SANGO AUTOMATION

Version: 2506

Product Catalogue
Cam Indexing Table

Help you realize the desire of precision product conception

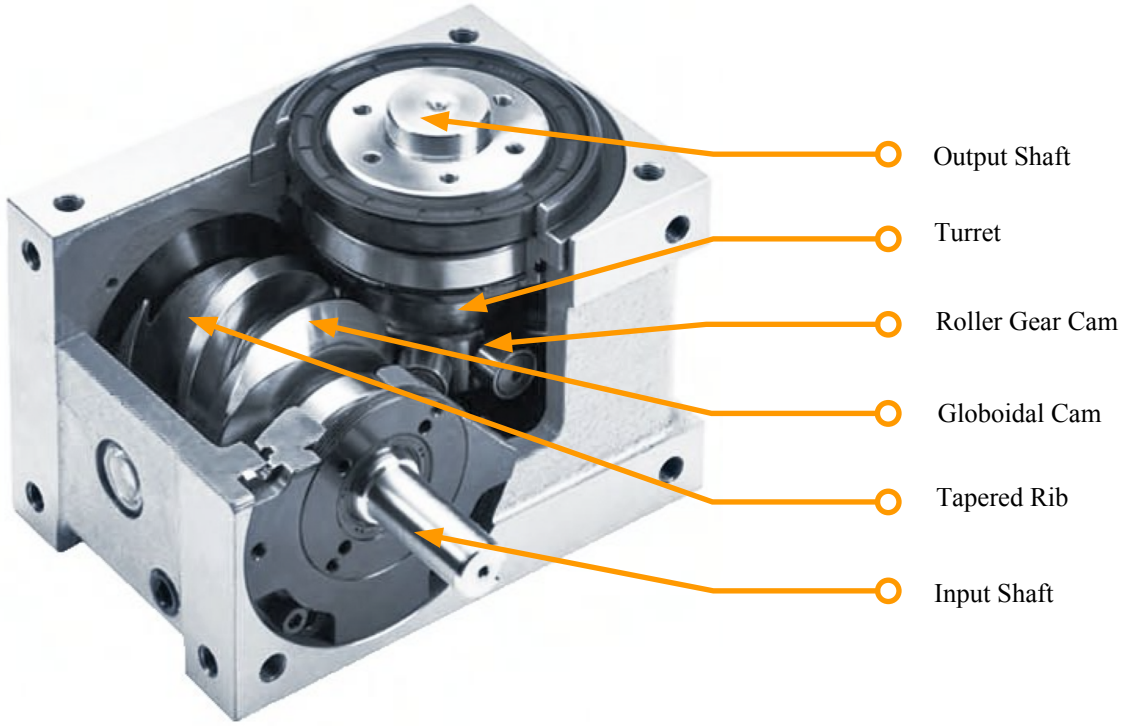
三工自动化（深圳）有限公司

Sango Automation Limited

www.sango-automation.com

Index

Mechanism Principle



Pic.1

Terms and Definition

1. Indexing 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 Rid

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 Hansheng 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 Sango index drives.

5. Numble of station

The number of stations per revolution of the output shaft.

6. Drive Angle (Cam Indexer 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.

Mechanism Principle

Sango Automation's indexer 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 Pic1. The cam follower which is radially embedded in the circumferential surface of the turret comes into linear contact with the tapered ribof the cam to their respective wall surfaces.

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

The tapered rib always comes into contact with two or three cam followers so that the revolution of the inputshaft 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 shorten-ing 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.

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 Pic2. 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 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 Motion Diagram are Classified as Follows

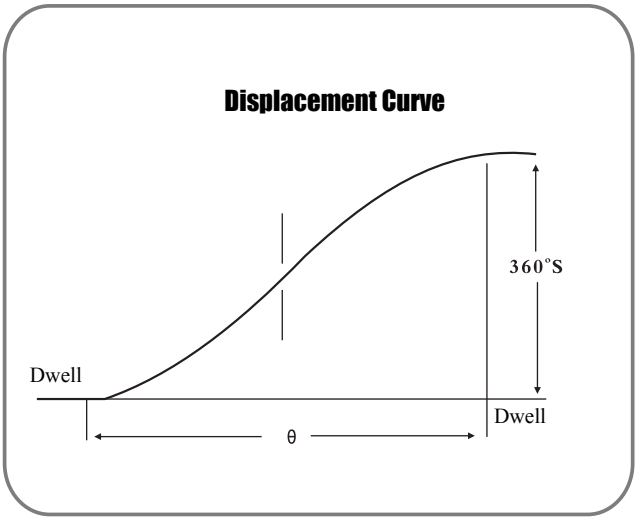
1.Discontinuous Curve

2.Double Stationary Symmetric Curve

