	32D	0.18	0.16	0.12	0.10	0.09	5
		38D	1.15	0.61	0.50	0.44	0.40	6
	180	32D	0.18	0.16	0.12	0.10	0.09	5
		38D	1.21	0.61	0.50	0.44	0.40	6
	210	32D	0.18	0.16	0.12	0.11	0.10	5
		38D	1.25	0.60	0.49	0.44	0.40	6
	240	32D	0.18	0.17	0.13	0.11	0.10	5
		38D	1.28	0.60	0.48	0.43	0.39	6
	270	32D	0.18	0.17	0.13	0.11	0.10	5
		38D	1.30	0.58	0.47	0.42	0.39	6

DS.DF TYPE

Stops S	Index period θ	Code	Static torque Ts (kgf-m)	Net dynamic torque to (kgf-m) Indexes per min.NN(rpm)								Cam shaft riction torque Tx (kgf-m)	Bearing sleeve ø (mm)
				50	100	150	200	300	400	500	700		
2	270	45D	1.22	0.48	0.39	0.35	0.32	0.28	0.26	0.24		0.12	13
		60D	4.34	1.41	1.15	1.02	0.93	0.83	0.76	0.71	0.64	0.22	16
		70D	11.3	4.3	3.5	3.1	2.9	2.5	2.3	2.2	2.0	0.5	19
		80D	20.2	7.8	6.4	5.6	5.2	4.6	4.2	3.9	3.6	0.8	22
		83D	22.4	8.4	7.1	6.3	5.9	5.2	4.4	4.1	3.9	0.9	22
		100D	30.5	14.8	13.7	12.8	11.6	10.2	9.6	8.3		1.3	22
		110D	49.8	19.0	15.4	13.7	12.5	11.1	10.2	9.5		1.6	30
		140D	80.4	28.6	23.2	20.6	18.9	16.7	15.3			2.3	40
		180D	175.4	62.9	51.1	45.2	41.5	36.7				4.1	47
		250D	377.2	136.1	110.5	97.9	89.8					7.2	60
3	180	45D	1.22	0.58	0.47	0.42	0.38	0.34	0.31	0.29		0.12	13
		60D	4.34	1.70	1.38	1.22	1.12	0.99	0.91	0.85	0.77	0.22	16
		70D	11.3	5.2	4.2	3.7	3.4	3.0	2.8	2.6	2.4	0.5	19
		80D	20.2	9.4	7.7	6.8	6.2	5.5	5.0	4.7		0.8	22
		83D	23.2	11.4	10.2	9.6	7.3	6.1	5.7	5.1		0.9	22
		100D	31.7	17.3	16.5	14.3	13.8	11.5	10.9			1.3	22
		110D	49.8	22.8	18.5	16.4	15.0	13.3	12.2			1.6	30
		140D	80.4	34.3	27.9	24.7	22.6	20.0	18.4			2.3	40
		180D	175.4	75.4	61.3	54.3	49.8	44.1				4.1	47
		250D	377.2	163.3	132.7	117.5	107.8					7.2	60
	270	45D	3.10	1.23	1.00	0.88	0.81	0.72	0.66	0.61	0.56	0.12	13
		60D	12.26	4.30	3.49	3.09	2.84	2.51	2.31	2.16	1.95	0.28	16
		70D	15.5	5.9	4.8	4.3	3.9	3.5	3.2	3.0	2.7	0.4	19
		80D	25.3	9.3	7.6	6.7	6.2	5.5	5.0	4.7	4.2	0.7	22
		83D	29.4	11.3	10.1	9.5	7.1	6.0	5.6	5.1		0.8	22
		100D	38.6	16.9	16.1	14.1	13.2	12.9	11.8	10.2		1.2	22
		110D	61.8	22.5	18.3	16.2	14.8	13.1	12.1	11.3		1.3	30
		140D	97.6	33.5	27.2	24.1	22.1	19.6	17.9	16.8		1.9	40
		180D	251.9	93.7	76.1	67.4	61.8	54.7	50.2			4.0	47
		250D	588.0	230.5	187.3	165.8	152.1	134.7				7.0	60
4	180	45D	1.17	0.53	0.43	0.38	0.35	0.31	0.28	0.27		0.09	10
		60D	2.06	0.81	0.66	0.59	0.54	0.48	0.44	0.41		0.13	14
		70D	12.6	5.7	4.6	4.1	3.8	3.3	3.1	2.9	2.6	0.4	16
		80D	21.7	10.1	8.2	7.3	6.7	5.9	5.4	5.1	4.6	0.7	19
		83D	24.2	12.3	10.1	9.2	8.1	7.2	6.8	6.4	5.8	0.8	19
		100D	30.6	19.2	16.8	15.1	14.1	11.8	10.3	9.2		1.2	22
		110D	48.2	22.4	18.2	16.1	14.8	13.1	12.0	11.2		1.2	26
		140D	74.5	32.4	26.4	23.3	21.4	19.0	17.4			1.7	35
		180D	149.2	66.0	53.6	47.5	43.5	38.6				3.0	40
		250D	327.0	152.3	123.7	109.6	100.5					5.3	52
	270	45D	1.75	0.71	0.57	0.51	0.47	0.41	0.38	0.35	0.32	0.10	12
		60D	5.42	1.90	1.54	1.36	1.25	1.11	1.02	0.95	0.86	0.18	14
		70D	14.8	5.5	4.5	3.9	3.6	3.2	2.9	2.7	2.5	0.3	16
		80D	25.7	9.7	7.9	7.0	6.4	5.7	5.2	4.9	4.4	0.6	19
		83D	29.7	11.8	9.8	9.2	8.4	7.1	6.3	5.7	5.1	0.7	19
		100D	39.1	18.7	16.8	14.2	12.9	11.3	10.6	9.5	8.2	0.9	22
		110D	56.9	21.5	17.5	15.5	14.2	12.6	11.5	10.8	9.8	1.0	26
		140D	86.5	31.0	25.1	22.3	20.4	18.1	16.6	15.5		1.4	35
		180D	239.2	93.4	75.9	67.2	61.6	54.6	50.1	46.8		3.2	40
		250D	528.5	210.1	170.7	151.1	138.6	122.8				5.5	52
5	180	45D	1.15	0.57	0.41	0.32	0.27	0.21	0.19			0.07	10
		60D	1.76	0.69	0.56	0.50	0.45	0.40	0.37	0.35		0.10	12
		70D	5.0	2.3	1.9	1.6	1.5	1.3	1.2	1.1		0.3	14
		80D	22.8	8.6	8.6	7.8	7.1	6.3	5.8	5.4	4.9	0.6	16
		83D	25.3	10.3	10.1	9.3	8.6	7.8	7.2	6.4	5.3	0.7	16
		100D	28.7	14.9	12.5	11.2	9.1	8.2	7.4	6.9		0.8	19
		110D	36.3	16.6	13.5	11.9	10.9	9.7	8.9	8.3		0.9	22
		140D	46.0	19.0	15.5	13.7	12.6	11.1	10.2			1.1	22
		180D	108.7	46.3	37.6	33.3	30.5	27.0				2.2	35
		250D	312.7	145.2	118.0	104.4	95.8					4.3	47
	270	45D	1.15	0.61	0.54	0.47	0.37	0.31	0.23			0.07	10
		60D	2.37	0.84	0.68	0.61	0.56	0.49	0.45	0.42	0.38	0.11	12
		70D	5.7	2.1	1.7	1.5	1.4	1.3	1.1	1.1	1.0	0.2	14
		80D	22.1	9.2	8.3	7.4	6.8	6.0	5.5	5.1	4.6	0.5	16
		83D	25.3	11.3	10.2	9.1	8.2	7.1	6.3	5.8	5.1	0.6	16
		100D	28.7	15.1	11.3	10.4	9.0	8.1	7.2	6.3	5.9	0.7	19
		110D	41.2	15.6	12.7	11.2	10.3	9.1	8.4	7.8	7.1	0.8	22
		140D	75.8	27.7	22.5	19.9	18.3	16.2	14.8	13.9		1.2	22

Stops S	Index period θ	Code	Static torque Ts (kgf-m)	Net dynamic torque to (kgf-m) Indexes per min.NN(rpm)								Cam shaft riction torque Tx (kgf-m)	Bearing sleeve ø (mm)
				50	100	150	200	300	400	500	700		
5	270	180D	148.0	55.0	44.7	39.6	36.3	32.1	29.5	27.6		2.2	35
		250D	425.6	169.1	137.3	121.6	111.6	98.8				4.3	47
6	90	45D	1.22	0.79	0.64	0.57	0.52	0.46	0.43			0.12	13
		60D	4.34	2.32	1.88	1.67	1.53	1.35	1.24	1.16		0.22	16
		70D	12.5	8.2	6.7	5.9	5.4	4.8	4.4	4.1		0.5	19
		80D	20.2	12.9	10.5	9.3	8.5	7.5	6.9	6.4		0.8	22
		83D	22.3	14.7	12.3	11.4	10.2	9.6	8.1	7.5		0.9	22
		100D	33.2	26.5	23.7	21.8	19.6	16.5				1.3	22
		110D	49.8	31.1	25.3	22.4	20.6	18.2				1.6	30
		140D	80.4	46.9	38.1	33.7	30.9	27.4				2.3	40
		180D	175.4	103.1	83.7	74.1	68.0					4.1	47
		250D	377.2	223.1	181.2	160.5						7.2	60
	120	45D	2.92	1.68	1.37	1.21	1.11	0.98	0.90	0.84	0.76	0.12	13
		60D	11.69	5.77	4.83	4.27	3.92	3.47	3.18	2.98	2.69	0.30	16
		70D	14.6	8.2	6.6	5.9	5.4	4.8	4.4	4.1	3.7	0.5	22
		80D	35.1	20.0	16.3	14.4	13.2	11.7	10.7	10.0	9.1	0.9	26
		83D	37.2	23.2	17.2	15.1	14.3	12.6	11.5	10.7	9.8	1.1	26
		100D	48.4	28.4	24.6	22.3	20.8	18.5	16.2	14.7		1.2	26
		110D	60.7	32.9	26.7	23.7	21.7	19.2	17.6	16.5		1.4	30
		140D	115.7	60.3	49.0	43.4	39.8	35.2	32.3			2.3	40
		180D	238.5	129.0	104.8	92.8	85.1	75.3				4.2	47
		250D	550.0	315.5	256.3	226.9	208.2					7.4	80
	150	45D	3.26	1.66	1.35	1.20	1.10	0.97	0.89	0.83	0.75	0.11	13
		60D	12.73	5.80	4.71	4.17	3.83	3.39	3.11	2.91	2.63	0.27	16
		70D	16.1	8.0	6.5	5.8	5.3	4.7	4.3	4.0	3.6	0.4	22
		80D	38.8	19.7	16.0	14.2	13.0	11.5	10.6	9.9	8.9	0.9	26
		83D	39.2	22.1	20.5	16.8	15.2	13.7	11.6	10.4	9.2	1.0	26
		100D	48.4	27.9	24.2	22.7	20.1	16.9	15.4	14.8		1.2	26
		110D	66.9	32.3	26.2	23.2	21.3	18.9	17.3	16.2		1.3	30
		140D	126.0	58.9	47.8	42.3	38.8	34.4	31.6	29.5		2.1	40
		180D	263.0	126.6	102.9	91.1	83.6	74.0	67.9			3.8	47
		250D	620.6	313.5	254.6	225.5	206.8					6.8	80
	180	45D	3.50	1.63	1.32	1.17	1.08	0.95	0.87	0.82	0.74	0.11	13
		60D	13.43	5.64	4.58	4.06	3.72	3.30	3.02	2.83	2.56	0.26	16
		70D	17.2	7.8	6.4	5.6	5.2	4.6	4.2	3.9	3.6	0.4	22
		80D	41.4	19.3	15.7	13.9	12.7	11.3	10.3	9.7	8.7	0.8	26
		83D	43.6	21.8	18.6	15.4	13.7	12.8	11.2	10.3	9.2	0.9	26
		100D	57.2	34.5	30.6	27.1	24.6	21.6	20.5	18.1	15.9	1.3	26
		110D	85.9	39.3	31.9	28.3	25.9	23.0	21.1	19.7	17.8	1.4	30
		140D	133.0	57.3	46.5	41.2	37.8	33.4	30.7	28.7		2.0	40
		180D	375.5	176.6	143.5	127.0	116.5	103.2	94.7	88.5		4.3	60
		250D	873.9	425.4	345.5	305.9	280.7	248.5				8.0	80
	210	45D	3.68	1.60	1.30	1.15	1.06	0.93	0.85	0.80	0.72	0.10	13
		60D	13.91	5.48	4.45	3.94	3.62	3.20	2.94	2.75	2.48	0.25	16
		70D	17.9	7.6	6.2	5.5	5.0	4.5	4.1	3.8	3.5	0.4	22
		80D	43.3	18.8	15.3	13.5	12.4	11.0	10.1	9.4	8.5	0.8	26
		83D	45.2	20.3	18.2	17.1	15.4	13.2	12.5	10.8	9.4	0.9	26
		100D	58.3	33.2	30.2	25.8	23.2	21.1	18.2	16.1	14.9	1.3	26
		110D	89.5	38.3	31.1	27.6	25.3	22.4	20.5	19.2	17.4	1.4	30
		140D	137.7	55.6	45.2	40.0	36.7	35.5	29.8	27.9	25.2	1.9	40
		180D	392.5	172.4	140.1	124.0	113.8	100.7	92.4	86.4		4.1	60
		250D	926.0	418.1	339.6	300.7	275.8	244.2	224.1			7.6	80
	240	45D	3.80	1.56	1.27	1.12	1.03	0.91	0.84	0.78	0.71	0.10	13
		60D	14.25	5.33	4.33	3.83	3.52	3.11	2.86	2.67	2.42	0.24	16
		70D	18.5	7.5	6.1	5.4	4.9	4.4	4.0	3.7	3.4	0.4	22
		80D	44.6	18.4	14.9	13.2	12.1	10.7	9.8	9.2	8.3	0.7	26
		83D	46.7	20.1	18.5	16.1	14.7	13.2	11.3	10.5	9.6	0.8	26
		100D	62.9	33.1	28.5	24.3	22.7	20.9	18.6	16.4	13.6	1.2	26
		110D	92.2	37.4	30.3	26.9	24.6	21.8	20.0	18.7	16.9	1.3	30
		140D	141.1	54.1	43.9	38.9	35.7	31.6	29.0	27.1	24.5	1.8	40
		180D	404.8	168.3	136.7	121.0	111.0	98.3	90.2	84.3	76.2	4.0	60
		250D	965.3	410.1	333.1	295.0	270.6	239.6	219.8			7.3	80
	270	45D	3.90	1.52	1.24	1.10	1.01	0.89	0.82	0.76	0.69	0.10	13
		60D	14.50	5.19	4.22	3.73	3.42	3.03	2.78	2.60	2.35	0.23	16
		70D	18.8	7.3	5.9	5.2	4.8	4.2	3.9	3.6	3.3	0.4	22
		80D	45.6	17.9	14.6	12.9	11.8	10.5	9.6	9.0	8.1	0.7	26
		83D	47.3	18.4	16.9	14.1	13.2	11.6	10.2	9.6	8.7	0.8	26
		100D	63.3	32.5	27.2	24.6	22.9	20.2	18.1	16.9	14.2	1.2	26

PS: O:1DWELL ※:2DWELL ●:3DWELL ☆:4DWELL

DS.DF TYPE

Stops S	Index period θ	Code	Static torque Ts (kgf-m)	Net dynamic torque to (kgf-m) Indexes per min.NN(rpm)								Cam shaft riction torque Tx (kgf-m)	Bearing sleeve ø (mm)
				50	100	150	200	300	400	500	700		
6	270	110D	94.1	36.4	29.6	26.2	24.0	21.3	19.5	18.3	16.5	1.3	30
		140D	143.6	52.7	42.8	37.9	34.8	30.8	28.2	26.4	23.9	1.8	40
		180D	414.0	164.2	133.4	118.1	108.4	96.0	88.0	82.3	74.4	3.8	60
		250D	995.3	402.0	326.5	289.1	265.2	234.8	215.4	201.5		7.1	80
	300	45D	3.97	1.49	1.21	1.07	0.98	0.87	0.80	0.75	0.68	0.10	13
		60D	14.68	5.06	4.11	3.64	3.34	2.96	2.71	2.54	2.29	0.23	16
		70D	19.1	7.1	5.8	5.1	4.7	4.1	3.8	3.6	3.2	0.3	22
		80D	46.4	17.5	14.2	12.6	11.6	10.2	9.4	8.8	7.9	0.7	26
		83D	48.3	18.2	15.1	13.6	12.4	11.8	10.5	9.2	8.4	0.8	26
		100D	62.5	30.5	24.3	22.1	20.6	18.7	16.8	15.4	14.2	1.1	26
		110D	95.6	35.6	28.9	25.6	23.5	20.8	19.1	17.8	16.1	1.3	30
		140D	145.4	51.4	41.7	36.9	33.9	30.0	27.5	25.7	23.3	1.7	40
		180D	421.0	160.5	130.3	115.4	105.9	93.7	86.0	80.4	72.7	3.8	60
		250D	1018.5	394.0	320.0	283.4	259.9	230.2	211.1	197.5		6.9	80
	330	45D	4.03	1.46	1.18	1.05	0.96	0.85	0.78	0.73	0.66	0.09	13
		60D	14.82	4.94	4.01	3.55	3.26	2.89	2.65	2.48	2.24	0.22	16
		70D	19.4	6.9	5.6	5.0	4.6	4.1	3.7	3.5	3.1	0.3	22
		80D	47.0	17.1	13.9	12.3	11.3	10.0	9.2	8.6	7.8	0.7	26
		83D	49.3	18.0	14.9	13.4	12.1	11.5	10.2	8.9	8.1	0.8	26
		100D	64.2	30.2	23.7	21.8	21.2	18.4	16.5	15.1	13.6	1.1	26
		110D	96.7	34.8	28.2	25.0	22.9	20.3	18.6	17.4	15.8	1.2	30
		140D	146.8	55.2	40.7	36.1	33.1	29.3	26.9	25.1	22.7	1.7	40
		180D	426.4	156.9	127.5	112.9	103.5	91.7	84.1	78.7	71.1	3.7	60
		250D	1036.8	386.3	313.8	277.8	254.9	225.7	207.0	193.6		6.8	80
8	90	45D	1.50	0.96	0.78	0.69	0.63	0.56	0.51	0.48		0.09	12
		60D	2.06	1.11	0.90	0.80	0.73	0.65	0.60	0.56		0.13	14
		70D	12.6	6.9	6.3	5.6	5.2	4.6	4.2	3.9	3.5	0.4	16
		80D	21.5	11.4	11.4	10.2	9.4	8.3	7.6	7.1		0.7	19
		83D	23.2	13.5	13.1	12.6	11.5	10.4	9.3	8.4		0.8	22
		100D	34.5	28.1	23.2	21.1	19.2	16.3	14.8			1.1	26
		110D	48.2	30.6	24.8	22.0	20.2	17.9	16.4			1.2	26
		140D	74.5	44.3	36.0	31.9	29.2	25.9				1.7	35
		180D	149.2	90.2	73.2	64.8	59.5					3.0	40
		250D	327.0	208.1	169.0	149.7						5.3	52
	120	45D	2.15	1.25	1.02	0.90	0.83	0.73	0.67	0.63	0.57	0.10	12
		60D	5.29	2.65	2.15	1.91	1.75	1.55	1.42	1.33	1.20	0.18	14
		70D	14.2	7.4	6.2	5.5	5.0	4.4	4.1	3.8	3.5	0.4	16
		80D	24.7	11.9	11.0	9.7	8.9	7.9	7.2	6.8	6.1	0.6	19
		83D	26.5	13.2	12.3	11.0	10.1	9.1	8.4	8.0	7.3	0.7	22
		100D	36.3	21.2	16.6	13.8	12.0	10.1	9.3	8.4		1.0	26
		110D	54.7	29.9	24.3	21.5	19.7	17.5	16.0	15.0		1.1	26
		140D	86.6	45.6	37.1	32.8	30.1	26.7	24.5	22.9		1.6	35
		180D	167.3	87.6	71.2	63.0	57.8	51.2				2.8	52
		250D	503.2	290.2	235.7	208.7	191.4					5.7	60
	150	45D	2.33	1.22	0.99	0.88	0.81	0.71	0.65	0.61	0.55	0.09	12
		60D	5.52	2.53	2.06	1.82	1.67	1.48	1.36	1.27	1.15	0.17	14
		70D	15.2	7.4	6.0	5.3	4.9	4.3	3.9	3.7	3.3	0.3	16
		80D	26.5	12.3	10.6	9.4	8.6	7.7	7.0	6.6	5.9	0.6	19
		83D	28.4	14.6	12.9	11.7	10.9	10.0	9.2	8.4	7.4	0.7	22
		100D	38.5	20.5	16.1	13.4	11.3	10.6	10.1	9.5		0.9	26
		110D	58.7	29.0	23.5	20.8	19.1	16.9	15.5	14.5		1.0	26
		140D	92.2	44.1	35.8	31.7	29.1	25.7	23.6	22.1		1.4	35
		180D	246.6	125.5	102.0	90.3	82.8	73.3	67.3	62.9		3.1	52
		250D	549.1	283.5	230.3	203.9	187.0	165.6				5.3	60
	180	45D	2.44	1.18	0.96	0.85	0.78	0.69	0.63	0.59	0.54	0.09	12
		60D	5.66	2.43	1.97	1.75	1.60	1.42	1.30	1.22	1.10	0.17	14
		70D	16.8	8.0	6.5	5.8	5.3	4.7	4.3	4.0	3.6	0.3	16
		80D	30.4	14.7	11.9	10.5	9.7	8.6	7.9	7.3	6.6	0.6	19
		83D	32.3	17.1	13.4	12.1	11.3	10.4	9.6	8.8	7.8	0.7	22
		100D	40.6	24.3	16.6	13.8	12.3	11.2	10.6	9.4	8.5	1.0	26
		110D	74.3	35.7	29.0	25.7	23.6	20.9	19.1	17.9	16.2	1.1	26
		140D	113.4	51.4	41.8	37.0	33.9	30.0	27.5	25.8	23.3	1.6	35
		180D	257.3	121.4	98.6	87.3	80.1	70.9	65.1	60.9		2.9	52
		250D	739.7	373.0	303.0	268.3	246.1	217.9	199.9			5.8	60
	210	45D	2.52	1.15	0.93	0.83	0.76	0.67	0.62	0.58	0.52	0.09	12

Stops S	Index period θ	Code	Static torque Ts (kgf-m)	Net dynamic torque to (kgf-m) Indexes per min.NN(rpm)								Cam shaft riction torque Tx (kgf-m)	Bearing sleeve ø (mm)
				50	100	150	200	300	400	500	700		
8	210	60D	5.75	2.33	1.90	1.68	1.54	1.36	1.25	1.17	1.06	0.16	14
		70D	17.3	7.7	6.3	5.6	5.1	4.5	4.2	3.9	3.5	0.3	16
		80D	31.3	14.2	11.5	10.2	9.4	8.3	7.6	7.1	6.4	0.6	19
		83D	34.3	16.8	13.1	11.8	10.2	9.6	8.4	7.8	6.6	0.7	22
		100D	42.5	23.4	16.4	13.2	11.5	10.3	8.6	8.2	7.2	1.0	26
		110D	76.5	34.6	28.1	24.9	22.8	20.2	18.5	17.3	15.7	1.1	26
		140D	115.9	49.6	40.3	35.7	32.7	29.0	26.6	24.9	22.5	1.5	35
		180D	264.5	117.5	95.5	84.5	77.5	68.7	63.0	58.9		2.8	52
		250D	767.6	362.8	294.7	261.0	239.4	212.0	194.4			5.6	60
	240	45D	2.58	1.12	0.91	0.80	0.74	0.65	0.60	0.56	0.51	0.09	12
		60D	5.81	2.25	1.83	1.62	1.49	1.32	1.21	1.13	1.02	0.16	14
		70D	17.6	7.5	6.1	5.4	5.0	4.4	4.0	3.8	3.4	0.3	16
		80D	31.9	13.8	11.2	9.9	9.1	8.0	7.4	6.9	6.2	0.6	19
		83D	34.7	15.4	12.8	11.4	10.1	9.4	8.2	7.4	6.5	0.7	22
		100D	43.1	22.8	16.2	13.0	11.1	10.1	8.4	8.0	6.8	1.0	26
		110D	77.9	33.5	27.2	24.1	22.1	19.6	18.0	16.8	15.2	1.0	26
		140D	117.7	48.0	39.0	34.5	31.7	28.1	25.7	24.1	21.8	1.5	35
		180D	316.4	138.7	112.7	99.8	91.5	81.0	74.3	69.5	62.8	3.1	52
		250D	787.6	353.1	286.8	254.0	233.0	206.3	189.2	177.0		5.5	60
	270	45D	2.62	1.09	0.88	0.78	0.72	0.63	0.58	0.54	0.49	0.08	12
		60D	5.85	2.18	1.77	1.57	1.44	1.28	1.17	1.09	0.99	0.16	14
		70D	17.8	7.3	5.9	5.2	4.8	4.3	3.9	3.7	3.3	0.3	16
		80D	32.3	13.4	10.9	9.6	8.8	7.8	7.2	6.7	6.1	0.6	19
		83D	35.6	16.1	12.4	11.0	9.8	9.1	7.9	7.2	6.8	0.7	22
		100D	45.2	21.3	15.8	12.3	10.8	9.3	8.1	7.6	7.2	1.0	26
		110D	79.0	32.6	26.5	23.4	21.5	19.0	17.5	16.3	14.8	1.0	26
		140D	118.9	46.6	37.9	33.5	30.7	27.2	25.0	23.4	21.1	1.4	35
		180D	320.6	134.8	109.5	96.9	88.9	78.7	72.2	67.6	61.1	3.0	52
		250D	802.2	344.0	279.4	247.4	226.9	200.9	184.3	172.4		5.3	60
	300	45D	2.65	1.06	0.86	0.76	0.70	0.62	0.57	0.53	0.48	0.08	12
		60D	5.88	2.12	1.72	1.53	1.40	1.24	1.14	1.06	0.96	0.15	14
		70D	18.0	7.1	5.8	5.1	4.7	4.1	3.8	3.6	3.2	0.3	16
		80D	32.6	13.0	10.6	9.4	8.6	7.6	7.0	6.5	5.9	0.6	19
		83D	36.0	15.9	12.1	10.7	9.5	8.8	7.6	6.9	6.5	0.7	22
		100D	45.8	20.6	15.1	11.6	11.4	9.6	8.4	7.9	8.1	1.0	26
		110D	79.8	31.7	25.8	22.8	20.9	18.5	17.0	15.9	14.4	1.0	26
		140D	119.8	45.3	36.8	32.6	29.9	26.5	24.3	22.7	20.5	1.4	35
		180D	323.7	131.2	106.6	94.4	86.6	76.7	70.3	65.8	59.5	3.0	52
		250D	813.2	335.5	272.5	241.3	221.4	196.0	179.8	168.2		5.2	60
	330	45D	2.67	1.03	0.84	0.74	0.68	0.60	0.55	0.52	0.47	0.08	12
		60D	5.90	2.07	1.68	1.49	1.36	1.21	1.11	1.04	0.94	0.15	14
		70D	18.1	6.9	5.6	5.0	4.6	4.0	3.7	3.5	3.1	0.3	16
		80D	32.9	12.7	10.3	9.1	8.4	7.4	6.8	6.4	5.8	0.5	19
		83D	36.3	15.7	11.8	10.4	9.2	8.5	7.3	6.6	6.4	0.6	22
		100D	46.6	19.8	14.8	11.3	11.0	9.3	8.1	7.6	7.6	0.9	26
		110D	80.4	31.0	25.1	22.3	20.4	18.1	16.6	15.5	14.0	1.0	26
		140D	120.5	44.2	35.9	31.8	29.1	25.8	23.7	22.1	20.0	1.4	35
		180D	326.0	128.0	104.0	92.1	84.4	74.8	68.6	64.1	58.0	2.9	52
		250D	821.6	327.8	266.2	235.7	216.2	191.5	175.6	164.3		5.1	60
10	90	45D	1.15	0.65	0.52	0.4	0.33	0.29	0.24	0.21		0.08	10
		60D	1.76	0.94	0.76	0.68	0.62	0.55	0.50	0.47		0.10	12
		70D	25.0	3.0	2.5	2.2	2.0	1.8	1.6	1.5		0.3	14
		80D	22.7	8.4	8.4	8.4	8.4	8.3	7.6	7.1	6.4	0.6	16
		83D	23.1	8.7	8.6	8.7	8.7	8.6	7.8	7.4	6.8	0.7	19
		100D	28.4	16.4	14.3	12.2	10.6	10.1	9.6			0.8	22
		110D	36.2	22.3	18.1	16.1	14.7	13.1	12.0			0.9	22
		140D	46.0	26.0	21.1	18.7	17.2	15.2				1.1	22
		180D	108.7	63.2	51.4	45.5	41.7					2.2	35
		250D	312.7	198.4	161.1	142.7						4.3	40
	120	45D	1.15	0.7	0.62	0.49	0.41	0.33	0.29	0.25		0.07	10
		60D	2.33	1.18	0.96	0.85	0.78	0.69	0.63	0.59	0.54	0.12	12
		70D	5.5	2.9	2.4	2.1	1.9	1.7	1.6	1.5	1.3	0.3	14
		80D	23.1	8.8	8.8	8.8	8.8	8.0	7.3	6.9	6.2	0.6	16
		83D	24.8	9.3	9.2	8.9	8.9	8.4	7.6	7.4	6.8	0.7	19
		100D	30.2	15.7	14.6	13.1	10.9	10.7	10.4			0.8	22
		110D	39.7	21.4	17.4	15.4	14.2	12.5	11.5	10.8		0.8	22
		140D	73.8	38.7	31.4	27.8	25.5	22.6	20.7	19.4		1.2	26
		180D	144.1	76.8	62.4	55.2	50.7	44.9				2.3	35

PS: O:1DWELL ※:2DWELL ●:3DWELL ☆:4DWELL

DS.DF TYPE

Stops S	Index period θ	Code	Static torque Ts (kgf-m)	Net dynamic torque to (kgf-m) Indexes per min.NN(rpm) 50	100	150	200	300	400	500	700	Cam shaft riction torque Tx (kgf-m)	Bearing sleeve ø (mm)
10	120	250D	410.8	235.1	190.9	169.1	155.1					4.5	47
	150	45D	1.3	0.69	0.59	0.45	0.38	0.31	0.27	0.22		0.06	10
		60D	2.40	1.12	0.91	0.81	0.74	0.65	0.60	0.56	0.51	0.11	12
		70D	5.7	2.8	2.3	2.0	1.8	1.6	1.5	1.4	1.3	0.2	14
		80D	26.4	9.0	9.0	9.0	8.7	7.7	7.0	6.6	5.9	0.5	16
		83D	28.2	9.6	9.5	9.4	9.1	8.6	7.4	7.0	6.5	0.6	19
		100D	34.3	10.4	10.1	9.6	9.4	9.1	8.6	8.1		0.7	22
		110D	41.7	20.6	16.7	14.8	13.6	12.0	11.0	10.3		0.8	22
		140D	77.3	37.0	30.1	26.6	24.4	21.6	19.8	18.6		1.1	26
		180D	151.1	73.5	59.7	52.9	48.5	43.0	39.4			2.2	35
		250D	437.2	226.8	184.2	163.1	149.6	132.5				4.2	47
	180	45D	1.35	0.63	0.54	0.43	0.36	0.29	0.25	0.2		0.06	10
		60D	2.44	1.07	0.87	0.77	0.71	0.63	0.57	0.54	0.48	0.11	12
		70D	5.9	2.7	2.2	1.9	1.8	1.6	1.4	1.3	1.2	0.2	14
		80D	27.2	9.2	9.2	9.1	8.3	7.4	6.8	6.3	5.7	0.5	16
		83D	28.9	9.8	9.7	9.5	9.2	8.8	7.5	7.2	6.8	0.6	19
		100D	35.2	10.6	10.3	9.9	9.7	9.4	9.2	8.6	8.4	0.6	22
		110D	42.9	19.7	16.0	14.2	13.0	11.5	10.6	9.9	8.9	0.7	22
		140D	79.5	35.6	28.9	25.6	23.5	20.8	19.1	17.8	16.1	1.1	26
		180D	191.7	90.7	73.7	65.3	59.9	53.0	48.6	45.5		2.4	40
		250D	453.9	218.8	177.7	157.4	144.4	127.8				4.0	47
	210	45D	1.4	0.61	0.52	0.4	0.33	0.27	0.21	0.18		0.06	10
		60D	2.47	1.03	0.83	0.74	0.68	0.60	0.55	0.51	0.47	0.11	12
		70D	6.0	2.6	2.1	1.9	1.7	1.5	1.4	1.3	1.2	0.2	14
		80D	27.7	9.3	9.3	8.7	8.0	7.1	6.5	6.1	5.5	0.5	16
		83D	29.3	10.1	9.9	9.7	9.4	9.0	7.7	7.4	7.1	0.6	19
		100D	35.4	10.9	10.4	10.1	9.9	9.5	9.3	8.8	8.5	0.7	22
		110D	43.6	19.0	15.4	13.7	12.5	11.1	10.2	9.5	8.6	0.7	22
		140D	80.9	34.2	27.8	24.6	22.6	20.0	18.3	17.2	15.5	1.1	26
		180D	194.9	87.4	71.0	62.8	57.6	51.0	46.8	43.8		2.3	40
		250D	625.3	300.6	244.1	216.2	198.3	175.6	181.1			4.6	47
	240	45D	1.45	0.59	0.48	0.37	0.3	0.27	0.21	0.18		0.06	10
		60D	2.49	0.99	0.80	0.71	0.65	0.58	0.53	0.50	0.45	0.11	12
		70D	6.0	2.5	2.0	1.8	1.6	1.5	1.3	1.2	1.1	0.2	14
		80D	28.1	9.3	9.3	8.5	7.8	6.9	6.3	5.9	5.3	0.5	16
		83D	30.2	10.0	9.7	9.5	9.1	8.7	7.4	7.1	6.5	0.5	19
		100D	36.2	12.5	12.1	11.8	11.3	10.6	10.1	9.6	9.1	0.6	22
		110D	44.2	18.4	14.9	13.2	12.1	10.7	9.9	9.2	8.3	0.7	22
		140D	81.8	33.1	26.9	23.8	21.8	19.3	17.7	16.6	15.0	1.0	26
		180D	197.1	84.4	68.6	50.7	55.7	49.3	45.2	42.3	38.2	2.2	40
		250D	636.1	291.2	236.6	209.5	192.1	170.1	158.1	146.0		4.5	47
	270	45D	1.5	0.56	0.45	0.34	0.3	0.26	0.2	0.17		0.06	10
		60D	2.50	0.96	0.78	0.69	0.63	0.56	0.51	0.48	0.43	0.10	12
		70D	6.1	2.4	2.0	1.7	1.6	1.4	1.3	1.2	1.1	0.2	14
		80D	28.3	9.4	9.3	8.2	7.5	6.7	6.1	5.7	5.2	0.5	16
		83D	30.8	9.8	9.5	9.3	8.8	8.4	7.3	6.9	6.3	0.5	19
		100D	36.6	12.3	11.8	11.2	10.9	9.5	9.4	9.1	8.4	0.6	22
		110D	44.6	17.8	14.5	12.8	11.8	10.4	9.5	8.9	8.1	0.7	22
		140D	82.5	32.1	26.0	23.1	21.2	18.7	17.2	16.1	14.5	1.0	26
		180D	198.6	81.8	66.4	58.8	54.0	47.8	43.8	41.0	37.1	2.2	40
		250D	643.9	282.8	229.7	203.4	186.6	165.2	151.6	141.8		4.4	47
	300	45D	1.52	0.54	0.43	0.33	0.29	0.25	0.2	0.16		0.06	10
		60D	2.51	0.93	0.76	0.67	0.61	0.54	0.50	0.47	0.42	0.10	12
		70D	6.1	2.3	1.9	1.7	1.5	1.4	1.3	1.2	1.1	0.2	14
		80D	28.5	9.4	9.0	8.0	7.3	6.5	5.9	5.6	5.0	0.5	16
		83D	31.3	9.7	9.4	9.2	9.0	8.1	7.2	6.8	6.2	0.5	19
		100D	37.1	12.1	11.5	10.9	10.4	9.3	9.1	8.8	8.1	0.6	22
		110D	44.8	17.3	14.1	12.5	11.4	10.1	9.3	8.7	7.8	0.7	22
		140D	83.0	31.2	25.3	22.4	20.6	18.2	16.7	15.6	14.1	1.0	26
		180D	199.8	79.5	64.6	57.2	52.4	46.4	42.6	39.8	36.0	2.2	40
		250D	649.6	275.3	223.6	198.0	181.6	160.8	147.5	138.0		4.4	47
	330	45D	1.52	0.51	0.41	0.3	0.28	0.23	0.19	0.15		0.06	10
		60D	2.51	0.90	0.73	0.65	0.60	0.53	0.48	0.45	0.41	0.10	12
		70D	6.1	2.3	1.9	1.6	1.5	1.3	1.2	1.1	1.0	0.2	14
		80D	28.7	9.4	8.8	7.8	7.1	6.3	5.8	5.4	4.9	0.5	16
		83D	31.4	9.7	9.3	8.9	8.6	7.9	6.8	6.3	5.9	0.5	19
10	330	100D	37.1	11.7	11.3	10.7	10.2	9.8	8.7	8.1	7.3	0.6	22
		110D	45.0	16.9	13.7	12.1	11.1	9.9	9.0	8.5	7.6	0.7	22
		140D	83.3	30.4	24.7	21.8	20.0	17.7	16.3	15.2	13.8	1.0	26
		180D	200.6	77.4	62.9	55.7	51.1	45.2	41.5	38.8	35.1	2.1	40
		250D	653.9	268.4	218.0	193.0	177.1	156.8	143.8	134.5		4.3	47
12	90	45D	0.5	0.31	0.21	0.19	0.15	0.13				0.06	10
		60D	0.94	0.49	0.40	0.35	0.32	0.29	0.26			0.09	10
		70D	2.7	1.6	1.3	1.1	1.1	0.9	0.9			0.2	12
		80D	24.3	8.7	8.7	8.7	8.7	8.7	8.4	7.9	7.1	0.6	16
		83D	25.3	8.9	8.9	8.8	8.8	8.8	8.6	8.1	7.6	0.7	16
		100D	28.2	12.2	12.1	11.8	11.6	10.2	9.8			0.7	19
		110D	35.5	16.8	16.8	15.9	14.6	12.9	11.8			0.8	19
		140D	48.3	27.9	22.7	20.1	18.4	16.3				1.0	22
		180D	110.9	65.7	53.3	47.2	43.3	38.4				2.0	30
		250D	246.7	151.7	123.3	109.1						3.4	40
	120	45D	1.42	0.8	0.6	0.51	0.45	0.4	0.36			0.06	10
		60D	1.91	0.96	0.78	0.69	0.63	0.56	0.51	0.48	0.43	0.09	10
		70D	2.8	1.5	1.2	1.1	1.0	0.9	0.8	0.8		0.2	12
		80D	26.1	9.0	9.0	9.0	9.0	8.7	8.0	7.5	6.8	0.5	16
		83D	26.7	9.3	9.3	9.2	9.1	9.0	8.9	8.4	8.0	0.6	16
		100D	29.3	13.5	13.2	12.8	10.1	9.8	9.6	9.0		0.7	19
		110D	38.4	17.5	17.1	15.2	13.9	12.3	11.3	10.6		0.7	19
		140D	51.4	26.4	21.5	19.0	17.4	15.4	14.2			0.9	22
		180D	118.2	62.2	50.5	44.7	41.0	36.3				1.9	30
		250D	367.6	211.5	171.8	152.1	139.6					3.7	40
	150	45D	1.42	0.75	0.56	0.49	0.4	0.37	0.31			0.06	10
		60D	1.95	0.91	0.74	0.65	0.60	0.53	0.49	0.45	0.41	0.09	10
		70D	2.9	1.4	1.2	1.0	0.9	0.8	0.8	0.7		0.2	12
		80D	27.2	9.2	9.2	9.2	9.2	8.3	7.6	7.1	6.65	0.5	16
		83D	27.5	9.6	9.5	9.5	9.4	9.3	9.1	9.0	7.5	0.6	16
		100D	30.2	13.6	13.4	13.3	12.1	11.0	10.5	9.2		0.7	19
		110D	40.0	17.9	16.3	14.5	13.3	11.7	10.8	10.1		0.7	19
		140D	53.0	25.1	20.4	18.1	16.6	14.7	13.5	12.6		0.9	22
		180D	126.7	62.6	50.9	45.0	41.3	36.6	33.6			1.9	30
		250D	385.0	202.5	164.4	145.6	133.6	118.3				3.6	40
	180	45D	1.42	0.71	0.54	0.47	0.4	0.35	0.3			0.06	10
		60D	1.97	0.86	0.70	0.62	0.57	0.50	0.46	0.43	0.39	0.09	10
		70D	3.0	1.4	1.1	1.0	0.9	0.8	0.7	0.7	0.6	0.2	12
		80D	27.8	9.3	9.3	9.3	9.0	8.0	7.3	6.8	6.2	0.5	16
		83D	28.1	9.8	9.8	9.8	9.3	9.0	8.6	7.9	7.5	0.6	16
		100D	31.2	14.6	14.3	12.6	12.3	10.8	9.4	8.8	8.0	0.7	19
		110D	40.9	18.1	15.6	13.9	12.7	11.3	10.3	9.7	8.7	0.7	19
		140D	79.3	37.2	30.2	26.7	24.5	21.7	19.9	18.6	16.8	1.0	22
		180D	157.1	75.3	61.2	54.2	49.7	44.0	40.3	37.7		2.0	35
		250D	395.5	194.3	157.8	139.7	128.2	113.5				3.4	40
	210	45D	1.42	0.69	0.51	0.45	0.39	0.33	0.29			0.06	10
		60D	1.99	0.83	0.67	0.60	0.55	0.48	0.44	0.41	0.37	0.09	10
		70D	3.0	1.3	1.1	0.9	0.9	0.8	0.7	0.7	0.6	0.2	12
		80D	28.2	9.4	9.4	9.4	8.7	7.7	7.0	6.6	5.9	0.5	16
		83D	29.2	10.2	10.1	9.8	9.5	9.2	8.8	8.1	7.7	0.6	16
		100D	32.3	14.8	14.4	12.7	18.1	10.9	9.6	9.2	8.7	0.7	19
		110D	41.5	18.2	15.1	13.3	12.2	10.8	9.9	9.3	8.4	0.7	19
		140D	80.1	35.7	29.0	25.7	23.6	20.9	19.1	17.9	16.2	1.0	22
		180D	159.0	72.3	58.7	52.0	47.7	42.3	38.8	36.2		2.0	35
		250D	474.9	229.1	186.1	164.8	151.1	133.8	122.8			3.8	40
	240	45D	1.5	0.61	0.50	0.43	0.36	0.3	0.27			0.06	10
		60D	2.00	0.80	0.65	0.57	0.53	0.47	0.43	0.40	0.36	0.09	10
		70D	3.0	1.3	1.0	0.9	0.8	0.7	0.7	0.6	0.6	0.2	12
		80D	28.5	9.4	9.4	9.1	8.4	7.4	6.8	6.4	5.7	0.5	16
		83D	29.6	9.6	9.6	9.5	8.7	7.7	7.1	6.7	6.0	0.6	16
		100D	33.4	14.3	14.1	11.1	10.9	9.8	9.4	8.2	7.6	0.6	19
		110D	41.9	17.9	14.5	12.9	11.8	10.5	9.6	9.0	8.1	0.6	19
		140D	80.7	34.4	28.0	24.8	22.7	20.1	18.4	17.3	15.6	1.0	22
		180D	160.2	69.8	56.7	50.2	46.0	40.8	37.4	35.0	31.6	1.9	35
		250D	480.4	221.4	179.8	159.2	146.1	129.3	118.6	111.0		3.7	40
	270	45D	1.55	0.58	0.49	0.4	0.35	0.29	0.25			0.06	10
		60D	2.01	0.77	0.63	0.55	0.51	0.45	0.41	0.39	0.35	0.09	10

PS: ○:1DWELL ※:2DWELL ●:3DWELL ☆:4DWELL

DS.DF TYPE

Stops S	Index period θ	Code	Static torque Ts (kgf-m)	Net dynamic torque to (kgf-m) Indexes per min.NN(rpm) 50	100	150	200	300	400	500	700	Cam shaft riction torque Tx (kgf-m)	Bearing sleeve ø (mm)
12	270	70D	3.1	1.2	1.0	0.9	0.8	0.7	0.7	0.6	0.6	0.2	12
		80D	28.6	9.4	9.4	8.8	8.1	7.2	6.6	6.1	5.6	0.5	16
		83D	29.8	9.5	9.5	8.9	8.4	7.5	6.9	6.7	5.8	0.5	16
		100D	34.3	14.5	14.3	14.0	13.0	10.8	10.2	9.2	8.9	0.6	19
		110D	46.4	20.0	16.2	14.4	13.2	11.7	10.7	10.0	9.0	0.7	19
		140D	81.2	33.3	27.1	24.0	22.0	19.5	17.9	16.7	15.1	1.0	22
		180D	161.1	67.5	54.8	48.8	44.6	39.4	36.2	33.8	30.6	1.9	35
		250D	484.4	214.6	174.3	154.3	141.6	125.3	115.0	107.5		3.7	40
	300	45D	1.55	0.52	0.47	0.38	0.33	0.27	0.24			0.06	10
		60D	2.01	0.75	0.61	0.54	0.49	0.44	0.40	0.37	0.34	0.09	10
		70D	3.1	1.2	1.0	0.9	0.8	0.7	0.6	0.6	0.5	0.2	12
		80D	28.8	9.4	9.4	8.6	7.9	7.0	6.4	6.0	5.4	0.5	16
		83D	30.2	9.5	9.5	8.9	8.7	7.8	7.1	6.8	6.0	0.5	16
		100D	35.1	14.3	14.1	13.6	12.3	10.5	9.5	8.8	8.4	0.6	19
		110D	46.6	19.4	15.8	14.0	12.8	11.3	10.4	9.7	8.8	0.7	19
		140D	81.5	32.3	26.3	23.3	21.3	18.9	17.3	16.2	14.7	1.0	22
		180D	161.8	65.6	53.2	47.1	43.3	38.3	35.1	32.9	29.7	1.9	35
		250D	487.2	208.5	169.4	150.0	137.6	121.8	111.7	104.5		3.6	40
	330	45D	1.55	0.51	0.45	0.35	0.31	0.25	0.22			0.06	10
		60D	2.01	0.73	0.59	0.52	0.48	0.42	0.39	0.36	0.33	0.09	10
		70D	3.1	1.2	0.9	0.8	0.8	0.7	0.6	0.6	0.5	0.2	12
		80D	28.9	9.5	9.4	8.3	7.7	6.8	6.2	5.8	5.3	0.5	16
		83D	30.3	9.6	9.6	9.2	8.9	8.0	7.3	7.0	6.3	0.5	16
		100D	35.7	14.3	14.1	13.2	11.4	9.8	9.2	8.6	8.1	0.6	19
		110D	46.8	18.9	15.3	13.6	12.5	11.0	10.1	9.5	8.6	0.7	19
		140D	81.7	31.5	25.6	22.6	20.8	18.4	16.9	15.8	14.3	1.0	22
		180D	162.3	63.8	51.8	45.9	42.1	37.3	34.2	32.0	28.9	1.9	35
		250D	489.4	203.1	165.0	146.1	134.0	118.6	108.8	100.8		3.6	40
16	※90	45D	1.5	0.7	0.51	0.43	0.4	0.35				0.1	12
		60D	2.06	1.11	0.90	0.80	0.73	0.65				0.13	14
		70D	12.6	6.9	6.3	5.6	5.2	4.6	4.2	3.9		0.4	16
		80D	21.5	11.4	11.4	10.2	9.4	8.3	7.6			0.7	19
		83D	22.5	11.7	11.6	10.5	9.7	8.6	7.9			0.7	19
		100D	28.4	12.0	11.9	10.8	10.1	8.9	8.2			0.7	22
	90	110D	36.2	12.5	12.5	12.5	12.5	12.5	12.2	11.4		0.7	16
		140D	46.3	20.8	20.8	19.6	17.9	15.9	14.6			0.9	19
		180D	65.9	37.6	30.5	27.0	24.8					1.4	22
		250D	178.6	108.6	88.2	78.1						2.5	30
	※120	45D	1.67	0.98	0.79	0.70	0.6	0.57	0.52	0.49		0.10	12
		60D	5.29	2.65	2.15	1.91	1.75	1.55	1.42	1.33	1.20	0.18	14
		70D	15.1	8.6	7.0	6.2	5.6	5.0	4.6	4.3	3.9	0.4	16
		80D	24.8	12.2	11.4	10.1	9.2	8.2	7.5	7.0		0.6	19
		83D	25.3	12.5	11.7	10.4	9.5	8.4	7.8	7.4		0.7	19
		100D	29.2	12.6	12.6	12.5	10.1	9.5	9.4	9.1		0.7	22
	120	110D	38.1	12.8	12.8	12.8	12.8	12.5	11.4	10.7		0.7	16
		140D	48.1	21.1	20.6	18.3	16.8	14.8	13.6	12.7		0.8	19
		180D	68.5	35.2	28.6	25.3	23.2	20.5				1.4	22
		250D	228.5	128.1	104.0	92.1	84.5					2.7	30
	※150	45D	1.81	0.95	0.77	0.68	0.63	0.55	0.51	0.48		0.09	12
		60D	5.52	2.53	2.06	1.82	1.67	1.48	1.36	1.27	1.15	0.17	14
		70D	16.1	8.3	6.7	6.0	5.5	4.8	4.4	4.2	3.8	0.4	10
		80D	26.9	12.7	11.1	9.8	9.0	8.0	7.3	6.8	6.2	0.6	19
		83D	27.1	12.8	11.4	10.3	9.3	8.4	7.4	7.2	6.5	0.6	19
		100D	30.2	12.9	11.5	10.6	9.8	8.5	7.8	7.5	7.0	0.6	22
	150	110D	39.1	13.0	13.0	13.0	13.0	11.8	10.8	10.1	9.2	0.6	16
		140D	48.9	21.3	19.5	17.2	15.8	14.0	12.8	12.0		0.8	19
		180D	69.8	33.2	27.0	23.9	21.9	19.4	17.8			1.3	22
		250D	234.9	121.5	98.7	87.4	80.1	71.0				2.6	30
	※180	45D	1.90	0.92	0.75	0.66	0.61	0.54	0.49	0.46	0.42	0.09	12
		60D	5.66	2.43	1.97	1.75	1.60	1.42	1.30	1.22	1.10	0.17	14
		70D	16.8	8.0	6.5	5.8	5.3	4.7	4.3	4.0	3.6	0.3	16
		80D	31.4	15.6	12.7	11.3	10.3	9.1	8.4	7.8	7.1	0.6	19
		83D	32.5	16.9	13.1	11.7	10.8	9.4	8.7	8.1	7.4	0.6	19
		100D	33.2	17.1	13.6	12.5	11.3	10.0	9.3	8.4	7.7	0.6	22
	180	110D	39.6	18.1	18.1	13.1	12.7	11.3	10.3	9.7	8.7	0.6	16
		140D	49.4	21.4	18.5	16.4	15.0	13.3	12.2	11.4	10.3	0.8	19
		180D	104.5	49.6	40.3	35.6	32.7	29.0	26.6	24.8		1.5	26
		250D	295.1	149.1	121.1	107.3	98.4	87.1				2.8	35
16	※210	45D	1.96	0.89	0.73	0.64	0.59	0.52	0.48	0.45	0.41	0.09	12
		60D	5.75	2.33	1.90	1.68	1.54	1.36	1.25	1.17	1.06	0.16	14
		70D	17.3	7.7	6.3	5.6	5.1	4.9	4.2	3.8	3.5	0.3	16
		80D	32.5	15.2	12.4	10.9	10.0	8.9	8.2	7.6	6.9	0.6	19
		83D	33.4	15.5	12.8	11.2	10.4	9.2	8.5	7.9	7.2	0.6	19
		100D	35.2	16.3	13.1	11.3	10.7	9.5	8.7	8.7	8.2	0.6	22
	210	110D	40.0	18.2	16.2	13.2	12.2	10.8	9.9	9.3	8.4	0.6	16
		140D	49.7	21.5	17.7	15.7	14.4	12.8	11.7	10.9	9.9	0.8	19
		180D	105.2	47.5	38.6	34.1	31.3	27.7	25.4	23.8		1.5	26
		250D	297.9	143.1	116.2	102.9	94.4	83.6	76.7			2.7	35
	※240	45D	2.01	0.87	0.71	0.62	0.57	0.51	0.47	0.44	0.39	0.09	12
		60D	5.81	2.25	1.83	1.62	1.49	1.32	1.21	1.13	1.02	0.16	14
		70D	17.6	7.5	6.1	5.4	5.0	4.4	4.0	3.8	3.4	0.3	16
		80D	33.4	14.8	12.0	10.6	9.8	8.6	7.9	7.4	6.7	0.6	19
		83D	34.3	15.1	12.3	10.9	9.1	8.9	8.2	7.7	7.1	0.6	19
		100D	35.7	15.6	12.8	11.2	9.8	9.2	8.5	8.1	7.8	0.6	22
	240	110D	40.2	18.2	16.2	12.8	11.7	10.4	9.5	8.9	8.1	0.6	16
		140D	49.9	21.0	17.1	15.1	13.9	12.3	11.3	10.5	9.5	0.7	19
		180D	105.7	45.7	37.1	32.9	30.2	26.7	24.5	22.9	20.7	1.5	26
		250D	299.7	137.9	112.0	99.2	91.0	80.5	73.9			2.7	35
	※270	45D	2.04	0.84	0.69	0.61	0.56	0.49	0.45	0.42	0.38	0.08	12
		60D	5.85	2.18	1.77	1.57	1.44	1.28	1.17	1.09	0.99	0.16	14
		70D	17.8	7.3	5.9	5.2	4.8	4.3	3.9	3.7	3.3	0.3	16
		80D	33.9	14.4	11.7	10.4	9.5	8.4	7.7	7.2	6.5	0.6	19
		83D	34.6	14.7	12.0	10.7	9.9	8.7	8.1	7.6	7.1	0.6	19
		100D	36.3	15.0	12.3	11.0	10.2	9.3	8.4	7.9	7.5	0.6	22
	270	110D	40.4	18.2	16.2	12.4	11.4	10.1	9.2	8.6	7.8	0.6	16
		140D	50.1	20.3	16.5	14.6	13.4	11.9	10.9	10.2	9.2	0.7	19
		180D	106.0	44.2	35.9	31.8	29.2	25.8	23.7	22.1	20.0	1.4	26
		250D	301.0	133.4	108.3	95.9	88.0	77.9	71.5	66.8		2.7	35
	※300	45D	2.06	0.82	0.67	0.59	0.54	0.48	0.44	0.41	0.37	0.08	12
		60D	5.88	2.12	1.72	1.53	1.40	1.24	1.14	1.06	0.96	0.15	14
		70D	18.0	7.1	5.8	5.1	4.7	4.1	3.8	3.6	3.2	0.3	16
		80D	34.4	14.1	11.4	10.1	9.3	8.2	7.5	7.0	6.4	0.6	19
		83D	34.9	14.4	12.7	10.5	9.8	8.7	7.8	7.3	6.7	0.6	19
		100D	37.1	15.6	13.0	11.2	10.2	9.0	8.2	7.6	7.1	0.6	22
	300	110D	40.5	18.2	14.2	12.0	11.0	9.8	9.0	8.4	7.6	0.6	16
		140D	50.2	19.7	16.0	14.2	13.0	11.5	10.6	9.9	8.9	0.7	19
		180D	106.3	42.9	34.8	30.8	28.3	25.0	23.0	21.5	19.4	1.4	26
		250D	302.0	129.4	105.1	93.1	85.4	75.6	69.4	64.9		2.7	35
	※330	45D	2.08	0.80	0.65	0.58	0.53	0.47	0.43	0.40	0.36	0.08	12
		60D	5.90	2.07	1.68	1.49	1.36	1.21	1.11	1.04	0.94	0.15	14
		70D	18.1	6.9	5.6	5.0	4.6	4.0	3.7	3.5	3.1	0.3	16
		80D	34.7	13.7	11.1	9.9	9.1	8.0	7.4	6.9	6.2	0.5	19
		83D	35.1	13.9	11.4	10.2	9.4	8.5	7.7	7.2	6.5	0.5	19
		100D	38.1	14.3	11.8	10.7	8.7	8.6	8.1	7.5	7.3	0.6	22
	330	110D	40.6	18.3	13.2	11.7	10.7	9.5	8.7	8.1	7.4	0.6	16
		140D	50.2	19.2	15.6	13.8	12.7	11.2	10.3	9.6	8.7	0.7	19
		180D	106.4	41.7	33.9	30.0	27.5	24.4	22.3	20.9	18.9	1.4	26
		250D	302.7	125.9	102.3	90.6	83.1	73.6	67.5	63.1		2.6	35
20	※90	45D	1.15	0.65	0.52	0.4	0.33	0.29				0.08	10
		60D	1.76	0.94	0.76	0.68	0.62	0.55				0.10	12
		70D	5.0	3.0	2.5	2.2	2.0	1.8	1.6			0.3	14
		80D	22.8	8.6	8.6	8.6	8.6	8.6	7.9	7.4		0.6	16
		83D	23.4	8.9	8.9	8.9	8.9	8.9	8.2	7.7		0.6	16
		100D	28.1	11.2	10.6	10.2	9.6	9.2	8.9	8.3		0.8	19
		110D	36.2	22.3	18.1	16.1	14.7	13.1				0.9	19
		140D	46.0	26.0	21.1	18.7	17.2					1.1	22
		180D	108.7	63.2	51.4	45.5	41.7					2.2	35
		250D	312.7	198.4	161.1							4.3	40
	※120	45D	1.15	0.7	0.62	0.49	0.41	0.33	0.29	0.25		0.07	10
		60D	2.33	1.18	0.96	0.85	0.78	0.69	0.63	0.59		0.12	12
		70D	5.5	2.9	2.4	2.1	1.9	1.7	1.6	1.5		0.3	14
		80D	25.4	9.1	9.1	9.1	9.1	8.3	7.6	7.2	6.5	0.6	16
		83D	27.1	9.4	9.4	9.4	9.4	8.6	7.9	7.5	6.8	0.6	16
		100D	29.3	10.6	9.8	9.7	9.7	9.1	8.2	8.0	7.2	0.7	19
		110D	39.7	21.4	17.4	15.4	14.2	12.5				0.8	19

PS: ○:1DWELL ※:2DWELL ●:3DWELL ☆:4DWELL

DS.DF TYPE

Stops S	Index period θ	Code	Static torque Ts (kgf-m)	Net dynamic torque to (kgf-m) Indexes per min.NN(rpm) 50	100	150	200	300	400	500	700	Cam shaft friction torque Tx (kgf-m)	Bearing sleeve ø (mm)
20	※120	140D	73.8	38.7	31.4	27.8	25.5	22.6				1.2	14
		180D	144.1	76.8	62.4	55.2	50.7					2.3	16
		250D	410.8	235.1	190.9	169.1						4.5	19
	※150	45D	1.3	0.69	0.59	0.45	0.38	0.31	0.27	0.22		0.06	10
		60D	2.40	1.12	0.91	0.81	0.74	0.65	0.60	0.56		0.11	12
		70D	5.7	2.8	2.3	2.0	1.8	1.6	1.5	1.4		0.2	14
		80D	27.0	9.4	9.4	9.4	9.1	8.0	7.4	6.9	6.2	0.5	16
		83D	28.1	9.7	9.7	9.7	9.4	8.3	7.6	7.1	6.4	0.6	16
		100D	30.2	10.2	10.1	10.0	9.7	8.7	7.9	7.5	6.7	0.7	19
		110D	41.7	20.6	16.7	14.8	13.6	12.0	11.0			0.8	19
		140D	77.3	37.0	30.1	26.6	24.4	21.6	19.8			1.1	22
		180D	151.1	73.5	59.7	52.9	48.5	43.0				2.2	35
		250D	437.2	226.8	184.2	163.1	149.6					4.2	40
	※180	45D	1.35	0.63	0.54	0.43	0.36	0.29	0.25	0.2		0.06	10
		60D	2.44	1.07	0.87	0.77	0.71	0.63	0.57	0.54	0.48	0.11	12
		70D	5.9	2.7	2.2	1.9	1.8	1.6	1.4	1.3	1.2	0.2	14
		80D	28.0	9.5	9.5	9.5	8.7	7.7	7.1	6.6	6.0	0.5	16
		83D	29.2	9.8	9.8	9.7	9.1	8.1	7.4	6.9	6.3	0.6	16
		100D	31.2	10.4	10.2	10.0	9.4	8.6	7.9	7.3	6.5	0.7	19
		110D	42.9	19.7	16.0	14.2	13.0	11.5	10.6	9.9		0.7	19
		140D	79.5	35.6	28.9	25.6	23.5	20.8	19.1	17.8		1.1	22
		180D	191.7	90.7	73.7	65.3	59.9	53.0	48.6			2.4	35
		250D	453.9	218.8	177.7	157.4	144.4					4.0	40
	※210	45D	1.4	0.61	0.52	0.4	0.33	0.27	0.21	0.18		0.06	10
		60D	2.47	1.03	0.83	0.74	0.68	0.60	0.55	0.51	0.47	0.11	12
		70D	6.0	2.6	2.1	1.9	1.7	1.5	1.4	1.3	1.2	0.2	14
		80D	28.7	9.6	9.6	9.2	8.4	7.5	6.9	6.4	5.8	0.5	16
		83D	30.2	9.9	9.8	9.5	8.7	7.8	7.2	6.7	6.1	0.6	16
		100D	33.0	10.4	10.3	10.0	9.0	8.2	7.5	7.1	6.5	0.7	19
		110D	43.6	19.0	15.4	13.7	12.5	11.1	10.2	9.5		0.7	19
		140D	80.9	34.2	27.8	24.6	22.6	20.0	18.3	17.2		1.1	22
		180D	194.9	87.4	71.0	62.8	57.6	51.0	48.8			2.3	35
		250D	625.3	300.6	244.1	216.2	198.3	175.6				4.6	40
	※240	45D	1.45	0.59	0.48	0.37	0.3	0.27	0.21	0.18		0.06	10
		60D	2.49	0.99	0.80	0.71	0.65	0.58	0.53	0.50	0.45	0.11	12
		70D	6.0	2.5	2.0	1.8	1.6	1.5	1.3	1.2	1.1	0.2	14
		80D	29.1	9.7	9.7	8.9	8.2	7.2	6.6	6.2	5.6	0.5	16
		83D	31.5	9.9	9.8	9.1	8.5	7.5	6.9	6.6	6.0	0.6	16
		100D	34.1	10.4	10.3	10.0	9.0	8.2	7.5	7.1	6.5	0.7	19
		110D	44.2	18.4	14.9	13.2	12.1	10.7	9.9	9.2		0.7	19
		140D	81.8	33.1	26.9	23.8	21.8	19.3	17.7	16.6		1.0	22
		180D	197.1	84.4	68.6	60.7	55.7	49.3	45.2	42.3		2.2	35
		250D	636.1	291.2	236.6	209.5	192.1	170.1				4.5	40
	※270	45D	1.5	0.56	0.45	0.34	0.3	0.26	0.2	0.17		0.06	10
		60D	2.50	0.96	0.78	0.69	0.63	0.56	0.51	0.48	0.43	0.10	12
		70D	6.1	2.4	2.0	1.7	1.6	1.4	1.3	1.2	1.1	0.2	14
		80D	29.4	9.8	9.8	8.7	7.9	7.0	6.4	6.0	5.5	0.5	16
		83D	32.0	10.2	10.1	9.3	8.4	7.5	6.7	6.2	5.8	0.6	16
		100D	35.2	10.7	10.6	9.8	8.8	7.9	7.5	6.8	6.3	0.7	19
		110D	44.6	17.8	14.5	12.8	11.8	10.4	9.5	8.9	8.1	0.7	19
		140D	82.5	32.1	26.0	23.1	21.2	18.7	17.2	16.1	14.5	1.0	22
		180D	198.6	81.8	66.4	58.8	54.0	47.8	43.8	41.0		2.2	35
		250D	643.9	232.8	229.7	203.4	186.6	165.2	151.6			4.4	40
	※300	45D	1.52	0.54	0.43	0.33	0.29	0.25	0.2	0.16		0.06	10
		60D	2.51	0.93	0.76	0.67	0.61	0.54	0.50	0.47	0.42	0.10	12
		70D	6.1	2.3	1.9	1.7	1.5	1.4	1.3	1.2	1.1	0.2	14
		80D	29.7	9.8	9.5	8.4	7.7	6.8	6.3	5.9	5.3	0.5	16
		83D	32.3	10.2	10.1	9.0	8.1	7.1	6.7	6.5	6.0	0.6	16
		100D	35.6	10.8	10.3	9.4	8.6	7.5	7.2	6.9	6.3	0.7	19
		110D	44.8	17.3	14.1	12.5	11.4	10.1	9.3	8.7	7.8	0.7	19
		140D	83.0	31.2	25.3	22.4	20.6	18.2	16.7	15.6	14.1	1.0	22
		180D	199.8	79.5	64.6	57.2	52.4	46.4	42.6	39.8		2.2	35
		250D	649.6	275.3	223.6	198.1	181.6	160.8	147.5			4.4	40
	※330	45D	1.52	0.51	0.41	0.3	0.28	0.23	0.19	0.15		0.06	10
		60D	2.51	0.90	0.73	0.65	0.60	0.53	0.48	0.45	0.41	0.10	12
		70D	6.1	2.3	1.9	1.6	1.5	1.3	1.2	1.1	1.0	0.2	14

Stops S	Index period θ	Code	Static torque Ts (kgf-m)	Net dynamic torque to (kgf-m) Indexes per min.NN(rpm) 50	100	150	200	300	400	500	700	Cam shaft friction torque Tx (kgf-m)	Bearing sleeve ø (mm)
20	※330	80D	29.8	9.8	9.3	8.2	7.5	6.7	6.1	5.7	5.2	0.5	16
		83D	32.4	10.2	10.0	9.0	8.1	7.8	6.5	6.3	4.9	0.5	16
		100D	35.8	10.6	10.4	9.4	9.4	9.5	8.7	7.6	7.2	0.6	19
		110D	45.0	16.9	13.7	12.1	11.1	9.9	9.0	8.5	7.6	0.7	19
		140D	83.3	30.4	24.7	21.8	20.0	17.7	16.3	15.2	13.8	1.0	22
		180D	200.6	77.4	62.9	55.7	51.1	45.2	41.5	38.8		2.1	35
		250D	653.9	268.4	218.0	193.0	177.1	156.8	143.8			4.3	40
24	※90	45D	0.5	0.31	0.21	0.19	0.15	0.13				0.06	10
		60D	0.94	0.49	0.40	0.35	0.32	0.29				0.09	10
		70D	2.7	1.6	1.3	1.1	1.1	0.9				0.2	12
		80D	24.5	8.9	8.9	8.9	8.9	8.9	8.8	8.2		0.6	16
		83D	26.5	9.3	9.3	9.3	9.3	9.3	9.0	8.5		0.6	16
		100D	28.5	10.3	9.8	9.8	9.8	9.5	9.4	8.8		0.7	19
		110D	35.5	16.8	16.8	15.9	14.6	12.9				0.8	19
		140D	48.3	27.9	22.7	20.1	18.4					1.0	22
		180D	110.9	65.7	53.3	47.2	43.3					2.0	30
		250D	246.7	151.7	123.3							3.4	40
	※120	45D	1.42	0.8	0.6	0.51	0.45	0.4	0.36			0.06	10
		60D	1.93	0.46	0.37	0.33	0.30	0.27	0.25			0.09	10
		70D	2.8	1.5	1.2	1.1	1.0	0.9	0.8			0.2	12
		80D	26.8	9.3	9.3	9.3	9.3	9.2	8.4	7.9	7.1	0.5	16
		83D	28.8	9.5	9.5	9.5	9.5	9.4	8.7	8.1	7.5	0.6	16
		100D	30.8	10.4	10.1	10.0	9.9	9.7	9.0	8.4	7.8	0.7	19
		110D	38.4	17.5	17.1	15.2	13.9	12.3	11.3			0.7	19
		140D	51.4	26.4	21.5	19.0	17.4	15.4				0.9	22
		180D	118.2	62.2	50.5	44.7	41.0					1.9	30
		250D	367.6	211.5	171.8	152.1	139.6					3.7	40
	※150	45D	1.42	0.75	0.56	0.49	0.4	0.37	0.31			0.06	10
		60D	1.95	0.91	0.74	0.65	0.60	0.53	0.49	0.45		0.09	10
		70D	2.9	1.4	1.2	1.0	0.9	0.8	0.8	0.7		0.2	12
		80D	28.0	9.5	9.5	9.5	9.5	8.8	8.0	7.5	6.8	0.5	16
		83D	30.1	9.8	9.8	9.7	9.7	9.3	8.4	7.8	7.2	0.6	16
		100D	32.2	10.7	10.7	10.5	10.3	9.8	8.7	8.2	7.5	0.7	19
		110D	40.0	17.9	16.3	14.5	13.3	11.7	10.8	10.1		0.7	19
		140D	53.0	25.1	20.4	18.1	16.6	14.7	13.5			0.9	22
		180D	126.7	62.6	50.9	45.0	41.3	36.6				1.9	30
		250D	385.0	202.5	164.4	145.6	133.6					3.6	40
	※180	45D	1.42	0.71	0.54	0.47	0.4	0.35	0.3			0.06	10
		60D	1.97	0.86	0.70	0.62	0.57	0.50	0.46	0.43	0.39	0.09	10
		70D	3.0	1.4	1.1	1.0	0.9	0.8	0.7	0.7		0.2	12
		80D	28.8	9.7	9.7	9.7	9.5	8.4	7.7	7.2	6.5	0.5	16
		83D	29.8	10.1	10.1	10.1	9.8	8.7	8.0	7.5	6.8	0.6	16
		100D	30.2	11.0	10.4	10.4	9.9	9.8	8.4	7.8	7.2	0.7	19
		110D	40.9	18.1	15.6	13.9	12.7	11.3	10.3	9.7		0.7	19
		140D	54.0	24.0	19.5	17.2	15.8	14.0	12.9			0.9	22
		180D	157.1	75.3	61.2	54.2	49.7	44.0	40.3			2.0	30
		250D	395.5	194.3	157.8	139.7	128.2					3.4	40
	※210	45D	1.42	0.69	0.51	0.45	0.39	0.33	0.29			0.06	10
		60D	1.99	0.83	0.67	0.60	0.55	0.48	0.44	0.41	0.37	0.09	10
		70D	3.0	1.3	1.1	0.9	0.9	0.8	0.7	0.7		0.2	12
		80D	29.2	9.7	9.7	9.7	9.1	8.1	7.4	7.0	6.3	0.5	16
		83D	30.3	10.1	10.1	10.1	9.4	8.4	7.7	7.3	6.6	0.6	16
		100D	32.1	11.0	10.6	10.4	9.7	8.7	7.9	7.6	7.1	0.7	19
		110D	41.5	18.2	15.1	13.3	12.2	10.8	9.9	9.3		0.7	19
		140D	54.6	23.0	18.7	16.6	15.2	13.5	12.3	11.5		0.8	22
		180D	159.0	72.3	58.7	52.0	47.7	42.3	38.8			2.0	30
		250D	474.9	229.1	186.6	164.8	151.1	133.8				3.8	40
	※240	45D	1.5	0.61	0.50	0.43	0.36	0.3	0.27			0.06	10
		60D	2.00	0.80	0.65	0.57	0.53	0.47	0.43	0.40	0.36	0.09	10
		70D	3.0	1.3	1.0	0.9	0.8	0.7	0.7	0.6	0.6	0.2	12
		80D	29.6	9.8	9.8	9.6	8.8	7.8	7.2	6.7	6.1	0.5	16
		83D	30.5	10.2	10.2	10.1	9.3	8.2	7.5	7.1	6.5	0.6	16
		100D	32.8	10.5	10.5	10.2	9.7	8.5	7.8	7.4	6.8	0.7	19
		110D	41.9	17.9	14.5	12.9	11.8	10.5	9.6	9.0	8.1	0.6	19
		140D	55.0	22.2	18.0	16.0	14.6	13.0	11.9	11.1		0.8	22
		180D	160.2	69.8	56.7	50.2	46.0	40.8	37.4	35.0		1.9	30
		250D	480.4	221.4	179.8	159.2	146.1	129.3				3.7	40

PS: O:1DWELL ※:2DWELL ●:3DWELL ☆:4DWELL

DS.DF TYPE

Stops S	Index period θ	Code	Static torque Ts (kgf-m)	Net dynamic torque to (kgf-m) Indexes per min.NN(rpm) 50	100	150	200	300	400	500	700	Cam shaft friction torque Tx (kgf-m)	Bearing sleeve ø (mm)
24	※270	45D	1.55	0.58	0.49	0.4	0.35	0.29	0.25			0.06	10
		60D	2.01	0.77	0.63	0.55	0.51	0.45	0.41	0.39	0.35	0.09	10
		70D	3.1	1.2	1.0	0.9	0.8	0.7	0.7	0.6	0.6	0.2	12
		80D	29.8	9.8	9.8	9.3	8.6	7.6	7.0	6.5	5.9	0.5	16
		83D	30.5	11.3	11.3	11.0	10.5	9.5	9.1	8.5	7.1	0.5	16
		100D	31.6	12.8	12.6	12.5	12.1	11.2	10.6	9.8	8.5	0.6	19
		110D	42.2	17.3	14.1	12.5	11.4	10.1	9.3	8.7	7.9	0.6	19
		140D	55.3	21.5	17.5	15.5	14.2	12.6	11.5	10.8		0.8	22
		180D	161.1	67.5	54.8	48.6	44.6	39.4	36.2	33.8		1.9	30
		250D	484.4	214.6	174.3	154.3	141.6	125.3	115.0			3.7	40
	※300	45D	1.55	0.52	0.47	0.38	0.33	0.27	0.24			0.06	10
		60D	2.01	0.75	0.61	0.54	0.49	0.44	0.40	0.37	0.34	0.09	10
		70D	3.1	1.2	1.0	0.9	0.8	0.7	0.6	0.6	0.5	0.2	12
		80D	30.0	9.9	9.9	9.1	8.3	7.4	6.8	6.3	5.7	0.5	16
		83D	30.5	11.4	11.3	10.8	10.0	9.6	9.3	8.7	6.2	0.5	16
		100D	31.2	12.8	12.6	11.7	11.4	10.9	10.2	9.7	7.1	0.6	19
		110D	42.4	16.8	13.7	12.1	11.1	9.8	9.0	8.4	7.6	0.6	19
		140D	82.5	32.9	26.7	23.7	21.7	19.2	17.6	16.5	14.9	1.0	22
		180D	161.8	65.6	53.2	47.1	43.3	38.3	35.1	32.9		1.9	30
		250D	487.2	208.5	169.4	150.0	137.6	121.8	111.7			3.6	40
	※330	45D	1.55	0.51	0.45	0.35	0.31	0.25	0.22			0.06	10
		60D	2.01	0.73	0.59	0.52	0.48	0.42	0.39	0.36	0.33	0.09	10
		70D	3.1	1.2	0.9	0.8	0.8	0.7	0.6	0.6	0.5	0.2	12
		80D	30.1	9.9	9.9	8.8	8.1	7.2	6.6	6.2	5.6	0.5	16
		83D	30.6	11.8	11.6	11.2	10.1	8.7	8.6	8.0	6.4	0.5	16
		100D	31.4	13.4	12.4	11.4	10.5	9.0	8.6	8.1	6.6	0.6	19
		110D	42.6	16.4	13.3	11.8	10.8	9.6	8.8	8.2	7.4	0.6	19
		140D	82.8	32.0	26.0	23.0	21.1	18.7	17.2	16.0	14.5	1.0	22
		180D	162.3	63.8	51.8	45.9	42.1	37.3	34.2	32.0		1.9	30
		250D	489.4	203.1	165.0	146.1	134.0	118.6	108.8			3.6	40
30	●90	45D	1.15	0.65	0.52	0.4	0.33	0.29	0.24	0.21		0.08	10
		60D	1.76	0.94	0.76	0.68	0.62	0.55	0.50	0.47		0.10	12
		70D	5.0	3.0	2.5	2.2	2.0	1.8	1.6	1.5		0.3	14
		80D	22.7	8.4	8.4	8.4	8.4	8.3	7.6	7.1	6.4	0.6	16
		83D	23.4	10.5	10.3	10.1	10.0	9.8	9.6	9.1	8.4	0.7	16
		100D	24.0	20.4	16.1	14.0	12.7	11.2	10.0			0.8	19
		110D	36.2	22.3	18.1	16.1	14.7	13.1	12.0			0.9	19
		140D	46.0	20.6	21.1	18.7	17.2	15.2				1.1	22
		180D	108.7	63.2	51.4	45.5	41.7					2.2	35
		250D	312.7	198.4	161.1	142.7						4.3	40
	●120	45D	1.15	0.7	0.62	0.48	0.41	0.33	0.29	0.25		0.07	10
		60D	2.33	1.18	0.96	0.49	0.78	0.69	0.63	0.59	0.54	0.12	12
		70D	5.5	2.9	2.4	0.85	1.9	1.7	1.6			0.3	14
		80D	25.4	9.1	9.1	9.1	9.1	8.3	7.6	7.2		0.6	16
		83D	25.9	11.1	11.1	11.0	11.0	10.3	9.7	9.2		0.7	16
		100D	26.3	19.3	17.1	14.6	12.1	10.4	9.8	10.3		0.8	19
		110D	39.7	21.4	17.4	15.4	14.2	12.5	11.5	10.8		0.8	19
		140D	73.8	38.7	31.4	27.8	25.5	22.6	20.7	19.4		1.2	22
		180D	144.1	76.8	62.4	55.2	50.7	44.9				2.3	35
		250D	410.8	235.1	190.9	169.1	155.1					4.5	40
	●150	45D	1.3	0.69	0.59	0.45	0.38	0.31	0.27	0.22		0.06	10
		60D	2.40	1.12	0.91	0.81	0.74	0.65	0.60	0.56	0.51	0.11	12
		70D	5.7	2.8	2.3	2.0	1.8	1.6	1.5	1.4		0.2	14
		80D	27.0	9.4	9.4	9.4	9.1	8.0	7.4	6.9	6.2	0.5	16
		83D	27.9	11.5	11.4	11.4	11.1	10.0	9.5	8.9	8.4	0.6	16
		100D	28.7	18.6	14.5	12.6	11.4	10.8	10.1	9.0		0.7	19
		110D	41.7	20.6	16.7	14.8	13.6	12.0	11.0	9.5		0.8	19
		140D	77.3	37.0	30.1	26.6	24.4	21.6	19.8	10.3		1.1	22
		180D	151.1	73.5	59.7	52.9	48.5	43.0	39.4	18.6		2.2	35
		250D	437.2	226.8	184.2	163.1	149.6	132.5				4.2	40
	※180	45D	1.35	0.63	0.54	0.43	0.36	0.29	0.25	0.22		0.06	10
		60D	2.44	1.07	0.87	0.77	0.71	0.63	0.57	0.54	0.48	0.11	12
		70D	5.9	2.7	2.2	1.9	1.8	1.6	1.4	1.3		0.2	14
		80D	28.0	9.5	9.5	9.5	8.7	7.7	7.1	6.6	6.0	0.5	16
		83D	28.7	11.6	11.5	11.5	10.7	9.6	9.0	8.6	7.9	0.6	16
		100D	29.3	17.7	14.2	12.1	11.8	11.2	9.6	9.3	8.2	0.7	19
		110D	42.9	19.7	16.0	14.2	13.0	11.5	10.6	9.9	8.9	0.7	19
		140D	79.5	35.6	28.9	25.6	23.5	20.8	19.1	17.8	16.1	1.1	22

Stops S	Index period θ	Code	Static torque Ts (kgf-m)	Net dynamic torque to (kgf-m) Indexes per min.NN(rpm) 50	100	150	200	300	400	500	700	Cam shaft friction torque Tx (kgf-m)	Bearing sleeve ø (mm)
30	●180	180D	191.7	90.7	73.7	65.3	59.9	53.0	48.6	45.5		2.4	35
		250D	453.9	218.8	177.7	157.4	144.4	127.8				4.0	40
	●210	45D	1.4	0.61	0.52	0.4	0.33	0.27	0.21	0.18		0.06	10
		60D	2.47	1.03	0.83	0.74	0.68	0.60	0.55	0.51	0.47	0.11	12
		70D	6.0	2.6	2.1	1.9	1.7	1.5	1.4	1.3		0.2	14
		80D	28.7	9.6	9.6	9.2	8.4	7.5	6.9	6.4	5.8	0.5	16
		83D	29.3	11.6	11.6	11.2	10.4	9.4	8.8	8.3	7.2	0.6	16
		100D	31.2	17.0	13.4	11.6	11.3	10.6	9.5	9.1	7.9	0.7	19
		110D	43.6	19.0	15.4	13.7	12.5	11.1	10.2	9.5	8.6	0.7	19
		140D	80.9	34.2	27.8	24.6	22.6	20.0	18.3	17.2	15.5	1.1	22
		180D	194.9	87.4	71.0	62.8	57.6	51.0	46.8	43.8		2.3	35
		250D	625.3	300.6	244.1	216.2	198.3	175.6	161.1			4.6	40
	●240	45D	1.45	0.59	0.48	0.37	0.3	0.27	0.21	0.18		0.06	10
		60D	2.49	0.99	0.80	0.71	0.65	0.58	0.53	0.50	0.45	0.11	12
		70D	6.0	2.5	2.0	1.8	1.6	1.5	1.3	1.2	1.1	0.2	14
		80D	29.1	9.7	9.7	8.9	8.2	7.2	6.6	6.2	5.6	0.5	16
		83D	29.6	11.7	11.7	10.9	10.2	8.1	7.7	7.1	6.3	0.6	16
		100D	31.3	16.3	12.8	11.5	11.6	9.2	8.7	8.4	7.2	0.7	19
		110D	44.2	18.4	14.9	13.2	12.1	10.7	9.9	9.2	8.3	0.7	19
		140D	81.8	33.1	26.9	23.8	21.8	19.3	17.7	16.6	15.0	1.0	22
		180D	197.1	84.4	68.6	60.7	55.7	49.3	45.2	42.3	38.2	2.2	35
		250D	636.1	291.2	236.6	209.5	192.1	170.1	156.1	146.0		4.5	40
	●270	45D	1.5	0.56	0.45	0.34	0.3	0.26	0.2	0.17		0.06	10
		60D	2.50	0.96	0.78	0.69	0.63	0.56	0.51	0.48	0.43	0.10	12
		70D	6.1	2.4	2.0	1.7	1.6	1.4	1.3	1.2	1.1	0.2	14
		80D	29.4	9.8	9.8	8.7	7.9	7.0	6.4	6.0	5.5	0.5	16
		83D	30.2	11.8	11.8	10.2	9.6	8.2	7.4	6.8	6.1	0.6	16
		100D	32.4	15.6	12.3	11.8	11.5	9.4	9.1	8.6	7.0	0.7	19
		110D	44.6	17.8	14.5	12.8	11.8	10.4	9.5	8.9	8.1	0.7	19
		140D	82.5	32.1	26.0	23.1	21.2	18.7	17.2	16.1	14.5	1.0	22
		180D	198.6	81.8	66.4	58.8	54.0	47.8	43.8	41.0	37.1	2.2	35
		250D	643.9	282.8	229.7	203.4	186.6	165.2	151.6	141.8		4.4	40
	●300	45D	1.52	0.54	0.43	0.33	0.29	0.25	0.2	0.16		0.06	10
		60D	2.51	0.93	0.76	0.67	0.61	0.54	0.50	0.47	0.42	0.10	12
		70D	6.1	2.3	1.9	1.7	1.5	1.4	1.3	1.2	1.1	0.2	14
		80D	29.7	9.8	9.5	8.4	7.7	6.8	6.3	5.9	5.3	0.5	16
		83D	30.7	11.8	11.5	10.0	9.1	8.4	7.6	7.1	6.4	0.6	16
		100D	32.8	15.4	12.1	11.2	10.9	10.0	9.2	8.6	7.4	0.7	19
		110D	44.8	17.3	14.1	12.5	11.4	10.1	9.3	8.7	7.8	0.7	19
		140D	83.0	31.2	25.3	22.4	20.6	18.2	16.7	15.6	14.1	1.0	22
		180D	199.8	79.5	64.6	57.2	52.4	46.4	42.6	39.8	36.0	2.2	35
		250D	649.6	275.3	223.6	198.0	181.6	160.8	147.5	138.0		4.4	40
	●330	45D	1.52	0.51	0.41	0.3	0.28	0.23	0.19	0.15		0.06	10
		60D	2.51	0.90	0.73	0.65	0.60	0.53	0.48	0.45	0.41	0.10	12
		70D	6.1	2.3	1.9	1.6	1.5	1.3	1.2	1.1	1.0	0.2	14
		80D	29.8	9.8	9.3	8.2	7.5	6.7	6.1	5.7	5.2	0.5	16
		83D	31.1	11.7	11.4	9.7	8.7	8.3	7.4	6.9	6.8	0.6	16
		100D	33.2	14.6	11.9	10.8	10.4	9.2	8.5	8.1	7.2	0.7	19
		110D	45.0	16.9	13.7	12.1	11.1	9.9	9.0	8.5	7.6	0.7	19
		140D	83.3	30.4	24.7	21.8	20.0	17.7	16.3		13.8	1.0	22
		180D	200.6	77.4	62.9	55.7	51.1	45.2	41.5	38.8	35.1	2.1	35
		250D	653.9	268.4	218.0	193.0	177.1	156.8	143.8	134.5		4.3	40
32	☆90	80D	21.5	11.4	11.4	10.2	9.4	8.3	7.6			0.7	19
		83D	22.1	11.7	11.4	10.8	10.2	9.3	8.4			0.6	19
		100D	22.7	12.3	12.3	11.3	10.3	9.8				0.7	19
	※90	110D	36.2	12.5	12.5	12.5	12.5	12.5				0.7	16
		140D	46.3	20.8	20.8	19.6	17.9	15.9				0.9	19
		180D	65.9	37.6	30.5	27.0	24.8					1.4	22
		250D	178.6	108.6	88.2							2.5	30
	☆120	80D	23.4	8.7	8.7	8.7	8.2	7.3	6.7			0.6	19
		83D	23.7	11.8	11.6	11.0	10.2	9.4				0.6	19
		100D	24.5	12.2	12.3	11.3	10.3	9.8				0.7	19
	※120	110D	38.1	12.8	12.8	12.8	12.8	12.5	11.4			0.7	16
		140D	48.1	21.1	20.6	18.3	16.8	14.8	13.6			0.8	19
		180D	68.5	35.2	28.6	25.3	23.2					1.4	22
		250D	228.5	128.1	104.0	92.1						2.7	30

PS: O:1DWELL ※:2DWELL ●:3DWELL ☆:4DWELL

DS.DF TYPE

Stops S	Index period θ	Code	Static torque Ts (kgf-m)	Net dynamic torque to (kgf-m) Indexes per min.NN(rpm)								Cam shaft riction torque Tx (kgf-m)	Bearing sleeve ø (mm)
				50	100	150	200	300	400	500	700		
32	☆150	80D	26.9	12.7	11.1	9.8	9.0	8.0	7.3	6.8		0.6	19
	※150	83D	28.7	12.8	11.4	10.1	9.3	8.3	7.4	7.2		0.6	12
		100D	35.2	12.9	12.8	12.8	12.7	11.4	10.5	8.9		0.6	14
		110D	39.1	13.0	13.0	13.0	13.0	11.8	10.8	10.1		0.6	16
		140D	48.9	21.3	19.5	17.2	15.8	14.0	12.8			0.8	19
		180D	69.8	33.2	27.0	23.9	21.9	19.4				1.3	22
		250D	234.9	121.5	98.7	87.4	80.1					2.6	30
	☆180	80D	31.4	15.6	12.7	11.3	10.3	9.1	8.4	7.8		0.6	19
	※180	83D	33.7	12.9	11.6	10.8	9.5	8.5	7.6	7.4		0.6	12
		100D	35.4	12.9	12.8	12.8	12.7	11.4	10.5	8.9		0.6	14
		110D	39.6	13.1	13.1	13.1	12.7	11.3	10.3	9.7		0.6	16
		140D	49.4	21.4	18.5	16.5	15.0	13.3	12.2	11.4		0.8	19
		180D	104.5	49.6	40.3	35.6	32.7	29.0	26.6			1.5	22
		250D	295.1	149.1	121.1	107.3	98.4					2.8	30
	☆210	80D	32.5	15.2	12.4	10.9	10.0	8.9	8.2	7.6	6.9	0.6	19
	※210	83D	34.1	12.7	11.4	10.6	9.3	8.3	7.4	7.2	6.7	0.6	12
		100D	37.3	12.9	12.8	12.7	11.6	9.4	9.1	8.9	8.1	0.6	14
		110D	40.0	13.2	13.2	13.2	12.2	10.8	9.9	9.3	8.4	0.6	16
		140D	49.7	21.5	17.7	15.7	14.4	12.8	11.7	10.9		0.8	19
		180D	105.2	47.5	38.6	34.1	31.3	27.7	25.4			1.5	22
		250D	297.9	143.1	116.2	102.9	94.4	83.6				2.7	30
	☆240	80D	33.4	14.8	12.0	10.6	9.8	8.6	7.9	7.4	6.7	0.6	19
	※240	83D	35.2	12.6	11.2	10.4	9.1	9.1	7.3	7.1	6.0	0.6	12
		100D	38.1	12.9	12.8	12.7	11.6	9.5	9.2	8.9	8.1	0.6	14
		110D	40.2	13.2	13.2	12.8	11.7	10.4	9.5	8.9	8.1	0.6	16
		140D	49.9	21.0	17.1	15.1	13.9	12.3	11.3	10.5		0.7	19
		180D	105.7	45.7	37.1	32.9	30.2	26.7	24.5	22.9		1.5	22
		250D	299.7	137.9	112.0	99.2	91.0	80.5				2.7	30
	☆270	80D	33.9	14.4	11.7	10.4	9.5	8.4	7.7	7.2	6.5	0.6	19
	※270	83D	35.7	12.3	11.2	10.2	9.3	8.2	7.4	7.1	6.0	0.6	12
		100D	38.3	12.9	12.8	12.1	11.2	9.6	9.2	8.6	7.8	0.6	14
		110D	40.4	13.2	13.2	12.4	11.4	10.1	9.2	8.6	7.8	0.6	16
		140D	50.1	20.3	16.5	14.6	13.4	11.9	10.9	10.2	9.2	0.7	19
		180D	106.0	44.2	35.9	31.8	29.2	25.8	23.7	22.1		1.4	22
		250D	301.0	133.4	108.3	95.9	88.0	77.9				2.7	30
	☆300	80D	34.4	14.1	11.4	10.1	9.3	8.2	7.5	7.0	6.4	0.6	19
	※300	83D	36.2	12.2	11.0	9.8	9.1	8.1	7.2	6.9	5.8	0.6	12
		100D	38.5	12.7	12.6	11.9	10.8	10.3	8.7	7.4	6.6	0.6	14
		110D	40.5	13.2	13.2	12.0	11.0	9.8	9.0	8.4	7.6	0.6	16
		140D	50.2	19.7	16.0	14.2	13.0	11.5	10.6	9.9	8.9	0.7	19
		180D	106.3	42.9	34.8	40.8	28.3	25.0	23.0	21.5		1.4	22
		250D	302.0	129.4	105.1	93.1	85.4	75.6	69.4			2.7	30
	☆330	80D	34.7	13.7	11.1	9.9	9.1	8.0	7.4	6.9	6.2	0.5	19
	※330	83D	36.5	12.0	10.8	9.6	8.9	7.9	7.0	6.7	5.6	0.5	12
		100D	38.6	12.5	12.4	11.7	10.3	9.1	8.2	7.6	6.5	0.6	14
		110D	40.6	13.3	13.2	11.7	10.7	9.5	8.7	8.1	7.4	0.6	16
		140D	50.2	19.2	15.6	13.8	12.7	11.2	10.3	9.6	8.7	0.7	19
		180D	106.4	41.7	33.9	30.0	27.5	24.4	22.3	20.9		1.4	22
		250D	302.7	125.9	102.3	90.6	83.1	73.6	67.5			2.6	30
36	●90	70D	2.7	1.6	1.3	1.1	1.1	0.9	0.9			0.2	12
		80D	24.5	8.9	8.9	8.9	8.9	8.9	8.8	8.2		0.6	16
		83D	27.2	10.9	10.9	10.9	10.9	10.9	10.8	10.2		0.6	16
		100D	32.4	14.6	14.6	13.7	12.4					0.7	19
		110D	35.5	16.8	16.8	15.9	14.6					0.8	19
		140D	48.3	27.9	22.7	20.1	18.4					1.0	22
		180D	110.9	65.7	53.3	47.2	43.3	38.4				2.0	30
		250D	246.7	151.7	123.3	109.1						3.4	40
	●120	70D	2.8	1.5	1.2	1.1	1.0	0.9				0.2	12
		80D	26.8	9.3	9.3	9.3	9.3	9.2	8.4	7.9		0.5	16
		83D	28.1	11.3	11.3	11.3	11.3	11.2	10.4	9.9		0.6	16
		100D	36.7	15.5	15.1	13.2	12.6	11.4				0.7	19
		110D	38.4	17.5	17.1	15.2	13.9	12.3				0.7	19
		140D	51.4	26.4	21.5	19.0	17.4	15.4				0.9	22
		180D	118.2	62.2	50.5	44.7	41.0	36.3				1.9	30
		250D	367.6	211.5	171.8	152.1	139.6					3.7	40
	●150	70D	2.9	1.4	1.2	1.0	0.9	0.8	0.8			0.2	12
		80D	28.0	9.5	9.5	9.5	9.5	8.8	8.0	7.5	6.8	0.5	16
		83D	29.7	11.5	11.5	11.5	11.5	10.8	8.2	9.5	8.6	0.5	16

Stops S	Index period θ	Code	Static torque Ts (kgf-m)	Net dynamic torque to (kgf-m) Indexes per min.NN(rpm)								Cam shaft riction torque Tx (kgf-m)	Bearing sleeve ø (mm)
				50	100	150	200	300	400	500	700		
36	●150	100D	38.4	15.8	14.3	12.3	11.3	9.7	8.8			0.7	19
		110D	40.0	17.9	16.3	14.5	13.3	11.7	10.8			0.7	19
		140D	53.0	25.1	20.4	18.1	16.6	14.7				0.9	22
		180D	126.7	62.6	50.9	45.0	41.3	36.6	33.6			1.9	30
		250D	385.0	202.5	164.4	145.6	133.6	118.3				3.6	40
	●180	70D	3.0	1.4	1.1	1.0	0.9	0.8	0.7			0.2	12
		80D	28.8	9.7	9.7	9.7	9.5	8.4	7.7	7.2	6.5	0.5	16
		83D	30.2	12.7	12.7	12.7	12.0	11.0	10.0	10.2	6.8	0.6	16
		100D	38.6	16.1	15.3	13.6	12.3	11.2	10.2			0.7	19
		110D	40.9	18.1	15.6	13.9	12.7	11.3	10.3			0.7	19
		140D	54.0	24.0	19.5	17.2	15.8	14.0	12.9	37.7		0.9	22
		180D	157.1	75.3	61.2	54.2	49.7	44.0	40.3			2.0	30
		250D	395.5	194.3	157.8	139.7	128.2	113.5				3.4	40
	●210	70D	3.0	1.3	1.1	0.9	0.9	0.8	0.7	0.7		0.2	12
		80D	29.2	9.7	9.7	9.7	9.1	8.1	7.4	7.0	6.3	0.5	16
		83D	31.4	12.7	12.7	12.7	12.0	11.0	10.0	10.2	6.8	0.5	16
		100D	39.2	16.1	15.3	13.6	12.3	11.2	10.2			0.7	19
		110D	41.5	18.2	15.1	13.3	12.2	10.8	9.9	9.3		0.7	19
		140D	54.6	23.0	18.7	16.6	15.2	13.5	12.3			0.8	22
		180D	159.0	72.3	58.7	52.0	47.7	42.3	38.8	36.2		2.0	30
		250D	474.9	229.1	186.1	164.8	151.1	133.8	122.8			3.8	40
	●240	70D	3.0	1.3	1.0	0.9	0.8	0.7	0.7	0.6		0.2	12
		80D	29.6	9.8	9.8	9.6	8.8	7.8	7.2	6.7	6.1	0.5	16
		83D	31.7	12.8	12.8	10.6	9.4	8.5	8.4	7.5		0.5	16
		100D	40.1	16.0	14.1	11.3	10.5	9.6	9.2	8.4		0.6	19
		110D	41.9	17.9	14.5	12.9	11.8	10.5	9.6	9.0		0.6	19
		140D	55.0	22.2	18.0	16.0	14.6	13.0	11.9	11.1		0.8	22
		180D	160.2	69.8	56.7	50.2	46.0	40.8	37.4	35.0	31.6	1.9	30
		250D	480.4	221.4	179.8	159.2	146.1	129.3	118.6	111.0		3.7	40
	●270	70D	3.1	1.2	1.0	0.9	0.8	0.7	0.7	0.6		0.2	12
		80D	29.8	9.8	9.8	9.3	8.6	7.6	7.0	6.5	5.9	0.5	16
		83D	31.9	12.8	12.8	10.3	9.2	8.3	8.1	7.4	5.7	0.5	16
		100D	40.3	16.0	13.8	11.0	10.3	9.3	8.9	8.3		0.6	19
		110D	42.2	17.3	14.1	12.5	11.4	10.1	9.3	8.7		0.6	19
		140D	55.3	21.5	17.5	15.5	14.2	12.6	11.5	10.8		0.8	22
		180D	161.1	67.5	54.8	48.6	44.6	39.4	36.2	33.8	30.6	1.9	30
		250D	484.4	214.6	174.3	154.3	141.6	125.3	115.0	107.5		3.7	40
	●300	70D	3.1	1.2	1.0	0.9	0.8	0.7	0.6	0.6	0.5	0.2	12
		80D	30.0	9.9	9.9	9.1	8.3	8.0	6.8	6.3	5.7	0.5	16
		83D	32.1	12.9	12.9	10.1	9.0	8.4	7.9	7.3	6.2	0.5	16
		100D	40.5	15.7	12.4	11.2	10.3	9.0	8.5	8.2	7.1	0.6	19
		110D	42.4	16.8	13.7	12.1	11.1	9.2	9.0	8.4	7.6	0.6	19
		140D	82.5	32.9	26.7	23.7	21.7	19.2	17.6	16.5	14.9	1.0	22
		180D	161.8	65.6	53.2	47.1	43.3	38.3	35.1	32.9	29.7	1.9	30
		250D	487.2	208.5	169.4	150.0	137.6	121.8	111.7	104.5		3.6	40
	●330	70D	3.1	1.2	0.9	0.8	0.8	0.7	0.6	0.6	0.5	0.2	12
		80D	30.1	9.9	9.9	8.8	8.1	7.2	6.6	6.2	5.6	0.5	16
		83D	33.1	12.9	12.9	9.8	9.0	8.1	7.6	7.1	5.8	0.5	16
		100D	40.8	15.3	12.4	11.2	10.3	9.1	8.6	8.0	7.1	0.6	19
		110D	42.6	16.4	13.3	11.8	10.8	9.6	8.8	8.2	7.4	0.6	19
		140D	82.8	32.0	26.0	23.0	21.1	18.7	17.2	16.0	14.5	1.0	22
		180D	162.3	63.8	51.8	45.9	42.1	37.3	34.2	32.0	28.9	1.9	30
		250D	489.4	203.1	165.0	146.1	134.0	118.6	108.8	101.8		3.6	40
40	☆90	70D	5.0	3.0	2.5	2.2	2.0	1.8	1.6	1.5		0.3	14
		80D	22.7	8.4	8.4	8.4	8.4	8.3	7.6	7.1	6.4	0.6	16
		83D	24.5	10.3	10.3	10.3	10.3	8.5				0.6	16
		100D	34.6	19.6	16.1	14.1	12.6	8.7				0.7	19
		110D	36.2	22.3	18.1	16.1	14.7	8.9				0.9	19
		140D	46.0	26.0	21.1	18.7	17.2	15.2	12.0			1.1	22
		180D	108.7	63.2	51.4	45.5	41.7					2.2	35
		250D	312.7	198.4	161.1	142.7						4.3	40
	☆120	70D	5.5	2.9	2.4	2.1	1.9	1.7				0.3	14
		80D	25.4	9.1	9.1	9.1	9.1	8.3	7.6	7.2		0.6	16
		83D	27.5	10.6	10.6	10.6	10.6	9.1				0.6	16
		100D	36.9	19.2	15.6	13.7	13.1	9.4				0.7	19
		110D	39.7	21.4	17.4	15.4	14.2	9.7				0.8	19
		140D	73.8	38.7	31.4	27.8	25.5					1.2	22

PS: ○:1DWELL ※:2DWELL ●:3DWELL ☆:4DWELL

DS.DF TYPE

Stops S	Index period θ	Code	Static torque Ts (kgf-m)	Net dynamic torque to (kgf-m) Indexes per min.NN(rpm)								Cam shaft riction torque Tx (kgf-m)	Bearing sleeve ø (mm)
				50	100	150	200	300	400	500	700		
40	☆120	180D	144.1	76.8	62.4	55.2	50.7	44.9				2.3	35
		250D	410.8	235.1	190.9	169.1	155.1					4.5	40
	☆150	70D	5.7	2.8	2.3	2.0	1.8	1.6	1.5			0.2	14
		80D	27.0	9.4	9.4	9.4	9.1	8.0	7.4	6.9		0.5	16
		83D	29.5	11.2	11.2	11.0	10.8	9.1	8.3	7.4		0.6	16
		100D	38.1	18.7	15.6	13.2	12.3	11.2				0.7	19
		110D	41.7	20.6	16.7	14.8	13.6	12.0				0.8	19
		140D	77.3	37.0	30.1	26.6	24.4	21.6				1.1	22
		180D	151.1	73.5	59.7	52.9	48.5	43.0	39.4			2.2	35
		250D	437.2	226.8	184.2	163.1	149.6	132.5				4.2	40
	☆180	70D	5.9	2.7	2.2	1.9	1.8	1.6	1.4	1.3		0.2	14
		80D	28.0	9.5	9.5	9.5	8.7	7.7	7.1	6.6	6.0	0.5	16
		83D	30.1	11.4	11.3	11.2	10.2	8.9	8.4	7.7	7.2	0.5	16
		100D	38.4	17.6	15.2	13.1	11.8	10.9	9.8			0.6	19
		110D	42.9	19.7	16.0	14.2	13.0	11.5	10.6			0.7	19
		140D	79.5	35.6	28.9	25.6	23.5	20.8				1.1	22
		180D	191.7	90.7	73.7	65.3	59.9	53.0	48.6	45.5		2.4	35
		250D	453.9	218.8	177.7	157.4	144.4	127.8				4.0	40
	☆210	70D	6.0	2.6	2.1	1.9	1.7	1.5	1.4	1.3		0.2	14
		80D	28.7	9.6	9.6	9.2	8.4	7.5	6.9	6.4	5.8	0.5	16
		83D	30.7	11.5	11.4	11.3	9.8	8.7	8.2	7.6	7.1	0.5	16
		100D	41.2	17.4	15.0	12.9	11.7	10.7	9.6			0.6	19
		110D	43.6	19.0	15.4	13.7	12.5	11.1	10.2			0.7	19
		140D	80.9	34.2	27.8	24.6	22.6	20.0	18.3			1.1	22
		180D	194.9	87.4	71.0	62.8	57.6	51.0	46.8	43.8		2.3	35
		250D	625.3	300.6	244.1	216.2	198.3	175.6	161.1			4.6	40
	☆240	70D	6.0	2.5	2.0	1.8	1.6	1.5	1.3	1.2		0.2	14
		80D	29.1	9.7	9.7	8.9	8.2	7.2	6.6	6.2	5.6	0.5	16
		83D	32.1	11.5	11.4	11.2	9.7	8.6	8.1	7.5	6.9	0.5	16
		100D	41.7	17.2	14.8	12.7	11.5	10.3	9.2	8.6		0.6	19
		110D	44.2	18.4	14.9	13.2	12.1	10.7	9.9	9.2		0.7	22
		140D	81.8	33.1	26.9	23.8	21.8	19.3	17.7			1.0	35
		180D	197.1	84.4	68.6	60.7	55.7	49.3	45.2	42.3	38.2	2.2	40
		250D	636.1	291.2	236.6	209.5	192.1	170.1	156.1	146.0		4.5	60
	☆270	70D	6.1	2.4	2.0	1.7	1.6	1.4	1.3	1.2	1.1	0.2	14
		80D	29.4	9.8	9.8	8.7	7.9	7.0	6.4	6.0	5.5	0.5	16
		83D	32.6	11.6	11.5	11.0	9.4	8.5	7.9	7.3	6.7	0.5	16
		100D	42.1	16.8	13.9	12.5	11.2	10.1	8.9	8.6		0.6	19
		110D	44.6	17.8	14.5	12.8	11.8	10.4	9.5	8.9		0.7	19
		140D	82.5	32.1	26.0	23.1	21.2	18.7	17.2	16.1		1.0	22
		180D	198.6	81.8	66.4	58.8	54.0	47.8	43.8	41.0	37.1	2.2	35
		250D	643.9	282.8	229.7	203.4	186.6	165.2	151.6	141.8		4.4	40
	☆300	70D	6.1	2.3	1.9	1.7	1.5	1.4	1.3	1.2	1.1	0.2	14
		80D	29.7	9.8	9.5	8.4	7.7	6.8	6.3	5.9	5.3	0.5	16
		83D	32.6	11.6	11.4	10.8	9.2	8.2	7.7	7.2	6.4	0.5	16
		100D	42.1	16.5	13.7	12.3	11.0	9.7	8.7	8.3		0.6	19
		110D	44.8	17.3	14.1	12.5	11.4	10.1	9.3	8.7		0.7	19
		140D	83.0	31.2	25.3	22.4	20.6	18.2	16.7	15.6		1.0	22
		180D	199.8	79.5	64.6	57.2	52.4	46.4	42.6	39.8	36.0	2.2	35
		250D	649.6	275.3	223.6	198.0	181.6	160.8	147.5	138.0		4.4	40
	☆330	70D	6.1	2.3	1.9	1.6	1.5	1.3	1.2	1.1	1.0	0.2	14
		80D	29.8	9.8	9.3	8.2	7.5	6.7	6.1	5.7	5.2	0.5	16
		83D	32.6	11.6	11.4	10.6	9.0	8.1	7.4	6.9	6.2	0.5	16
		100D	42.1	16.5	13.4	11.8	10.7	9.4	8.2	7.9		0.6	19
		110D	45.0	16.9	13.7	12.1	11.1	9.9	9.0	8.5		0.7	19
		140D	83.3	30.4	24.7	21.8	20.0	17.7	16.3	15.2		1.0	22
		180D	200.6	77.4	62.9	55.7	51.1	45.2	41.5	38.8	35.1	2.1	35
		250D	653.9	268.4	218.0	193.0	177.1	156.8	143.8	134.5		4.3	40
48	☆90	70D	2.7	1.6	1.3	1.1	1.1	0.9	0.9			0.2	12
		80D	24.3	8.7	8.7	8.7	8.7	8.7	8.4	7.9	7.1	0.6	16
		83D	27.5	9.2	9.2	9.2	9.2	9.0	8.8	8.3	8.1	0.6	16
		100D	34.1	10.9	10.7	10.6	10.5	10.3				0.7	19
	●90	110D	36.2	12.5	12.5	12.5	12.5	12.5				0.7	19
		140D	46.3	20.8	20.8	19.6	17.9					0.9	19
		180D	110.9	65.7	53.3	47.2	43.3	38.4				2.0	22
		250D	246.7	151.7	123.3	109.1						3.4	30

Stops S	Index period θ	Code	Static torque Ts (kgf-m)	Net dynamic torque to (kgf-m) Indexes per min.NN(rpm)								Cam shaft riction torque Tx (kgf-m)	Bearing sleeve ø (mm)
				50	100	150	200	300	400	500	700		
48	☆120	70D	2.8	1.5	1.2	1.1	1.0	0.9				0.2	12
		80D	26.8	9.3	9.3	9.3	9.3	9.2	8.4	7.9		0.5	16
		83D	28.3	9.6	9.6	9.5	9.5	9.4	9.2	8.9		0.5	16
		100D	36.2	11.3	11.3	11.0	11.0	10.8	10.3			0.6	19
	●120	110D	38.1	12.8	12.8	12.8	12.8	12.5	11.4			0.7	19
		140D	48.1	21.1	20.6	18.3	16.8	14.8				0.8	22
		180D	118.2	62.2	50.5	44.7	41.0	36.3				1.9	30
		250D	367.6	211.5	171.8	152.1	139.6					3.7	47
	☆150	70D	2.9	1.4	1.2	1.0	0.9	0.8				0.2	12
		80D	28.0	9.5	9.5	9.5	9.5	8.8	8.0	7.5		0.5	16
		83D	29.4	9.8	9.8	9.7	9.7	9.5	9.0	8.7		0.5	16
		100D	37.1	11.5	11.5	11.3	11.3	10.8	10.6			0.6	19
	●150	110D	39.1	13.0	13.0	13.0	13.0	11.8	10.8			0.6	19
		140D	48.9	21.3	19.5	17.2	15.8	14.0				0.8	22
		180D	126.7	62.6	50.9	45.0	41.3	36.6	33.6			1.9	22
		250D	385.0	202.5	164.4	145.6	133.6	118.3				3.6	30
	☆180	70D	3.0	1.4	1.1	1.0	0.9	0.8	0.7			0.2	12
		80D	28.8	9.7	9.7	9.7	9.5	8.4	7.7	7.2	6.5	0.5	16
		83D	29.7	10.1	10.1	9.8	9.8	9.7	8.7	8.5	7.8	0.5	16
		100D	37.2	11.6	11.6	11.2	11.2	10.6	10.3	9.2		0.6	19
	●180	110D	39.6	13.1	13.1	13.1	12.7	11.3	10.3	9.7		0.6	19
		140D	49.4	21.4	18.5	16.4	15.0	13.3	12.2			0.8	22
		180D	157.1	75.3	61.2	54.2	49.7	44.0	40.3	37.7		2.0	22
		250D	395.5	194.3	157.8	139.7	128.2	113.5				3.4	30
	☆210	70D	3.0	1.3	1.1	0.9	0.9	0.8	0.7			0.2	12
		80D	29.2	9.7	9.7	9.7	9.1	8.1	7.4	7.0	6.3	0.5	16
		83D	30.4	10.1	10.1	9.8	9.8	9.7	8.4	8.1	7.5	0.5	16
		100D	38.2	11.7	11.7	11.5	11.5	10.2	9.8	8.9		0.6	19
	●210	110D	40.0	13.2	13.2	13.2	12.2	10.8	9.9	9.3		0.6	19
		140D	49.7	21.5	17.7	15.7	14.4	12.8	11.7	10.9		0.8	22
		180D	159.0	72.3	58.7	52.0	47.7	42.3	38.8	36.2		2.0	22
		250D	474.9	229.1	186.1	164.8	151.1	133.8	122.8			3.8	30
	☆240	70D	3.0	1.3	1.0	0.9	0.8	0.7	0.7	0.6		0.2	12
		80D	29.6	9.8	9.8	9.6	8.8	7.8	7.2	6.7	6.1	0.5	16
		83D	31.5	10.2	10.2	9.9	9.9	8.5	8.4	7.9	7.3	0.5	16
		100D	38.6	11.7	11.7	11.0	10.8	9.9	9.4	8.6		0.6	19
	●240	110D	40.2	13.2	13.2	12.8	11.7	10.4	9.5	8.9		0.6	19
		140D	49.9	21.0	17.1	15.1	13.9	12.3	11.3	10.5		0.7	22
		180D	160.2	69.8	56.7	50.2	46.0	40.8	37.4	35.0	31.6	1.9	22
		250D	480.4	221.4	179.8	159.2	146.1	129.3	118.6	111.0		3.7	30
	☆270	70D	3.1	1.2	1.0	0.9	0.8	0.7	0.7	0.6		0.2	12
		80D	29.8	9.8	9.8	9.3	8.6	7.6	7.0	6.5	5.9	0.5	16
		83D	32.0	10.2	10.2	9.9	9.7	8.3	8.2	7.7	7.1	0.5	16
		100D	38.7	11.7	11.7	11.0	10.5	9.7	8.9	8.4	8.2	0.6	19
	●270	110D	40.4	13.2	13.2	12.4	11.4	10.1	9.2	8.6	7.8	0.6	19
		140D	50.1	20.3	16.5	14.6	13.4	11.9	10.9	10.2		0.7	22
		180D	161.1	67.5	54.8	48.6	44.6	39.4	36.2	33.8	30.6	1.9	22
		250D	484.4	214.6	174.3	154.3	141.6	125.3	115.0	107.5		3.7	30
	☆300	70D	3.1	1.2	1.0	0.9	0.8	0.7	0.6	0.6		0.2	12
		80D	30.0	9.9	9.9	9.1	8.3	7.4	6.8	6.3	5.7	0.5	16
		83D	32.5	10.3	10.3	9.7	9.5	8.1	8.0	7.5	6.9	0.5	16
		100D	38.9	11.7	11.7	10.8	10.3	9.6	8.7	8.2	8.0	0.6	19
	●300	110D	40.5	13.2	13.2	12.0	11.0	9.8	9.0	8.4	7.6	0.6	19
		140D	50.2	19.7	16.0	14.2	13.0	11.5	10.6	9.9		0.7	22
		180D	161.8	65.6	53.2	47.1	43.3	38.3	35.1	32.9	29.7	1.9	22
		250D	467.2	208.5	169.4	150.0	137.6	121.8	111.7	104.5		3.6	30
	☆330	70D	3.1	1.2	0.9	0.8	0.8	0.7	0.6	0.6		0.2	12
		80D	30.1	9.9	9.9	8.8	8.1	7.2	6.6	6.2	5.6	0.5	16
		83D	32.7	10.3	10.3	9.4	9.3	7.9	7.8	7.3	6.4	0.5	16
		100D	39.1	11.8	11.8	10.7	10.3	8.9	8.4	8.1	7.0	0.6	19
	●330	110D	40.6	13.3	13.2	11.7	10.7	9.5	8.7	8.1	7.4	0.6	19
		140D	50.2	19.2	15.6	13.8	12.7	11.2	10.3	9.6	8.7	0.7	22
		180D	162.3	63.8	51.8	45.9	42.1	37.3	34.2	32.0	28.9	1.9	22
		250D	487.2	203.1	165.0	146.1	134.0	118.6	108.8	101.8		3.6	30

PS: ○:1DWELL ※:2DWELL ●:3DWELL ☆:4DWELL

DT TYPE

Stops S	Index period θ	Code	Static torque Ts (kgf-m)	Net dynamic torque to (kgf-m) Indexes per min.NN(rpm) 50	100	150	200	300	400	500	Cam shaft riction torque Tx (kgf-m)	Bearing sleeve ø (mm)
4	270	80DT	30.5	11.3	9.7	8.1	7.3	6.1	5.2		0.9	22
		110DT	56.9	24.5	19.9	17.6	16.2	14.3	13.1	12.3	1.0	26
		140DT	104.6	50.0	40.6	36.0	33.0	29.2	26.8		1.7	40
		180DT	230.4	110.2	89.5	79.3	72.7	64.4	59.1		3.2	47
		210DT	344.7	151.9	123.3	109.3	100.2	88.7			4.1	52
		250DT	527.6	218.7	177.6	157.3	144.3				5.5	60
		350DT	1262.3	510.6	438.1	387.9	355.8				10.6	80
	300	80DT	32.1	11.0	9.4	7.9	7.0	5.8	5.0		0.9	22
		110DT	59.9	24.3	19.8	17.5	16.1	14.2	13.0	12.2	1.0	26
		140DT	111.4	50.0	40.6	36.0	33.0	29.2	26.8	25.1	1.7	40
		180DT	244.9	110.1	89.4	79.2	72.6	64.3	59.0		3.1	47
		210DT	346.2	149.3	122.7	108.5	99.6	87.9			4.2	52
		250DT	551.9	216.7	176.0	155.9	143.0	126.6			5.3	60
		350DT	1697.0	681.5	584.7	517.7	474.9				11.7	80
	330	80DT	35.6	10.7	9.4	7.6	6.8	5.6	5.0		0.9	22
		110DT	62.5	24.1	19.6	17.4	15.9	14.1	12.9	12.1	1.0	26
		140DT	117.3	49.9	40.5	35.9	32.9	29.1	26.7	25.0	1.6	40
		180DT	257.6	109.7	89.1	78.9	72.4	64.1	58.8	55.0	3.0	47
		210DT	351.6	148.1	121.6	107.1	98.4	85.6			4.0	52
		250DT	728.3	291.3	236.6	209.5	192.2	170.1			6.0	60
		350DT	1772.6	676.9	580.7	514.2	471.7				11.4	80
5	180	80DT	21.5	7.3	6.0	5.1	4.2	4.0			0.9	19
		110DT	32.2	16.1	13.1	11.6	10.6	9.4			0.8	19
		140DT	43.9	22.2	18.0	15.9	14.6	13.0	11.9		1.1	35
		180DT	102.8	55.3	44.9	39.8	36.5	32.3	29.6	27.7	2.2	35
		210DT	213.3	106.4	86.4	76.5	70.2				3.3	40
		250DT	310.0	151.1	122.7	108.7					4.3	47
		350DT	698.8	328.7	282.0						7.9	60
	210	80DT	22.7	7.3	6.0	5.0	4.0	3.8			0.7	19
		110DT	35.0	16.0	13.0	11.5	10.6	9.4			0.8	19
		140DT	70.2	34.6	28.1	24.9	22.8	20.2	8.6		1.2	35
		180DT	135.5	69.2	56.2	49.8	45.6	40.4			2.4	35
		210DT	218.2	102.7	83.4	73.9	67.7	59.9			3.1	40
		250DT	333.9	149.7	121.6	107.7	98.8				4.1	47
		350DT	963.1	441.1	378.5	335.1					8.6	60
	240	80DT	25.2	8.5	7.1	6.2	5.7	5.1			0.7	19
		110DT	41.0	18.3	14.9	13.2	12.1	10.7			0.8	19
		140DT	75.4	34.5	28.0	24.8	22.8	20.1	9.8	9.2	1.2	35
		180DT	146.0	69.0	56.0	49.6	45.5	40.3	18.5		2.3	35
		210DT	223.1	102.6	83.1	73.6	66.9	59.6			3.1	40
		250DT	414.1	180.6	146.7	129.9	119.1				4.5	47
		350DT	1027.3	437.7	375.5	332.5					8.3	60
	270	80DT	26.0	8.1	6.5	5.8	5.5	4.8			0.7	19
		110DT	43.0	18.1	14.7	13.0	12.0	10.6	9.7	9.1	0.8	19
		140DT	96.4	44.0	35.7	31.6	29.0	25.7	23.6	22.0	1.3	35
		180DT	193.3	88.8	72.2	63.9	58.6	51.9	47.6		2.5	35
		210DT	332.5	140.8	114.4	101.3	92.9	82.3			3.5	47
		250DT	432.0	178.0	144.6	128.0	117.4				4.3	47
		350DT	1401.3	593.5	509.2	450.8	413.6				9.9	60
	300	80DT	27.8	8.0	6.4	5.7	5.0	4.5			0.7	19
		110DT	44.7	17.9	14.5	12.9	11.8	10.4			0.8	19
		140DT	100.9	43.6	35.4	31.3	28.8	25.5	9.6	9.0	1.3	35
		180DT	202.2	88.0	71.5	63.3	58.1	51.4	23.4	21.8	2.4	35
		210DT	336.5	138.9	112.6	100.2	92.1	81.8	47.2		3.6	47
		250DT	446.3	175.3	142.4	126.1	115.7	102.4			4.2	47
		350DT	1458.4	586.6	503.3	445.6	408.8				9.7	60
	330	80DT	28.3	7.9	6.4	5.6	4.9	4.3			0.7	19
		110DT	46.0	17.6	14.3	12.7	11.6	10.3	9.5	8.8	0.8	19
		140DT	108.7	45.4	36.8	32.6	29.9	26.5	24.3	22.7	1.3	35
		180DT	209.7	87.1	70.8	62.7	57.5	50.9	46.7	43.7	2.4	35
		210DT	345.7	137.6	112.1	99.6	91.7	80.6	79.5		3.6	47
		250DT	612.9	244.8	198.8	176.0	161.5	143.0	131.2		4.9	47
		350DT	1505.5	579.2	496.9	440.0	403.6				9.4	60
6	180	80DT	23.1	7.7	6.2	5.4	4.6	4.1			0.7	16
		110DT	35.5	18.0	14.8	13.1	12.0	10.6			0.8	19
		140DT	48.9	25.3	20.5	18.2	16.7	14.8	9.7		1.0	22
		180DT	111.3	59.3	48.1	42.6	39.1				2.0	30
		210DT	179.7	88.0	71.4	63.2	58.0				2.7	35
		250DT	248.2	116.7	94.8	83.9					3.4	40
		350DT	770.5	371.8	319.0	282.5					7.4	60
	210	80DT	24.2	7.7	6.0	5.3	4.4	4.0			0.7	16
		110DT	38.1	18.0	14.6	12.9	11.9	10.5	9.6	9.0	0.7	19

Stops S	Index period θ	Code	Static torque Ts (kgf-m)	Net dynamic torque to (kgf-m) Indexes per min.NN(rpm) 50	100	150	200	300	400	500	Cam shaft riction torque Tx (kgf-m)	Bearing sleeve ø (mm)
6	210	140DT	52.8	25.1	20.4	18.0	16.5	14.6			1.0	22
		180DT	120.5	58.9	47.8	42.4	38.9	34.4			1.9	30
		210DT	190.7	90.9	73.8	65.4	60.0	53.0			2.5	35
		250DT	359.3	167.8	136.3	120.7	110.7				3.9	40
		350DT	826.1	367.6	315.4	279.3					7.1	60
	240	80DT	25.0	7.4	6.0	5.3	4.4	4.0			0.7	16
		110DT	40.1	17.7	14.4	12.8	11.7	10.4	9.5	8.9	0.7	19
		140DT	82.2	38.5	31.3	27.7	25.4	22.5	20.6		1.1	22
		180DT	132.7	61.8	50.2	44.4	40.8	36.1			2.0	30
		210DT	196.5	90.5	74.9	67.8	62.5	54.9			2.5	35
		250DT	375.6	164.8	133.9	118.6	108.8				3.7	40
		350DT	869.4	362.3	310.8	275.2					6.9	60
	270	80DT	27.2	8.4	7.0	6.2	5.7	5.0			0.7	16
		110DT	45.8	20.1	16.3	14.5	13.3	11.8	10.8	10.1	0.8	19
		140DT	85.8	38.0	30.8	27.3	25.1	22.2	20.3	19.0	1.1	22
		180DT	138.9	61.0	49.6	43.9	40.3	35.6	32.7		1.9	30
		210DT	271.8	114.7	93.2	82.5	75.7	67.0			2.8	40
		250DT	388.1	161.8	131.4	116.3	106.7	94.5			3.6	40
		350DT	1150.8	481.7	413.2	365.9	335.7				7.7	60
	300	80DT	28.9	8.1	6.8	6.0	5.4	4.7			0.7	16
		110DT	47.1	19.8	16.1	14.2	13.1	11.6	10.6	9.9	0.7	19
		140DT	88.8	37.4	30.4	26.9	24.7	21.9	20.1	18.8	1.1	22
		180DT	173.6	75.4	61.3	54.2	49.8	44.1	40.4		2.1	30
		210DT	292.5	134.2	107.6	97.5	86.4	76.9	67.8		2.8	40
		250DT	468.6	194.1	157.7	139.6	128.1	113.4			4.0	40
		350DT	1186.3	473.8	406.5	359.9	330.2				7.5	60
	330	80DT	29.7	8.0	6.6	5.7	4.9	4.5			0.7	16
		110DT	48.2	19.5	15.8	14.0	12.8	11.4	10.4	9.7	0.7	19
		140DT	91.2	36.9	29.9	26.5	24.3	21.5	19.7	18.5	1.1	22
		180DT	178.7	74.4	60.4	53.5	49.1	43.4	39.8	37.3	2.1	30
		210DT	293.6	130.9	107.5	96.8	85.1	75.4	65.6		2.8	40
		250DT	477.9	190.5	154.7	137.0	125.7	111.3			4.0	40
		350DT	1214.7	465.9	399.7	354.0	324.7				7.4	60
8	150	80DT	32.1	14.7	11.9	10.5	9.7	8.6	7.9		0.8	22
		110DT	59.9	33.2	27.0	23.9	21.9	19.4	17.8	16.7	1.0	26
		140DT	111.4	68.3	55.5	49.1	45.1	39.9	36.6		1.7	40
		180DT	244.9	150.4	122.2	108.2	99.2	87.9	80.6		3.1	52
		210DT	362.9	206.4	167.7	148.5	136.2	120.7			4.0	52
		250DT	551.9	296.0	240.5	212.9	195.3				5.3	80
		350DT	1697.0	931.0	798.7	707.3	648.8				11.7	80
	180	80DT	33.4	16.8	14.2	13.1	11.5	10.5	9.1		0.8	22
		110DT	78.4	42.2	34.3	30.3	27.8	24.6	22.6	21.1	1.1	26
		140DT	122.6	67.8	55.1	48.8	44.7	39.6	36.3	34.0	1.6	40
		180DT	315.3	181.7	147.6	130.7	119.9	106.2	97.4	91.1	3.3	52
		210DT	508.9	275.8	224.1	198.4	182.0	161.2			4.4	60
		250DT	751.0	393.6	319.7	283.1	259.7	229.9			5.8	60
		350DT	1837.4	917.2	786.9	696.7	639.1				11.1	80
	210	80DT	37.1	15.2	13.6	12.6	12.0	10.0	8.1		0.8	22
		110DT	82.8	41.4	33.6	29.8	27.3	24.2	22.2	20.7	1.1	26
		140DT	163.7	86.7	70.6	62.5	57.3	50.8	46.6	43.5	1.7	40
		180DT	336.6	179.3	145.6	128.9	118.3	104.7	96.1	89.8	3.2	52
		210DT	536.5	270.5	223.7	194.5	178.5	158.0			4.3	60
		250DT	786.5	384.6	312.4	276.6	253.7	224.7			5.6	60
		350DT	2077.6	997.8	856.0	758.0	695.3				11.5	80
	240	80DT	38.9	14.8	13.1	12.5	11.7	9.2	7.6		0.8	22
		110DT	86.1	40.6	32.9	29.2	26.8	23.7	21.7	20.3	1.0	26
		140DT	171.6	85.5	69.4	61.5	56.4	49.9	45.8	42.8	1.7	40
		180DT	353.0	176.4	143.2	126.8	116.3	103.0	94.5	88.4	3.1	52
		210DT	551.7	268.3	221.6	193.1	176.2	156.3	147.1		4.3	60
		250DT	812.4	375.5	305.0	270.1	247.8	219.4	201.2		5.5	60
		350DT	2159.0	977.2	838.4	742.4	681.0				11.1	80
	270	80DT	41.0	14.3	12.8	12.1	11.0	8.8	7.0		0.8	22
		110DT	88.6	39.7	32.3	28.6	26.2	23.2	21.3	19.9	1.0	26
		140DT	177.9	84.0	68.2	60.4	55.4	49.1	45.0	42.1	1.7	40
		180DT	365.7	173.3	140.7	124.6	114.3	101.2	92.8	86.8	3.0	52
		210DT	572.8	259.3	210.5	186.5	171.0	151.5	138.9		4.0	60
		250DT	831.7	366.8	297.9	263.8	242.0	214.3	196.6		5.3	60
		350DT	2220.6	956.7	820.7	726.7	666.6				10.9	80
	300	80DT	43.5	13.8	12.1	11.6	10.5	8.1	6.5		0.8	22
		110DT	90.5	38.9	31.6	28.0	25.7	22.7	20.8	19.5	1.0	26
		140DT	182.7	82.5	67.0	59.3	54.4	48.2	44.2	41.3	1.6	40
		180DT	375.7	170.1	138.2	122.4	112.3	99.4	92.1	85.3	3.0	52

PS: ○:1DWELL ※:2DWELL ●:3DWELL ☆:4DWELL

DT TYPE

Stops S	Index period θ	Code	Static torque Ts (kgf-m)	Net dynamic torque to (kgf-m) Indexes per min.NN(rpm) 50	100	150	200	300	400	500	Cam shaft riction torque Tx (kgf-m)	Bearing sleeve ø (mm)
8	300	210DT	582.6	252.1	206.3	182.5	167.9	147.6	181.3	172.5	4.0	60
		250DT	846.4	358.5	291.2	257.8	236.5	209.4	192.1	179.9	5.2	60
		350DT	2268.1	936.8	803.7	711.6	652.8				10.6	80
	330	80DT	45.1	13.4	11.2	10.3	9.7	7.7	5.9		0.8	22
		110DT	92.0	38.1	31.0	27.4	25.1	22.3	20.4	19.1	1.0	26
		140DT	186.6	81.0	65.8	58.3	53.4	47.3	43.4	40.6	1.6	40
		180DT	383.6	167.1	135.7	120.2	110.2	97.6	89.5	83.7	2.9	52
		210DT	593.1	257.2	208.9	184.7	170.2	148.3	136.2		4.0	60
		250DT	1123.8	485.6	394.4	349.3	320.4	283.7	260.2	243.4	6.4	60
		350DT	2305.2	917.8	787.4	697.2	639.5				10.5	80
10	150	80DT	24.0	7.8	6.5	5.6	4.6	4.4	4.0		0.7	19
		110DT	44.7	24.4	19.8	17.6	16.1	14.3	13.1	12.2	0.9	19
		140DT	180.9	59.5	48.4	42.8	39.3	34.8	31.9		1.3	26
		180DT	202.2	120.3	97.7	86.5	79.3	70.3	64.4		2.4	47
		210DT	344.6	189.6	154.2	136.5	125.2				3.1	47
		250DT	446.3	239.5	194.5	172.2	158.0				4.2	52
		350DT	1458.4	801.4	687.5	608.8	558.4				9.7	60
	180	80DT	26.1	8.1	6.7	5.6	4.5	4.5	4.1		0.7	19
		110DT	69.5	37.5	30.5	27.0	24.7	21.9	20.1	18.8	0.8	19
		140DT	111.9	61.2	49.7	44.0	40.4	35.8	32.8	30.7	1.3	26
		180DT	216.0	117.7	95.6	84.6	77.6	68.7	63.1		2.4	47
		210DT	359.5	191.7	155.7	137.8	126.5				4.2	47
		250DT	626.1	329.2	267.4	236.8	217.2	192.3			4.8	52
		350DT	1544.6	780.8	669.9	593.1	544.1				9.2	80
	210	80DT	30.1	9.2	7.6	6.6	5.9	5.4	4.6		0.7	19
		110DT	72.2	36.5	29.6	26.2	24.1	21.3	19.6	18.3	0.9	19
		140DT	141.3	75.2	61.1	54.1	49.6	44.0	40.3	37.7	1.5	26
		180DT	309.0	169.9	138.0	122.2	112.1	99.3	91.1	85.2	2.7	47
		210DT	438.7	227.4	184.7	163.5	145.7	132.7	121.7		4.3	52
		250DT	646.1	319.3	259.4	229.7	210.7	186.6	171.1		4.6	52
		350DT	2063.8	1028.2	882.1	781.1	716.5				10.2	80
	240	80DT	33.7	8.8	7.5	6.4	5.7	5.2	4.4		0.7	19
		110DT	74.1	35.5	28.9	25.6	23.4	20.8	19.0	17.8	0.9	19
		140DT	145.9	73.4	59.7	52.8	48.5	42.9	39.4	36.8	1.4	26
		180DT	320.0	166.1	135.0	119.5	109.6	97.1	89.0	83.3	2.6	47
		210DT	440.1	225.6	183.1	160.5	143.2	130.2	119.8		4.3	52
		250DT	660.1	310.1	251.9	223.0	204.6	181.2	166.2		4.5	52
		350DT	2122.3	1001.8	859.4	761.0	698.1				10.0	80
	270	80DT	35.2	8.6	7.3	6.2	5.5	5.0	4.1		0.7	19
		110DT	75.5	34.6	28.1	24.9	22.8	20.2	18.6	17.3	0.8	19
		140DT	149.3	71.7	58.2	51.6	47.3	41.9	38.4	35.9	1.4	35
		180DT	328.2	162.4	131.9	116.8	107.2	94.9	87.0	81.4	2.6	47
		210DT	459.7	215.6	175.5	155.3	142.5	126.2	115.7		3.3	52
		250DT	670.3	301.7	245.0	217.0	199.0	176.2	161.7		4.4	52
		350DT	2165.5	976.8	838.0	742.0	680.6				9.8	80
	300	80DT	36.5	8.4	7.1	6.0	5.3	4.8	3.9		0.7	19
		110DT	76.6	33.8	27.4	24.3	22.3	19.7	18.1	16.9	0.8	19
		140DT	151.9	70.1	56.9	50.4	46.2	40.9	37.6	35.1	1.4	35
		180DT	334.5	158.9	129.0	114.3	104.8	92.8	85.1	79.6	2.6	47
		210DT	462.2	213.5	173.2	153.6	141.5	125.1	113.1	102.5	3.3	52
		250DT	677.9	293.9	238.7	211.4	193.9	171.7	157.5	147.3	4.4	52
		350DT	2198.0	953.4	818.0	724.3	664.4				9.6	80
	330	80DT	38.1	8.1	6.9	5.7	4.9	4.3	3.6		0.7	19
		110DT	77.4	33.0	26.8	23.7	21.8	19.3	17.7	16.5	0.8	19
		140DT	153.9	68.6	55.7	49.3	45.2	40.0	36.7	34.4	1.4	35
		180DT	398.4	189.4	153.9	136.3	125.0	110.7	101.5	94.9	2.9	47
		210DT	469.2	212.6	171.6	150.4	139.8	123.2	111.6	100.4	3.3	52
		250DT	683.7	286.8	233.0	206.3	189.2	167.6	153.7	143.8	4.3	52
		350DT	2223.0	931.8	799.4	707.9	649.3				9.5	80
12	150	80DT	22.1	8.0	6.2	5.8	4.9	4.5	3.7		0.6	16
		110DT	47.1	27.0	22.0	19.4	17.8	15.8	14.5	13.5	0.7	19
		140DT	88.8	51.1	41.5	36.8	33.7	29.9	27.4		1.1	30
		180DT	173.6	103.0	83.7	74.1	68.0	60.2	55.2		2.1	35
		210DT	206.4	150.6	122.4	108.4	99.4	88.1			2.7	40
		250DT	468.6	265.2	215.4	190.7	174.9	154.9			4.0	47
		350DT	1186.3	647.3	555.3	491.7	451.0				7.5	60
	180	80DT	23.5	8.5	6.8	6.0	5.2	4.8	4.1		0.6	16
		110DT	49.1	26.1	21.2	18.8	17.2	15.3	14.0	13.1	0.7	19
		140DT	93.2	49.6	40.3	35.7	32.7	29.0	26.6	24.8	1.0	30
		180DT	227.4	130.3	105.9	93.7	86.0	76.1	69.8	65.3	2.3	35
		210DT	438.6	227.3	184.7	163.5	150.0	132.8	121.8		3.4	47
		250DT	485.5	255.5	207.6	183.8	168.6	149.3			4.0	47
		350DT	1237.8	626.0	537.0	475.5	436.2				7.2	60

Stops S	Index period θ	Code	Static torque Ts (kgf-m)	Net dynamic torque to (kgf-m) Indexes per min.NN(rpm) 50	100	150	200	300	400	500	Cam shaft riction torque Tx (kgf-m)	Bearing sleeve ø (mm)
12	210	80DT	29.0	8.2	6.8	6.1	5.2	4.8	4.1		0.6	16
		110DT	50.5	25.3	20.5	18.2	16.7	14.8	13.5	12.7	0.7	19
		140DT	117.2	62.0	50.4	44.6	40.9	36.2	33.2	31.1	1.2	30
		180DT	235.3	126.6	102.8	91.0	83.5	73.9	67.8	63.4	2.2	35
		210DT	459.8	215.9	175.4	155.3	142.5	134.0	115.7		3.3	47
		250DT	496.6	246.8	200.4	177.5	162.8	144.2	132.2		3.8	47
		350DT	1272.2	605.9	519.9	460.3	422.2				7.1	60
	240	80DT	30.2	8.3	6.5	5.7	4.9	4.2	3.8		0.6	16
		110DT	51.4	24.5	19.9	17.6	16.2	14.3	13.1	12.3	0.7	19
		140DT	119.9	60.2	48.9	43.3	39.7	35.2	32.3	30.2	1.2	30
		180DT	240.8	123.0	99.9	88.5	81.2	71.9	65.9	61.7	2.2	35
		210DT	462.3	213.2	173.1	152.4	139.6	132.1	113.2		3.3	47
		250DT	504.2	238.9	194.0	171.8	157.6	139.6	128.0		3.7	47
		350DT	1296.2	587.6	504.1	446.4	409.5				6.9	60
	270	80DT	31.5	9.2	8.0	7.1	6.3	5.6	4.3		0.6	16
		110DT	52.0	23.8	19.3	17.1	15.7	13.9	12.8	11.9	0.7	19
		140DT	126.4	62.2	50.5	44.7	41.0	36.3	33.3	31.2	1.2	30
		180DT	244.8	119.7	97.3	86.1	79.0	70.0	64.2	60.0	2.1	35
		210DT	399.2	185.1	150.4	133.1	122.1	108.1	99.2		3.3	47
		250DT	509.6	231.8	188.3	166.7	153.0	135.4	124.2		3.7	47
		350DT	1313.5	571.0	489.9	433.7	397.9				6.8	60
	300	80DT	32.7	8.4	6.7	5.9	5.1	4.4	4.0		0.6	16
		110DT	52.5	23.2	18.8	16.7	15.3	13.5	12.4	11.6	0.7	19
		140DT	127.9	60.6	49.2	43.6	40.0	35.4	32.5	30.4	1.2	30
		180DT	247.8	116.7	94.8	84.0	77.0	68.2	62.6	58.5	2.1	35
		210DT	403.2	184.2	148.3	131.2	120.6	106.7	97.5	81.2	3.3	47
		250DT	513.6	225.5	183.2	162.2	148.8	131.7	120.8	113.0	3.6	47
		350DT	1326.3	555.9	476.9	422.3	387.4				6.7	60
	330	80DT	33.2	8.2	6.4	5.3	4.8	4.0	3.6		0.6	16
		110DT	52.9	22.6	18.4	16.3	14.9	13.2	12.1	11.3	0.7	19
		140DT	129.0	59.2	48.0	42.5	39.0	34.6	31.7	29.6	1.2	30
		180DT	250.1	114.0	92.6	82.0	75.2	66.6	61.1	57.1	2.1	35
		210DT	405.7	182.6	146.3	128.9	118.6	103.4	94.6	79.1	3.3	47
		250DT	516.7	219.8	178.5	158.1	145.0	128.4	117.8	110.2	3.6	47
		350DT	1748.1	745.9	639.9	566.6	519.8				8.1	60
15	90	80DT	17.0	4.8	3.1	2.0	1.6	1.2	1.0		0.6	14
		110DT	37.0	13.6	13.6	13.6	13.6	13.6	13.6		0.7	16
		140DT	49.6	24.5	24.5	24.5	22.7				0.9	22
		180DT	102.6	73.4	59.6	52.8	48.4				1.7	30
		210DT	162.3	102.1	84.5	73.6	68.2				2.1	30
		250DT	216.5	139.4	113.3	100.3					2.9	35
		350DT	637.2	411.6	353.1						6.0	52
	120	80DT	18.1	5.1	3.3	2.3	1.8	1.3	1.1		0.6	14
		110DT	40.5	14.2	14.2	14.2	14.2	14.2	13.0	12.2	0.7	16
		140DT	60.5	38.3	31.1	27.6	25.3	22.4			0.9	22
		180DT	114.3	71.1	57.7	51.1	46.9	41.5			1.6	30
		210DT	167.2	98.5	80.0	70.8	65.0	57.5			2.1	30
		250DT	233.3	132.8	107.8	95.5	87.6				2.7	35
		350DT	696.0	394.6	338.5	299.7					5.6	52
	150	80DT	18.9	5.4	3.5	2.6	2.1	1.6	1.3		0.6	14
		110DT	42.6	14.6	14.6	14.6	14.6	13.6	12.5	11.7	0.6	16
		140DT	64.0	36.9	30.0	26.5	24.3	21.6	19.8		0.9	22
		180DT	147.5	87.8	71.3	63.2	57.9	51.3	47.1		1.7	30
		210DT	224.6	126.1	102.4	90.7	83.2	73.7			2.3	35
		250DT	301.7	164.4	133.5	118.2	108.5				2.9	35
		350DT	729.3	377.7	324.1	286.9					5.4	52
	180	80DT	23.2	6.8	5.0	3.7	3.1	2.7	2.4		0.6	14
		110DT	46.4	20.6	20.4	18.0	16.5	14.6	13.4	12.6	0.6	16
		140DT	66.2	35.5	28.9	25.6	23.4	20.8	19.0	17.8	0.8	22
		180DT	153.0	84.7	68.8	60.9	55.9	49.5	45.4	42.4	1.7	30
		210DT	230.7	121.1	98.3	87.1	79.8	70.7	64.9		2.3	35
		250DT	308.5	157.4	127.9	113.2	103.8	92.0			2.8	40
		350DT	749.5	362.6	311.0	275.4	252.6				5.2	52
	210	80DT	24.5	6.7	4.8	3.8	3.0	2.5	2.0		0.6	14
		110DT	47.3	20.8	19.6	17.4	15.9	14.1	12.9	12.1	0.6	16
		140DT	67.7	34.3	27.9	24.7	22.6	20.0	18.4	17.2	0.8	22
		180DT	156.6	81.8	66.5	58.9	54.0	47.8	43.8	41.0	1.7	30
		210DT	234.7	116.5	94.7	83.9	75.1	68.1	62.4		2.3	35
		250DT	312.8	151.3	122.9	108.9	99.9	88.4			2.8	40
		350DT	1023.0	493.2	423.1	374.7	343.7				6.0	52
	240	80DT	26.1	6.8	4.8	3.7	3.1	2.4	2.2		0.6	14
		110DT	47.8	20.9	19.0	16.8	15.4	13.6	12.5	11.7	0.6	16

PS: ○:1DWELL ※:2DWELL ●:3DWELL ☆:4DWELL

DT TYPE

Stops S	Index period θ	Code	Static torque Ts (kgf-m)	Net dynamic torque to (kgf-m) Indexes per min.NN(rpm)							Cam shaft riction torque Tx (kgf-m)	Bearing sleeve ø (mm)
				50	100	150	200	300	400	500		
15	240	140DT	68.7	33.2	27.0	23.9	21.9	19.4	17.8	16.6	0.8	22
		180DT	159.1	79.2	64.4	57.0	52.3	46.3	42.5	39.7	1.7	30
		210DT	235.6	114.3	92.6	81.2	73.1	66.2	60.2		2.1	35
		250DT	315.8	146.1	118.7	105.1	96.4	85.3	78.3		2.7	40
		350DT	1035.4	476.7	409.0	362.1	332.2				5.9	52
	270	80DT	27.5	7.2	5.3	4.4	3.4	2.7	2.4		0.6	14
		110DT	48.2	21.0	18.4	16.3	14.9	13.2	12.1	11.3	0.6	16
		140DT	69.4	32.2	26.2	23.2	21.2	18.8	17.3	16.1	0.8	22
		180DT	167.0	81.5	66.2	58.6	53.8	47.6	43.7	40.9	1.7	30
		210DT	238.5	104.0	84.5	74.7	68.6	60.7	55.7		2.1	35
		250DT	317.8	141.5	114.9	101.7	93.3	82.6	75.8		2.7	40
		350DT	1044.1	462.1	396.4	351.0	322.0				5.8	52
	300	80DT	28.1	7.5	5.5	4.5	3.6	2.8	2.5		0.6	14
		110DT	48.5	21.1	17.9	15.8	14.5	12.9	11.8	11.0	0.6	16
		140DT	69.9	31.3	25.4	22.5	20.7	18.3	16.8	15.7	0.8	22
		180DT	168.3	79.3	64.4	57.0	52.3	46.3	42.5	39.7	1.7	30
		210DT	239.2	102.3	81.6	72.9	67.1	58.4	52.6		2.1	35
		250DT	319.3	137.4	111.6	98.8	90.6	80.3	73.6		2.7	40
		350DT	1050.6	449.1	385.3	341.2	312.9				5.8	52
	330	80DT	28.7	7.5	5.6	4.4	3.5	2.7	2.4		0.6	14
		110DT	48.8	21.1	17.4	15.4	14.1	12.5	11.5	10.7	0.6	16
		140DT	70.3	30.5	24.8	21.9	20.1	17.8	16.4	15.3	0.8	22
		180DT	169.4	77.3	62.8	55.6	51.0	45.2	41.4	38.7	1.7	30
		210DT	240.2	101.2	80.2	70.5	65.4	56.1	49.8	45.1	2.1	35
		250DT	320.4	133.7	108.6	96.2	88.2	78.1	71.7	67.0	2.6	40
		350DT	1055.4	437.4	375.3	332.3	304.8				5.7	52
16	90	80DT	16.2	4.1	3.0	2.2	1.4	0.9	0.7		0.6	14
		110DT	37.9	13.7	13.7	13.7	13.7	13.7	13.7		0.7	16
		140DT	50.9	24.8	24.8	24.8	23.6	20.9			0.9	22
		180DT	105.5	76.2	61.9	54.8	50.3				1.7	30
		210DT	156.2	103.2	84.6	75.9	69.3				2.1	30
		250DT	220.8	144.0	117.0	103.6					2.8	40
		350DT	652.0	425.9	365.4						5.9	47
	120	80DT	16.4	4.3	3.1	2.3	1.5	1.0	0.8		0.6	14
		110DT	41.2	14.3	14.3	14.3	14.3	14.3	13.4	12.6	0.7	16
		140DT	61.6	39.6	32.2	28.5	26.1	23.1	21.2		0.9	22
		180DT	116.5	73.4	59.7	52.8	48.5	42.9			1.6	30
		210DT	169.7	101.5	82.5	73.0	67.0	59.3			2.1	30
		250DT	236.3	136.7	111.0	98.3	90.2				2.7	40
		350DT	706.7	406.7	349.0	309.0					5.5	47
	150	80DT	16.4	4.5	3.3	2.4	1.8	1.3	1.0		0.6	14
		110DT	43.1	14.6	14.6	14.6	14.6	14.0	12.9	12.0	0.6	16
		140DT	64.9	38.0	30.9	27.3	25.1	22.2	20.4		0.9	22
		180DT	149.6	90.5	73.5	65.1	59.7	52.9	48.5		1.7	30
		210DT	226.9	129.7	105.4	93.2	85.5	75.8			2.3	35
		250DT	304.3	168.9	137.2	121.4	111.4				2.9	40
		350DT	737.1	388.5	333.3	295.1	270.7				5.3	47
	180	80DT	20.2	5.2	3.5	2.5	1.9	1.4	1.1		0.6	14
		110DT	44.2	14.8	14.8	14.8	14.8	13.4	12.3	11.5	0.6	16
		140DT	66.9	36.5	29.7	26.3	24.1	21.3	19.6	18.3	0.8	22
		180DT	154.6	87.2	70.8	62.7	57.5	50.9	46.7	43.7	1.7	30
		210DT	232.5	124.3	101.0	89.4	82.0	72.6	66.6		2.3	35
		250DT	310.5	161.5	131.2	116.1	106.5	94.3			2.8	40
		350DT	755.4	372.4	319.5	282.9	259.5				5.2	52
	210	80DT	21.0	5.5	3.6	2.7	2.0	1.6	1.3		0.6	14
		110DT	44.9	15.0	15.0	15.0	14.6	12.9	11.9	11.1	0.6	16
		140DT	68.2	35.2	28.6	25.3	23.2	20.6	18.9	17.7	0.8	22
		180DT	157.9	84.1	68.3	60.5	55.5	49.1	45.1	42.2	1.7	30
		210DT	236.1	119.6	97.1	86.1	78.9	69.8	64.1		2.2	35
		250DT	314.3	155.1	126.0	111.6	102.3	90.6			2.7	40
		350DT	1029.3	506.1	434.2	384.5	352.7				5.9	52
	240	80DT	22.1	5.5	3.6	2.7	2.0	1.7	1.2		0.6	14
		110DT	45.4	15.0	15.0	15.0	14.1	12.5	11.5	10.7	0.6	16
		140DT	69.1	34.1	27.7	24.5	22.5	19.9	18.3	17.1	0.8	22
		180DT	160.2	81.4	66.1	58.5	53.7	47.5	43.6	40.8	1.6	30
		210DT	238.2	117.3	94.2	84.9	76.5	67.1	63.2		2.2	35
		250DT	316.9	149.7	121.6	107.6	98.7	87.4	80.2		2.7	40
		350DT	1040.4	488.8	419.4	371.4	340.7				5.9	52
	270	80DT	22.9	5.6	4.9	2.6	1.9	1.5	1.0		0.6	14
		110DT	45.8	15.1	15.1	14.9	13.7	12.1	11.1	10.4	0.6	19
		140DT	69.7	33.0	26.8	23.8	21.8	19.3	17.7	16.6	0.8	22
		180DT	167.8	83.7	67.9	60.2	55.2	48.9	44.8	41.9	1.7	30
16	270	210DT	224.4	106.6	86.6	76.7	70.3	62.3	57.1		2.1	35
		250DT	318.8	144.9	117.7	104.2	95.6	84.6	77.6		2.7	40
		350DT	1048.2	473.6	406.3	359.8	330.1				5.8	52
	300	80DT	23.2	5.6	3.8	2.7	1.8	1.6	1.1		0.6	14
		110DT	46.0	15.1	15.1	14.5	13.3	11.8	10.8	10.1	0.6	19
		140DT	70.2	32.1	26.1	23.1	21.2	18.8	17.2	16.1	0.8	22
		180DT	169.1	81.3	66.1	58.5	53.7	47.5	43.6	40.8	1.7	30
		210DT	226.5	104.7	84.9	74.3	67.8	60.2	56.2		2.1	35
		250DT	320.1	140.7	114.2	101.2	92.8	82.2	75.4		2.7	40
		350DT	1053.9	460.2	394.8	349.6	320.7				5.7	52
	330	80DT	23.4	5.7	3.9	2.8	1.8	1.5	1.0		0.6	14
		110DT	46.2	15.2	15.2	14.1	12.9	11.5	10.5	9.8	0.6	19
		140DT	70.5	31.3	25.4	22.5	20.6	18.3	16.8	15.7	0.8	22
		180DT	170.0	79.3	64.4	57.0	52.3	46.3	42.5	39.7	1.7	30
		210DT	227.3	103.2	83.2	71.5	66.3	59.8	54.2	46.2	2.1	35
		250DT	321.1	136.9	111.2	98.5	90.3	80.0	73.4	68.6	2.6	40
		350DT	1058.2	448.1	384.4	340.4	31.2				5.7	52
20	※90	80DT	19.0	6.2	4.8	3.9	3.0	2.6	2.0		0.7	19
	90	110DT	14.8	11.3	9.2	8.1	7.5	6.6			0.4	14
		140DT	52.0	18.5	18.5	18.5	18.5	18.5			0.8	19
		180DT	77.8	54.8	44.5	39.4	36.2				1.4	22
		210DT	127.6	83.2	69.0	62.1	56.2				1.8	26
		250DT	185.7	120.5	97.8	86.6					2.3	30
		350DT	432.9	268.9	230.7	218.4					4.3	40
	※120	80DT	20.5	6.4	5.0	4.2	3.3	2.9	2.3		0.7	19
	120	110DT	16.2	10.8	8.8	7.8	7.2	6.3	5.8		0.4	14
		140DT	55.8	19.1	19.1	19.1	19.1	19.1	18.3		0.7	19
		180DT	83.4	52.1	42.3	37.5	34.4	30.4			1.3	22
		210DT	138.9	82.6	67.1	59.4	54.5	48.1			1.8	26
		250DT	194.5	113.1	91.8	81.3	74.6				2.2	30
		350DT	627.9	369.6	317.1	280.8					4.8	40
	※150	80DT	24.0	7.8	6.5	5.6	4.6	4.4	4.0		0.7	19
	150	110DT	17.0	10.4	8.4	7.5	6.9	6.1	5.6		0.4	14
		140DT	57.9	19.5	19.5	19.5	19.5	19.0	17.4	16.3	0.7	19
		180DT	86.5	49.6	40.3	35.7	32.7	29.0			1.3	22
		210DT	134.9	75.5	61.3	54.3	49.8	44.1			1.7	26
		250DT	207.6	114.3	92.8	82.2	75.4				2.2	30
		350DT	646.3	350.7	300.9	266.4	244.4				4.6	40
	※180	80DT	26.1	8.1	6.7	5.6	4.5	4.5	4.1		0.7	19
	180	110DT	17.5	10.0	8.1	7.2	6.6	5.8	5.4	5.0	0.4	14
		140DT	62.0	27.2	27.2	24.6	22.6	20.0	18.3	17.2	0.8	19
		180DT	130.5	74.3	60.4	53.5	49.1	43.4	39.8	37.3	1.5	22
		210DT	121.3	80.1	65.1	57.4	52.9	46.7	42.8		1.6	26
		250DT	210.4	108.9	88.5	78.3	71.8	63.6			2.2	30
		350DT	657.1	334.8	287.2	254.3	233.3				4.5	47
	※210	80DT	30.1	9.2	7.6	6.6	5.9	5.4	4.6		0.7	19
	210	110DT	17.9	9.6	7.8	6.9	6.3	5.6	5.2	4.8	0.4	14
		140DT	62.8	27.4	26.7	23.6	21.7	19.2	17.6	16.5	0.7	19
		180DT	132.2	71.5	58.1	51.4	47.2	41.8	38.3	35.8	1.4	22
		210DT	185.6	93.4	75.9	67.2	61.7	54.6	50.0		1.9	30
		250DT	212.1	104.4	84.8	75.1	68.9	61.0			2.2	30
		350DT	663.8	321.3	275.7	244.1	223.9				4.5	47
	※240	80DT	33.7	8.8	7.5	6.4	5.7	5.2	4.4		0.7	19
	240	110DT	18.1	9.3	7.6	6.7	6.1	5.4	5.0	4.7	0.4	14
		140DT	63.3	27.5	25.8	22.8	20.9	18.5	17.0	15.9	0.7	19
		180DT	133.4	69.0	56.0	49.6	45.5	40.3	37.0	34.6	1.4	22
		210DT	186.1	92.1	74.6	66.2	60.1	52.9	48.2		1.8	30
		250DT	213.2	100.6	81.7	72.3	66.4	58.8			2.1	30
		350DT	668.3	309.7	265.7	235.3	215.8				4.4	47
	※270	80DT	35.2	8.6	7.3	6.2	5.5	5.0	4.1		0.7	19
	270	110DT	18.2	9.0	7.3	6.5	5.9	5.3	4.8	4.5	0.4	16
		140DT	63.7	27.6	24.9	22.1	20.3	17.9	16.4	15.4	0.7	19
		180DT	134.3	66.8	54.3	48.0	44.1	39.0	35.8	33.5	1.4	22
		210DT	187.4	87.1	70.7	62.7	57.5	50.8	46.7		1.9	30
		250DT	214.0	97.3	79.0	70.0	64.2	56.8	52.1		2.1	30
		350DT	671.4	299.7	257.1	227.7	208.8				4.4	47
	※300	80DT	36.5	8.4	7.1	6.0	5.3	4.8	3.9		0.7	19
	300	110DT	18.3	8.8	7.1	6.3	5.8	5.1	4.7	4.4	0.4	16
		140DT	63.9	27.7	24.2	21.4	19.7	17.4	16.0	14.9	0.7	19
		180DT	134.9	64.9	52.7	46.6	42.8	37.9	34.8	32.5	1.4	22
		210DT	189.2	86.2	69.4	60.2	56.1	48.2	45.1		1.9	30
		250DT	214.6	94.4	76.6	67.9	62.3	55.1	50.6		2.1	30
		350DT	673.7	290.8	249.5	220.9	202.7				4.4	47

PS: ○:1DWELL ※:2DWELL ●:3DWELL ☆:4DWELL

DT TYPE

Stops S	Index period θ	Code	Static torque Ts (kgf-m)	Net dynamic torque to (kgf-m) Indexes per min.NN(rpm)							Cam shaft riction torque Tx (kgf-m)	Bearing sleeve ø (mm)
				50	100	150	200	300	400	500		
20	※330	80DT	38.1	8.1	6.9	5.7	4.9	4.3	3.6		0.7	19
	330	110DT	18.4	8.5	6.9	6.1	5.6	5.0	4.6	4.3	0.3	16
		140DT	64.1	27.7	23.6	20.9	19.1	16.9	15.6	14.5	0.7	19
		180DT	135.3	63.1	51.3	45.4	41.7	36.9	33.8	31.6	1.4	22
		210DT	191.2	84.7	67.6	58.1	54.1	46.3	42.1		1.9	30
		250DT	215.0	91.8	74.6	66.0	60.6	53.6	49.2		2.1	30
		350DT	675.4	263.0	242.8	215.0	197.2				4.3	47
24	※90	80DT	18.2	4.9	3.1	2.2	1.7				0.6	16
	90	110DT	7.9	5.9	4.8	4.2	3.9				0.4	12
		140DT	54.6	18.9	18.9	18.9	18.9	18.9			0.8	16
		180DT	72.9	32.9	32.9	32.9	32.5				1.3	19
		210DT	110.2	58.4	51.3	46.7	43.2				1.5	22
		250DT	107.2	65.7	53.3	47.2	43.3	38.4			1.7	22
		350DT	361.1	224.2	192.3						3.8	35
	※120	80DT	18.2	5.0	3.1	2.3	1.8				0.6	16
	120	110DT	8.5	5.6	4.6	4.0	3.7	3.3			0.3	12
		140DT	57.5	19.4	19.4	19.4	19.4	19.4	19.4		0.7	16
		180DT	76.1	33.7	33.7	33.2	30.4	26.9			1.2	19
		210DT	113.2	59.8	52.2	48.1	44.1	39.0			1.5	22
		250DT	162.7	94.7	76.9	68.1	62.5				1.9	22
		350DT	375.9	209.8	180.0	159.4					3.7	35
	※150	80DT	22.1	8.0	6.2	5.8	4.9	4.5	3.7		0.6	16
	150	110DT	8.8	5.3	4.3	3.8	3.5	3.1	2.9		0.3	12
		140DT	59.1	19.7	19.7	19.7	19.7	19.7	18.7	17.5	0.7	16
		180DT	77.8	34.0	34.0	31.4	28.8	25.5	23.4		1.2	19
		210DT	115.3	57.7	50.5	45.4	41.7	36.9			1.5	22
		250DT	165.3	89.3	72.5	64.2	58.9				1.9	22
		350DT	476.9	257.0	220.4	195.2	179.1				3.9	35
	※180	80DT	23.5	8.5	6.8	6.0	5.2	4.8	4.1		0.6	16
	180	110DT	17.9	10.7	8.7	7.7	7.1	6.3	5.7	5.4	0.4	14
		140DT	60.0	19.8	19.8	19.8	19.8	19.4	17.8	16.7	0.7	16
		180DT	78.7	34.2	33.7	29.9	27.4	24.3	22.3		1.2	19
		210DT	116.4	55.9	48.8	43.2	39.6	35.1	32.2		1.5	22
		250DT	166.7	84.9	68.9	61.0	56.0	49.6			1.9	26
		350DT	482.2	244.6	209.9	185.8	170.5				3.9	40
	※210	80DT	.29.0	8.2	6.8	6.1	5.2	4.8	4.1		0.6	16
	210	110DT	18.1	10.3	8.4	7.4	6.8	6.0	5.5	5.2	0.4	14
		140DT	60.5	19.9	19.9	19.9	19.9	18.6	17.1	16.0	0.7	16
		180DT	79.3	34.4	32.3	28.6	26.3	23.3	21.3	19.9	1.2	19
		210DT	117.1	54.5	46.7	41.3	38.0	33.7	30.8		1.5	22
		250DT	167.6	81.3	66.0	58.4	53.6	47.5			1.8	26
		350DT	4854	234.4	201.1	178.0	163.3				3.8	40
	※240	80DT	30.2	8.3	6.5	5.7	4.9	4.2	3.8		0.6	16
	240	110DT	18.3	9.9	8.1	7.2	6.6	5.8	5.3	5.0	0.4	14
		140DT	60.9	20.0	20.0	20.0	20.0	18.0	16.5	15.4	0.7	16
		180DT	79.7	34.4	31.1	27.6	25.3	22.4	20.5	19.2	1.2	19
		210DT	118.2	53.2	45.2	40.1	36.4	31.2	29.3		1.5	22
		250DT	168.2	78.2	63.5	56.3	51.6	45.7			1.8	26
		350DT	487.6	225.7	193.6	171.4	157.2				3.8	40
	※270	80DT	31.5	9.2	8.0	7.1	6.3	5.8	4.3		0.6	16
	270	110DT	18.4	9.6	7.8	6.9	6.4	5.6	5.2	4.8	0.3	14
		140DT	61.2	20.0	20.0	20.0	19.6	17.4	15.9	14.9	0.7	16
		180DT	79.9	34.5	30.1	26.7	24.5	21.7	19.9	18.6	1.2	19
		210DT	117.9	52.1	43.5	38.5	35.4	31.3	28.7	26.8	1.5	22
		250DT	168.7	75.6	61.4	54.4	49.9	44.2	40.5		1.8	26
		350DT	489.1	218.2	187.2	165.7	152.0				3.8	40
	※300	80DT	32.7	8.4	6.7	5.9	5.1	4.4	4.0		0.6	16
	300	110DT	18.5	9.4	7.6	6.7	6.2	5.5	5.0	4.7	0.3	14
		140DT	61.3	20.1	20.1	20.1	19.0	16.9	15.5	14.5	0.7	16
		180DT	80.1	34.5	29.2	25.9	23.7	21.0	19.3	18.0	1.2	19
		210DT	118.4	51.6	41.8	36.7	34.2	30.1	26.1	24.2	1.5	22
		250DT	169.0	73.3	59.5	52.7	48.4	42.8	39.3		1.8	26
		350DT	490.2	211.6	181.5	160.7	147.4				3.8	40
	※330	80DT	33.2	8.2	6.4	5.3	4.8	4.0	3.6		0.6	16
	330	110DT	18.6	9.1	7.4	6.5	6.0	5.3	4.9	4.6	0.3	14
		140DT	61.5	20.1	20.1	20.1	18.5	16.4	15.0	14.1	0.7	16
		180DT	80.3	34.6	28.4	25.2	23.1	20.4	18.7	17.5	1.2	19
		210DT	119.2	49.8	41.0	35.2	33.1	29.1	24.6	22.8	1.5	22
		250DT	169.2	71.3	57.9	51.3	47.0	41.6	38.2		1.8	26
		350DT	491.0	205.8	176.6	156.3	143.4				3.7	40
30	※90	80DT	17.0	4.8	3.1	2.0	1.6	1.2	1.0		0.6	14
		110DT	37.0	13.6	13.6	13.6	13.6	13.6			0.7	16
30	※90	140DT	49.6	24.5	24.5	24.5	22.7				0.9	22
		180DT	102.6	73.4	59.6	52.5					1.7	30
		210DT	167.3	101.2	81.2	73.4					2.1	30
		250DT	216.5	139.4	113.3						2.9	35
		350DT	637.2	411.6							6.0	52
	※120	80DT	18.1	5.1	3.3	2.3	1.8	1.3	1.1		0.6	14
		110DT	40.5	14.2	14.2	14.2	14.2	14.2			0.7	16
		140DT	60.5	38.3	31.1	27.6	25.3				0.9	22
		180DT	114.3	71.1	57.7	51.1	46.9				1.6	30
		210DT	183.1	98.5	79.9	70.8	65.0				2.1	30
		250DT	233.3	132.8	107.8	95.5					2.7	35
		350DT	696.0	394.6	338.5						5.6	52
	※150	80DT	18.9	5.4	3.5	2.6	2.1	1.6	1.3		0.6	14
		110DT	42.6	14.6	14.6	14.6	14.6	13.6	12.5	11.6	0.6	16
		140DT	64.0	36.9	30.0	26.5	24.3	21.6			0.9	22
		180DT	147.5	87.8	71.3	63.2	57.9	51.3			1.7	30
		210DT	224.6	126.1	102.4	90.7	83.2	73.7			2.3	35
		250DT	301.7	164.4	133.5	118.2	108.5				2.9	35
		350DT	729.3	377.7	324.1						5.4	52
	※180	80DT	23.2	6.8	5.0	3.7	3.1	2.7	2.4		0.6	14
		110DT	46.4	20.6	20.4	18.0	16.5	14.6	13.4	12.1	0.6	16
		140DT	66.2	35.5	28.9	25.6	23.4	20.8	19.0		0.8	22
		180DT	153.0	84.7	68.8	60.9	55.9	49.5			1.7	30
		210DT	230.7	121.1	98.4	87.1	79.8	70.7			2.3	35
		250DT	308.5	157.4	127.9	113.2	103.8				2.8	35
		350DT	749.5	362.6	311.0	275.4					5.2	52
	※210	80DT	24.5	6.7	4.8	3.8	3.0	2.5	2.0		0.6	14
		110DT	47.3	20.8	19.6	17.4	15.9	14.1	12.9	11.7	0.6	16
		140DT	67.7	34.3	27.9	24.7	22.6	20.0	18.4	17.6	0.8	22
		180DT	156.6	81.8	66.5	58.9	54.0	47.8	43.8		1.7	30
		210DT	234.7	116.5	94.7	83.9	76.9	68.1			2.3	35
		250DT	312.8	151.3	122.9	108.9	99.9				2.8	35
		350DT	1023.0	493.2	423.1	374.7	343.7				6.0	52
	※240	80DT	26.1	6.8	4.8	3.7	3.1	2.4	2.2		0.6	14
		110DT	47.8	20.9	19.0	16.8	15.4	13.6	12.5	11.3	0.6	16
		140DT	68.7	33.2	27.0	23.9	21.9	19.4	17.8	16.1	0.8	22
		180DT	159.1	79.2	64.4	57.0	52.3	46.3	42.5	40.9	1.7	30
		210DT	236.2	114.2	92.6	81.9	74.8	66.5			2.3	35
		250DT	315.8	146.1	118.7	105.1	96.4				2.7	35
		350DT	1035.4	476.7	409.0	362.1	332.2				5.9	52
	※270	80DT	27.5	7.2	5.3	4.4	3.4	2.7	2.4		0.6	14
		110DT	48.2	21.0	18.4	16.3	14.9	13.2	12.1	11.0	0.6	16
		140DT	69.4	32.2	26.2	23.2	21.2	18.8	17.3	15.7	0.8	22
		180DT	167.0	81.5	66.2	58.6	53.8	47.6	43.7	39.7	1.7	30
		210DT	223.5	104.0	84.5	74.7	68.6	60.7	55.7		2.1	35
		250DT	317.8	141.5	114.9	101.7	93.3	82.6			2.7	35
		350DT	1044.1	462.1	396.4	351.0	322.0				5.8	52
	※300	80DT	28.1	7.5	5.5	5.4	3.6	2.8	2.5		0.6	14
		110DT	48.5	21.1	17.9	15.8	14.5	12.9	11.8	10.7	0.6	16
		140DT	69.9	31.3	25.4	22.5	20.7	18.3	16.8	15.3	0.8	22
		180DT	168.3	79.3	64.4	57.0	52.3	46.3	42.5	38.7	1.7	30
		210DT	224.3	102.1	83.1	73.2	67.5	58.9	53.2		2.1	35
		250DT	319.3	137.4	111.6	98.8	90.6	80.3			2.7	35
		350DT	1050.6	449.1	385.3	341.2	312.9				5.8	52
	※330	80DT	28.7	7.5	5.6	4.4	3.5	2.7	2.4		0.6	14
		110DT	48.8	21.1	17.4	15.4	14.1	12.5	11.5		0.6	16
		140DT	70.3	30.5	24.8	21.9	20.1	17.8	16.4		0.8	22
		180DT	169.4	77.3	62.8	55.6	51.0	45.2	41.4		1.7	30
		210DT	225.1	101.6	82.0	71.4	65.9	57.1	51.2		2.1	35
		250DT	320.4	133.7	108.6	96.2	88.2	78.1			2.6	35
		350DT	1055.4	437.4	375.3	332.3	304.8				5.7	52
32	※90	80DT	16.2	4.1	3.0	2.2	1.4	0.9	0.7		0.6	14
		110DT	37.9	13.7	13.7	13.7	13.7	13.7			0.7	16
		140DT	50.9	24.8	24.8	24.8	23.6				0.9	22
		180DT	105.5	76.2	61.9	54.8	50.3				1.7	30
		210DT	158.4	103.2	84.6	74.9	68.3				2.1	30
		250DT	220.8	144.0	117.0						2.8	40
		350DT	652.0	425.9	365.4						5.9	47
	※120	80DT	16.4	4.3	3.1	2.3	1.5	1.0	0.8		0.6	14
		110DT	41.2	14.3	14.3	14.3	14.3	14.3	13.4		0.7	16
		140DT	61.6	39.6	32.2	28.5	26.1	23.1			0.9	22
		180DT	116.5	73.4	59.7	52.8	48.5				1.6	30

PS: ○:1DWELL ※:2DWELL ●:3DWELL ☆:4DWELL

DT TYPE

Stops S	Index period θ	Code	Static torque Ts (kgf-m)	Net dynamic torque to (kgf-m) Indexes per min.NN(rpm) 50	100	150	200	300	400	500	Cam shaft riction torque Tx (kgf-m)	Bearing sleeve ø (mm)
32	※120	210DT	169.7	101.5	82.5	73.0	67.1				2.1	30
		250DT	236.3	136.7	111.0	98.3					2.7	40
		350DT	706.7	406.5	349.0						5.5	47
	※150	80DT	16.4	4.5	3.3	2.4	1.8	1.3	1.0		0.6	14
		110DT	43.1	14.6	14.6	14.6	14.6	14.0	12.9		0.6	16
		140DT	64.9	38.0	38.0	27.3	25.1	22.2			0.9	22
		180DT	149.6	90.5	90.5	65.1	59.7	52.9			1.7	30
		210DT	226.9	129.7	129.7	94.7	85.6	75.8			2.3	35
		250DT	304.3	168.9	168.9	121.4	111.4				2.9	40
		350DT	737.1	308.5	333.3	295.1					5.3	47
	※180	80DT	20.2	5.2	3.5	2.5	1.9	1.4	1.1		0.6	14
		110DT	44.2	14.8	14.8	14.8	14.8	13.4	12.3	11.5	0.6	16
		140DT	66.9	36.5	29.7	26.3	24.1	21.3	19.6		0.8	22
		180DT	154.6	87.2	70.8	62.7	57.5	50.9			1.7	30
		210DT	232.5	124.3	101.0	89.4	82.0	72.6			2.3	35
		250DT	310.5	161.5	131.2	116.1	106.5				2.8	40
		350DT	755.4	372.4	319.5	282.9					5.2	47
	※210	80DT	21.0	5.5	3.6	2.7	2.0	1.6	1.3		0.6	14
		110DT	44.9	15.0	15.0	15.0	14.6	12.9	11.9	11.1	0.6	16
		140DT	68.2	35.2	28.6	25.3	23.2	20.6	18.9		0.8	22
		180DT	157.9	84.1	68.3	60.5	55.5	49.1	45.1		1.7	30
		210DT	236.1	119.5	97.1	86.1	78.9	69.8			2.2	35
		250DT	314.3	155.1	126.0	111.6	102.3				2.7	40
		350DT	1029.3	506.1	434.2	394.5	352.7				5.9	47
	※240	80DT	22.1	5.5	3.6	2.7	2.0	1.7	1.2		0.6	14
		110DT	45.4	15.0	5.0	15.0	14.1	12.6	11.5	10.7	0.6	16
		140DT	69.1	34.1	27.7	24.5	22.5	19.9	18.3	17.1	0.8	22
		180DT	160.2	81.4	66.1	58.5	53.7	47.5	43.6		1.6	30
		210DT	238.2	117.5	96.3	84.2	77.3	68.5			2.2	35
		250DT	316.9	149.7	121.6	107.6	98.7	87.4			2.7	40
		350DT	1040.4	488.8	419.4	371.4	340.7				5.9	47
	※270	80DT	22.9	5.6	4.9	2.6	1.9	1.5	1.0		0.6	14
		110DT	45.8	15.1	15.1	14.9	13.7	12.1	11.1	10.4	0.6	16
		140DT	69.7	33.0	26.8	23.8	21.8	19.3	17.7	16.6	0.8	22
		180DT	167.8	83.7	67.9	60.2	55.2	48.9	44.8	41.9	1.7	30
		210DT	244.4	106.6	86.6	76.7	70.3	62.3	57.1		2.1	35
		250DT	318.8	144.9	117.7	104.2	95.6	84.6			2.7	40
		350DT	1048.2	473.6	406.3	359.8	330.1				5.8	47
	※300	80DT	23.2	5.6	3.8	2.7	1.8	1.6	1.1		0.6	14
		110DT	46.0	15.1	15.1	14.5	13.3	11.8	10.8	10.1	0.6	16
		140DT	70.2	32.1	26.1	23.1	21.2	18.8	17.2	16.1	0.8	22
		180DT	169.1	81.3	66.1	58.5	53.7	47.5	43.6	40.8	1.7	30
		210DT	246.3	105.4	85.1	74.9	68.9	60.3	54.9		2.1	35
		250DT	320.1	140.7	114.2	101.2	92.8	82.2			2.7	40
		350DT	1048.2	473.6	406.3	359.8	330.1				5.8	47
	※330	80DT	23.4	5.7	3.9	2.8	1.8	1.5	1.0		0.6	14
		110DT	46.2	15.2	15.2	14.1	12.9	11.5	10.5	9.8	0.6	16
		140DT	70.5	31.3	25.4	22.5	20.6	18.3	16.8	15.7	0.8	22
		180DT	170.0	79.3	64.4	57.0	52.3	46.3	42.5	39.7	1.7	30
		210DT	251.3	103.2	84.0	73.2	67.1	58.4	52.6		2.1	35
		250DT	321.1	136.9	111.2	98.5	90.3	80.0			2.6	40
		350DT	1058.2	448.1	384.4	340.4	312.2				5.7	47
40	☆90	80DT	19.0	6.2	4.8	3.9	3.0	2.6	2.0		0.7	12
	※90	110DT	14.8	11.3	9.2	8.1	7.5				0.4	14
		140DT	52.0	18.5	18.5	18.5	18.5				0.8	19
		180DT	77.8	54.8	44.5	39.4					1.4	22
		210DT	125.1	83.1	69.4	60.3	56.1				1.8	26
		250DT	185.7	120.5	97.8						2.3	30
		350DT	432.9	268.9							4.3	40
	☆120	80DT	20.5	6.4	5.0	4.2	3.3	2.9	2.3		0.7	12
	※120	110DT	16.2	10.8	8.8	7.8	7.2	6.3			0.4	14
		140DT	55.8	19.1	19.1	19.1	19.1	19.1			0.8	19
		180DT	83.4	52.1	42.3	37.5	34.4				1.3	22
		210DT	138.9	82.6	67.1	59.4	54.5				1.8	26
		250DT	194.5	113.1	91.8	81.3					2.2	30
		350DT	627.9	369.6	317.1						4.8	40
	☆150	80DT	24.0	7.8	6.5	5.6	4.6	4.4	4.0		0.7	12
	※150	110DT	17.0	10.4	8.4	7.5	6.9	6.1			0.4	14
		140DT	57.9	19.5	19.5	19.5	19.5	19.0			0.7	19
		180DT	86.5	49.6	40.3	35.7	32.7				1.3	22
		210DT	134.9	75.5	61.3	54.3	49.8				1.7	26
		250DT	207.6	114.3	92.8	82.2	75.4				2.2	30
		350DT	646.3	350.7	300.9	284.9					4.6	40

Stops S	Index period θ	Code	Static torque Ts (kgf-m)	Net dynamic torque to (kgf-m) Indexes per min.NN(rpm) 50	100	150	200	300	400	500	Cam shaft riction torque Tx (kgf-m)	Bearing sleeve ø (mm)
40	☆180	80DT	26.1	8.1	6.7	5.6	4.5	4.5	4.1		0.7	19
	※180	110DT	17.5	10.0	8.1	7.2	6.6	5.8	5.4		0.4	14
		140DT	62.0	27.2	27.2	24.6	22.6	20.0	18.3		0.8	19
		180DT	130.5	74.3	60.4	53.5	49.1	43.4	39.8		1.5	22
		210DT	183.7	97.4	79.1	70.0	64.2	56.7			2.0	30
		250DT	210.4	108.9	88.5	78.3	71.8				2.2	30
		350DT	657.1	334.8	287.2	254.3					4.5	40
	☆210	80DT	30.1	9.2	7.6	6.6	5.9	5.4	4.6		0.7	19
	※210	110DT	17.9	9.6	7.8	6.9	6.3	5.6	5.2		0.4	14
		140DT	62.8	27.4	26.7	23.6	21.7	19.2	17.6	16.5	0.7	19
		180DT	132.2	71.5	58.1	51.4	47.2	41.8	38.3		1.4	22
		210DT	185.5	93.4	75.9	67.2	61.7	54.6			2.0	30
		250DT	212.1	104.4	84.8	75.1	68.9				2.2	30
		350DT	663.8	321.3	275.7	244.1	223.9				4.5	40
	☆240	80DT	33.7	8.8	7.5	6.4	5.7	5.2	4.4		0.7	19
	※240	110DT	18.1	9.3	7.6	6.7	6.1	5.4	5.0	4.7	0.4	14
		140DT	63.3	27.5	25.8	22.8	20.9	18.5	17.0	15.9	0.7	19
		180DT	133.4	69.0	56.0	49.6	45.5	40.3	37.0	34.6	1.4	22
		210DT	186.2	92.3	74.6	66.3	59.2	53.2			1.8	30
		250DT	213.2	100.6	81.7	72.3	66.4				2.1	30
		350DT	668.3	309.7	265.7	235.3	215.8				4.4	40
	☆270	80DT	35.2	8.6	7.3	6.2	5.5	5.0	4.1		0.7	19
	※270	110DT	18.2	9.0	7.3	6.5	5.9	5.3	4.8	4.5	0.4	14
		140DT	63.7	27.6	24.9	22.1	20.3	17.9	16.4	15.4	0.7	19
		180DT	134.3	66.8	54.3	48.0	44.1	39.0	35.8	33.5	1.4	22
		210DT	187.4	87.1	70.7	62.7	57.5	50.8			1.9	30
		250DT	214.0	97.3	79.0	70.0	64.2	56.8			2.1	30
		350DT	671.4	299.7	257.1	227.7	208.8				4.4	40
	☆300	80DT	36.5	8.4	7.1	6.0	5.3	4.8	3.9		0.7	19
	※300	110DT	18.3	8.8	7.1	6.3	5.8	5.1	4.7	4.4	0.4	14
		140DT	63.9	27.7	24.2	21.4	19.7	17.4	16.0	14.9	0.7	19
		180DT	134.9	64.9	52.7	46.6	42.8	37.9	34.8	32.5	1.4	22
		210DT	188.2	86.3	68.4	60.2	55.1	48.6			1.9	30
		250DT	214.6	94.4	76.6	67.9	62.3	55.1			2.1	30
		350DT	673.7	290.8	249.5	220.9	202.7				4.4	40
	☆330	80DT	38.1	8.1	6.9	5.7	4.9	4.3	3.6		0.7	19
	※330	110DT	18.4	8.5	6.9	6.1	5.6	5.0	4.6	4.3	0.3	14
		140DT	64.1	27.7	23.6	20.9	19.1	16.9	15.5	14.5	0.7	19
		180DT	135.3	63.1	51.3	45.4	41.7	36.9	33.8	31.6	1.4	22
		210DT	190.3	85.4	67.1	59.2	53.6	46.3			1.9	30
		250DT	215.0	91.8	74.6	66.0	60.6	53.6			2.1	30
		350DT	675.4	283.0	242.8	215.0	197.2				4.3	40
48	☆90	80DT	18.2	4.9	3.1	2.2	1.7				0.6	16
	※90	110DT	7.9	5.9	4.8	4.2	3.9				0.4	12
		140DT	54.6	18.9	18.9	18.9	18.9				0.8	16
		180DT	72.9	32.9	32.9	32.9	32.5				1.3	19
		210DT	110.2	57.6	51.0	46.8	42.9				1.5	22
		250DT	107.2	65.7	53.3	47.2	43.3				1.7	22
		350DT	361.1	224.2							3.8	35
	☆120	80DT	18.2	5.0	3.1	2.3	1.8				0.6	16
	※120	110DT	8.5	5.6	4.6	4.0	3.7				0.3	12
		140DT	57.5	19.4	19.4	19.4	19.4	19.4			0.7	16
		180DT	76.1	33.7	33.7	33.2	30.4				1.2	19
		210DT	113.2	59.8	52.2	48.1	44.1				1.5	22
		250DT	162.7	94.7	76.9	68.1					1.9	22
		350DT	375.9	209.8	180.0						3.7	35
	☆150	80DT	22.1	8.0	6.2	5.8	4.9	4.5	3.7		0.6	16
	※150	110DT	8.8	5.3	4.3	3.8	3.5				0.3	12
		140DT	59.1	19.7	19.7	19.7	19.7	19.7	19.7	18.7	0.7	16
		180DT	77.8	34.0	34.0	31.4	28.8				1.2	19
		210DT	115.3	57.7	50.5	46.9	43.3				1.5	22
		250DT	165.3	89.3	72.5	64.2					1.9	22
		350DT	476.9	257.0	220.4	195.2					3.9	35
	☆180	80DT	23.5	8.5	6.8	6.0	5.2	4.8	4.1		0.6	16
	※180	110DT	17.9	10.7	8.7	7.7	7.1	6.3	5.7		0.4	12
		140DT	60.0	19.8	19.8	19.8	19.8	19.4	17.8		0.7	16
		180DT	78.7	34.2	33.7	29.9	27.4	24.3			1.2	19
		210DT	116.4	55.9	48.8	43.2	39.6				1.5	22
		250DT	166.7	84.9	68.9	61.0	56.0				1.9	22
		350DT	482.2	244.6	209.9	185.8					3.9	35
	☆210	80DT	29.0	8.2	6.8	6.1	5.2	4.8	4.1		0.6	16
	※210	110DT	18.1	10.3	8.4	7.4	6.8	6.0	5.5		0.4	12

PS: ○:1DWELL ※:2DWELL ●:3DWELL ☆:4DWELL

DT TYPE

Stops S	Index period θ	Code	Static torque Ts (kgf-m)	Net dynamic torque to (kgf-m) Indexes per min.NN(rpm) 50	100	150	200	300	400	500	Cam shaft riction torque Tx (kgf-m)	Bearing sleeve ø (mm)
48	※210	140DT	60.5	19.9	19.9	19.9	19.9	18.6	17.1		0.7	16
		180DT	79.3	34.4	32.3	28.6	26.3	23.3			1.2	19
		210DT	117.1	54.5	46.7	41.4	36.9	32.7			1.5	22
		250DT	167.6	81.3	66.0	58.4	53.6				1.8	22
		350DT	485.4	234.4	201.1	178.0	163.3				3.8	35
	☆240	80DT	30.2	8.3	6.5	5.7	5.2	4.9	4.2	3.8	0.6	16
	※240	110DT	18.3	9.9	8.1	7.1	6.6	5.8	5.3	5.0	0.4	12
		140DT	60.9	20.0	20.0	19.5	19.0	18.0	16.5	15.4	0.7	16
		180DT	79.7	34.4	31.1	28.3	25.3	22.4	20.5		1.2	19
		210DT	117.9	53.8	46.1	40.2	35.2	31.6			1.5	22
		250DT	168.2	78.2	63.5	58.4	51.6				1.8	22
		350DT	487.6	225.7	193.6	177.1	157.2				3.8	35
	☆270	80DT	31.5	9.2	8.0	6.9	6.4	5.6	4.3	3.8	0.6	16
	※270	110DT	18.4	9.6	7.8	7.0	6.4	5.6	5.2	4.9	0.3	12
		140DT	61.2	20.0	20.0	19.4	18.6	17.4	15.9		0.7	16
		180DT	79.9	34.5	30.1	27.4	23.2	21.7	19.9		1.2	19
		210DT	117.9	52.1	43.5	37.3	33.8	30.3			1.5	22
		250DT	168.7	75.6	61.4	57.6	49.3	44.2			1.8	22
		350DT	489.1	218.2	187.2	165.9	155.1				3.8	35
	☆300	80DT	32.7	8.4	6.7	6.3	5.8	4.4	4.0	3.6	0.6	16
	※300	110DT	18.5	9.4	7.6	6.8	6.2	5.5	5.0	4.6	0.3	12
		140DT	61.3	20.1	20.1	18.9	18.4	16.9	15.5	14.2	0.7	16
		180DT	80.1	34.5	29.2	26.2	24.3	21.0	19.3		1.2	19
		210DT	118.6	50.6	42.1	36.5	32.1	29.6			1.5	22
		250DT	169.0	73.3	59.5	52.1	47.1	42.8			1.8	22
		350DT	490.2	211.6	181.5	165.3	154.8				3.9	35
	☆330	80DT	33.2	8.2	6.4	6.1	5.4	4.0	3.6	3.0	0.6	16
	※330	110DT	18.6	9.1	7.4	6.5	6.1	5.3	4.9	4.1	0.3	12
		140DT	61.5	20.1	20.1	17.4	17.2	16.4	15.0	14.5	0.7	16
		180DT	80.3	34.6	28.4	25.8	23.6	20.4	18.7		1.2	19
		210DT	119.2	49.2	41.3	35.4	30.6	28.5			1.5	22
		250DT	169.2	71.3	57.9	50.8	46.3	41.6			1.8	22
		350DT	491.0	205.8	176.6	158.1	147.5				3.7	35
60	●90	110DT	14.8	11.3	9.2	8.5	8.1				0.4	14
		140DT	52.0	18.5	18.5	17.9					0.8	19
		180DT	77.8	54.8	44.5						1.4	22
		210DT	93.2	74.8	68.5						1.8	26
		250DT	185.7	120.5	97.8						2.3	30
		350DT	432.9	268.9							4.3	40
	●120	110DT	16.2	10.8	8.8	7.8	7.2				0.4	14
		140DT	55.8	19.1	19.1	19.1	19.1				0.8	19
		180DT	83.4	52.1	42.3	37.5	34.4				1.3	22
		210DT	95.6	73.2	66.9						1.8	26
		250DT	194.5	113.1	91.8						2.2	30
		350DT	627.9	369.6	317.1						4.8	40
	●150	110DT	17.0	10.4	8.4	7.5	6.9	6.1			0.4	14
		140DT	57.9	19.5	19.5	19.5	19.5	19.0			0.7	19
		180DT	86.5	49.6	40.3	35.7	32.7				1.3	22
		210DT	97.6	71.6	64.7	56.9					1.8	26
		250DT	207.6	114.3	92.8	82.2					2.2	30
		350DT	646.3	350.7	300.9						4.6	40
	●180	110DT	17.5	10.0	8.1	7.2	6.6	5.8			0.4	14
		140DT	62.0	27.2	27.2	24.6	22.6	20.0			0.8	19
		180DT	130.5	74.3	60.4	53.5	49.1	43.4			1.5	22
		210DT	108.2	89.6	82.4	73.1					1.8	26
		250DT	210.4	108.9	88.5	78.3					2.2	30
		350DT	657.1	334.8	287.2	254.3					4.5	40
	●210	110DT	17.9	9.6	7.8	6.9	6.3	5.6	5.2		0.4	14
		140DT	62.8	27.4	26.7	23.6	21.7	19.2	17.6		0.7	19
		180DT	132.2	71.5	58.1	51.4	47.2	41.8			1.4	22
		210DT	112.1	87.5	80.0	69.2	64.3				1.8	26
		250DT	212.1	104.4	84.8	75.1	68.9				2.2	30
		350DT	663.8	321.3	275.7	244.1					4.5	40
	●240	110DT	18.1	9.3	7.6	6.7	6.1	5.4	5.0		0.4	14
		140DT	63.3	27.5	25.8	22.8	20.9	18.5	17.0		0.7	19
		180DT	133.4	69.0	56.0	49.6	45.5	40.3	37.0		1.4	22
		210DT	114.5	85.2	78.6	67.1	63.2				1.8	26
		250DT	213.2	100.6	81.7	72.3	66.4				2.1	30
		350DT	668.3	309.7	265.7	235.3					4.4	40
	●270	110DT	18.2	9.0	7.3	6.5	5.9	5.3	4.8		0.4	14
		140DT	63.7	27.6	24.9	22.1	20.3	17.9	16.4	15.4	0.7	19
		180DT	134.3	66.8	54.3	48.0	44.1	39.0	35.8		1.4	22

Stops S	Index period θ	Code	Static torque Ts (kgf-m)	Net dynamic torque to (kgf-m) Indexes per min.NN(rpm) 50	100	150	200	300	400	500	Cam shaft riction torque Tx (kgf-m)	Bearing sleeve ø (mm)
60	●270	210DT	115.2	83.2	76.9	65.4	61.3				1.8	26
		250DT	214.0	97.3	79.0	70.0	64.2				2.1	30
		350DT	671.4	299.7	257.1	227.7	208.8				4.4	40
	●300	110DT	18.3	8.8	7.1	6.3	5.8	5.1	4.7	4.4	0.4	14
		140DT	63.9	27.7	24.2	21.4	19.7	17.4	16.0	14.9	0.7	19
		180DT	134.9	64.9	52.7	46.6	42.8	37.9	34.8		1.4	22
		210DT	116.5	82.6	75.4	64.3	60.9				1.8	26
		250DT	214.6	94.4	76.6	67.9	62.3				2.1	30
		350DT	673.7	290.8	249.5	220.9	202.7				4.4	40
	●330	110DT	18.4	8.5	6.9	6.1	5.6	5.0	4.6	4.3	0.3	14
		140DT	64.1	27.7	23.6	20.9	19.1	16.9	15.5	14.5	0.7	19
		180DT	135.3	63.1	51.3	45.4	41.7	36.9	33.8	31.6	1.4	22
		210DT	117.8	81.9	74.3	63.6	59.4	47.6			1.8	26
		250DT	215.0	91.8	74.6	66.0	60.6	53.6			2.1	30
		350DT	675.4	283.0	242.8	215.0	197.2				4.3	40
72	●90	110DT	7.9	5.9	4.8	4.2					0.4	12
		140DT	54.6	18.9	18.9	18.9	18.9				0.8	16
		180DT	72.9	32.9	32.9	32.9					1.3	19
		210DT	95.4	48.6	42.3	40.6					1.5	22
		250DT	107.2	65.7	53.3	47.2					1.7	22
		350DT	361.1	224.2							3.8	35
	●120	110DT	8.5	5.6	4.6	4.0	3.7				0.3	12
		140DT	57.5	19.4	19.4	19.4	19.4				0.7	16
		180DT	76.1	33.7	33.7	33.2	30.4				1.2	19
		210DT	98.4	80.6	74.1						1.6	22
		250DT	162.7	94.7	76.9						1.9	22
		350DT	375.9	209.8							3.7	35
	●150	110DT	8.8	5.3	4.3	3.8	3.5				0.3	12
		140DT	59.1	19.7	19.7	19.7	19.7	19.7			0.7	16
		180DT	77.8	34.0	34.0	31.4	28.8				1.2	19
		210DT	99.5	82.3	65.2	58.4					1.6	22
		250DT	165.3	89.3	72.5	64.2					1.9	22
		350DT	476.9	257.0	220.4						3.9	35
	●180	110DT	17.9	10.7	8.7	7.7	7.1	6.3			0.4	12
		140DT	60.0	19.8	19.8	19.8	19.8	19.4	17.8		0.7	16
		180DT	78.7	34.2	33.7	29.9	27.4				1.2	19
		210DT	102.1	83.2	66.1	59.3					1.6	22
		250DT	166.7	84.9	68.9	61.0					1.9	22
		350DT	482.2	244.6	209.9						3.9	35
	●210	110DT	18.1	10.3	8.4	7.4	6.8	6.0	5.5		0.4	12
		140DT	60.5	19.9	19.9	19.9	19.9	18.6	17.1		0.7	16
		180DT	79.3	34.4	32.3	28.6	26.3	23.3			1.2	19
		210DT	103.4	79.6	63.2	54.1	50.2				1.6	22
		250DT	167.6	81.3	66.0	58.4	53.6				1.8	22
		350DT	485.4	234.4	201.1	178.0					3.8	35
	●240	110DT	18.3	9.9	8.1	7.2	6.6	5.8	5.3		0.4	12
		140DT	60.9	20.0	20.0	20.0	20.0	18.0	16.5	15.4	0.7	16
		180DT	79.7	34.4	31.1	27.6	25.3	22.4			1.2	19
		210DT	103.8	76.4	60.2	52.3	49.7				1.6	22
		250DT	168.2	78.2	63.5	56.3	51.6				1.8	22
		350DT	487.6	225.7	193.6	171.4					3.8	35
	●270	110DT	18.4	9.6	7.8	6.9	6.4	5.6	5.2	4.8	0.3	12
		140DT	61.2	20.0	20.0	20.0	19.6	17.4	15.9	14.9	0.7	16
		180DT	79.9	34.5	30.1	26.7	24.5	21.7			1.2	19
		210DT	104.7	73.1	59.1	51.3	47.2				1.6	22
		250DT	168.7	75.6	61.4	54.4	49.9				1.8	22
		350DT	489.1	218.2	187.2	165.7	152.0				3.8	35
	●300	110DT	18.5	9.4	7.6	6.7	6.2	5.5	5.0	4.7	0.3	12
		140DT	61.3	20.1	20.1	20.1	19.0	16.9	15.5	14.5	0.7	16
		180DT	80.1	34.5	29.2	25.9	23.7	21.0	19.3		1.2	19
		210DT	105.3	71.8	57.3	48.6	45.2				1.6	22
		250DT	169.0	73.3	59.5	52.7	48.4				1.8	22
		350DT	490.2	211.6	181.5	160.7	147.4				3.8	35
	●330	110DT	18.6	9.1	7.4	6.5	6.0	5.3	4.9	4.6	0.3	12
		140DT	61.5	20.1	20.1	20.1	18.5	16.4	15.0	14.1	0.7	16
		180DT	80.3	34.6	28.4	25.2	23.1	20.4	18.7		1.2	19
		210DT	106.2	70.2	55.8	46.2	44.3	38.2			1.6	22
		250DT	169.2	71.3	57.9	51.3	47.0	41.6			1.8	22
		350DT	491.0	205.8	176.6	156.3	143.4				3.7	35

PS: ○:1DWELL ※:2DWELL ●:3DWELL ☆:4DWELL

DA TYPE(70DA)

Stops S	Index period θ	Static torque Ts (kgf-m)	Net dynamic torque to (kgf-m) Indexes per min.NN(rpm) 25	50	75	100	125	150	200	Cam shaft riction torque Tx (kgf-m)	Bearing sleeve ø (mm)
4	270	20.9	8.2	8.2	8.2	8.2	8.2	8.2	7.7	0.5	19
5	240	8.0	5.9	4.8	4.2	3.9	3.6	3.4	3.2	0.3	16
	270	23.2	8.6	8.6	8.6	8.6	8.6	8.6	8.6	0.5	16
6	180	24.3	19.5	16.4	14.5	13.3	12.4	11.8	10.8	0.6	22
	210	26.2	20.0	16.2	14.4	13.2	12.3	11.7	10.7	0.5	22
	240	27.7	19.8	16.1	14.2	13.0	12.2	11.5	10.6	0.5	22
	270	28.9	19.5	15.8	14.0	12.8	12.0	11.4	10.4	0.5	22
8	180	25.2	12.2	12.2	12.2	12.2	12.1	12.2	11.5	0.5	19
	210	26.3	17.1	16.0	14.1	13.0	12.1	11.5	10.5	0.5	19
	240	27.3	17.5	15.6	13.9	12.7	11.9	11.2	10.3	0.5	19
	270	28.1	17.7	15.3	13.6	12.4	11.6	11.0	10.1	0.5	19
10	180	20.5	7.3	7.3	7.3	7.3	7.3	7.3	7.3	0.4	16
	210	22.5	10.3	10.3	10.3	10.3	10.3	10.3	10.2	0.4	16
	240	23.1	10.4	10.4	10.4	10.4	10.4	10.4	10.0	0.4	16
	270	23.6	10.5	10.5	10.5	10.5	10.5	10.5	9.7	0.4	16
12	150	7.5	6.7	5.7	5.1	4.7	4.4	4.1	3.8	0.2	14
	180	21.5	7.4	7.4	7.4	7.4	7.4	7.4	7.4	0.4	14
	210	22.2	7.6	7.6	7.6	7.6	7.6	7.6	7.6	0.4	14
	240	22.6	7.6	7.6	7.6	7.6	7.6	7.6	7.6	0.4	14
	270	22.9	7.7	7.7	7.7	7.7	7.7	7.7	7.7	0.4	14
15	150	4.0	3.6	3.1	2.7	2.5	2.3	2.2	2.0	0.2	12
	180	4.1	3.7	3.0	2.6	2.4	2.3	2.1	2.0	0.2	12
	210	8.4	7.3	6.0	5.3	4.8	4.5	4.3	3.9	0.2	12
	240	8.5	7.1	5.8	5.1	4.7	4.4	4.1	3.8	0.2	12
	270	8.6	6.9	5.6	4.9	4.5	4.2	4.0	3.7	0.2	12
16	150	4.0	3.6	3.2	2.8	2.6	2.4	2.3	2.1	0.2	12
	180	4.2	3.7	3.1	2.7	2.5	2.3	2.2	2.0	0.2	12
	210	4.2	3.6	2.9	2.6	2.4	2.2	2.1	1.9	0.2	12
	240	4.3	3.5	2.8	2.5	2.3	2.2	2.0	1.9	0.2	12
	270	4.4	3.4	2.8	2.4	2.2	2.1	2.0	1.8	0.2	12
※16	210	23.4	17.1	17.1	17.1	16.0	14.9	14.1	12.9	0.5	19
	240	24.3	17.5	17.5	24.4	15.6	14.6	13.9	12.7	0.5	19
	270	25.0	17.7	17.7	16.7	15.3	14.3	13.6	12.4	0.5	19
※20	180	20.5	7.3	7.3	7.3	7.3	7.3	7.3	7.3	0.4	16
	210	21.4	7.4	7.4	7.4	7.4	7.4	7.4	7.4	0.4	16
	240	22.0	7.5	7.5	7.5	7.5	7.5	7.5	7.5	0.4	16
	270	23.6	10.5	10.5	10.5	10.5	10.5	10.5	10.5	0.4	16
※24	180	7.8	7.1	6.8	6.0	5.6	5.2	4.9	4.5	0.2	14
	210	8.1	7.3	6.6	5.9	5.4	5.0	4.8	4.4	0.2	14
	240	8.3	7.4	6.4	5.7	5.2	4.9	4.6	4.2	0.2	14
	270	22.9	7.7	7.7	7.7	7.7	7.7	7.7	7.7	0.4	14
※32	180	4.2	3.7	3.7	3.3	3.0	2.9	2.7	2.5	0.2	12
	210	4.2	3.8	3.6	3.2	2.9	2.8	2.6	2.4	0.2	12
	240	4.3	3.9	3.5	3.1	2.8	2.7	2.5	2.3	0.2	12
	270	4.4	3.9	3.4	3.0	2.8	2.6	2.4	2.2	0.2	12

PS ※2DWELL

DA TYPE(90DA)

Stops S	Index period θ	Static torque Ts (kgf-m)	Net dynamic torque to (kgf-m) Indexes per min.NN(rpm) 25	50	75	100	125	150	200	Cam shaft riction torque Tx (kgf-m)	Bearing sleeve ø (mm)
4	270	25.4	17.2	14.0	12.4	11.3	10.6	10.1	9.3	0.7	26
5	240	22.6	16.1	13.0	11.8	10.6	9.9	9.4	8.6	0.6	19
	270	25.2	17.9	14.6	12.9	11.8	11.0	10.5	9.6	0.6	19
6	180	31.6	26.2	21.2	18.8	17.3	16.2	15.3	14.0	0.9	26
	210	34.3	26.0	21.1	18.7	17.2	16.0	15.2	13.9	0.9	26
	240	36.5	25.8	20.9	18.6	17.0	15.9	15.1	13.8	0.9	26
	270	38.2	25.5	20.7	18.3	16.8	15.8	14.9	13.7	0.8	26
8	180	36.5	32.8	26.7	23.6	21.6	20.2	19.2	17.6	0.8	26
	210	38.7	32.3	26.0	23.2	21.3	20.0	18.9	17.3	0.8	26
	240	40.5	31.7	25.8	22.8	20.9	19.6	18.6	17.0	0.8	26
	270	41.7	31.1	25.3	22.4	20.5	19.2	18.2	16.7	0.8	26
10	180	27.0	23.9	19.5	17.2	15.8	14.8	14.0	12.8	0.6	19
	210	28.1	23.4	19.0	16.8	15.4	14.4	13.7	12.5	0.6	19
	240	28.9	22.8	18.5	16.4	15.1	14.1	13.3	12.2	0.6	19
	270	29.5	22.2	18.1	16.0	14.6	13.7	13.0	11.9	0.6	19
12	150	23.2	20.9	17.1	15.1	13.9	13.0	12.3	11.3	0.6	16
	180	25.8	22.9	18.6	16.5	15.1	14.1	13.4	12.3	0.6	16
	210	26.6	22.2	18.1	16.0	14.6	13.7	13.0	11.9	0.6	16
	240	27.2	21.6	17.5	15.5	14.2	13.3	12.6	11.6	0.6	16
	270	27.6	21.0	17.0	15.1	13.9	13.0	12.3	11.3	0.5	16
15	150	24.6	22.1	19.1	16.9	15.5	14.6	13.8	12.6	0.6	14
	180	25.4	22.7	18.4	16.3	15.0	14.0	13.2	12.2	0.5	14
	210	26.0	21.9	17.8	15.8	14.4	13.5	12.8	11.8	0.5	14
	240	26.3	21.2	17.2	15.3	14.0	13.1	12.4	11.3	0.5	14
	270	26.6	20.6	16.7	14.8	13.6	12.7	12.0	11.0	0.5	14
16	150	24.9	22.4	19.7	17.4	16.0	15.0	14.2	13.0	0.5	14
	180	25.7	23.1	19.0	16.8	15.4	14.4	13.7	12.5	0.5	14
	210	26.2	22.5	18.3	16.2	14.8	13.9	13.2	12.0	0.5	14
	240	26.5	21.8	17.6	15.7	14.4	13.4	12.7	11.6	0.5	14
	270	26.7	21.1	17.2	15.2	13.9	13.0	12.3	11.3	0.5	14
※16	210	26.4	23.7	20.4	18.1	16.6	15.5	14.7	13.5	0.7	26
	240	27.4	24.6	20.0	17.7	16.3	15.2	14.4	13.2	0.6	26
	270	41.7	37.6	31.1	27.6	25.3	23.6	22.4	20.5	0.8	26
※20	180	27.0	24.2	23.9	21.2	19.5	18.2	17.2	15.8	0.6	19
	210	28.1	25.3	23.4	20.7	19.0	17.7	16.8	15.4	0.6	19
	240	28.9	26.0	22.8	20.2	18.5	17.3	16.4	15.1	0.6	19
	270	29.5	26.6	22.2	19.7	18.1	16.9	16.0	14.6	0.6	19
※24	180	18.8	23.2	22.9	20.3	18.6	17.4	16.5	15.1	0.6	16
	210	26.6	23.9	22.2	19.7	18.1	16.9	16.0	14.6	0.6	16
	240	27.2	24.4	21.6	12.1	17.5	16.4	15.5	14.2	0.6	16
	270	27.6	24.9	21.0	18.6	17.0	16.0	15.1	13.9	0.6	16
※32	180	25.7	23.1	23.1	20.7	19.0	17.7	16.8	15.4	0.5	14
	210	26.2	23.5	22.5	20.0	18.3	17.1	16.2	14.8	0.5	14
	240	26.6	23.9	21.8	19.3	17.7	16.5	15.7	14.4	0.5	14
	270	26.7	24.1	21.1	18.7	17.2	16.0	15.2	13.9	0.5	14

PS ※2DWELL

DA TYPE(110DA)

Stops S	Index period θ	Static torque Ts (kgf-m)	Net dynamic torque to (kgf-m) Indexes per min.NN(rpm) 25	50	75	100	125	150	200	Cam shaft riction torque Tx (kgf-m)	Bearing sleeve ø (mm)
4	270	38.6	27.7	22.5	19.9	18.3	17.1	16.2	14.8	1.0	30
5	240	26.1	21.9	17.8	15.8	14.5	13.5	12.8	11.8	0.8	26
	270	43.3	32.6	26.5	23.4	21.5	20.1	19.0	17.4	1.0	26
6	180	48.6	40.3	32.8	29.0	26.6	24.9	23.5	21.6	1.3	26
	210	52.7	40.1	32.6	28.8	26.5	24.7	23.4	21.5	1.2	26
	240	62.2	39.7	32.3	28.6	26.2	24.5	23.2	21.3	1.2	26
	270	58.7	39.3	31.9	28.2	25.9	24.2	22.9	21.0	1.1	26
8	180	53.8	48.0	39.0	34.6	31.7	29.6	28.1	25.8	1.1	30
	210	59.5	49.8	40.4	35.8	32.8	30.7	29.1	26.7	1.1	30
	240	62.2	48.9	39.7	35.1	32.2	30.2	28.6	26.2	1.1	30
	270	64.2	47.9	38.9	34.4	31.6	29.5	28.0	25.7	1.1	30
10	180	48.4	43.1	35.0	31.0	28.4	26.6	25.2	23.1	0.9	26
	210	50.6	42.1	34.2	30.2	27.8	26.0	24.6	22.5	0.9	26
	240	63.7	53.2	43.3	38.3	35.1	32.8	31.1	28.5	1.1	26
	270	65.2	52.0	42.2	37.4	34.3	32.1	30.4	27.9	1.1	26
12	150	45.9	41.3	41.3	36.6	33.6	20.9	19.8	18.2	0.7	26
	180	49.4	44.4	40.6	35.9	33.0	19.5	19.5	17.9	0.7	26
	210	51.9	46.6	39.7	35.1	32.3	20.1	19.0	17.4	0.7	26
	240	53.7	47.8	38.8	34.4	31.5	19.7	18.6	17.1	0.7	26
	270	77.7	43.8	35.6	31.6	28.9	27.1	25.6	23.5	0.8	26
15	150	45.6	41.0	41.0	41.0	38.4	20.7	19.6	18.0	0.7	19
	180	48.1	43.3	43.3	40.7	37.3	20.2	19.1	17.5	0.7	19
	210	49.8	44.9	44.7	39.6	36.3	19.6	18.6	17.0	0.6	19
	240	51.1	46.0	43.5	38.4	35.3	19.0	18.1	16.5	0.6	19
	270	52.0	46.8	42.3	37.5	34.4	18.6	17.6	16.1	0.6	19
16	150	46.6	41.9	41.9	41.9	39.8	21.4	20.3	18.6	0.7	19
	180	48.9	44.0	44.0	42.0	38.6	20.8	19.7	18.1	0.6	19
	210	50.5	45.4	45.4	40.7	37.4	20.2	19.1	17.6	0.6	19
	240	51.6	46.4	44.7	39.6	36.3	19.6	18.6	17.0	0.6	19
	270	52.4	47.2	43.5	38.6	35.4	19.1	18.1	16.6	0.6	19
※16	210	59.5	53.6	49.8	44.1	40.4	37.8	35.8	32.8	0.0	30
	240	62.2	55.9	48.8	43.2	39.7	37.1	35.1	32.2	0.0	30
	270	64.2	57.8	47.9	42.4	38.9	36.4	34.4	31.6	0.0	30
※20	180	48.4	43.6	43.1	38.2	35.0	32.8	31.0	28.4	0.9	26
	210	50.6	45.6	42.1	37.2	34.2	32.0	30.2	27.8	0.9	26
	240	63.7	57.3	53.2	47.1	43.3	40.5	38.3	35.1	1.0	26
	270	65.2	58.7	52.0	46.1	42.2	39.5	37.4	34.3	1.0	26
※24	180	49.4	44.4	44.4	44.2	40.6	25.3	23.9	22.0	0.7	26
	210	51.9	46.6	46.6	43.3	39.7	24.8	23.5	21.5	0.7	26
	240	53.7	48.3	47.8	42.3	38.8	24.2	22.9	21.0	0.7	26
	270	77.7	54.0	43.5	38.9	35.6	33.3	31.6	28.9	0.8	26
※32	180	48.9	44.0	44.0	44.0	44.0	25.4	24.3	22.3	0.6	19
	210	50.5	45.4	45.4	45.4	45.4	24.9	23.5	21.6	0.6	19
	240	51.6	46.4	46.4	46.4	44.7	24.2	22.9	21.0	0.6	19
	270	52.4	47.2	47.2	47.2	43.5	23.5	22.3	20.4	0.6	19

PS ※2DWELL

DA TYPE(150DA)

Stops S	Index period θ	Static torque Ts (kgf-m)	Net dynamic torque to (kgf-m) Indexes per min.NN(rpm) 25	50	75	100	125	150	200	Cam shaft riction torque Tx (kgf-m)	Bearing sleeve ø (mm)
4	270	71.2	47.0	38.2	33.7	31.0	29.0	27.4	25.1	1.7	40
5	240	48.2	49.8	42.2	35.0	30.4	27.9	26.0	24.6	1.3	35
	270	78.7	53.0	43.0	38.1	34.9	32.7	30.9	28.4	1.5	35
6	180	66.8	52.2	42.3	37.5	34.4	32.2	30.5	27.9	2.2	30
	210	102.8	75.0	60.9	54.0	49.5	46.3	43.8	40.2	2.5	30
	240	110.2	74.6	60.6	53.6	49.2	46.0	43.6	40.0	2.4	30
	270	116.2	74.0	60.1	53.2	48.8	45.6	43.2	39.6	2.3	30
8	180	79.4	85.7	72.7	70.4	59.0	55.2	52.3	47.9	2.0	40
	210	118.0	104.9	85.2	75.5	69.2	64.8	61.3	56.2	2.3	40
	240	125.0	103.4	84.0	74.4	68.2	63.8	60.4	54.0	2.3	40
	270	128.8	101.7	82.6	73.1	67.1	62.7	59.4	54.5	2.2	40
10	180	70.6	63.6	55.0	48.7	44.7	41.8	39.6	36.3	1.7	35
	210	75.1	66.7	54.2	48.0	44.0	41.1	39.0	35.7	1.6	35
	240	97.6	84.7	68.8	60.9	55.9	52.3	49.5	45.4	1.8	35
	270	100.7	83.0	67.5	59.7	54.8	51.2	48.5	44.5	1.8	35
12	150	80.1	69.9	56.8	50.3	47.1	36.0	34.0	31.2	1.4	30
	180	89.0	72.7	59.0	52.3	47.9	37.4	35.4	32.5	1.4	30
	210	93.2	71.0	57.7	51.1	46.9	36.5	34.6	31.7	1.4	30
	240	119.4	80.0	65.0	57.5	52.8	44.9	42.5	39.0	1.5	30
	270	119.4	78.2	63.5	56.2	51.6	43.9	41.5	38.1	1.5	30
15	150	70.9	63.8	63.8	63.8	62.4	33.7	31.9	29.3	1.2	26
	180	91.5	77.3	62.8	55.6	51.0	39.7	37.6	34.5	1.3	26
	210	94.6	75.0	60.9	54.0	49.5	38.6	36.5	33.5	1.3	26
	240	102.0	72.9	59.2	52.4	48.1	37.5	35.5	32.5	1.3	26
	270	102.0	75.2	61.1	54.1	49.6	38.7	36.6	38.1	1.3	26
16	150	72.6	65.4	65.4	65.4	64.8	35.0	33.1	30.4	1.3	26
	180	77.0	69.3	69.3	68.8	63.2	34.1	32.3	29.6	1.3	26
	210	80.0	72.0	72.0	67.0	61.5	33.2	31.4	28.8	1.3	26
	240	99.1	74.0	73.7	65.3	59.9	32.3	30.6	28.1	1.1	26
	270	99.1	72.9	59.2	52.5	48.1	37.5	35.5	32.6	1.2	26
※16	210	61.6	56.9	50.4	46.2	43.2	43.2	40.9	37.5	0.0	40
	240	90.5	81.5	73.0	64.7	59.3	55.5	52.5	48.2	0.0	40
	270	128.7	115.9	101.7	90.0	82.6	77.2	73.1	67.1	0.0	40
※20	180	70.6	63.6	63.6	60.0	55.0	51.4	48.7	44.7	1.7	35
	210	93.6	84.2	84.2	76.4	70.1	65.6	62.1	56.9	1.8	35
	240	97.6	87.9	84.7	75.0	68.8	64.3	60.9	55.9	1.8	35
	270	100.7	90.6	83.0	73.5	67.5	63.1	59.7	54.8	1.8	35
※24	180	89.0	80.1	72.7	64.3	59.0	46.0	43.6	40.0	1.4	30
	210	93.2	83.9	71.0	62.9	57.7	45.0	42.6	39.0	1.4	30
	240	96.3	85.4	69.3	61.4	56.3	43.9	41.6	38.1	1.4	30
	270	119.4	96.2	78.2	69.2	63.5	54.0	51.1	46.9	1.5	30
※32	180	77.0	69.3	69.3	69.3	69.3	40.0	39.8	36.5	1.1	26
	210	80.0	72.0	72.0	72.0	72.0	40.9	38.7	35.5	1.1	26
	240	82.2	74.0	74.0	74.0	74.0	39.8	37.7	34.6	1.1	26
	270	99.1	89.2	72.9	64.6	59.2	46.2	43.7	40.1	1.3	26

PS ※2DWELL

DA TYPE(190DA)

Stops S	Index period θ	Static torque Ts (kgf-m)	Net dynamic torque to (kgf-m) Indexes per min.NN(rpm) 25	50	75	100	125	150	200	Cam shaft riction torque Tx (kgf-m)	Bearing sleeve ø (mm)
4	270	209.6	148.6	120.7	106.9	98.0	91.7	86.8	79.6	3.4	52
5	240	218.8	143.0	116.2	102.8	94.4	88.2	83.5	76.6	3.3	47
	270	233.7	142.7	115.9	102.6	94.1	88.0	83.3	76.4	3.2	47
6	180	164.6	106.5	86.5	76.6	70.3	65.7	62.2	57.1	4.0	40
	210	236.7	150.5	122.3	108.3	99.3	92.9	87.9	80.7	4.5	40
	240	255.6	150.3	122.1	108.1	99.1	92.7	87.8	80.5	4.4	40
	270	271.5	199.3	161.9	143.4	131.5	123.0	116.4	106.8	4.3	40
8	180	194.5	175.1	147.7	130.8	120.0	112.2	106.3	97.5	3.7	52
	210	209.2	180.1	146.3	129.5	118.8	111.1	105.2	96.5	3.6	52
	240	292.6	253.5	205.9	182.3	167.2	156.4	148.1	135.8	4.1	52
	270	305.7	250.1	203.1	179.9	165.0	154.3	146.1	134.0	4.0	52
10	180	214.0	192.6	166.1	147.0	134.9	126.2	119.4	109.6	3.2	47
	210	226.3	200.8	163.1	144.4	132.5	123.9	117.3	107.6	3.1	47
	240	276.6	239.7	194.7	172.4	158.1	147.9	140.0	128.4	3.4	47
	270	284.9	234.8	190.7	168.9	154.9	144.9	137.2	125.8	3.3	47
12	150	192.0	163.7	133.0	117.8	108.0	101.0	95.7	87.7	3.0	40
	180	204.6	160.0	130.0	115.1	105.6	98.7	93.5	85.7	2.9	40
	210	213.4	156.0	126.8	112.2	103.0	96.3	91.2	83.6	2.8	40
	240	219.8	152.2	123.6	109.4	100.4	93.9	88.9	81.5	2.8	40
	270	258.8	182.1	147.9	131.0	120.1	112.4	106.4	94.3	2.9	40
15	150	174.6	131.0	128.3	113.6	104.2	68.9	65.2	59.8	2.4	35
	180	185.1	138.8	125.0	110.5	101.5	67.1	63.6	58.3	2.4	35
	210	192.3	144.3	121.7	107.7	98.8	65.4	61.9	56.8	2.3	35
	240	197.6	145.9	118.5	104.9	96.2	63.6	60.3	55.3	2.3	35
	270	199.8	179.8	146.6	129.8	119.1	111.3	105.4	96.7	2.7	35
16	150	169.2	139.6	134.5	119.1	109.2	72.2	68.4	62.7	2.4	35
	180	188.3	155.3	142.1	125.9	115.5	76.4	72.3	66.3	2.4	35
	210	195.0	160.9	138.1	122.3	112.2	74.2	70.2	64.4	2.3	35
	240	199.7	164.8	134.3	118.9	109.1	72.1	68.3	62.6	2.3	35
	270	203.2	161.0	130.8	115.8	106.2	70.2	66.5	61.0	2.3	35
※16	210	136.5	187.1	172.5	152.7	140.1	131.0	124.1	113.8	3.2	52
	240	220.7	198.7	177.7	157.4	144.4	135.0	127.8	117.3	3.5	52
	270	305.7	275.1	250.1	221.4	203.1	190.0	179.9	252.6	4.0	52
※20	180	160.6	144.5	140.4	124.4	114.1	106.7	101.0	92.7	3.0	47
	210	200.1	174.6	172.1	152.4	139.8	130.7	123.8	113.5	3.1	47
	240	237.1	213.4	205.4	181.9	166.9	156.1	147.8	135.5	3.4	47
	270	244.2	219.8	201.3	178.2	163.5	152.9	144.7	132.8	3.3	47
※24	180	204.6	184.1	160.0	141.7	130.0	121.5	115.1	105.6	2.9	40
	210	213.4	192.1	156.0	138.2	126.8	118.5	112.2	103.0	2.8	40
	240	219.8	187.3	152.2	134.7	123.6	115.6	109.4	100.4	2.8	40
	270	258.8	224.2	182.1	161.2	147.9	138.3	131.0	120.1	2.9	40
※32	180	188.3	169.5	169.5	169.0	155.1	102.5	97.1	89.1	2.4	35
	210	195.0	175.5	175.5	164.2	150.7	99.6	94.3	86.5	2.3	35
	240	199.7	179.8	179.8	159.7	146.5	96.9	91.7	84.1	2.3	35
	270	203.2	182.9	175.6	155.5	142.6	94.3	89.3	81.9	2.3	35

PS ※2DWELL

DA TYPE(230DA)

Stops S	Index period θ	Static torque Ts (kgf-m)	Net dynamic torque to (kgf-m) Indexes per min.NN(rpm) 25	50	75	100	125	150	200	Cam shaft riction torque Tx (kgf-m)	Bearing sleeve ø (mm)
4	270	247.2	187.0	151.9	134.5	123.3	115.4	109.2	100.2	3.8	60
5	240	177.4	157.9	128.2	113.5	104.2	97.4	92.2	84.6	3.1	52
	270	284.8	224.5	182.4	161.5	148.1	138.5	131.2	120.3	3.6	52
6	180	259.9	206.8	167.9	148.7	136.4	127.6	120.8	110.8	5.2	47
	210	360.0	279.8	227.3	201.2	184.6	172.6	163.5	149.9	5.8	47
	240	389.6	279.7	227.2	201.1	184.5	172.6	163.4	149.9	5.5	47
	270	414.8	278.5	226.2	200.3	183.8	171.9	162.7	149.3	5.4	47
8	180	361.3	325.2	275.5	244.0	223.8	209.3	198.2	181.8	4.8	60
	210	390.3	336.6	273.4	242.1	222.1	207.7	196.7	180.4	4.6	60
	240	523.2	452.3	367.3	325.3	298.4	279.1	264.2	242.4	5.2	60
	270	547.8	446.7	362.8	321.3	294.7	275.6	261.0	239.4	5.0	60
10	180	299.1	269.2	234.7	207.8	190.7	178.3	168.8	154.9	3.8	52
	210	319.2	285.1	231.5	205.0	188.1	175.9	166.5	152.8	3.7	52
	240	446.6	386.6	314.0	278.1	255.1	238.6	225.9	207.1	4.3	52
	270	461.2	379.2	308.0	272.8	250.2	234.0	221.6	203.2	4.2	52
12	150	363.6	269.9	219.2	194.1	178.1	166.5	157.7	144.6	3.4	47
	180	456.3	325.9	264.7	234.4	215.0	201.1	190.4	174.6	3.7	47
	210	480.6	319.3	259.4	229.7	210.7	197.0	186.5	171.1	3.6	47
	240	498.7	312.5	253.8	224.7	206.2	192.8	182.6	167.5	3.5	47
	270	512.3	305.7	248.3	219.9	201.7	188.6	178.6	163.8	3.4	47
15	150	282.9	254.6	254.6	254.6	236.6	139.9	132.5	121.5	2.7	40
	180	304.0	273.6	273.6	253.1	232.2	137.3	130.0	119.3	2.7	40
	210	432.3	291.2	236.6	209.5	192.1	179.7	170.1	156.1	3.1	40
	240	443.0	283.2	230.1	203.7	186.9	174.8	165.5	151.8	3.0	40
	270	450.8	275.8	224.0	198.4	182.0	170.2	161.1	147.8	3.0	40
16	150	290.7	261.6	261.6	261.6	246.0	145.5	137.8	126.4	2.7	40
	180	310.7	279.6	279.6	262.5	240.8	142.4	134.8	123.7	2.6	40
	210	324.9	292.4	289.5	256.3	235.1	139.1	131.7	120.8	2.6	40
	240	335.2	301.7	282.5	250.1	229.4	135.7	128.5	117.9	2.6	40
	270	342.9	308.6	275.8	244.2	224.0	132.5	125.4	115.1	2.5	40
※16	210	390.3	351.3	336.6	298.1	273.4	255.7	242.1	222.1	4.6	60
	240	523.2	470.9	452.3	400.5	367.3	343.6	325.3	298.4	5.2	60
	270	547.8	493.0	446.7	395.5	362.8	339.3	321.3	294.7	5.0	60
※20	180	256.6	230.9	230.9	208.5	191.3	178.9	169.4	155.4	3.4	52
	210	319.2	287.3	285.1	252.4	231.5	216.5	205.0	188.1	3.7	52
	240	446.6	401.9	386.6	342.3	314.0	293.7	278.1	255.1	4.3	52
	270	461.2	415.1	379.2	335.8	308.0	288.1	272.8	250.2	4.2	52
※24	180	389.9	326.1	264.9	234.4	215.2	201.2	190.5	174.8	3.3	47
	210	409.5	319.1	259.2	301.0	210.6	196.9	186.4	171.0	3.2	47
	240	423.9	312.0	253.4	224.4	205.8	192.5	182.2	167.2	3.1	47
	270	512.3	376.4	305.7	270.7	248.3	232.2	219.9	201.7	3.4	47
※32	180	310.7	279.6	279.6	279.6	279.6	175.3	166.0	152.3	2.6	40
	210	324.9	292.4	292.4	292.4	292.4	171.2	162.1	148.7	2.6	40
	240	335.2	301.7	301.7	301.7	282.5	167.1	158.2	145.1	2.6	40
	270	342.9	308.6	308.6	300.6	275.8	163.1	154.4	141.7	2.5	40

PS ※2DWELL

DS.DF series technical support seek information table

Disk driving:☐

1·Number of divisions (How many workstations is necessary): _____

2·Angle of input shaft driven output shaft motion: _____ Degree

3·Input shaft rotation speed per minute: _____RPM

4·Disc diameter:_____ mm ; Thickness:_____ mm ; Material: _____

5·Weight of each group fixture:_____kg

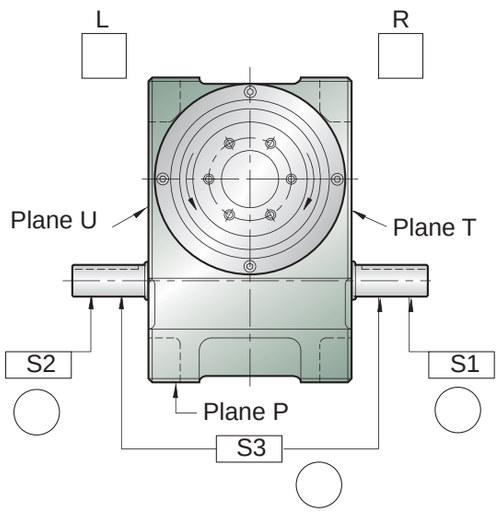
6·Weight of each group workpiece:_____kg

7·Pitch of circle diameter as fixed fixture and workpiece:_____mm

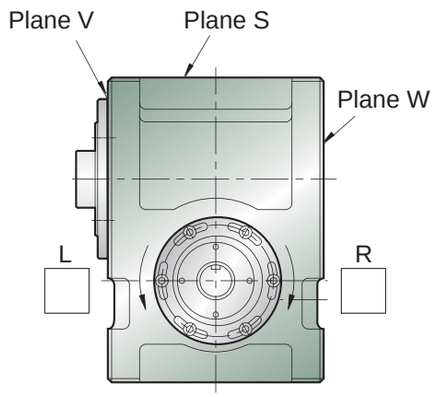
8·Whether there is support at the bottom of the disc? _____mm(Radius of the supporter)

Splitter mounting surface P____ S____ T____ U____ V____ W____

Please check the output shaft rotation direction



Please check the needs of input shaft on which side.
Just stay on the right S1, leaving only the left S2,
both sides have to be.



Please check the input shaft rotation direction

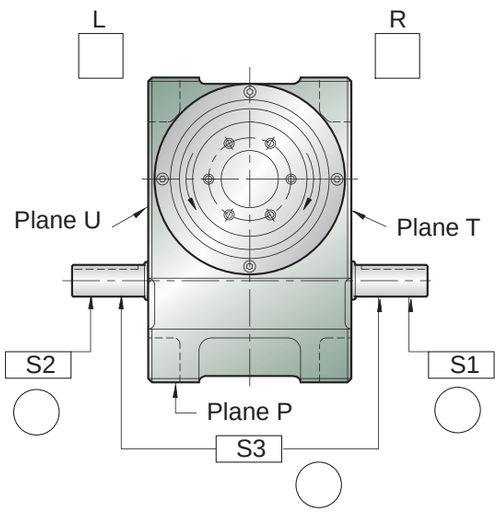
DS.DF series technical support seek information table

Conveyor driving:☐

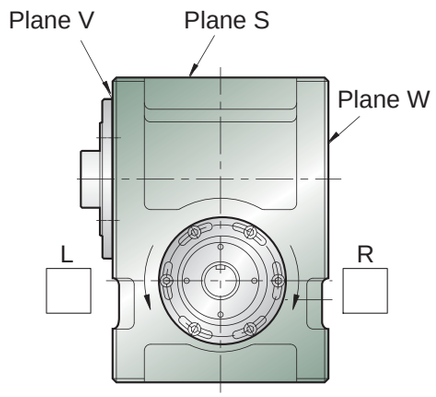
1. Number of divisions (How many workstations is necessary): _____
2. Angle of input shaft driven output shaft motion: _____ degree
3. Input shaft rotation speed per minute: _____ RPM
4. Pitch of conveyer belt: _____ mm
5. Pitch circle diameter of driving wheel: _____ mm; weight: _____ kg
6. Pitch circle diameter of follower wheel: _____ mm; weight: _____kg
7. Diameter of transmission shaft: mm; weight: _____ kg;
   Quantity: _____ piece
8. Pitch circle diameter of the sprocket wheel: _____ mm; weight: _____ kg;
   Quantity: _____ set
9. Weight of chain: _____ kg; Quantity: _____ set
10. Weight of each fixture set: _____ kg; Quantity: _____set
11. Weight of each workpiece set: _____ kg; Quantity: _____ set

Splitter mounting surface P____ S____ T____ U____ V____ W____

Please check the output shaft rotation direction



Please check the needs of input shaft on which side.
Just stay on the right S1, leaving only the left S2,
both sides have to be.



Please check the input shaft rotation direction

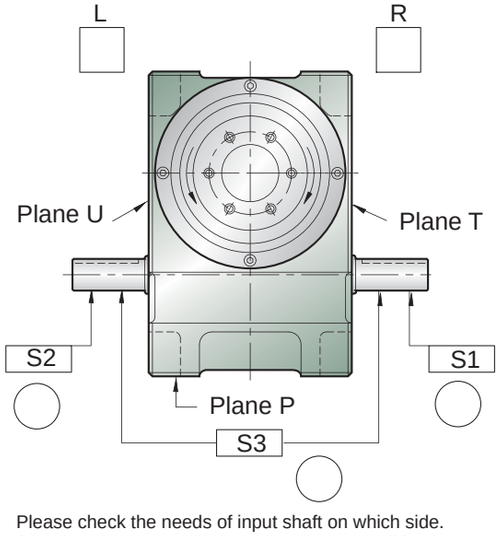
DS.DF series technical support seek information table

Indirect driven by gear:☐

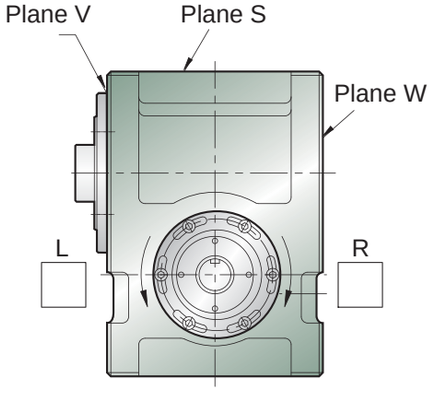
1. Number of divisions (How many workstations is necessary): _____
2. Angle of input shaft driven output shaft motion: _____ degree
3. Input shaft rotation speed per minute: _____ RPM
4. Pitch circle diameter of driving wheel: _____ mm; weight: _____ kg
5. Pitch circle diameter of follower wheel: _____ mm; weight: _____ kg
6. Weight of each fixture set: _____ kg; Quantity: _____ set
7. Weight of each workpiece set: _____ kg; Quantity: _____ set
8. Pitch of circle diameter as fixed fixture: _____ mm
9. Whether there is support at the bottom of the disc: _____ mm (Radius of the supporter)

Splitter mounting surface P____ S____ T____ U____ V____ W____

Please check the output shaft rotation direction



Please check the needs of input shaft on which side.
Just stay on the right S1, leaving only the left S2,
both sides have to be.

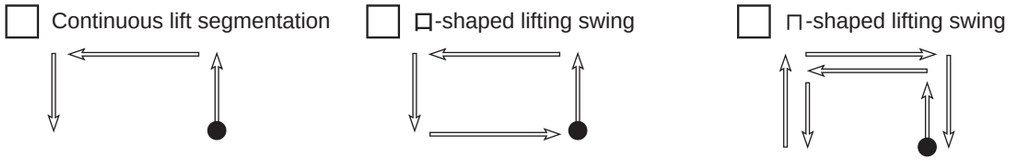


Please check the input shaft rotation direction

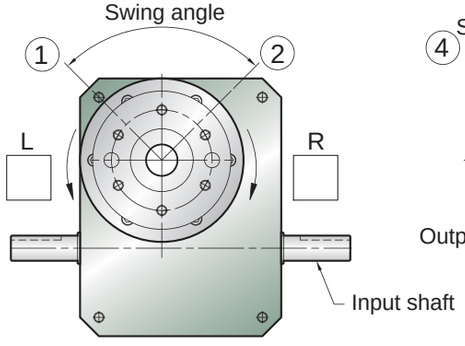
DH series technical support seek information table

1·Select the timing of the action

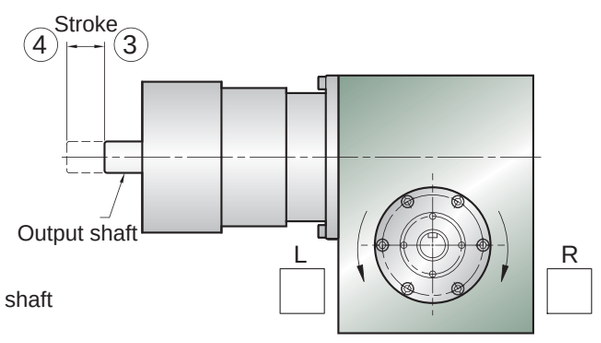
☐ Continuous lift segmentation ☐ ☐-shaped lifting swing ☐ ⊓-shaped lifting swing



2. Number of divisions (How many workstations is necessary): _____
Swing angle: _____ degree(Less than 90 degrees)
3. Lifting stroke: _____ mm
4. Input shaft rotation speed per minute: _____ RPM
5. Load conditions
Rocker length: _____ mm width: _____ mm thickness: _____ mm Material: _____
Disc diameter: _____ mm thickness: _____ mm Material: _____
Weight of each fixture set: _____ kg Quantity: _____ set
Weight of each workpiece set: _____ kg Quantity: _____ set
Pitch of circle diameter as fixed fixture and workpiece: _____ mm

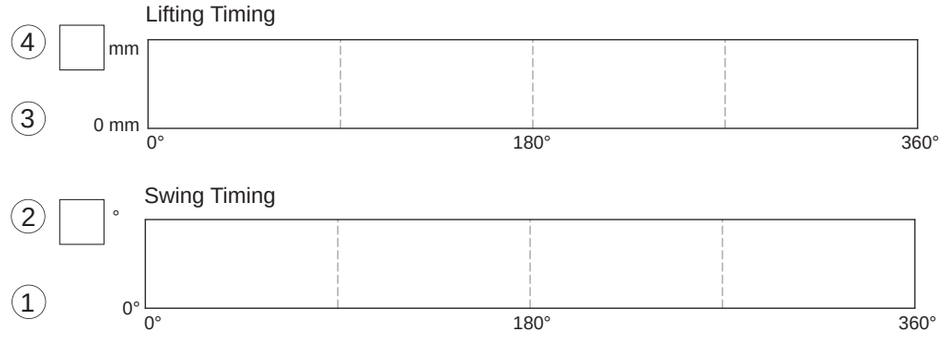


Please check the output shaft rotation direction



Please check the input shaft rotation direction

Actuation curve timing table



Paradex Model

PU 50DS, 60DS, 65DS, 80DS, 100DS, 125DS, 150DS, 175DS, 225DS, 250DS, 320DS, 400DS

It consists of 2 plate cams fixed to the input shaft and a spider that supports the cam follower to the output shaft. This indexing drive has a plane cam mechanism designed so that the follower contacting the 2 plate cams on the input side serves to transmit rotation to the spider of the output shaft. Best suited for driving conveyors moving at large feed pitches or for intermittent indexing that stops at comparatively long intervals. The another is 3 plate cams designed as heavy load type. It more suits for conveyor rapid moving, stop at more long intervals and larger feed pitches.

Input and Output Data

PU50 / 60 / 65 / 80 / 100 / 125 / 150 Type

Motion curve \ Number of stops	1	2	3	4	5	6	8	10	12	16
90				●						
120				●						
150			●	●						
180		●	●	●		●	●			
210		●	●	●		●	●			
240		●	●	●		●	●			
270	●	●	●	●		●	●			
300	●	●	●	●		●	●			
330	●	●	●	●		●	●			
360	●	●	●	●		●	●			

PU175 Type

Motion curve \ Number of stops	1	2	3	4	5	6	8	10	12	16
90				●	●					
120				●	●					
150			●	●	●					
180		●	●	●	●	●	●	●	●	
210		●	●	●	●	●	●	●	●	
240		●	●	●	●	●	●	●	●	
270	●	●	●	●	●	●	●	●	●	
300	●	●	●	●	●	●	●	●	●	
330	●	●	●	●	●	●	●	●	●	
360	●	●	●	●	●	●	●	●	●	

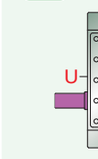
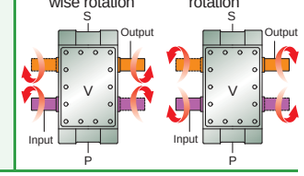
PU225 / 250 / 320 / 400 Type

Motion curve \ Number of stops	1	2	3	4	5	6	8	10	12	16
90				●	●					
120				●	●					
150			●	●	●					
180		●	●	●	●	●	●	●	●	●
210		●	●	●	●	●	●	●	●	●
240		●	●	●	●	●	●	●	●	●
270	●	●	●	●	●	●	●	●	●	●
300	●	●	●	●	●	●	●	●	●	●
330	●	●	●	●	●	●	●	●	●	●
360	●	●	●	●	●	●	●	●	●	●

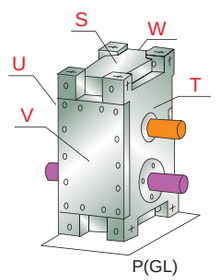
Model Code

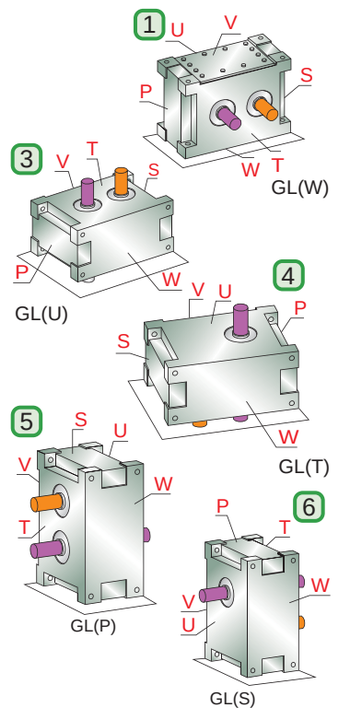
P - 080 S 01 270 2 A S12 W 1 X

a b c d e f g h i j k

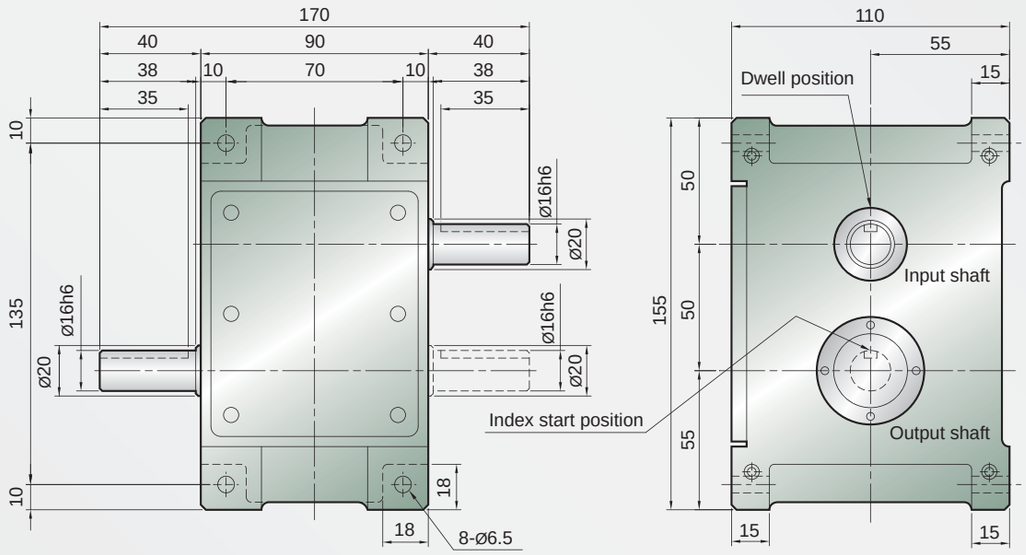
a Model	b Size	c Type	d Number of Stops (s)	e Index Period (θh)	f Motion Curve	g Hand of Cam
PU Paradex	080 80mm	S Type	01 1 stop	270 270°	2 MS Curve	A 1 Dwell Right Hand Cam
	Center distance 50/60/65/80/100/125/150/175/225/250/320/400	S Shaft Type	Number of stops of the Indexing Drive 1.2.3.4.6.8	Cam rotation period (during which the output moves.) 90°/120° 150°/180° 210°/240° 270°/300°	1 MT (Modified Traprzoid) 2 MS (Modified Sine) 3 MCV50 (Modified Constant Veiocity 50) 4 RBS (Rational B-Splines)	A Counter clock wise rotation / B Clock wise rotation 

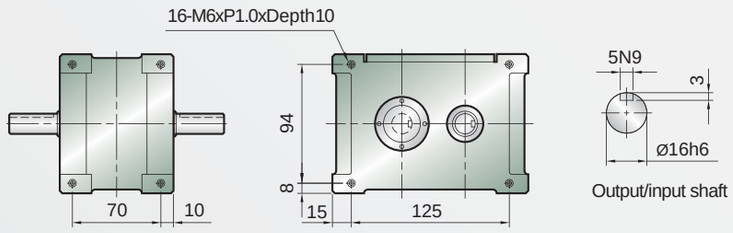
h Input Shaft Projection	i Mounting Holes	j Mounting Position	x Special Instructions
S12 Both T and U Surface	W	1	X
Select the output/ input shaft location of the assembly box S11 Output/ input shaft at plane T S21 Output shaft at plane U, input shaft at plane T S12 Output shaft at plane T, input shaft at plane U S22 Output/ input shaft at plane U S13 Output shaft at plane T, input shaft cross plane T/U S23 Output shaft at plane U, input shaft cross plane T/U	On 6 surfaces of the main housing body with six fixing holes for mounting screws，" W" shows the style of installation pattern.	Mounting position as shown below.	Include the symbol "X" in case of special instructions. Standard (No symbols) X Special Instructions





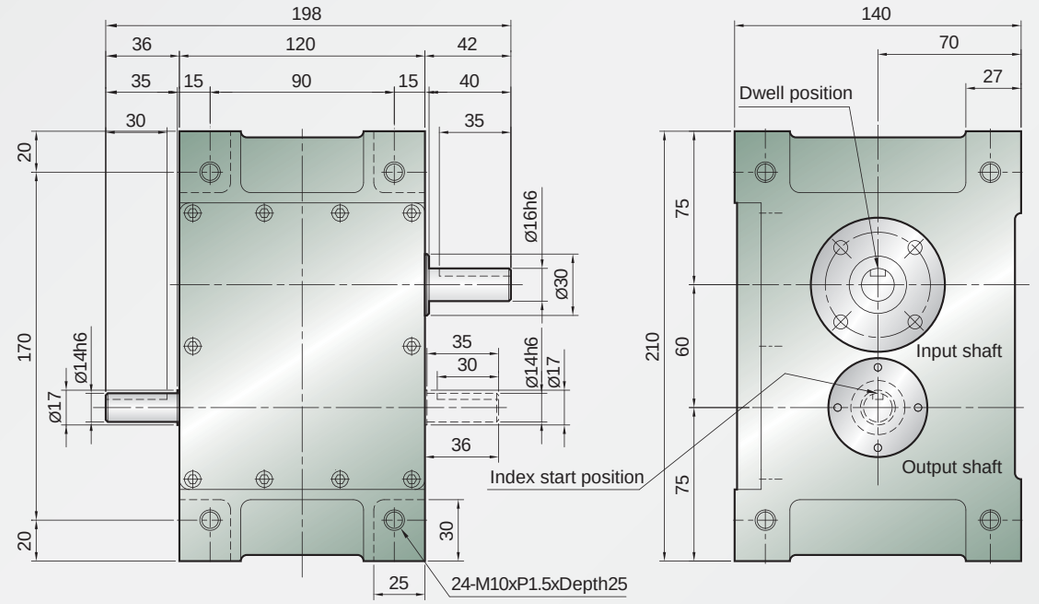
PU50DS

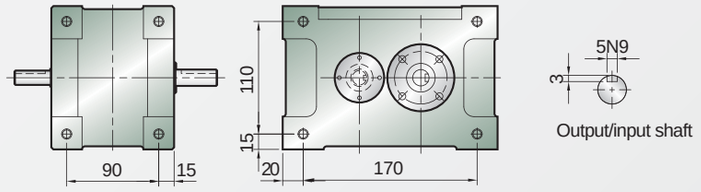




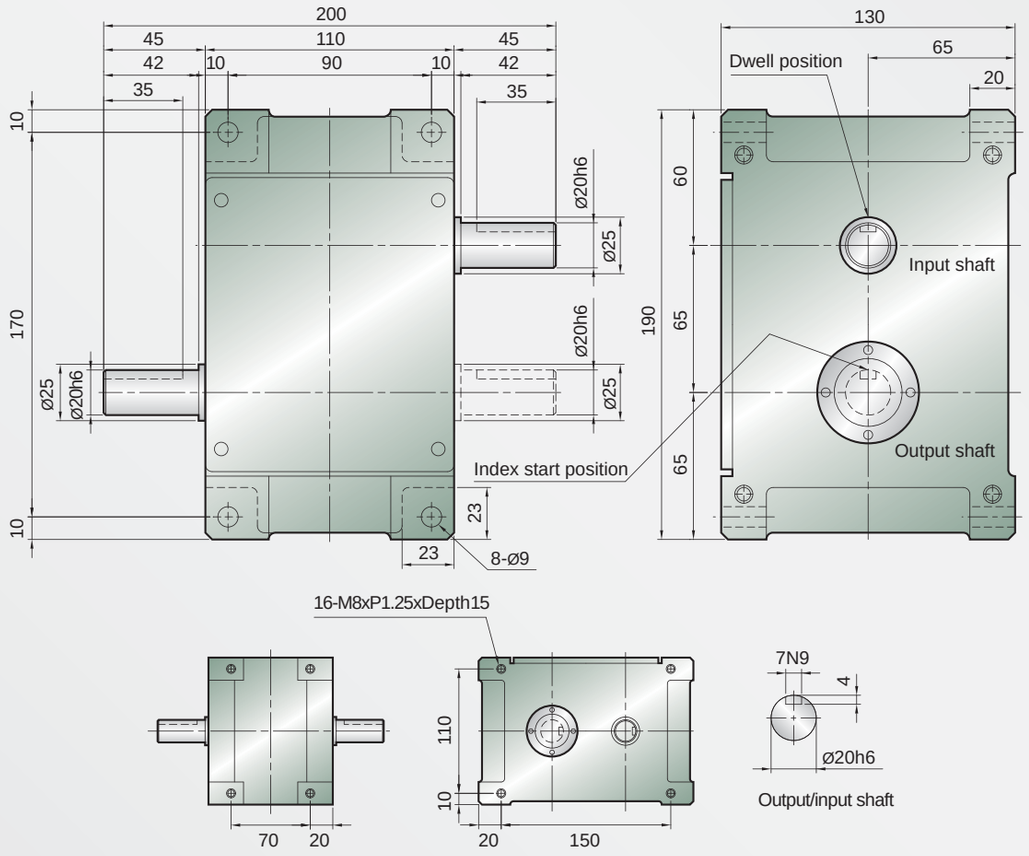
Item	Sym-bol	Unit	Value
Allowable thrust load on output shaft	P1	kgf	130
Allowable radial load on output shaft	P2	kgf	100
Allowable torque on output shaft	Ts	kgf-m	Refer torque table
Output shaft rotary rigid	K1	kgf-m/rad	4.4×10^2
Input shaft allowable axial stress	P4	kgf	130
Allowable thrust load on input shaft	P5	kgf	100
Allowable torque	P6	kgf-m	6
Input shaft rotary rigid	K2	$kgf\text{-}m^2$	4.4×10^2
1DWELL segmentation accuracy		sec.	±72
2DWELL segmentation accuracy		sec.	±144
Repeat positioning accuracy		sec.	72
Weight		kg	7

PU60DS



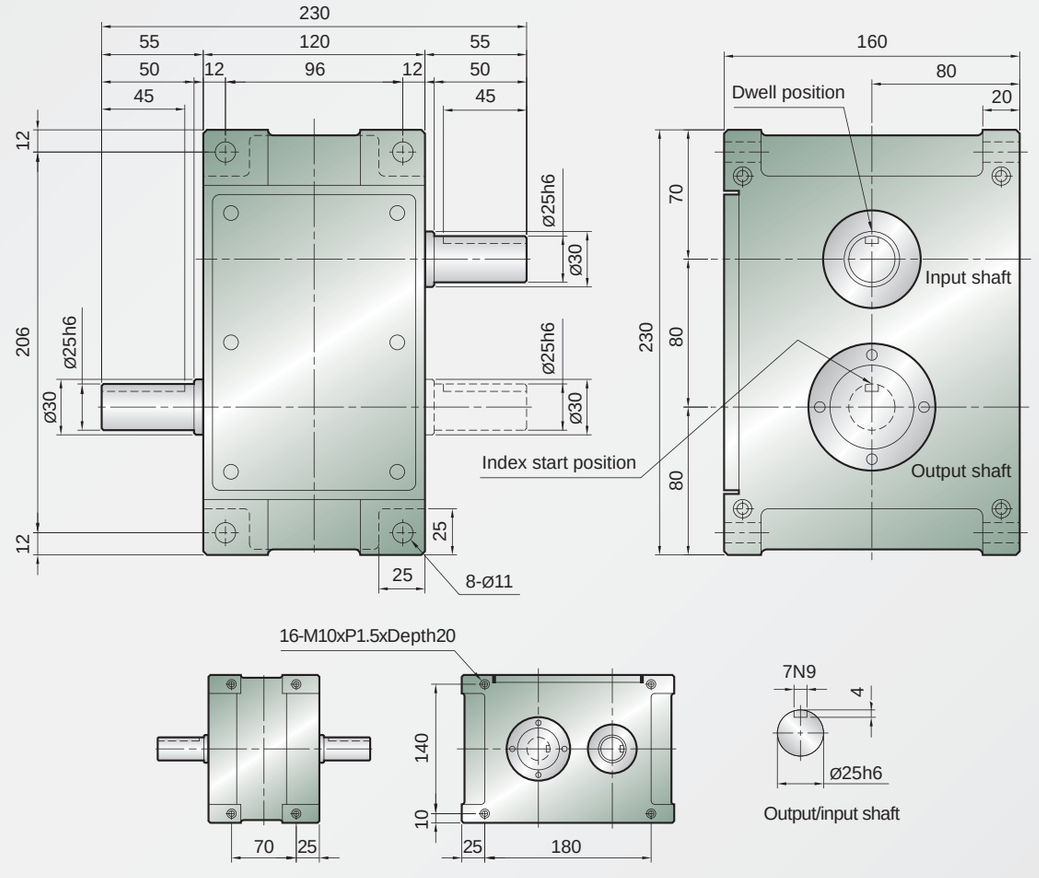


Item	Sym-bol	Unit	Value
Allowable thrust load on output shaft	P1	kgf	190
Allowable radial load on output shaft	P2	kgf	130
Allowable torque on output shaft	Ts	kgf-m	Refer torque table
Output shaft rotary rigid	K1	kgf-m/rad	6.8×10^2
Input shaft allowable axial stress	P4	kgf	190
Allowable thrust load on input shaft	P5	kgf	130
Allowable torque	P6	kgf-m	8.5
Input shaft rotary rigid	K2	$kgf\text{-}m^2$	6.8×10^2
1DWELL segmentation accuracy		sec.	±60
2DWELL segmentation accuracy		sec.	±120
Repeat positioning accuracy		sec.	60
Weight		kg	16



Item	Sym-bol	Unit	Value
Allowable thrust load on output shaft	P1	kgf	250
Allowable radial load on output shaft	P2	kgf	160
Allowable torque on output shaft	Ts	kgf-m	Refer torque table
Output shaft rotary rigid	K1	kgf-m/rad	9.2×10^2
Input shaft allowable axial stress	P4	kgf	250
Allowable thrust load on input shaft	P5	kgf	160
Allowable torque	P6	kgf-m	11
Input shaft rotary rigid	K2	kgf-m^2	9.2×10^2
1DWELL segmentation accuracy		sec.	±60
2DWELL segmentation accuracy		sec.	±120
Repeat positioning accuracy		sec.	60
Weight		kg	15

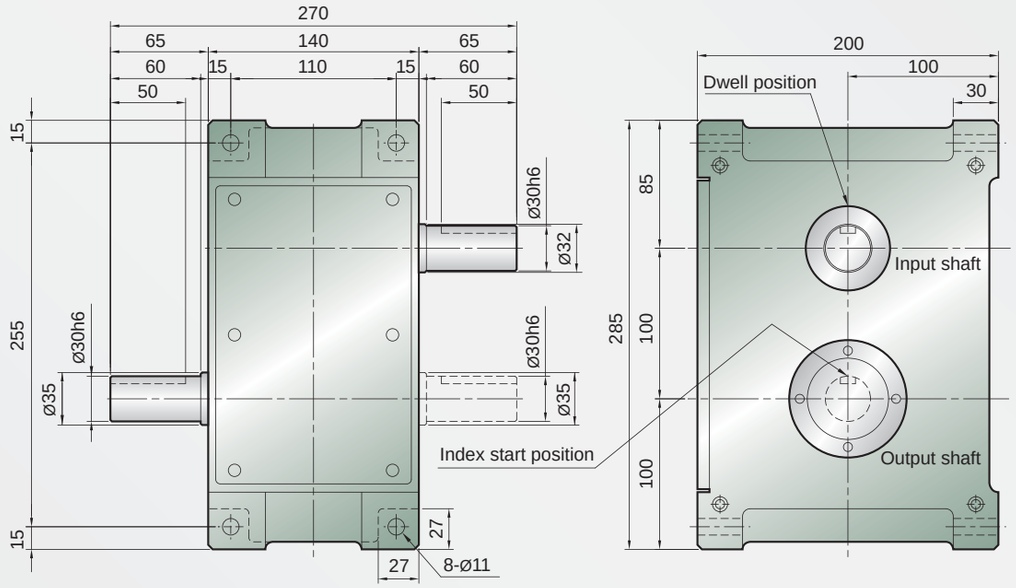
PU65DS

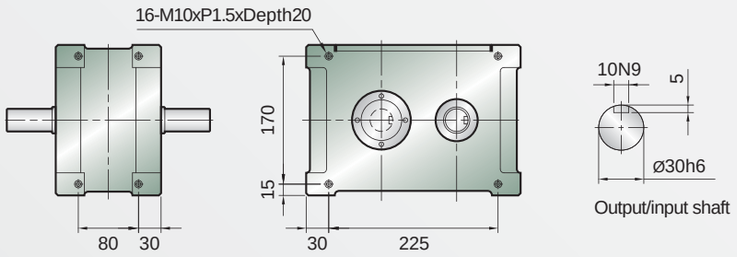


Item	Sym-bol	Unit	Value
Allowable thrust load on output shaft	P1	kgf	360
Allowable radial load on output shaft	P2	kgf	250
Allowable torque on output shaft	Ts	kgf-m	Refer torque table
Output shaft rotary rigid	K1	kgf-m/rad	1.85×10^3
Input shaft allowable axial stress	P4	kgf	360
Allowable thrust load on input shaft	P5	kgf	250
Allowable torque	P6	kgf-m	8.5
Input shaft rotary rigid	K2	kgf-m^2	1.85×10^3
1DWELL segmentation accuracy		sec.	±60
2DWELL segmentation accuracy		sec.	±120
Repeat positioning accuracy		sec.	60
Weight		kg	20

PU80DS

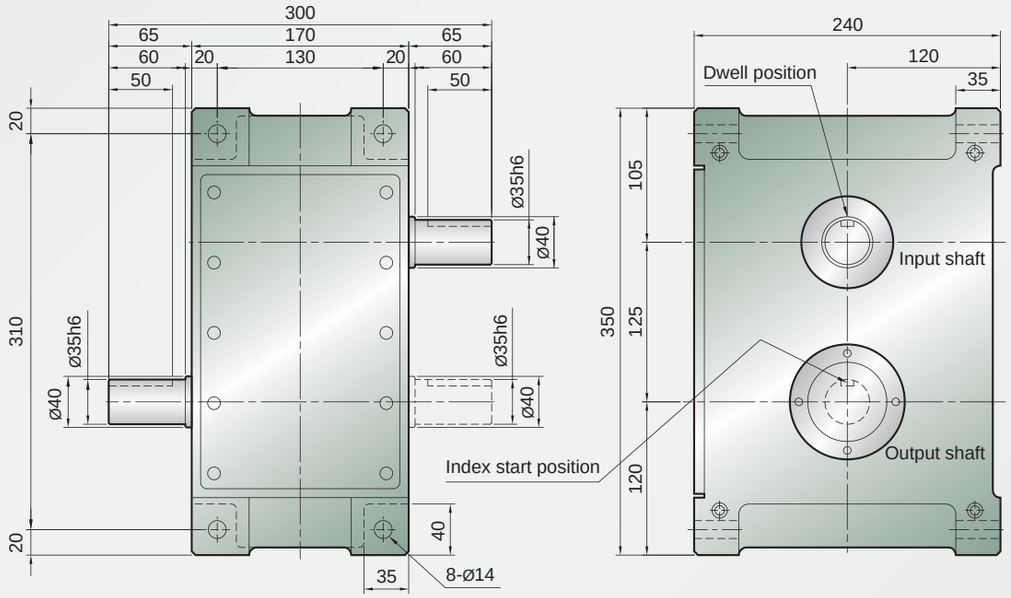
PU100DS

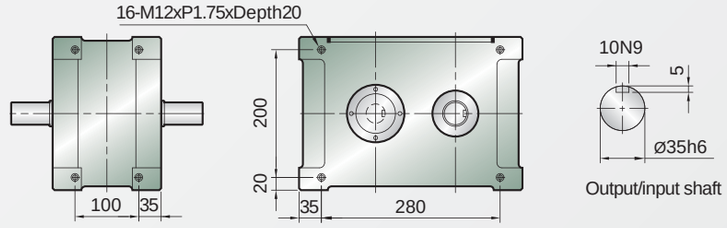




Item	Sym-bol	Unit	Value
Allowable thrust load on output shaft	P1	kgf	360
Allowable radial load on output shaft	P2	kgf	250
Allowable torque on output shaft	Ts	kgf-m	Refer torque table
Output shaft rotary rigid	K1	kgf-m/rad	1.85 x 10^3
Input shaft allowable axial stress	P4	kgf	360
Allowable thrust load on input shaft	P5	kgf	250
Allowable torque	P6	kgf-m	8.5
Input shaft rotary rigid	K2	kgf-m^2	1.85 x 10^3
1DWELL segmentation accuracy		sec.	±60
2DWELL segmentation accuracy		sec.	±120
Repeat positioning accuracy		sec.	60
Weight		kg	20

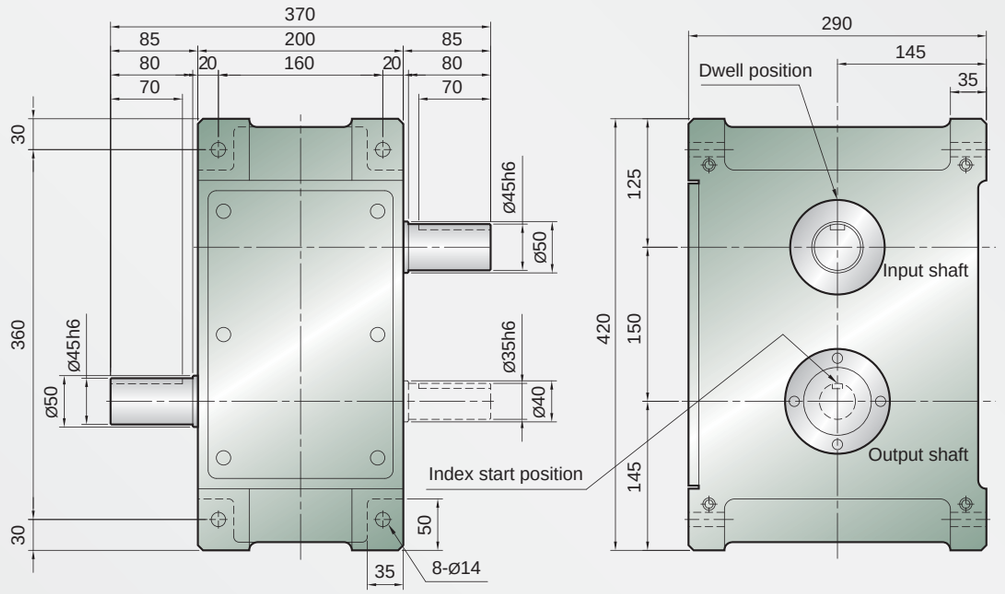
PU125DS

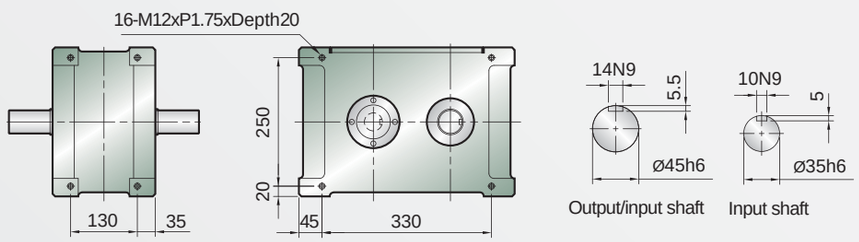




Item	Sym-bol	Unit	Value
Allowable thrust load on output shaft	P1	kgf	520
Allowable radial load on output shaft	P2	kgf	630
Allowable torque on output shaft	Ts	kgf-m	Refer torque table
Output shaft rotary rigid	K1	kgf-m/rad	5.03 x 10^3
Input shaft allowable axial stress	P4	kgf	520
Allowable thrust load on input shaft	P5	kgf	630
Allowable torque	P6	kgf-m	65
Input shaft rotary rigid	K2	kgf-m^2	5.03 x 10^3
1DWELL segmentation accuracy		sec.	±60
2DWELL segmentation accuracy		sec.	±120
Repeat positioning accuracy		sec.	60
Weight		kg	65

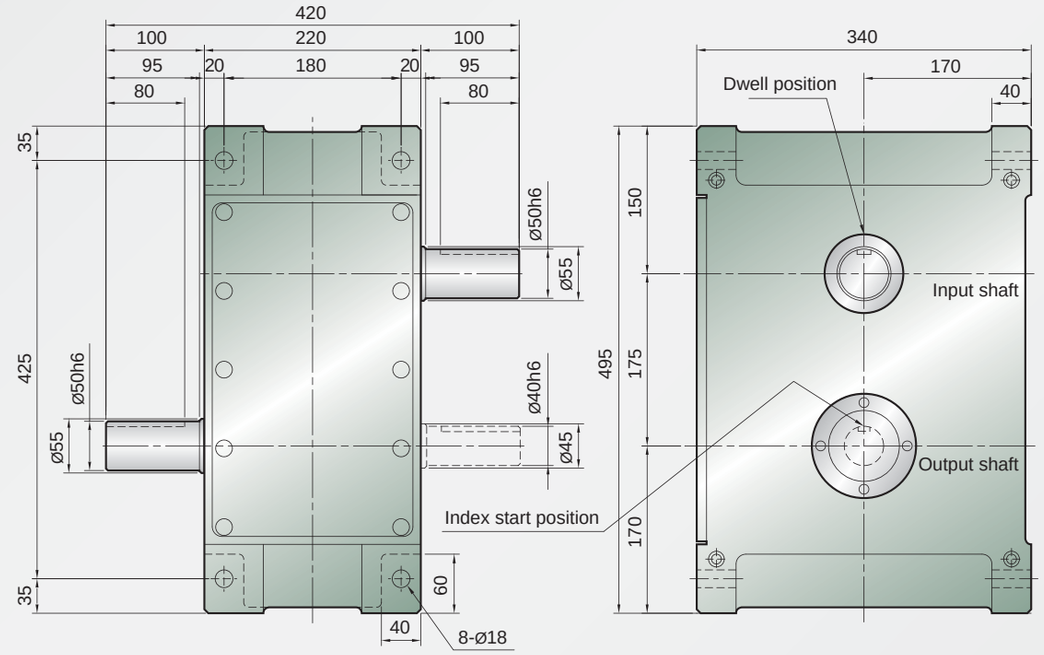
PU150DS

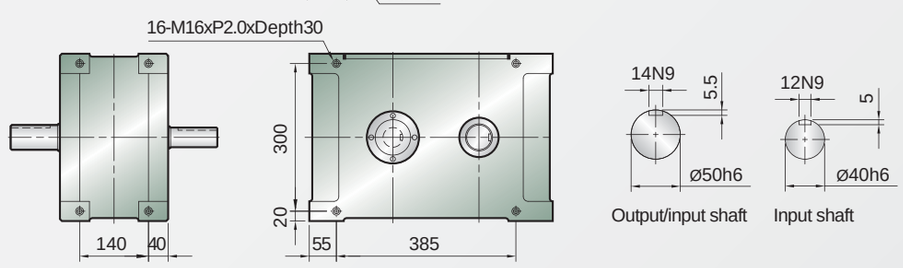




Item	Sym-bol	Unit	Value
Allowable thrust load on output shaft	P1	kgf	750
Allowable radial load on output shaft	P2	kgf	860
Allowable torque on output shaft	Ts	kgf-m	Refer torque table
Output shaft rotary rigid	K1	kgf-m/rad	1.8 x 10^4
Input shaft allowable axial stress	P4	kgf	750
Allowable thrust load on input shaft	P5	kgf	880
Allowable torque	P6	kgf-m	135
Input shaft rotary rigid	K2	$kgf-m^2$	1.8 x 10^4
1DWELL segmentation accuracy		sec.	±60
2DWELL segmentation accuracy		sec.	±120
Repeat positioning accuracy		sec.	60
Weight		kg	87

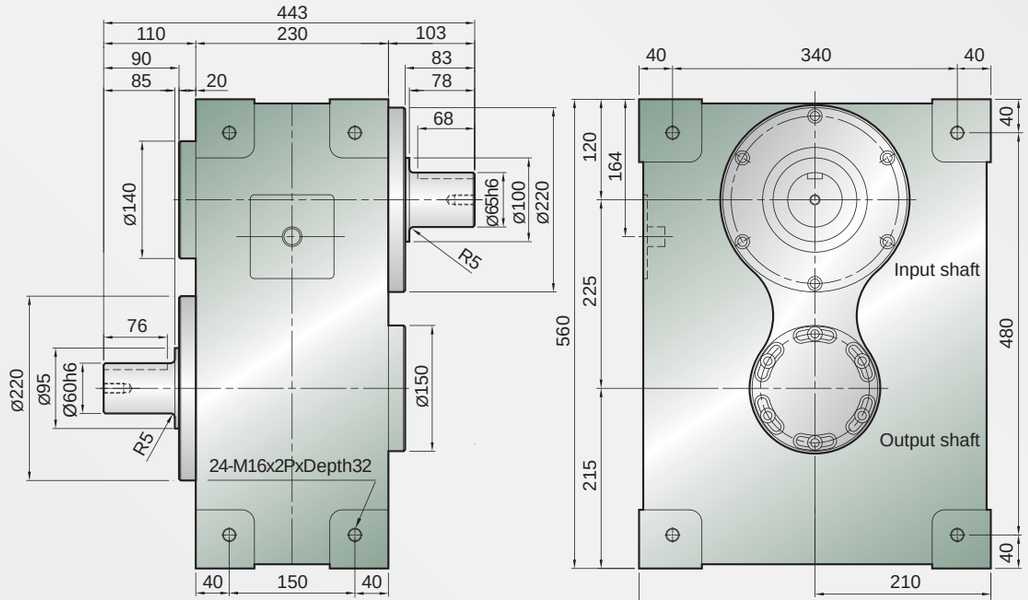
PU175DS

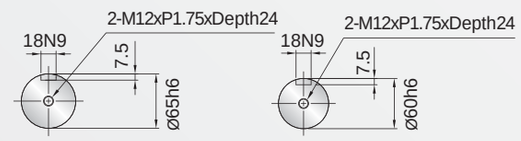




Item	Sym-bol	Unit	Value
Allowable thrust load on output shaft	P1	kgf	920
Allowable radial load on output shaft	P2	kgf	1000
Allowable torque on output shaft	Ts	kgf-m	Refer torque table
Output shaft rotary rigid	K1	kgf-m/rad	1.68 x 10^4
Input shaft allowable axial stress	P4	kgf	920
Allowable thrust load on input shaft	P5	kgf	1000
Allowable torque	P6	kgf-m	185
Input shaft rotary rigid	K2	$kgf-m^2$	1.68 x 10^4
1DWELL segmentation accuracy		sec.	±60
2DWELL segmentation accuracy		sec.	±120
Repeat positioning accuracy		sec.	60
Weight		kg	127

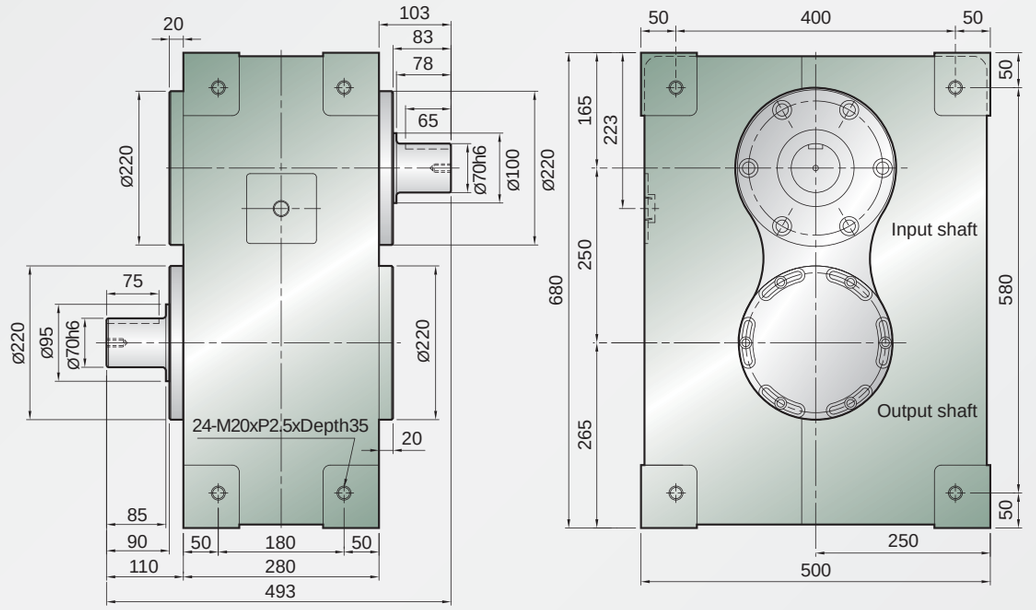
PU225DS

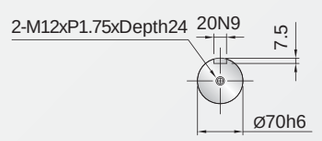




Item	Sym-bol	Unit	Value
Allowable thrust load on output shaft	P1	kgf	1435
Allowable radial load on output shaft	P2	kgf	1470
Allowable torque on output shaft	Ts	kgf-m	Refer torque table
Output shaft rotary rigid	K1	kgf-m/rad	4.31×10^4
Input shaft allowable axial stress	P4	kgf	1435
Allowable thrust load on input shaft	P5	kgf	2150
Allowable torque	P6	kgf-m	410
Input shaft rotary rigid	K2	$kgf-m^2$	4.31×10^4
1DWELL segmentation accuracy		sec.	±60
2DWELL segmentation accuracy		sec.	±120
Repeat positioning accuracy		sec.	60
Weight		kg	220

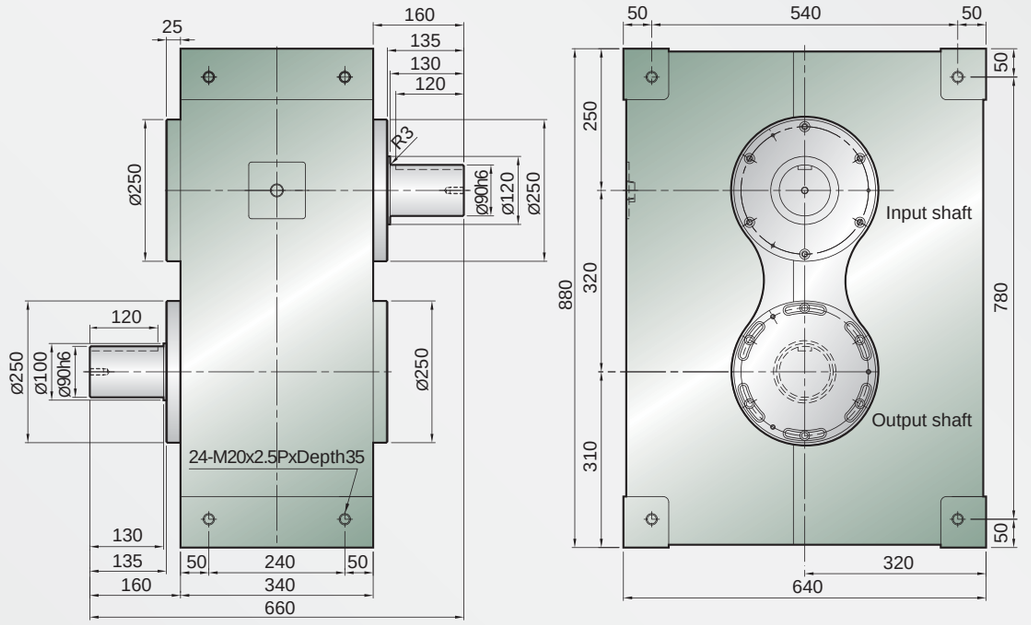
PU250DS

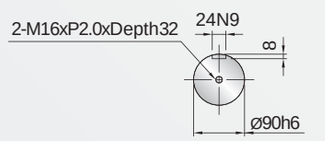




Item	Sym-bol	Unit	Value
Allowable thrust load on output shaft	P1	kgf	1550
Allowable radial load on output shaft	P2	kgf	1560
Allowable torque on output shaft	Ts	kgf-m	Refer torque table
Output shaft rotary rigid	K1	kgf-m/rad	5.37×10^4
Input shaft allowable axial stress	P4	kgf	1550
Allowable thrust load on input shaft	P5	kgf	2400
Allowable torque	P6	kgf-m	500
Input shaft rotary rigid	K2	$kgf-m^2$	5.37×10^{-4}
1DWELL segmentation accuracy		sec.	±60
2DWELL segmentation accuracy		sec.	±120
Repeat positioning accuracy		sec.	60
Weight		kg	388

PU320DS

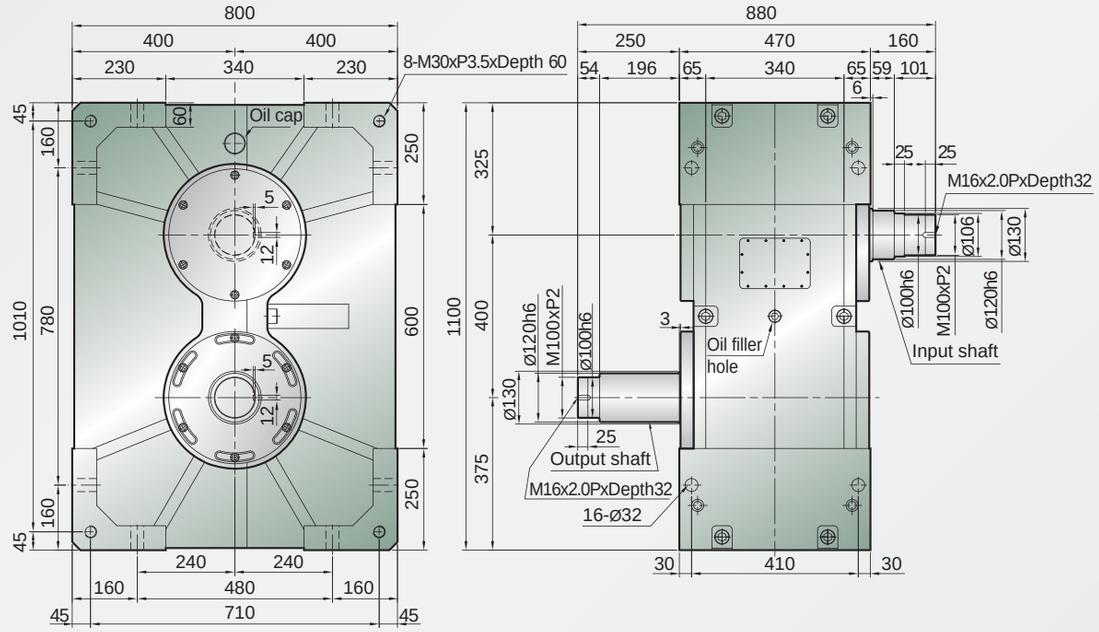




Output/input shaft

Item	Sym-bol	Unit	Value
Allowable thrust load on output shaft	P1	kgf	1720
Allowable radial load on output shaft	P2	kgf	1775
Allowable torque on output shaft	Ts	kgf-m	Refer torque table
Output shaft rotary rigid	K1	kgf-m/rad	5.82 x 10^4
Input shaft allowable axial stress	P4	kgf	1690
Allowable thrust load on input shaft	P5	kgf	2670
Allowable torque	P6	kgf-m	580
Input shaft rotary rigid	K2	kgf-m^2	5.82 x 10^4
1DWELL segmentation accuracy		sec.	±60
2DWELL segmentation accuracy		sec.	±120
Repeat positioning accuracy		sec.	60
Weight		kg	750

PU400DS



Item	Sym-bol	Unit	Value
Allowable thrust load on output shaft	P1	kgf	2968
Allowable radial load on output shaft	P2	kgf	3398
Allowable torque on output shaft	Ts	kgf-m	Refer torque table
Output shaft rotary rigid	K1	kgf-m/rad	6.35 x 10^4
Input shaft allowable axial stress	P4	kgf	2968
Allowable thrust load on input shaft	P5	kgf	6698
Allowable torque	P6	kgf-m	692
Input shaft rotary rigid	K2	kgf-m^2	6.85 x 10^4
1DWELL segmentation accuracy		sec.	±60
2DWELL segmentation accuracy		sec.	±120
Repeat positioning accuracy		sec.	60
Weight		kg	1000

PU type index drive torque transmission capability table view

(1) Opinion of transmission capability (index drive torque)

- In the torque transmission capacity table, it shows the internal inertia load torque Toi, dynamic rated output torque Top.
- In the assembly and lubrication of all normal operating conditions, the life time of a desired substantially designed for standard, also affect the transmission capacity and life.
- In addition, select models of the time, if the wrong torque transmission capacity table view, it can't properly be selected, so please note the following instructions.

Select data

Stops (S)..... 1
Index period (θ)..... 270deg
Motion Curve ..... MCV50(curve code3)
Input shaft rotating speed (N)..... 50rpm

Stops S	Index period θ (deg)	Motion curve	Code	Static torque Ts (kgf-m)	Up / Down	Dynamic rated output torque (kgf-m) Internal inertia load torque (kgf-m) Input shaft rotating speed N (rpm) 50	75	100	150	200	300	Cam shaft friction torque Tx (kgf-m)	Output shaft inertia GD² (kgf-m²)	Roller ø (mm)
1	270	MCV 50	P050 0127 3	3.68		1.35	1.20	1.10	0.97	0.89		0.13	0.0009	18
						0.01	0.01	0.01	0.02	0.03	0.79			
			P065 0127 3	7.81		3.13	2.77	2.54	2.25	2.06	0.05	0.26	0.0026	16
						0.01	0.01	0.02	0.04	0.07	1.83			
			P080 0127 3	15.06		6.28	5.56	5.10	4.51	4.14	0.15	0.40	0.0062	16
						0.01	0.03	0.04	0.09	0.16	3.66			
						10.58	9.37	8.59	7.61	6.98	0.35	0.60		

● When you need a quick start or emergency stop

In this case, the torque generated start stop torque Td please select smaller than the static nominal output torque.

● When selecting transmission and motors

Camshaft Tc must be determined. When calculated Tc, need camshaft friction torque.

● Other cam curve

Please contact us.

● Choice of models

Contrast must torque Tt and dynamic torque rated output Top, please select Tt<(Top-Toi).

Drive torque transmission capability index table PU type

Note:

Various record in order of stops, index period, curve code, model type size.
Motion curve -------MS (curve code2)
MCV50 (curve code3)
MCV25 (curve code5)

Stops S	Index period θ (deg)	Motion curve	Code	Static torque Ts (kgf-m)	Up / Down	Dynamic rated output torque (kgf-m) Internal inertia load torque (kgf-m) Input shaft rotating speed N (rpm) 50	75	100	150	200	300	Cam shaft friction torque Tx (kgf-m)	Output shaft inertia GD² (kgf-m²)	Roller ø (mm)
1	270	MCV 50	P050 0127 3	3.68		1.35	1.20	1.10	0.97	0.89	0.79	0.13	0.0009	16
						0.01	0.01	0.01	0.02	0.03	0.05			
			P060 0127 3	5.83		2.61	2.43	1.96	1.57	1.50	1.32	0.19	0.0014	16
						0.01	0.01	0.01	0.03	0.04	0.07			
			P065 0127 3	7.81		3.13	2.77	2.54	2.25	2.06	1.83	0.26	0.0026	16
						0.01	0.01	0.02	0.04	0.07	0.15			
			P080 0127 3	15.06		6.28	5.56	5.10	4.51	4.14	3.66	0.40	0.0062	22
						0.01	0.03	0.04	0.09	0.16	0.35			
			P100 0127 3	25.90		10.58	9.37	8.59	7.61	6.98	6.18	0.60	0.018	26
						0.03	0.07	0.12	0.26	0.46	1.03			
			P125 0127 3	38.94		17.79	15.75	14.45	12.79	11.74	10.39	0.83	0.057	35
						0.10	0.21	0.37	0.82	1.45	3.26			
			P150 0127 3	58.35		26.24	23.24	21.32	18.87	17.31	15.33	1.22	0.126	40
						0.20	0.45	0.80	1.80	3.20	7.19			
			P175 0127 3	91.50		41.38	36.64	33.61	29.76	27.30		1.69	0.259	47
						0.42	0.93	1.65	3.70	6.57				
			P225 0127 3	256.91		125.61	101.34	95.60	87.52	81.25		3.60	0.872	60
						1.25	2.74	4.83	8.67	17.52				
			P250 0127 3	339.24		140.93	124.79	114.47	101.36	92.98		4.45	1.225	80
						1.95	4.37	7.77	17.4	31.07				
			P320 0127 3	611.11		253.88	224.81	206.22	182.60			8.80	3.814	100
						6.05	13.61	24.19	54.41					
	300	MS	P050 0130 2	3.26		1.16	1.03	0.94	0.83	0.76	0.68	0.15	0.0009	16
						0.01	0.01	0.01	0.01	0.02	0.03			
			P060 0130 2	5.61		2.32	2.15	1.87	1.41	1.28	1.12	0.21	0.0014	16
						0.01	0.01	0.01	0.02	0.03	0.05			
			P065 0130 2	7.04		2.73	2.42	2.22	1.96	1.80	1.59	0.30	0.0026	16
						0.01	0.01	0.01	0.03	0.04	0.09			
			P080 0130 2	13.56		5.47	4.84	4.44	3.93	3.61	3.19	0.46	0.0060	22
						0.01	0.02	0.03	0.05	0.09	0.19			
			P100 0130 2	23.31		9.23	8.17	7.49	6.63	6.08	5.39	0.68	0.0175	26
						0.02	0.04	0.07	0.14	0.25	0.56			
		MCV 50	P050 0130 3	3.89		1.38	1.23	1.12	0.99	0.91	0.81	0.12	0.0009	16
						0.01	0.01	0.01	0.01	0.02	0.04			

Stops S	Index period θ (deg)	Motion curve	Code	Static torque Ts (kgf-m)	Dynamic rated output torque (kgf-m) Up / Down / Internal inertia load torque (kgf-m) — Input shaft rotating speed N (rpm) 50	75	100	150	200	300	Cam shaft friction torque Tx (kgf-m)	Output shaft inertia GD² (kgf-m²)	Roller ø (mm)
1	300	MCV 50	P060 0130 3	5.24	2.82	2.64	2.47	2.13	1.96	1.62	0.17	0.0014	16
					0.01	0.01	0.02	0.03	0.04	0.08			
			P065 0130 3	8.24	3.20	2.83	2.60	2.30	2.11	1.87	0.24	0.0026	16
					0.01	0.01	0.02	0.04	0.06	0.13			
			P080 0130 3	16.14	6.52	5.77	5.29	4.68	4.30	3.80	0.38	0.0063	22
					0.01	0.02	0.04	0.08	0.13	0.30			
			P100 0130 3	25.90	10.25	9.08	8.33	7.37	6.76	5.99	0.57	0.018	26
					0.03	0.06	0.10	0.21	0.37	0.84			
			P125 0130 3	40.71	18.02	15.96	14.64	12.96	11.89	10.53	0.78	0.058	35
					0.08	0.17	0.30	0.68	1.20	2.69			
			P150 0130 3	61.66	26.87	23.79	21.82	19.32	17.72	15.69	1.15	0.129	40
					0.17	0.38	0.67	1.50	2.65	5.97			
			P175 0130 3	97.50	42.73	37.83	34.70	30.73	28.19	24.96	1.60	0.265	47
					0.35	0.77	1.37	3.07	5.45	12.25			
			P225 0130 3	278.41	128.56	104.41	97.25	90.20	83.51		3.71	0.872	60
					1.02	2.63	4.79	11.33	20.12				
			P250 0130 3	356.68	143.57	127.13	116.61	103.26	94.72		4.23	1.260	80
					1.62	3.64	6.48	14.56	25.89				
			P320 0130 3	637.68	256.68	227.28	208.49	184.61	169.34		8.40	3.904	100
					5.02	11.28	20.05	45.11	80.20				
	330	MS	P050 0133 2	3.26	1.13	1.00	0.91	0.81	0.74	0.66	0.14	0.0009	16
					0.01	0.01	0.01	0.01	0.01	0.03			
			P060 0133 2	5.61	2.26	2.07	1.81	1.37	1.21	1.08	0.21	0.0014	16
					0.01	0.01	0.01	0.02	0.02	0.04			
			P065 0133 2	7.04	2.65	2.35	2.15	1.91	1.75	1.55	0.28	0.0026	16
					0.01	0.01	0.01	0.02	0.03	0.07			
			P080 0133 2	13.56	5.32	4.71	4.32	3.82	3.51	3.10	0.43	0.0060	22
					0.01	0.01	0.02	0.04	0.07	0.16			
			P100 0133 2	23.31	8.97	7.94	7.28	6.45	5.91	5.24	0.65	0.0175	26
					0.02	0.03	0.06	0.12	0.21	0.47			
		MCV 50	P050 0133 3	3.89	1.35	1.19	1.09	0.97	0.89	0.78	0.12	0.0009	16
					0.01	0.01	0.01	0.01	0.02	0.04			
			P060 0133 3	6.02	2.32	2.15	1.93	1.42	1.37	1.20	0.19	0.0014	16
					0.01	0.01	0.01	0.02	0.03	0.06			
			P065 0133 3	8.24	3.11	2.75	2.52	2.23	2.05	1.81	0.23	0.0026	16
					0.01	0.01	0.02	0.03	0.05	0.10			
			P080 0133 3	16.14	6.33	5.61	5.14	4.55	4.18	3.70	0.36	0.0063	22
					0.01	0.02	0.03	0.06	0.11	0.24			
			P100 0133 3	29.60	11.39	10.08	9.25	8.19	7.51	6.65	0.53	0.0188	26
					0.02	0.05	0.08	0.18	0.32	0.72			
		MCV 25	P125 0133 5	40.71	17.51	15.51	14.22	12.59	11.55	10.23	0.80	0.058	35
					0.05	0.11	0.20	0.43	0.77	1.72			
			P150 0133 5	60.56	25.64	22.71	20.83	18.44	16.92	14.98	1.18	0.128	40
					0.11	0.24	0.42	0.95	1.68	3.78			
			P175 0133 5	93.75	39.92	35.35	32.43	28.71	26.34	23.32	1.64	0.261	47
					0.22	0.49	0.86	1.93	3.43	7.71			
			P225 0133 5	278.41	126.71	101.69	94.50	86.73	81.20	76.51	3.70	0.872	60
					0.94	1.73	2.56	5.89	10.95	27.31			
			P250 0133 5	356.68	139.52	123.54	113.33	100.35	92.05	81.51	4.32	1.260	80
					1.04	2.33	4.14	9.30	16.53	37.20			
			P320 0133 5	627.05	245.29	217.19	199.23	176.41	161.83		8.58	3.868	100
					3.18	7.14	12.69	28.55	50.75				
2	150	MCV 50	P050 0215 3	3.68	1.37	1.22	1.12	0.99	0.90	0.80	0.12	0.0009	14
					0.01	0.01	0.01	0.02	0.04	0.08			
			P060 0215 3	5.97	2.86	2.45	2.07	1.83	1.59	1.29	0.18	0.0014	16
					0.01	0.01	0.01	0.04	0.07	0.12			
			P065 0215 3	8.24	3.40	3.01	2.76	2.45	2.24	1.99	0.24	0.0026	16
					0.01	0.02	0.03	0.07	0.11	0.25			

Stops S	Index period θ (deg)	Motion curve	Code	Static torque Ts (kgf-m)	Dynamic rated output torque (kgf-m) Up / Down / Internal inertia load torque (kgf-m) — Input shaft rotating speed N (rpm) 50	75	100	150	200	300	Cam shaft friction torque Tx (kgf-m)	Output shaft inertia GD² (kgf-m²)	Roller ø (mm)
2	150	MCV 50	P080 0215 3	15.06	6.08	5.38	4.94	4.37	4.01	3.55	0.38	0.0062	19
					0.02	0.04	0.07	0.15	0.26	0.57			
			P100 0215 3	25.90	10.45	9.25	8.49	7.52	6.89	6.10	0.57	0.018	26
					0.05	0.11	0.19	0.42	0.74	1.67			
			P125 0215 3	38.94	15.96	14.13	12.96	11.48	10.53		0.78	0.057	35
					0.15	0.33	0.59	1.32	2.35				
			P150 0215 3	58.35	23.50	20.81	19.09	16.90	15.50		1.16	0.126	40
					0.33	0.73	1.30	2.92	5.18				
			P175 0215 3	91.50	37.85	33.52	30.74	27.22	24.97		1.61	0.259	47
					0.67	1.50	2.67	5.99	10.65				
			P225 0215 3	202.31	95.61	90.28	82.43	72.70			3.61	0.723	60
					2.38	4.75	9.87	23.50					
			P250 0215 3	261.14	108.23	95.83	87.91	77.84			4.08	1.160	70
					2.98	6.71	11.92	26.81					
			P320 0215 3	555.74	228.79	202.59	185.84				8.42	3.827	80
					9.83	22.11	39.31						
	180	MS	P050 0218 2	3.68	1.30	1.15	1.06	0.93	0.86	0.76	0.13	0.0009	14
					0.01	0.01	0.01	0.01	0.02	0.04			
			P060 0218 2	6.94	2.63	2.30	2.01	1.74	1.48	1.21	0.19	0.0014	16
					0.01	0.01	0.02	0.02	0.04	0.08			
			P065 0218 2	7.81	2.98	2.64	2.42	2.14	1.97	1.74	0.26	0.0026	16
					0.01	0.01	0.02	0.03	0.06	0.12			
			P080 0218 2	15.06	5.75	5.09	4.67	4.14	3.79	3.36	0.41	0.0062	19
					0.01	0.02	0.04	0.07	0.13	0.28			
			P100 0218 2	25.90	9.78	8.66	7.94	7.03	6.45	5.71	0.61	0.018	26
					0.03	0.05	0.09	0.20	0.36	0.80			
			P125 0218 2	38.94	15.11	13.38	12.27	10.87	9.97	8.83	0.84	0.057	35
					0.08	0.16	0.29	0.64	1.13	2.53			
			P150 0218 2	58.35	22.25	19.70	18.07	16.00	14.68	13.00	1.24	0.126	40
					0.16	0.35	0.63	1.40	2.49	5.59			
			P175 0218 2	91.50	35.84	31.73	29.11	25.77	23.64		1.72	0.259	47
					0.32	0.72	1.28	2.87	5.11				
			P225 0218 2	202.31	90.21	85.14	79.35	67.93	60.25		3.74	0.723	60
					1.02	2.31	4.69	10.13	19.62				
			P250 0218 2	261.14	102.47	90.73	83.23	73.69	67.60		4.32	1.160	70
					1.43	3.22	5.72	12.86	22.85				
			P320 0218 2	555.74	216.61	191.80	175.94	155.79			8.88	3.827	80
					4.72	10.61	18.85	42.41					
		MCV 50	P050 0218 3	4.20	1.58	1.40	1.28	1.14	1.04	0.92	0.11	0.0009	14
					0.01	0.01	0.01	0.02	0.03	0.06			
			P060 0218 3	9.62	3.52	3.14	2.96	2.75	2.43	2.12	0.17	0.0014	16
					0.01	0.02	0.02	0.03	0.06	0.14			
			P065 0218 3	11.00	4.59	4.06	3.73	3.30	3.03	2.68	0.22	0.0029	16
					0.01	0.02	0.03	0.05	0.09	0.19			
			P080 0218 3	17.22	6.99	6.19	5.68	5.03	4.61	4.08	0.34	0.0065	19
					0.02	0.03	0.05	0.11	0.19	0.42			
			P100 0218 3	34.14	15.00	13.28	12.18	10.79	9.89	8.76	0.52	0.0208	26
					0.04	0.09	0.15	0.34	0.60	1.34			
			P125 0218 3	55.05	24.39	21.59	19.81	17.54	16.09	14.24	0.73	0.0648	35
					0.12	0.26	0.47	1.04	1.85	4.16			
			P150 0218 3	90.00	39.87	35.30	32.39	28.68	26.30	23.29	1.09	0.151	40
					0.27	0.61	1.08	2.43	4.31	9.70			
			P175 0218 3	123.27	53.32	47.22	43.31	38.35	35.18		1.50	0.293	47
					0.53	1.18	2.09	4.71	8.36				

Stops S	Index period θ (deg)	Motion curve	Code	Static torque Ts (kgf-m)	Dynamic rated output torque (kgf-m) Up / Down / Internal inertia load torque (kgf-m) — Input shaft rotating speed N (rpm)						Cam shaft friction torque Tx (kgf-m)	Output shaft inertia GD² (kgf-m²)	Roller ø (mm)
					50	75	100	150	200	300			
2	180	MCV 50	P225 0218 3	325.69	154.21 2.12	140.93 4.35	132.01 8.93	112.45 21.56	103.21 37.91		3.51	0.723	60
			P250 0218 3	387.70	166.44 2.65	147.37 5.96	135.19 10.59	119.70 23.82	109.81 42.34		3.89	1.484	70
			P320 0218 3	680.19	292.01 9.24	258.56 20.78	237.18 36.94	210.02 83.10			7.79	5.178	80
	210	MS	P050 0221 2	3.89	1.35 0.01	1.19 0.01	1.09 0.01	0.97 0.01	0.89 0.02	0.78 0.03	0.12	0.0009	14
			P060 02212	7.43	2.75 0.01	2.31 0.01	2.14 0.01	1.93 0.02	1.72 0.03	1.56 0.06	0.18	0.0014	16
			P065 0221 2	8.24	3.07 0.01	2.72 0.01	2.50 0.01	2.21 0.03	2.03 0.04	1.79 0.09	0.24	0.0026	16
			P080 0221 2	16.14	6.07 0.01	5.37 0.02	4.93 0.03	4.36 0.06	4.00 0.10	3.54 0.21	0.38	0.0063	19
			P100 0221 2	25.90	9.33 0.02	8.26 0.04	7.58 0.07	6.71 0.15	6.16 0.27	5.45 0.59	0.56	0.018	26
			P125 0221 2	40.71	15.38 0.06	13.62 0.12	12.49 0.21	11.06 0.48	10.15 0.84	8.98 1.89	0.77	0.058	35
			P150 0221 2	58.35	21.25 0.12	18.81 0.26	17.26 0.46	15.28 1.03	14.02 1.83	12.41 4.11	1.15	0.126	40
			P175 0221 2	91.50	34.22 0.24	30.30 0.53	27.79 0.94	24.61 2.11	22.57 3.75	19.99 8.44	1.60	0.259	47
			P225 0221 2	202.31	85.62 0.89	81.43 2.01	72.58 3.74	64.32 8.01	59.91 14.76		3.85	0.723	60
			P250 0221 2	261.14	97.83 1.05	86.63 2.37	79.47 4.20	70.36 9.45	64.54 16.79		4.05	1.160	70
			P320 0221 2	555.74	206.82 3.47	183.14 7.79	167.99 13.85	148.75 31.16	136.45 55.38		8.37	3.827	80
		MCV 50	P050 0221 3	4.73	1.81 0.01	1.60 0.01	1.47 0.01	1.30 0.02	1.19 0.03	1.06 0.06	0.10	0.0012	14
			P060 0221 3	10.25	4.89 0.01	4.02 0.01	3.94 0.02	3.63 0.03	3.25 0.06	2.91 1.25	0.18	0.0018	16
			P065 0221 3	12.80	5.47 0.01	4.84 0.02	4.44 0.03	3.93 0.05	3.61 0.09	3.19 0.20	0.20	0.0042	16
			P080 0221 3	18.83	7.65 0.02	6.78 0.04	6.22 0.06	5.50 0.13	5.05 0.23	4.47 0.50	0.32	0.0106	19
			P100 0221 3	34.14	14.32 0.03	12.68 0.07	11.63 0.11	10.30 0.25	9.45 0.44	8.36 0.99	0.48	0.0208	26
			P125 0221 3	55.05	23.28 0.09	20.62 0.20	18.91 0.34	16.75 0.77	15.36 1.36	13.60 3.06	0.68	0.0648	35
			P150 0221 3	90.00	38.07 0.20	33.71 0.45	30.92 0.80	27.38 1.79	25.12 3.17	22.24 7.13	1.03	0.151	40
			P175 0221 3	123.27	50.91 0.39	45.08 0.87	41.35 1.54	36.62 3.46	33.59 6.15	29.74 13.82	1.41	0.293	47
			P225 0221 3	345.81	143.60 1.51	126.51 3.92	117.84 7.31	109.61 14.20	98.69 27.51		3.01	0.973	60
			P250 0221 3	387.70	158.92 1.95	140.71 4.38	129.08 7.78	114.29 17.50	104.84 31.11		3.70	1.484	70
			P320 0221 3	680.19	278.81 6.79	246.88 15.27	226.46 27.14	200.52 61.05			7.41	5.178	80
	240	MS	P050 0224 2	4.20	1.45 0.01	1.28 0.01	1.18 0.01	1.04 0.01	0.96 0.01	0.85 0.03	0.11	0.0009	14
			P060 0224 2	9.68	3.78 0.01	3.46 0.01	3.15 0.01	2.76 0.02	2.41 0.03	2.01 0.05	0.19	0.0014	16
			P065 0224 2	11.00	4.21 0.01	3.73 0.01	3.42 0.01	3.03 0.02	2.78 0.04	2.46 0.08	0.23	0.0029	16

Stops S	Index period θ (deg)	Motion curve	Code	Static torque Ts (kgf-m)	Dynamic rated output torque (kgf-m) Up / Down / Internal inertia load torque (kgf-m) — Input shaft rotating speed N (rpm)						Cam shaft friction torque Tx (kgf-m)	Output shaft inertia GD² (kgf-m²)	Roller ø (mm)
					50	75	100	150	200	300			
2	240	MS	P080 0224 2	17.22	6.41 0.01	5.68 0.02	5.21 0.02	4.61 0.05	4.23 0.08	3.74 0.17	0.35	0.0065	19
			P100 0224 2	34.14	13.76 0.02	12.18 0.04	11.17 0.06	9.89 0.13	9.07 0.24	8.03 0.52	0.53	0.0208	26
			P125 0224 2	55.05	22.37 0.05	19.81 0.11	18.17 0.18	16.09 0.41	14.76 0.72	13.07 1.62	0.74	0.0648	35
			P150 0224 2	90.00	36.57 0.11	32.39 0.24	29.71 0.42	26.30 0.95	24.13 1.68	21.36 3.77	1.11	0.151	40
			P175 0224 2	123.27	48.91 0.21	43.31 0.46	39.73 0.82	35.18 1.83	32.27 3.25	28.57 7.31	1.52	0.293	47
			P225 0224 2	345.81	140.51 0.94	127.90 7.21	118.69 3.76	107.51 7.86	94.32 14.51	83.08 34.69	3.18	1.073	60
			P250 0224 2	387.70	152.67 1.03	135.19 2.32	124.10 4.12	109.81 9.25	100.73 16.45	89.19 37.00	3.94	1.484	70
			P320 0224 2	680.19	267.86 3.59	237.18 8.07	217.57 14.35	192.65 32.27	176.72 57.37		7.87	5.178	80
	240	MCV 50	P050 0224 3	4.73	1.74 0.01	1.54 0.01	1.41 0.01	1.25 0.02	1.15 0.02	1.01 0.05	0.09	0.0012	14
			P060 0224 3	9.81	4.72 0.01	3.91 0.01	3.87 0.02	3.39 0.03	3.14 0.05	2.69 0.08	0.13	0.0018	16
			P065 0224 3	11.00	5.25 0.01	4.65 0.01	4.27 0.02	3.78 0.04	3.46 0.07	3.07 0.16	0.19	0.0042	16
			P080 0224 3	19.91	8.03 0.02	7.11 0.03	6.52 0.05	5.77 0.10	5.29 0.18	4.69 0.39	0.30	0.0108	19
			P100 0224 3	38.41	16.49 0.04	14.60 0.09	13.39 0.15	11.86 0.33	10.87 0.58	9.63 1.29	0.45	0.0356	26
			P125 0224 3	61.66	26.62 0.10	23.57 0.23	21.62 0.40	19.14 0.89	17.56 1.59	15.55 3.56	0.63	0.0985	35
			P150 0224 3	101.25	43.88 0.24	38.81 0.54	35.60 0.96	31.52 2.15	28.91 3.82	25.60 8.60	0.96	0.238	40
			P175 0224 3	132.08	54.32 0.31	48.10 0.69	44.12 1.22	39.07 2.75	35.84 4.88	31.73 10.98	1.33	0.304	47
			P225 0224 3	398.95	165.91 2.12	158.12 4.63	136.91 8.57	120.51 20.94	109.43 39.65		3.10	1.975	60
			P250 0224 3	426.47	176.61 2.64	156.38 5.92	143.45 10.53	127.02 23.68	116.52 42.10		3.47	2.623	70
			P320 0224 3	743.96	307.12 6.33	271.94 14.23	249.46 25.29	220.89 56.90	202.62 101.15		7.00	6.303	80
	270	MS	P050 0227 2	4.20	1.40 0.01	1.24 0.01	1.14 0.01	1.01 0.01	0.92 0.01	0.82 0.02	0.11	0.0009	14
			P060 0227 2	9.76	3.53 0.01	3.26 0.01	2.97 0.01	2.54 0.02	2.09 0.02	1.87 0.04	0.17	0.0014	16
			P065 0227 2	11.00	4.06 0.01	3.60 0.01	3.30 0.01	2.92 0.02	2.68 0.03	2.37 0.06	0.21	0.0029	16
			P080 0227 2	17.22	6.19 0.01	5.48 0.01	5.03 0.02	4.45 0.04	4.08 0.06	3.61 0.13	0.33	0.0065	19
			P100 0227 2	34.14	13.28 0.02	11.76 0.03	10.79 0.05	9.55 0.11	8.76 0.19	7.76 0.41	0.50	0.0208	26
			P125 0227 2	55.05	21.59 0.06	19.12 0.13	17.54 0.22	15.53 0.49	14.24 0.87	12.61 1.95	0.70	0.0985	35
			P150 0227 2	90.00	35.30 0.14	31.26 0.30	28.68 0.53	25.39 1.18	23.29 2.09	20.62 4.69	1.06	0.238	40
			P175 0227 2	132.08	52.44 0.17	46.43 0.38	42.59 0.67	37.71 1.50	34.59 2.67	30.63 5.99	1.43	0.304	47

Stops S	Index period θ (deg)	Motion curve	Code	Static torque Ts (kgf-m)	Dynamic rated output torque (kgf-m) Up / Down / Internal inertia load torque (kgf-m) — Input shaft rotating speed N (rpm) 50	75	100	150	200	300	Cam shaft friction torque Tx (kgf-m)	Output shaft inertia GD² (kgf-m²)	Roller ø (mm)
2	270	MS	P225 0227 2	345.81	138.65	127.51	114.32	102.69	95.12	84.05	3.02	1.073	60
					0.74	1.52	2.73	5.61	11.89	27.31			
			P250 0227 2	387.70	147.37	130.49	119.70	105.99	97.23	86.09	3.78	1.484	70
					0.82	1.83	3.25	7.31	13.00	29.23			
			P320 0227 2	680.19	258.56	228.95	210.02	185.96	170.58		7.57	5.178	80
					2.84	6.38	11.34	25.50	45.33				
		MCV 50	P050 0227 3	4.73	1.68	1.49	1.36	1.21	1.11	0.98	0.09	0.0012	14
					0.01	0.01	0.01	0.01	0.02	0.04			
			P060 0227 3	9.76	4.56	3.81	3.43	3.05	2.92	2.68	0.15	0.0031	16
					0.01	0.01	0.02	0.02	0.04	0.08			
			P065 0227 3	11.00	5.07	4.49	4.12	3.65	3.34	2.96	0.18	0.0042	16
					0.01	0.01	0.02	0.03	0.06	0.12			
			P080 0227 3	19.91	7.75	6.86	6.29	5.57	5.11	4.52	0.28	0.0108	19
					0.01	0.02	0.04	0.08	0.14	0.31			
			P100 0227 3	38.41	15.91	14.09	12.92	11.44	10.50	9.29	0.43	0.0356	26
					0.03	0.07	0.12	0.26	0.46	1.02			
			P125 0227 3	61.66	26.69	22.75	20.87	18.48	16.95	15.01	0.61	0.0985	35
					0.08	0.18	0.32	0.71	1.25	2.82			
			P150 0227 3	101.25	42.31	37.46	34.36	30.43	27.91	24.71	0.92	0.238	40
					0.19	0.43	0.76	1.70	3.02	6.80			
			P175 0227 3	140.88	58.00	51.36	47.11	41.72	38.27	33.88	1.26	0.449	47
					0.36	0.81	1.43	3.21	5.70	12.81			
			P225 0227 3	345.81	163.21	145.51	131.88	118.40	107.69		2.89	1.972	60
					1.74	3.92	6.98	16.23	30.51				
			P250 0227 3	426.47	170.48	150.95	138.47	122.61	112.47		3.36	2.623	70
					2.08	4.68	8.32	18.71	33.26				
			P320 0227 3	770.53	313.22	277.35	254.41	225.28	206.65		6.73	7.838	80
					6.22	13.98	24.85	55.91	99.39				
	300	MS	P050 0230 2	4.73	1.63	1.44	1.32	1.17	1.07	0.95	0.10	0.0012	14
					0.01	0.01	0.01	0.01	0.01	0.02			
			P060 0230 2	9.76	4.45	3.62	3.20	2.91	2.76	2.48	0.16	0.0031	16
					0.01	0.01	0.01	0.02	0.02	0.05			
			P065 0230 2	11.00	4.91	4.35	3.99	3.53	3.24	2.87	0.20	0.0042	16
					0.01	0.01	0.01	0.02	0.03	0.07			
			P080 0230 2	19.91	7.51	6.65	6.10	5.40	4.95	4.38	0.31	0.0108	19
					0.01	0.02	0.02	0.05	0.08	0.18			
			P100 0230 2	38.41	15.42	13.65	12.52	11.09	10.17	9.01	0.47	0.0356	26
					0.02	0.04	0.07	0.15	0.26	0.57			
			P125 0230 2	61.66	24.89	22.04	20.22	17.90	16.42	14.54	0.66	0.0985	35
					0.05	0.10	0.18	0.40	0.70	1.58			
			P150 0230 2	101.25	40.99	36.29	33.29	29.48	27.04	23.94	0.99	0.238	40
					0.11	0.24	0.43	0.95	1.69	3.80			
			P175 0230 2	140.88	56.20	49.76	45.65	40.42	37.08	32.83	1.36	0.449	47
					0.20	0.45	0.80	1.80	3.19	7.17			
			P225 0230 2	345.81	158.42	140.61	128.65	115.02	104.32	92.60	3.02	1.972	60
					0.96	2.06	3.78	8.94	16.21	37.84			
			P250 0230 2	426.47	165.18	146.26	134.16	118.80	108.97	96.49	3.58	2.623	70
					1.17	2.62	4.65	10.42	18.60	41.85			
			P320 0230 2	770.53	303.48	268.72	246.50	218.27	200.22		7.15	7.838	80
					3.48	7.82	13.90	31.27	55.58				
		MCV 50	P050 0230 3	5.25	1.93	1.71	1.56	1.38	1.27	1.12	0.09	0.0012	14
					0.01	0.01	0.01	0.01	0.02	0.03			
			P060 0230 3	9.82	5.18	4.56	4.03	3.76	3.25	2.86	0.14	0.0031	16
					0.01	0.01	0.02	0.02	0.03	0.07			
			P065 0230 3	11.00	5.59	4.95	4.54	4.02	3.69	3.27	0.17	0.0043	16
					0.01	0.01	0.02	0.03	0.05	0.10			

Stops S	Index period θ (deg)	Motion curve	Code	Static torque Ts (kgf-m)	Dynamic rated output torque (kgf-m) Up / Down / Internal inertia load torque (kgf-m) — Input shaft rotating speed N (rpm) 50	75	100	150	200	300	Cam shaft friction torque Tx (kgf-m)	Output shaft inertia GD² (kgf-m²)	Roller ø (mm)
2	300	MCV 50	P080 0230 3	21.52	8.52	7.54	6.92	6.13	5.62	4.97	0.27	0.0111	19
					0.01	0.02	0.03	0.07	0.12	0.26			
			P100 0230 3	40.00	18.27	16.18	14.84	13.14	12.05	10.67	0.41	0.0372	26
					0.03	0.06	0.10	0.22	0.39	0.86			
			P125 0230 3	65.00	27.79	24.61	22.57	19.99	18.33	16.23	0.58	0.102	35
					0.07	0.15	0.27	0.59	1.05	2.36			
			P150 0230 3	111.00	47.52	42.07	38.59	34.17	31.35	27.76	0.87	0.249	40
					0.16	0.36	0.64	1.44	2.56	5.76			
			P175 0230 3	154.09	64.97	57.52	52.77	46.72	42.86	37.95	1.20	0.468	47
					0.31	0.68	1.21	2.71	4.81	10.82			
			P225 0230 3	345.81	173.81	162.14	146.51	133.20	126.51		2.65	1.984	60
					1.26	3.80	5.94	14.76	27.02				
			P250 0230 3	484.63	202.77	179.55	164.70	145.84	133.78		3.15	2.828	70
					1.82	4.09	7.27	16.34	29.05				
			P320 0230 3	850.24	355.75	315.00	288.96	255.86	234.71		6.40	8.943	80
					5.75	12.92	22.97	51.67	91.86				
3	120	MCV 25	P050 0312 5	3.99	2.14	1.90	1.74	1.54	1.41	1.25	0.12	0.0009	14
					0.01	0.01	0.01	0.02	0.03	0.07			
			P060 0312 5	8.54	4.73	4.05	4.06	3.68	3.41	3.05	0.21	0.0018	16
					0.01	0.02	0.03	0.08	0.10	0.14			
			P065 0312 5	10.24	5.94	5.26	4.82	4.27	3.92	3.47	0.24	0.0027	19
					0.01	0.02	0.03	0.05	0.09	0.20			
			P080 0312 5	16.14	9.23	8.17	7.50	6.64	6.09	5.39	0.37	0.006	22
					0.02	0.03	0.05	0.12	0.20	0.45			
			P100 0312 5	31.58	19.04	16.86	15.46	13.69	12.56	11.12	0.56	0.0188	30
					0.04	0.09	0.16	0.35	0.63	1.40			
			P125 0312 5	51.09	30.84	27.31	25.05	22.18	20.34	18.01	0.79	0.0582	35
					0.13	0.28	0.49	1.09	1.93	4.34			
			P150 0312 5	83.25	49.82	44.11	40.46	35.83	32.87	29.10	1.18	0.135	40
					0.28	0.63	1.12	2.52	4.47	10.05			
			P175 0312 5	114.47	75.76	67.08	61.54	54.49	49.98	44.26	1.61	0.265	52
					0.55	1.24	2.20	4.93	8.77	19.72			
			P225 0312 5	245.39	136.74	128.05	104.31	98.75	94.32		3.24	0.865	60
					1.94	3.86	8.51	18.21	34.05				
			P250 0312 5	276.07	158.22	140.10	128.52	113.80	104.39		3.99	1.109	80
					2.30	5.16	9.17	20.63	36.68				
			P320 0312 5	595.44	342.98	303.70	278.59	246.68			8.23	3.661	100
					7.57	17.03	30.27	68.11					
	150	MS	P050 0315 2	4.20	2.15	1.91	1.75	1.55	1.42	1.26	0.12	0.0009	14
					0.01	0.01	0.01	0.01	0.02	0.04			
			P060 0315 2	8.71	5.37	4.96	4.35	3.84	3.56	3.02	0.20	0.0018	16
					0.01	0.01	0.02	0.02	0.04	0.08			
			P065 0315 2	11.00	6.21	5.49	5.04	4.46	4.09	3.62	0.23	0.0027	19
					0.01	0.01	0.02	0.03	0.06	0.12			
			P080 0315 2	17.22	9.44	8.36	7.67	6.79	6.23	5.51	0.36	0.0061	22
					0.01	0.02	0.03	0.07	0.12	0.26			
			P100 0315 2	34.14	19.84	17.56	16.11	14.26	13.09	11.59	0.54	0.0194	30
					0.03	0.06	0.10	0.21	0.37	0.83			
			P125 0315 2	56.15	32.89	29.12	26.71	23.65	21.70	19.21	0.76	0.0606	35
					0.08	0.17	0.29	0.65	1.15	2.58			
			P150 0315 2	90.00	51.90	45.96	42.16	37.33	34.24	30.32	1.14	0.140	40
					0.17	0.38	0.67	1.49	2.65	5.96			
			P175 0315 2	123.27	78.51	69.52	63.77	56.47	51.80	45.87	1.56	0.273	52
					0.33	0.73	1.30	2.91	5.17	11.62			

Stops S	Index period θ (deg)	Motion curve	Code	Static torque Ts (kgf-m)	Dynamic rated output torque (kgf-m) Up / Down / Internal inertia load torque (kgf-m) — Input shaft rotating speed N (rpm) 50	75	100	150	200	300	Cam shaft friction torque Tx (kgf-m)	Output shaft inertia GD² (kgf-m²)	Roller ø (mm)
3	150	MS	P225 0315 2	345.61	204.51 / 1.27	176.35 / 3.02	161.20 / 4.95	137.04 / 12.61	118.65 / 23.11	107.66 / 51.21	3.51	0.914	60
			P250 0315 2	387.70	221.86 / 1.57	196.45 / 3.53	180.20 / 6.28	159.56 / 14.12	146.37 / 25.10	129.61 / 56.46	4.03	1.327	80
			P320 0315 2	680.19	389.24 / 5.59	344.66 / 12.57	316.16 / 22.35	279.95 / 50.27	256.80 / 89.37		8.05	4.726	100
	180	MS	P050 0318 2	4.73	2.41 / 0.01	2.13 / 0.01	1.96 / 0.01	1.73 / 0.01	1.59 / 0.02	1.41 / 0.04	0.10	0.0012	14
			P060 0318 2	8.71	5.68 / 0.01	5.31 / 0.01	4.89 / 0.01	4.25 / 0.02	3.87 / 0.03	3.34 / 0.06	0.18	0.0021	16
			P065 0318 2	11.00	6.52 / 0.01	5.78 / 0.01	5.30 / 0.01	4.69 / 0.03	4.30 / 0.04	3.81 / 0.09	0.21	0.0028	19
			P080 0318 2	19.37	10.57 / 0.01	9.36 / 0.02	8.58 / 0.04	7.60 / 0.08	6.97 / 0.14	6.17 / 0.31	0.33	0.0103	22
			P100 0318 2	36.70	20.80 / 0.03	18.42 / 0.07	16.89 / 0.11	14.96 / 0.25	13.72 / 0.44	12.15 / 0.99	0.49	0.0335	30
			P125 0318 2	60.56	34.66 / 0.08	30.69 / 0.18	28.16 / 0.31	24.93 / 0.69	22.87 / 1.21	20.25 / 2.73	0.69	0.0921	35
			P150 0318 2	101.25	58.09 / 0.19	51.44 / 0.42	47.18 / 0.74	41.78 / 1.66	38.33 / 2.95	33.94 / 6.62	1.03	0.224	47
			P175 0318 2	137.36	86.68 / 0.35	76.75 / 0.78	70.40 / 1.38	62.34 / 3.10	57.18 / 5.51	50.63 / 12.38	1.42	0.419	52
			P225 0318 2	385.64	226.30 / 1.70	198.66 / 4.10	174.31 / 6.94	150.69 / 15.81	141.25 / 28.94		3.16	2.018	60
			P250 0318 2	426.47	240.42 / 2.00	212.88 / 4.50	195.28 / 8.00	172.91 / 18.00	158.62 / 31.99		3.70	2.436	80
			P320 0318 2	743.96	418.37 / 4.74	370.45 / 10.66	339.82 / 18.94	300.90 / 42.61	276.02 / 75.74		7.44	5.768	100
	210	MS	P050 0321 2	4.73	2.30 / 0.01	2.04 / 0.01	1.87 / 0.01	1.65 / 0.01	1.52 / 0.02	1.34 / 0.03	0.10	0.0012	14
			P060 0321 2	8.71	5.42 / 0.01	5.02 / 0.01	4.63 / 0.01	3.98 / 0.02	3.62 / 0.03	3.07 / 0.04	0.17	0.0021	16
			P065 0321 2	11.00	6.23 / 0.01	5.52 / 0.01	5.06 / 0.01	4.48 / 0.02	4.11 / 0.03	3.64 / 0.06	0.20	0.0028	19
			P080 0321 2	19.37	10.09 / 0.01	8.94 / 0.02	8.20 / 0.03	7.26 / 0.06	6.66 / 0.10	5.89 / 0.23	0.30	0.0103	22
			P100 0321 2	40.00	23.28 / 0.03	20.62 / 0.05	18.91 / 0.09	16.74 / 0.19	15.36 / 0.34	13.60 / 0.76	0.45	0.0346	30
			P125 0321 2	64.41	36.18 / 0.06	32.04 / 0.13	29.39 / 0.23	26.02 / 0.52	23.87 / 0.91	21.14 / 2.05	0.64	0.0942	35
			P150 0321 2	105.00	58.47 / 0.14	51.77 / 0.31	47.49 / 0.55	42.05 / 1.24	38.57 / 2.19	34.15 / 4.93	0.97	0.227	47
			P175 0321 2	145.28	89.76 / 0.26	79.48 / 0.58	72.91 / 1.03	64.56 / 2.32	59.22 / 4.12	52.44 / 9.27	1.32	0.427	52
			P225 0321 2	408.61	245.31 / 1.31	212.60 / 3.12	198.60 / 4.97	174.25 / 11.25	163.51 / 20.63	140.89 / 52.12	3.02	2.121	60
			P250 0321 2	465.24	260.41 / 1.53	230.59 / 3.45	211.52 / 6.12	187.30 / 13.77	171.81 / 24.47	152.13 / 55.05	3.45	2.536	80
			P320 0321 2	797.10	441.33 / 4.18	390.78 / 9.40	358.47 / 16.71	317.41 / 37.59	291.17 / 66.82		6.99	6.926	100
	240	MS	P050 0324 2	5.25	2.58 / 0.01	2.28 / 0.01	2.09 / 0.01	1.85 / 0.01	1.70 / 0.01	1.50 / 0.02	0.09	0.0012	14
			P060 0324 2	8.71	6.25 / 0.01	6.01 / 0.01	5.64 / 0.01	4.96 / 0.02	4.37 / 0.02	4.01 / 0.04	0.16	0.0028	16
			P065 0324 2	11.00	7.43 / 0.01	6.58 / 0.01	6.04 / 0.01	5.34 / 0.02	4.90 / 0.03	4.34 / 0.07	0.18	0.0041	19

Stops S	Index period θ (deg)	Motion curve	Code	Static torque Ts (kgf-m)	Dynamic rated output torque (kgf-m) Up / Down / Internal inertia load torque (kgf-m) — Input shaft rotating speed N (rpm) 50	75	100	150	200	300	Cam shaft friction torque Tx (kgf-m)	Output shaft inertia GD² (kgf-m²)	Roller ø (mm)
3	240	MS	P080 0324 2	21.52	11.31 / 0.01	10.01 / 0.02	9.18 / 0.02	8.13 / 0.05	7.46 / 0.08	6.60 / 0.18	0.28	0.0106	22
			P100 0324 2	40.00	23.75 / 0.02	21.03 / 0.04	19.29 / 0.07	17.08 / 0.15	15.67 / 0.26	13.87 / 0.59	0.43	0.0351	30
			P125 0324 2	65.00	36.07 / 0.05	31.94 / 0.10	29.30 / 0.18	25.94 / 0.40	23.80 / 0.71	21.07 / 1.59	0.61	0.0951	35
			P150 0324 2	111.00	60.93 / 0.11	53.95 / 0.25	49.49 / 0.43	43.82 / 0.97	40.20 / 1.72	35.60 / 3.86	0.91	0.232	47
			P175 0324 2	154.09	94.02 / 0.21	83.25 / 0.46	76.37 / 0.81	67.62 / 1.82	62.03 / 3.23	54.92 / 7.27	1.25	0.437	52
			P225 0324 2	408.61	235.65 / 0.92	202.63 / 2.31	189.51 / 3.24	163.20 / 8.65	158.47 / 15.33	139.62 / 39.69	2.86	1.974	60
			P250 0324 2	465.24	250.19 / 1.18	221.53 / 2.64	203.22 / 4.69	179.94 / 10.54	165.06 / 18.74	146.16 / 42.15	3.31	2.536	80
			P320 0324 2	797.10	424.00 / 3.20	375.44 / 7.20	344.39 / 12.79	304.95 / 28.78	279.73 / 51.16	247.69 / 115.11	6.73	6.926	100
	270	MS	P050 0327 2	5.25	2.49 / 0.01	2.20 / 0.01	2.02 / 0.01	1.79 / 0.01	1.64 / 0.01	1.45 / 0.02	0.09	0.0012	14
			P060 0327 2	8.71	6.02 / 0.01	5.94 / 0.01	5.42 / 0.01	4.61 / 0.02	4.02 / 0.02	3.87 / 0.04	0.14	0.0028	16
			P065 0327 2	11.00	7.17 / 0.01	6.35 / 0.01	5.83 / 0.01	5.16 / 0.02	4.73 / 0.03	4.19 / 0.06	0.17	0.0041	19
			P080 0327 2	21.52	10.92 / 0.01	9.67 / 0.01	8.87 / 0.02	7.85 / 0.04	7.20 / 0.07	6.38 / 0.14	0.27	0.0106	22
			P100 0327 2	40.00	22.93 / 0.02	20.30 / 0.03	18.62 / 0.06	16.49 / 0.12	15.13 / 0.21	13.39 / 0.47	0.41	0.0351	30
			P125 0327 2	65.00	34.82 / 0.04	30.83 / 0.08	28.28 / 0.14	25.04 / 0.32	22.97 / 0.56	20.34 / 1.25	0.58	0.0951	35
			P150 0327 2	111.00	58.82 / 0.09	52.08 / 0.20	47.77 / 0.34	42.30 / 0.77	38.80 / 1.36	34.36 / 3.05	0.88	0.232	47
			P175 0327 2	154.09	90.76 / 0.16	80.36 / 0.36	73.72 / 0.64	65.27 / 1.44	59.87 / 2.56	53.02 / 5.74	1.20	0.437	52
			P225 0327 2	423.74	241.34 / 0.71	208.52 / 1.84	194.32 / 3.13	170.50 / 6.79	162.31 / 12.96	142.54 / 31.25	2.73	1.974	60
			P250 0327 2	484.63	256.45 / 0.95	227.07 / 2.13	208.30 / 3.78	184.44 / 8.50	169.19 / 15.11	149.81 / 34.00	3.17	2.589	80
			P320 0327 2	850.24	449.92 / 3.02	398.39 / 6.78	365.45 / 12.05	323.59 / 27.10	296.83 / 48.18	262.84 / 108.39	6.43	8.254	100
	300	MS	P050 0330 2	5.25	2.41 / 0.01	2.14 / 0.01	1.96 / 0.01	1.73 / 0.01	1.59 / 0.01	1.41 / 0.02	0.08	0.0012	14
			P060 0330 2	8.71	5.94 / 0.01	5.71 / 0.01	5.02 / 0.02	4.35 / 0.02	3.67 / 0.02	3.48 / 0.03	0.14	0.0028	16
			P065 0330 2	11.00	6.95 / 0.01	6.15 / 0.01	5.65 / 0.01	5.00 / 0.02	4.58 / 0.02	4.06 / 0.05	0.17	0.0041	19
			P080 0330 2	21.52	10.58 / 0.01	9.36 / 0.01	8.59 / 0.02	7.61 / 0.03	6.98 / 0.06	6.18 / 0.12	0.26	0.0106	22
			P100 0330 2	40.00	22.22 / 0.02	19.67 / 0.03	18.04 / 0.05	15.98 / 0.10	14.66 / 0.17	12.98 / 0.38	0.39	0.0351	30
			P125 0330 2	65.00	33.74 / 0.03	29.87 / 0.07	27.40 / 0.12	24.26 / 0.26	22.26 / 0.45	19.71 / 1.02	0.56	0.0951	35
			P150 0330 2	111.00	56.99 / 0.07	50.46 / 0.16	46.29 / 0.28	40.99 / 0.62	37.60 / 1.10	33.29 / 2.47	0.85	0.232	47
			P175 0330 2	154.09	87.93 / 0.13	77.86 / 0.30	71.42 / 0.52	63.24 / 1.17	58.01 / 2.07	51.37 / 4.65	1.17	0.437	52

Stops S	Index period θ (deg)	Motion curve	Code	Static torque Ts (kgf-m)	Dynamic rated output torque (kgf-m) Up / Down / Internal inertia load torque (kgf-m) — Input shaft rotating speed N (rpm)						Cam shaft friction torque Tx (kgf-m)	Output shaft inertia GD² (kgf-m²)	Roller ø (mm)
					50	75	100	150	200	300			
3	300	MS	P225 0330 2	423.74	238.60 0.59	202.41 1.37	187.65 2.63	163.61 4.36	157.84 10.52	137.21 22.65	2.46	1.974	60
			P250 0330 2	484.63	248.47 0.77	220.01 1.73	201.82 3.06	178.70 6.89	163.93 12.24	145.15 27.54	3.08	2.589	80
			P320 0330 2	850.24	435.92 2.44	385.99 5.49	354.08 9.76	313.52 21.95	287.60 39.02	254.66 87.79	6.27	8.254	100
4	90	MS	P050 0409 2	3.68	2.05 0.01	1.81 0.01	1.66 0.01	1.47 0.02	1.35 0.04	1.19 0.08	0.13	0.0009	14
			P060 0409 2	5.83	4.26 0.01	3.65 0.02	3.28 0.02	3.02 0.04	2.71 0.07	2.45 0.16	0.21	0.0018	16
			P065 0409 2	7.81	4.39 0.01	3.89 0.02	3.57 0.03	3.16 0.06	2.90 0.11	2.56 0.23	0.26	0.0026	16
			P080 0409 2	15.06	8.41 0.02	7.45 0.04	6.83 0.07	6.05 0.14	5.55 0.25	4.91 0.55	0.41	0.0062	19
			P100 0409 2	25.90	14.09 0.05	12.47 0.10	11.44 0.18	10.13 0.40	9.29 0.71	8.23 1.60	0.61	0.018	26
			P125 0409 2	38.94	24.57 0.15	21.75 0.32	19.95 0.57	17.67 1.27	16.21 2.25	14.35 5.06	0.84	0.057	35
			P150 0409 2	58.35	36.32 0.32	32.16 0.70	29.50 1.25	26.12 2.80	23.96 4.97		1.24	0.126	47
			P175 0409 2	91.50	56.95 0.64	50.42 1.44	46.25 2.56	40.96 5.74	37.57 10.21		1.72	0.259	52
			P225 0409 2	223.65	140.25 2.06	132.65 4.98	122.01 10.39	109.33 23.65	104.25 42.68		3.74	0.894	60
			P250 0409 2	261.14	164.75 2.86	145.88 6.43	133.82 11.43	118.49 25.71	108.70 45.70		4.32	1.160	80
			P320 0409 2	555.74	350.62 9.43	310.46 21.21	284.79 37.69	252.17 84.81			8.88	3.827	100
	120	MS	P050 0412 2	4.20	1.45 0.01	1.29 0.01	1.18 0.01	1.04 0.02	0.96 0.02	0.85 0.05	0.11	0.0009	14
			P060 0412 2	8.96	4.52 0.01	4.12 0.01	3.64 0.02	3.12 0.03	2.96 0.05	2.74 0.11	0.19	0.0021	16
			P065 0412 2	11.00	4.84 0.01	4.29 0.01	3.93 0.02	3.48 0.04	3.19 0.07	2.83 0.15	0.23	0.0029	16
			P080 0412 2	17.22	7.36 0.01	6.51 0.03	5.97 0.04	5.29 0.09	4.85 0.15	4.29 0.33	0.35	0.0065	19
			P100 0412 2	34.14	16.26 0.03	14.40 0.07	13.21 0.12	11.69 0.26	10.72 0.47	9.50 1.04	0.53	0.0208	32
			P125 0412 2	55.05	29.61 0.09	26.22 0.21	24.05 0.36	21.30 0.81	19.53 1.44	17.30 3.24	0.74	0.0648	35
			P150 0412 2	90.00	48.41 0.20	42.86 0.44	39.32 0.78	34.81 1.75	31.93 3.11	28.28 6.98	1.11	0.140	47
			P175 0412 2	123.27	64.44 0.41	57.06 0.92	52.34 1.63	46.34 3.66	42.51 6.50	37.64 14.61	1.52	0.293	52
			P225 0412 2	354.26	178.64 1.84	151.20 3.75	140.12 6.43	128.65 16.25	118.45 29.74		3.51	1.212	60
			P250 0412 2	387.70	191.31 2.06	169.40 4.63	155.39 8.23	137.59 18.50	126.21 32.89		3.94	1.484	80
			P320 0412 2	680.19	335.64 7.18	297.20 16.14	272.62 28.69	241.40 64.54			7.87	5.178	100
	150	MS	P050 0415 2	4.73	1.63 0.01	1.44 0.01	1.32 0.01	1.17 0.01	1.07 0.02	0.95 0.04	0.10	0.0012	14
			P060 0415 2	8.96	5.21 0.01	4.63 0.01	4.23 0.02	3.87 0.02	3.43 0.04	3.12 0.10	0.17	0.0028	16
			P065 0415 2	11.00	5.65 0.01	5.00 0.01	4.59 0.02	4.06 0.04	3.72 0.06	3.30 0.14	0.20	0.0042	16

Stops S	Index period θ (deg)	Motion curve	Code	Static torque Ts (kgf-m)	Dynamic rated output torque (kgf-m) Up / Down / Internal inertia load torque (kgf-m) — Input shaft rotating speed N (rpm)						Cam shaft friction torque Tx (kgf-m)	Output shaft inertia GD² (kgf-m²)	Roller ø (mm)
					50	75	100	150	200	300			
4	150	MS	P080 0415 2	19.91	8.61 0.01	7.62 0.03	6.99 0.04	6.19 0.09	5.68 0.16	5.03 0.35	0.31	0.0108	19
			P100 0415 2	38.41	18.22 0.04	16.13 0.08	14.80 0.13	13.10 0.29	12.02 0.51	10.64 1.14	0.47	0.0356	32
			P125 0415 2	61.66	29.18 0.09	25.84 0.20	23.70 0.35	20.98 0.79	19.25 1.40	17.04 3.15	0.66	0.0985	35
			P150 0415 2	101.25	48.03 0.22	42.53 0.48	39.01 0.85	34.55 1.90	31.69 3.38	28.06 7.60	0.99	0.238	47
			P175 0415 2	140.88	65.55 0.40	58.04 0.90	53.24 1.60	47.15 3.59	43.25 6.37	38.29 14.33	1.36	0.449	52
			P225 0415 2	387.65	173.31 2.07	156.14 4.51	141.33 7.56	124.52 17.38	113.65 35.26		3.14	1.987	60
			P250 0415 2	426.47	183.27 2.33	162.28 5.24	148.86 9.30	131.81 20.93	120.91 37.20		3.58	2.623	80
			P320 0415 2	743.96	318.69 5.59	282.19 12.57	258.86 22.35	229.21 50.28	210.26 89.39		7.20	6.303	100
	180	MS	P050 0418 2	5.25	1.83 0.01	1.62 0.01	1.48 0.01	1.31 0.01	1.21 0.02	1.07 0.03	0.09	0.0012	14
			P060 0418 2	9.24	5.07 0.01	4.31 0.01	4.02 0.02	3.68 0.02	3.17 0.03	3.02 0.07	0.15	0.0035	16
			P065 0418 2	11.00	5.58 0.01	4.94 0.01	4.53 0.02	4.01 0.03	3.68 0.05	3.26 0.10	0.18	0.0043	19
			P080 0418 2	21.52	8.48 0.01	7.51 0.02	6.89 0.03	6.10 0.07	5.60 0.11	4.95 0.25	0.28	0.0111	22
			P100 0418 2	40.00	18.75 0.03	16.61 0.06	15.23 0.10	13.49 0.21	12.37 0.37	10.95 0.83	0.43	0.0372	32
			P125 0418 2	65.00	30.84 0.07	27.31 0.15	25.05 0.26	22.18 0.57	20.35 1.01	18.01 2.27	0.61	0.102	40
			P150 0418 2	111.00	52.72 0.16	46.68 0.35	42.82 0.62	37.92 1.38	34.78 2.46	30.80 5.52	0.91	0.249	47
			P175 0418 2	154.09	71.75 0.29	63.53 0.65	58.27 1.16	51.60 2.60	47.33 4.61	41.91 10.38	1.25	0.468	52
			P225 0418 2	453.62	202.56 1.21	174.92 3.12	162.35 5.73	147.99 14.21	129.85 25.20		2.87	2.215	60
			P250 0418 2	484.63	213.00 1.75	188.61 3.92	173.01 6.97	153.20 15.67	140.53 27.86		3.27	2.828	80
			P320 0418 2	850.24	373.70 5.51	330.90 12.39	303.54 22.02	268.77 49.55	246.55 88.08		6.63	8.943	100
	210	MS	P050 0421 2	5.25	1.75 0.01	1.55 0.01	1.42 0.01	1.25 0.01	1.15 0.01	1.02 0.02	0.08	0.0012	14
			P060 0421 2	9.24	4.92 0.01	4.13 0.01	3.92 0.01	3.47 0.02	3.26 0.03	2.94 0.05	0.14	0.0035	16
			P065 0421 2	11.00	5.33 0.01	4.72 0.01	4.33 0.01	3.83 0.02	3.52 0.04	3.11 0.07	0.17	0.0043	19
			P080 0421 2	21.52	8.10 0.01	7.17 0.02	6.58 0.03	5.83 0.05	5.34 0.09	4.73 0.19	0.27	0.0111	22
			P100 0421 2	40.00	17.91 0.02	15.85 0.04	14.54 0.07	12.88 0.16	11.81 0.27	10.46 0.61	0.40	0.0372	32
			P125 0421 2	65.00	29.45 0.05	26.07 0.11	23.92 0.19	21.18 0.42	19.43 0.74	17.20 1.67	0.58	0.102	40
			P150 0421 2	111.00	50.34 0.12	44.57 0.26	40.89 0.46	36.20 1.02	33.21 1.81	29.40 4.02	0.87	0.249	47
			P175 0421 2	154.09	68.50 0.22	60.66 0.48	55.64 0.85	49.27 1.91	45.19 3.39	40.02 7.62	1.19	0.468	52

Stops S	Index period θ (deg)	Motion curve	Code	Static torque Ts (kgf-m)	Up / Down	Dynamic rated output torque (kgf-m) Internal inertia load torque (kgf-m) Input shaft rotating speed N (rpm) 50	75	100	150	200	300	Cam shaft friction torque Tx (kgf-m)	Output shaft inertia GD² (kgf-m²)	Roller ø (mm)
4	210	MS	P225 0421 2	453.62		195.43	168.52	156.94	143.21	128.50	112.32	2.62	2.215	60
						1.16	2.16	4.21	9.82	17.46	43.51			
			P250 0421 2	484.63		203.38	180.08	165.19	146.27	134.18	118.81	3.14	2.828	80
						1.28	2.88	5.12	11.51	20.47	46.04			
			P320 0421 2	850.24		356.81	315.95	289.82	256.63	235.41		6.37	8.943	100
						4.05	9.10	16.18	36.40	64.71				
	240	MS	P050 0424 2	5.25		1.68	1.48	1.36	1.21	1.11	0.98	0.08	0.0012	14
						0.01	0.01	0.01	0.01	0.01	0.02			
			P060 0424 2	9.24		4.83	4.25	3.84	3.35	3.04	2.86	0.13	0.0035	16
						0.01	0.01	0.01	0.02	0.02	0.04			
			P065 0424 2	11.00		5.12	4.53	4.16	3.68	3.38	2.99	0.16	0.0043	19
						0.01	0.01	0.01	0.02	0.03	0.06			
			P080 0424 2	21.52		7.78	6.89	6.32	5.60	5.13	4.54	0.25	0.0111	22
						0.01	0.01	0.02	0.04	0.07	0.14			
			P100 0424 2	40.00		17.20	15.23	13.97	12.37	11.35	10.05	0.39	0.0372	32
						0.02	0.03	0.06	0.12	0.21	0.47			
			P125 0424 2	65.00		28.29	25.05	22.98	20.35	18.66	16.52	0.55	0.102	40
						0.04	0.08	0.15	0.32	0.57	1.28			
			P150 0424 2	111.00		48.36	42.82	39.28	34.78	31.90	28.25	0.83	0.249	47
						0.09	0.20	0.35	0.78	1.38	3.11			
			P175 0424 2	154.09		65.81	58.27	53.46	47.33	43.42	38.45	1.14	0.468	52
						0.17	0.37	0.65	1.46	2.60	5.84			
			P225 0424 2	453.62		190.32	160.21	150.31	138.25	120.34	108.75	2.58	2.215	60
						0.83	1.94	3.10	6.76	13.52	33.71			
			P250 0424 2	484.63		195.39	173.01	158.71	140.53	128.91	114.14	3.04	2.828	80
						0.98	2.21	3.92	8.82	15.67	35.25			
			P320 0424 2	850.24		342.80	303.54	278.44	246.55	226.16		6.18	8.943	100
						3.10	6.97	12.39	27.87	49.55				
	270	MS	P050 0427 2	5.25		1.62	1.43	1.31	1.16	1.07	0.94	0.08	0.0012	14
						0.01	0.01	0.01	0.01	0.01	0.02			
			P060 0427 2	9.24		4.62	4.02	3.62	3.14	2.98	2.74	0.13	0.0035	16
						0.01	0.01	0.01	0.02	0.02	0.03			
			P065 0427 2	11.00		4.94	4.38	4.01	3.55	3.26	2.89	0.16	0.0043	19
						0.01	0.01	0.01	0.02	0.02	0.05			
			P080 0427 2	21.52		7.51	6.65	6.10	5.40	4.95	4.39	0.25	0.0111	22
						0.01	0.01	0.02	0.03	0.05	0.11			
			P100 0427 2	40.00		16.61	14.70	13.49	11.94	10.95	9.70	0.37	0.0372	32
						0.02	0.03	0.05	0.10	0.17	0.37			
			P125 0427 2	65.00		27.31	24.18	22.18	19.64	18.01	15.95	0.53	0.102	40
						0.03	0.07	0.12	0.26	0.45	1.01			
			P150 0427 2	111.00		46.68	41.33	37.92	33.57	30.80	27.27	0.81	0.249	47
						0.07	0.16	0.28	0.62	1.09	2.46			
			P175 0427 2	154.09		63.53	56.25	51.60	45.69	41.91	37.11	1.11	0.468	52
						0.13	0.29	0.52	1.16	2.05	4.61			
			P225 0427 2	453.62		183.40	161.25	146.31	128.65	116.51	104.32	2..31	2.215	60
						0.73	1.40	2.67	5.84	10.35	25.12			
			P250 0427 2	484.63		188.61	167.00	153.20	135.65	124.43	110.18	2.96	2.828	80
						0.78	1.75	3.10	6.97	12.38	27.86			
			P320 0427 2	850.24		330.90	293.00	268.77	237.99	218.31	193.31	6.02	8.943	100
						2.45	5.51	9.79	22.02	39.15	88.08			
	300	MS	P050 0430 2	5.25		1.57	1.39	1.27	1.13	1.03	0.91	0.07	0.0012	14
						0.01	0.01	0.01	0.01	0.01	0.01			
			P060 0430 2	9.24		4.42	3.87	3.47	2.96	2.69	2.52	0.13	0.0035	16
						0.01	0.01	0.01	0.01	0.02	0.03			
			P065 0430 2	11.00		4.79	4.24	3.89	3.44	3.16	2.80	0.15	0.0043	19
						0.01	0.01	0.01	0.01	0.02	0.04			

Stops S	Index period θ (deg)	Motion curve	Code	Static torque Ts (kgf-m)	Up / Down	Dynamic rated output torque (kgf-m) Internal inertia load torque (kgf-m) Input shaft rotating speed N (rpm) 50	75	100	150	200	300	Cam shaft friction torque Tx (kgf-m)	Output shaft inertia GD² (kgf-m²)	Roller ø (mm)
4	300	MS	P080 0430 2	21.52		7.28	6.44	5.91	5.23	4.80	4.25	0.24	0.0111	22
						0.01	0.01	0.01	0.03	0.04	0.09			
			P100 0430 2	40.00		16.09	14.25	13.07		10.61	9.40	0.36	0.0372	32
						0.01	0.02	0.04		0.14	0.30			
			P125 0430 2	65.00		26.46	23.43	21.49	19.03	17.45	15.45	0.52	0.102	40
						0.03	0.06	0.10	0.21	0.37	0.82			
			P150 0430 2	111.00		45.23	40.05	36.74		29.84	26.42	0.79	0.249	47
						0.06	0.13	0.23		0.89	1.99			
			P175 0430 2	154.09		61.55	54.50	49.99	44.27	40.61	35.96	1.08	0.468	52
						0.11	0.24	0.42	0.94	1.66	3.74			
			P225 0430 2	453.62		178.51	156.82	140.33	124.83	112.37	102.50	2.31	2.215	60
						0.58	1.10	1.94	4.25	8.31	20.33			
			P250 0430 2	484.63		182.74	161.81	148.43	131.43	120.56	106.75	2.90	2.828	80
						0.63	1.41	2.51	5.64	10.03	22.56			
			P320 0430 2	850.24		320.61	283.89	260.41		211.52	187.29	5.90	8.943	100
						1.99	4.46	7.93		31.71	71.34			
※ 6	180 (90x2)	MS	P050 0618 2	4.20		1.78	1.57	1.44	1.28	1.17	1.04	0.11	0.0009	14
						0.01	0.01	0.01	0.02	0.03	0.05			
			P060 0618 2	8.37		5.83	4.77	4.34		3.95	3.47	0.17	0.0018	16
						0.01	0.01	0.02		0.05	0.12			
			P065 0618 2	11.00		6.57	5.81	5.33		4.33	3.83	0.21	0.0027	19
						0.01	0.01	0.02		0.08	0.16			
			P080 0618 2	17.22		10.12	8.96	8.22	7.28	6.68	5.91	0.32	0.0061	19
						0.01	0.03	0.04	0.09	0.16	0.36			
			P100 0618 2	31.58		19.02	16.84	15.44		12.54	11.11	0.49	0.0188	30
						0.04	0.07	0.13		0.50	1.12			
			P125 0618 2	56.15		34.84	30.84	28.29	25.05	22.98	20.35	0.66	0.0606	35
						0.10	0.23	0.40	0.90	1.60	3.59			
			P150 0618 2	93.00		58.97	52.22	47.90		38.91	34.45	0.97	0.142	40
						0.24	0.53	0.94		3.73	8.40			
			P175 0618 2	129.43		79.98	70.82	64.97	57.52	52.77	46.72	1.29	0.279	47
						0.46	1.04	1.84	4.13	7.33	16.49			
			P225 0618 2	245.39		139.86	130.21	106.51	101.25	96.38		2.84	0.865	60
						1.56	3.26	5.31	14.33	25.46				
			P250 0618 2	276.07		161.08	142.63	130.84	115.85	106.27		3.06	1.109	80
						1.83	4.10	7.29	16.39	29.13				
			P320 0618 2	595.44		349.19	309.19	283.63		230.37		6.00	3.661	100
						6.01	13.53	24.04		96.15				
	210 (105x2)	MS	P050 0621 2	4.73		2.01	1.78	1.63	1.44	1.32	1.17	0.10	0.0012	14
						0.01	0.01	0.01	0.02	0.03	0.05			
			P060 0621 2	8.72		6.12	5.38	4.96		4.25	3.72	0.16	0.0021	16
						0.01	0.01	0.02		0.04	0.07			
			P065 0621 2	11.00		6.96	6.16	5.65		4.59	4.06	0.20	0.0028	19
						0.01	0.01	0.02		0.06	0.12			
			P080 0621 2	19.37		11.43	10.12	9.28	8.22	7.54	6.67	0.30	0.0103	19
						0.02	0.03	0.05	0.12	0.20	0.45			
			P100 0621 2	36.70		22.40	19.83	18.19		14.78	13.08	0.45	0.0335	30
						0.05	0.10	0.17		0.65	1.46			
			P125 0621 2	60.56		37.03	32.79	30.07	26.63	24.43	21.63	0.61	0.0921	35
						0.12	0.25	0.45	1.00	1.78	4.00			
			P150 0621 2	101.25		63.57	56.29	51.63		41.94	37.14	0.89	0.224	40
						0.28	0.61	1.09		4.33	9.73			
			P175 0621 2	137.36		83.13	73.61	67.52	59.79	54.85	48.56	1.19	0.419	47
						0.51	1.14	2.03	4.55	8.09	18.19			

※ 6 STOP and 8 STOP the cam each revolution, the out shaft rotated twice.

Stops S	Index period θ (deg)	Motion curve	Code	Static torque Ts (kgf-m)	Dynamic rated output torque (kgf-m) Up / Down — Internal inertia load torque (kgf-m) — Input shaft rotating speed N (rpm) 50	75	100	150	200	300	Cam shaft friction torque Tx (kgf-m)	Output shaft inertia GD² (kgf-m²)	Roller ø (mm)
※ 6	210 (105x2)	MS	P225 0621 2	354.26	212.01	193.21	167.25	152.01	142.51	130.20	2.76	0.962	60
					1.42	2.84	4.81	12.30	21.32	54.31			
			P250 0621 2	387.70	231.66	205.13	188.16	166.61	152.84	135.33	3.00	1.327	80
					1.61	3.61	6.41	14.41	25.61	57.61			
			P320 0621 2	678.43	406.43	359.88	330.12	292.31	268.14		5.62	4.726	100
					5.70	12.83	22.80	51.30	91.19				
	240 (120x2)	MS	P050 0624 2	5.25	2.25	1.99	1.83	1.62	1.48	1.31	0.09	0.0012	14
					0.01	0.01	0.01	0.01	0.02	0.04			
			P060 0624 2	9.65	6.48	5.63	5.12	4.95	4.38	4.02	0.14	0.0028	16
					0.01	0.01	0.02	0.03	0.04	0.10			
			P065 0624 2	13.21	7.39	6.54	6.00	5.31	4.87	4.31	0.19	0.0041	19
					0.01	0.01	0.02	0.04	0.06	0.14			
			P080 0624 2	20.44	11.88	10.51	9.65	8.54	7.83	6.94	0.28	0.0104	19
					0.01	0.03	0.04	0.09	0.16	0.35			
			P100 0624 2	34.51	25.23	22.34	20.49	18.15	16.65	14.74	0.41	0.0346	30
					0.04	0.08	0.13	0.29	0.52	1.16			
			P125 0624 2	64.41	38.89	34.44	31.59	27.97	25.66	22.72	0.57	0.0942	35
					0.09	0.20	0.35	0.79	1.40	3.14			
			P150 0624 2	112.63	64.38	57.00	52.29	46.30	42.47	37.61	0.84	0.227	40
					0.21	0.48	0.84	1.89	3.36	7.55			
			P175 0624 2	145.28	86.63	76.71	70.37	62.31	57.15	50.61	1.12	0.427	47
					0.40	0.89	1.58	3.55	6.31	14.20			
			P225 0624 2	432.65	262.31	241.86	226.15	201.35	182.31	162.87	2.33	2.025	60
					2.02	4.31	7.56	19.80	35.24	80.20			
			P250 0624 2	465.24	288.99	255.89	234.73	207.85	190.66	168.82	2.71	2.536	80
					2.35	5.27	9.37	21.08	37.47	84.30			
			P320 0624 2	723.65	489.75	433.66	397.80	352.24	323.11		5.13	6.926	100
					6.40	14.39	25.58	57.56	102.32				
	270 (135x2)	MS	P050 0627 2	5.25	2.17	1.92	1.76	1.56	1.43	1.27	0.09	0.0012	14
					0.01	0.01	0.01	0.01	0.02	0.04			
			P060 0627 2	9.89	7.15	5.83	5.34	5.11	4.83	4.43	0.14	0.0028	16
					0.01	0.02	0.02	0.04	0.06	0.08			
			P065 0627 2	14.05	8.02	7.10	6.51	5.77	5.29	4.68	0.17	0.0041	19
					0.01	0.01	0.02	0.03	0.05	0.11			
			P080 0627 2	21.52	12.36	10.94	10.04	8.89	8.15	7.22	0.26	0.0106	19
					0.01	0.02	0.04	0.07	0.13	0.28			
			P100 0627 2	35.62	25.86	22.90	21.01	18.60	17.06	15.11	0.39	0.0351	30
					0.03	0.06	0.11	0.24	0.41	0.93			
			P125 0627 2	65.00	38.95	34.49	31.64	28.02	25.70	22.75	0.54	0.0951	35
					0.07	0.16	0.28	0.63	1.12	2.50			
			P150 0627 2	114.82	67.41	59.69	54.75	48.48	44.47	39.38	0.79	0.232	40
					0.17	0.39	0.68	1.53	2.71	6.10			
			P175 0627 2	154.09	91.17	80.72	74.05	65.57	60.15	53.26	1.05	0.437	47
					0.32	0.72	1.28	2.87	5.11	11.48			
			P225 0627 2	546.72	270.31	248.65	231.25	213.01	187.65	168.19	2.21	2.074	60
					1.80	3.65	4.35	14.69	27.21	65.11			
			P250 0627 2	584.63	296.22	262.29	240.60	213.04	195.43	173.04	2.57	2.589	80
					1.89	4.25	7.56	17.00	30.22	68.00			
			P320 0627 2	831.69	519.69	460.17	422.12	373.77	342.87		4.83	8.254	100
					6.03	13.55	24.09	54.20	96.35				
※ 8	120 (60x2)	MS	P050 0812 2	3.68	1.67	1.48	1.36	1.20	1.10	0.97	0.11	0.0008	14
					0.01	0.01	0.01	0.03	0.04	0.09			
			P060 0812 2	8.98	4.02	3.54	3.20	2.91	2.61	2.12	0.18	0.0020	16
					0.01	0.02	0.02	0.04	0.08	0.20			
			P065 0812 2	11.00	4.32	3.82	3.51	3.10	2.85	2.52	0.23	0.0026	16
					0.01	0.02	0.03	0.07	0.12	0.26			

Stops S	Index period θ (deg)	Motion curve	Code	Static torque Ts (kgf-m)	Dynamic rated output torque (kgf-m) Up / Down — Internal inertia load torque (kgf-m) — Input shaft rotating speed N (rpm) 50	75	100	150	200	300	Cam shaft friction torque Tx (kgf-m)	Output shaft inertia GD² (kgf-m²)	Roller ø (mm)
※ 8	120 (60x2)	MS	P080 0812 2	15.06	8.27	7.32	6.72	5.95	5.45	4.83	0.35	0.0062	19
					0.02	0.04	0.07	0.16	0.28	0.62			
			P100 0812 2	25.90	13.94	12.34	11.32	10.02	9.19	8.14	0.51	0.0180	26
					0.05	0.12	0.20	0.45	0.80	1.80			
			P125 0812 2	38.94	21.01	18.60	17.06	15.11	13.86	12.27	0.69	0.0571	30
					0.16	0.36	0.64	1.43	2.54	5.70			
			P150 0812 2	58.35	31.75	28.11	25.79	22.83	20.94		0.99	0.126	40
					0.35	0.79	1.40	3.15	5.59				
			P175 0812 2	91.50	49.50	43.83	40.20	35.60	32.65		1.36	0.259	47
					0.72	1.62	2.87	6.46	11.48				
			P225 0812 2	223.65	128.65	117.36	108.42	96.51			2.91	0.894	60
					2.46	5.38	10.78	26.21					
			P250 0812 2	261.14	141.50	125.29	114.93	101.77			3.25	1.160	80
					3.22	7.23	12.86	28.92					
			P320 0812 2	555.74	301.13	266.64	244.59	216.58			6.38	3.827	100
					10.61	23.86	42.41	95.41					
	150 (75x2)	MS	P050 0815 2	3.89	1.37	1.22	1.12	0.99	0.90	0.80	0.10	0.0009	14
					0.01	0.01	0.01	0.02	0.03	0.06			
			P060 0815 2	6.94	3.12	2.94	2.61	2.31	2.02	1.94	0.16	0.0020	16
					0.01	0.02	0.02	0.03	0.05	0.12			
			P065 0815 2	8.24	3.54	3.14	2.88	2.55	2.34	2.07	0.20	0.0026	16
					0.01	0.02	0.02	0.05	0.08	0.17			
			P080 0815 2	17.22	7.63	6.76	6.20	5.49	5.03	4.46	0.31	0.0065	19
					0.02	0.03	0.05	0.11	0.19	0.42			
			P100 0815 2	34.14	16.39	14.52	13.32	11.79	10.81	9.58	0.46	0.0208	26
					0.04	0.09	0.15	0.34	0.59	1.33			
			P125 0815 2	55.05	26.44	23.41	21.47	19.01	17.44	15.44	0.63	0.0648	30
					0.12	0.26	0.46	1.04	1.84	4.14			
			P150 0815 2	90.00	44.04	39.00	35.77	31.68	29.06	25.73	0.93	0.140	40
					0.25	0.56	1.00	2.24	3.98	8.94			
			P175 0815 2	123.27	60.33	53.42	49.00	43.39	39.80		1.24	0.293	47
					0.52	1.17	2.08	4.68	8.32				
			P225 0815 2	354.26	146.37	132.21	122.69	108.95	97.61		2.61	0.972	60
					2.02	4.61	8.53	24.31	38.21				
			P250 0815 2	387.70	169.67	150.24	137.81	122.03	111.94		3.05	1.484	80
					2.64	5.92	10.53	23.68	42.10				
			P320 0815 2	680.19	321.00	284.23	260.73	230.87			5.73	5.178	100
					9.18	20.66	36.72	82.62					
	180 (90x2)	MS	P050 0818 2	4.20	1.46	1.29	1.18	1.05	0.96	0.85	0.09	0.0009	14
					0.01	0.01	0.01	0.01	0.02	0.04			
			P060 0818 2	9.02	4.32	3.87	3.61	2.82	2.74	2.54	0.15	0.0021	16
					0.01	0.01	0.02	0.02	0.04	0.09			
			P065 0818 2	11.00	4.76	4.21	3.86	3.42	3.14	2.78	0.19	0.0029	19
					0.01	0.01	0.02	0.04	0.06	0.13			
			P080 0818 2	19.91	9.04	8.01	7.35	6.50	5.97	5.28	0.28	0.0108	22
					0.02	0.03	0.06	0.12	0.22	0.48			
			P100 0818 2	38.41	18.60	16.47	15.11	13.38	12.27	10.86	0.42	0.0356	26
					0.05	0.10	0.18	0.40	0.71	1.58			
			P125 0818 2	61.66	29.79	26.37	24.19	21.42	19.65	17.40	0.58	0.0985	30
					0.13	0.28	0.49	1.10	1.95	4.37			
			P150 0818 2	101.25	49.97	44.24	40.59	35.94	32.96	29.19	0.84	0.238	40
					0.30	0.66	1.18	2.64	4.69	10.55			
			P175 0818 2	137.36	67.42	59.70	54.76	48.49	44.48	39.38	1.13	0.444	47
					0.55	1.23	2.19	4.92	8.75	19.68			

※ 6 STOP and 8 STOP the cam each revolution, the out shaft rotated twice.

Stops S	Index period θ (deg)	Motion curve	Code	Static torque Ts (kgf-m)	Dynamic rated output torque (kgf-m) Internal inertia load torque (kgf-m) Up Down — Input shaft rotating speed N (rpm) 50	75	100	150	200	300	Cam shaft friction torque Tx (kgf-m)	Output shaft inertia GD² (kgf-m²)	Roller ø (mm)
※ 8	180 (90x2)	MS	P225 0818 2	386.52	184.65	161.30	147.32	136.51	126.51		2.05	2.053	60
					2.62	6.18	10.43	24.32	46.51				
			P250 0818 2	426.47	200.38	177.43	162.76	144.12	132.20		2.79	2.623	80
					3.23	7.27	12.92	29.07	51.67				
			P320 0818 2	743.96	348.46	308.55	283.03	250.62			5.24	6.303	100
					7.76	17.46	31.04	69.84					
	210 (105x2)	MS	P050 0821 2	4.73	1.67	1.48	1.36	1.20	1.10	0.97	0.09	0.0012	14
					0.01	0.01	0.01	0.01	0.02	0.04			
			P060 0821 2	9.03	4.65	4.20	3.94	3.43	3.02	2.65	0.15	0.0023	16
					0.01	0.01	0.02	0.02	0.03	0.07			
			P065 0821 2	11.00	5.08	4.50	4.13	3.65	3.35	2.97	0.18	0.0030	19
					0.01	0.01	0.02	0.03	0.05	0.10			
			P080 0821 2	19.91	8.64	7.65	7.01	6.21	5.70	5.04	0.26	0.0108	22
					0.01	0.03	0.04	0.09	0.16	0.36			
			P100 0821 2	38.41	17.76	15.72	14.42	12.77	11.72	10.37	0.40	0.0356	26
					0.04	0.08	0.13	0.29	0.52	1.16			
			P125 0821 2	61.66	28.44	25.18	23.10	20.45	18.76	16.61	0.54	0.0985	30
					0.09	0.21	0.36	0.81	1.43	3.21			
			P150 0821 2	101.25	47.71	42.24	38.75	34.31	31.47	27.87	0.80	0.238	40
					0.22	0.49	0.87	1.94	3.45	7.75			
			P175 0821 2	140.88	66.99	59.32	54.42	48.18	44.20	39.14	1.07	0.449	47
					0.41	0.92	1.63	3.66	6.50	14.62			
			P225 0821 2	386.52	178.65	157.31	143.25	130.20	120.51		1.94	2.053	60
					1.95	4.20	7.51	18.65	34.31				
			P250 0821 2	426.47	191.33	169.41	155.41	137.61	126.23		2.65	2.623	80
					2.38	5.34	9.49	21.36	37.96				
			P320 0821 2	770.53	351.52	311.26	285.52	252.82	231.92		4.93	7.383	100
					6.68	15.03	26.71	60.10	106.84				
	240 (120x2)	MS	P050 0824 2	5.25	1.90	1.68	1.54	1.37	1.25	1.11	0.08	0.0012	14
					0.01	0.01	0.01	0.01	0.02	0.03			
			P060 0824 2	9.41	5.85	5.43	4.67	4.02	3.55	3.02	0.13	0.0035	16
					0.01	0.01	0.02	0.02	0.03	0.06			
			P065 0824 2	11.00	6.20	5.49	5.03	4.46	4.09	3.62	0.16	0.0043	19
					0.01	0.01	0.02	0.03	0.05	0.11			
			P080 0824 2	21.52	9.42	8.34	7.65	6.77	6.21	5.50	0.25	0.0111	22
					0.01	0.02	0.04	0.07	0.13	0.28			
			P100 0824 2	40.00	20.22	17.90	16.42	14.54	13.34	11.81	0.37	0.0372	26
					0.03	0.06	0.11	0.24	0.42	0.93			
			P125 0824 2	65.00	30.50	27.01	24.78	21.94	20.12	17.82	0.51	0.102	30
					0.08	0.16	0.29	0.64	1.14	2.55			
			P150 0824 2	111.00	53.14	47.05	43.16	38.21	35.05	31.04	0.75	0.249	40
					0.18	0.39	0.69	1.56	2.76	6.21			
			P175 0824 2	154.09	74.40	65.88	60.43	53.51	49.09	43.46	1.00	0.468	47
					0.33	0.73	1.30	2.92	5.19	11.67			
			P225 0824 2	420.63	203.6	187.41	171.25	150.65	132.05		1.72	2.154	60
					1.05	3.74	6.25	14.89	27.65				
			P250 0824 2	484.63	225.65	199.81	183.28	162.29	148.87		2.44	2.828	80
					1.96	4.41	7.84	17.63	31.34				
			P320 0824 2	850.24	395.89	350.55	321.56	284.73	261.19		4.58	8.943	100
					6.20	13.94	24.78	55.74	99.09				
	270 (135x2)	MS	P050 0827 2	5.25	1.84	1.63	1.49	1.32	1.21	1.07	0.08	0.0012	14
					0.01	0.01	0.01	0.01	0.02	0.03			
			P060 0827 2	9.41	5.62	5.12	4.60	3.85	3.31	2.98	0.13	0.0035	16
					0.01	0.01	0.01	0.02	0.03	0.06			
			P065 0827 2	11.00	5.98	5.30	4.86	4.30	3.94	3.49	0.16	0.0043	19
					0.01	0.01	0.01	0.03	0.04	0.09			

Stops S	Index period θ (deg)	Motion curve	Code	Static torque Ts (kgf-m)	Dynamic rated output torque (kgf-m) Internal inertia load torque (kgf-m) Up Down — Input shaft rotating speed N (rpm) 50	75	100	150	200	300	Cam shaft friction torque Tx (kgf-m)	Output shaft inertia GD² (kgf-m²)	Roller ø (mm)
※ 8	270 (135x2)	MS	P080 0827 2	21.52	9.09	8.05	7.38	6.54	5.99	5.31	0.24	0.0111	22
					0.01	0.02	0.03	0.06	0.10	0.22			
			P100 0827 2	40.00	19.52	17.28	15.85	14.04	12.88	11.40	0.36	0.0372	26
					0.03	0.05	0.09	0.19	0.33	0.74			
			P125 0827 2	65.00	29.44	26.07	23.91	21.18	19.42	17.20	0.49	0.102	30
					0.06	0.13	0.23	0.51	0.90	2.01			
			P150 0827 2	111.00	51.29	45.42	41.66	36.89	33.84	29.96	0.72	0.249	40
					0.14	0.31	0.55	1.23	2.18	4.91			
			P175 0827 2	154.09	71.82	63.59	58.34	51.65	47.38	41.96	0.96	0.468	47
					0.26	0.58	1.03	2.31	4.10	9.22			
			P225 0827 2	420.63	196.31	180.25	162.31	142.50	127.86	112.01	1.68	2.154	60
					0.98	3.52	5.02	11.69	20.65	50.25			
			P250 0827 2	484.63	217.82	192.87	176.92	156.66	143.70	127.24	2.36	2.828	80
					1.55	3.49	6.19	13.93	24.76	55.71			
			P320 0827 2	850.24	382.15	338.38	310.40	274.85	252.12		4.42	8.943	100
					4.90	11.01	19.58	44.04	78.29				

※ 6 STOP and 8 STOP the cam each revolution, the out shaft rotated twice.

PU series technical support seek information table

Disk driving:☐

1·Number of divisions (How many workstations is necessary): _____

2·Angle of input shaft driven output shaft motion: _____ Degree

3·Input shaft rotation speed per minute: _____RPM

4·Disc diameter:_____ mm ; Thickness:_____ mm ; Material: _____

5·Weight of each group fixture:_____kg

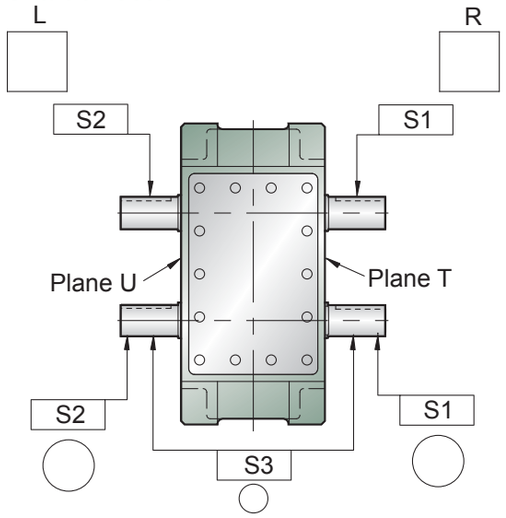
6·Weight of each group workpiece:_____kg

7·Pitch of circle diameter as fixed fixture and workpiece:_____mm

8·Whether there is support at the bottom of the disc? _____mm(Radius of the supporter)

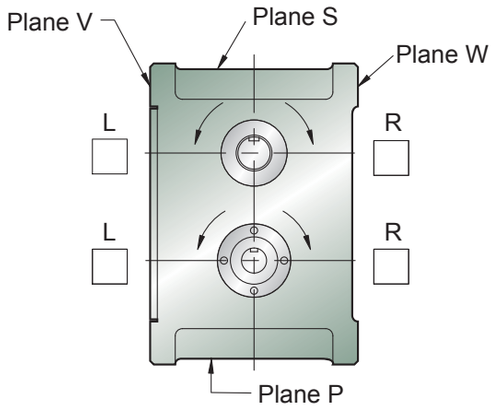
Splitter mounting surface P____ S____ T____ U____ V____ W____

Please check the needs of output shaft direction.



Please check the needs of input shaft on which side. Just stay on the right S1, leaving only the left S2, both sides have to be.

Please check the output shaft rotation direction



Please check the input shaft rotation direction

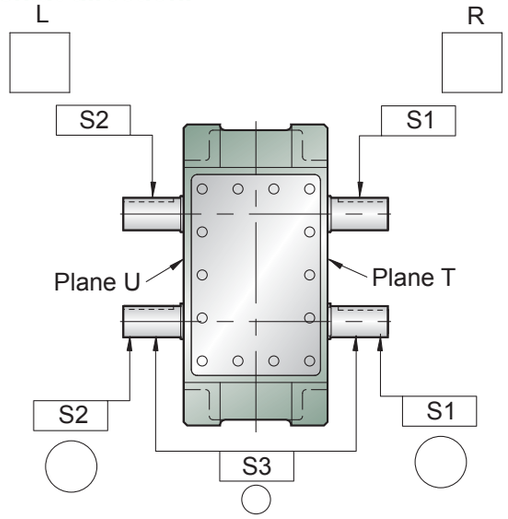
PU series technical support seek information table

Conveyor driving:☐

1. Number of divisions (How many workstations is necessary): _____
2. Angle of input shaft driven output shaft motion: _____ degree
3. Input shaft rotation speed per minute: _____ RPM
4. Pitch of conveyer belt: _____ mm
5. Pitch circle diameter of driving wheel: _____ mm; weight: _____ kg
6. Pitch circle diameter of follower wheel: _____ mm; weight: _____kg
7. Diameter of transmission shaft: mm; weight: _____ kg;
   Quantity: _____ piece
8. Pitch circle diameter of the sprocket wheel: _____ mm; weight: _____ kg;
   Quantity: _____ set
9. Weight of chain: _____ kg; Quantity: _____ set
10. Weight of each fixture set: _____ kg; Quantity: _____set
11. Weight of each workpiece set: _____ kg; Quantity: _____ set

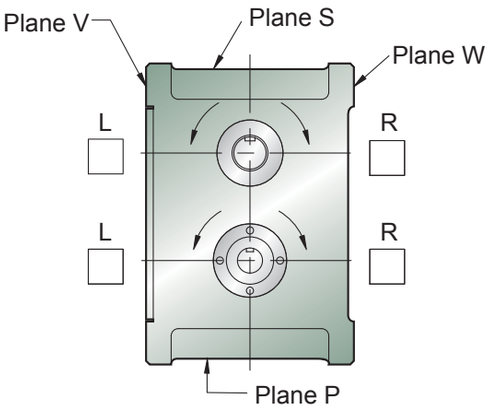
Splitter mounting surface P____ S____ T____ U____ V____ W____

Please check the needs of output shaft direction.



Please check the needs of input shaft on which side. Just stay on the right S1, leaving only the left S2, both sides have to be.

Please check the output shaft rotation direction



Please check the input shaft rotation direction

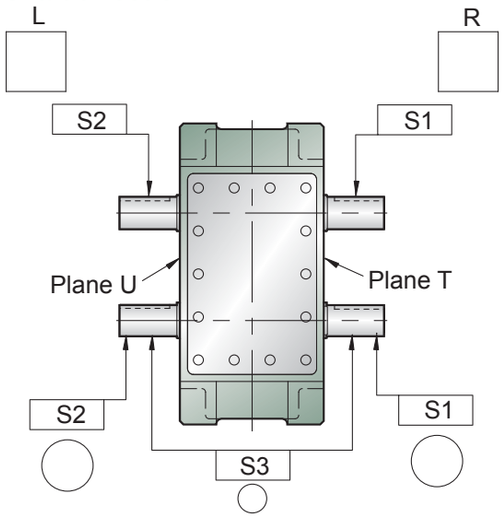
PU series technical support seek information table

Indirect driven by gear:☐

1. Number of divisions (How many workstations is necessary): _____
2. Angle of input shaft driven output shaft motion: _____ degree
3. Input shaft rotation speed per minute: _____ RPM
4. Pitch circle diameter of driving wheel: _____ mm; weight: _____ kg
5. Pitch circle diameter of follower wheel: _____ mm; weight: _____ kg
6. Weight of each fixture set: _____ kg; Quantity: _____ set
7. Weight of each workpiece set: _____ kg; Quantity: _____ set
8. Pitch of circle diameter as fixed fixture: _____ mm
9. Whether there is support at the bottom of the disc: _____ mm (Radius of the supporter)

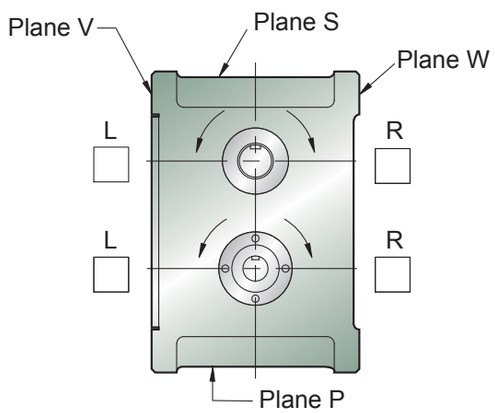
Splitter mounting surface P____ S____ T____ U____ V____ W____

Please check the needs of output shaft direction.



Please check the needs of input shaft on which side.
Just stay on the right S1, leaving only the left S2,
both sides have to be.

Please check the output shaft rotation direction



Please check the input shaft rotation direction

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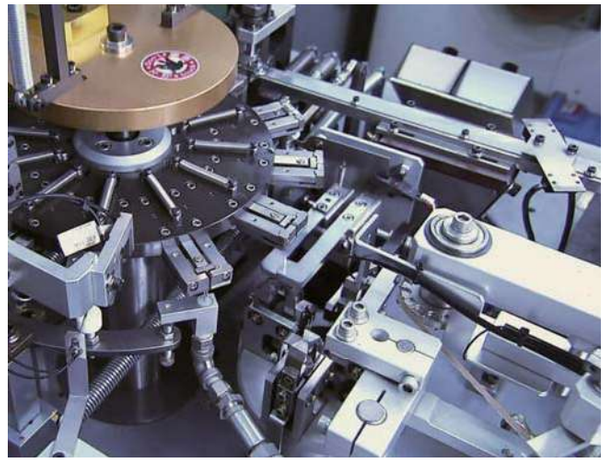

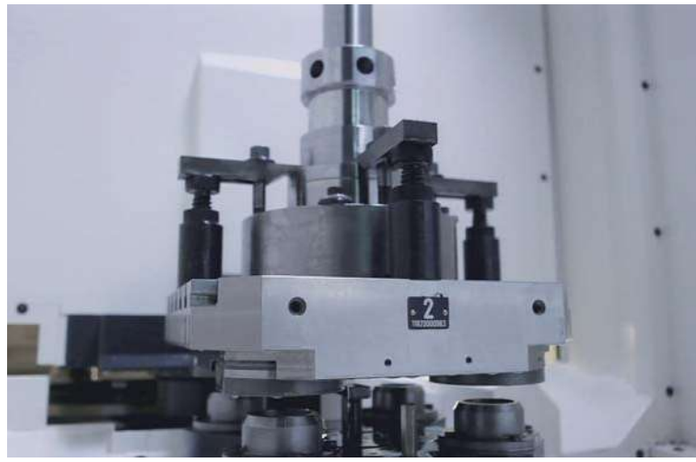

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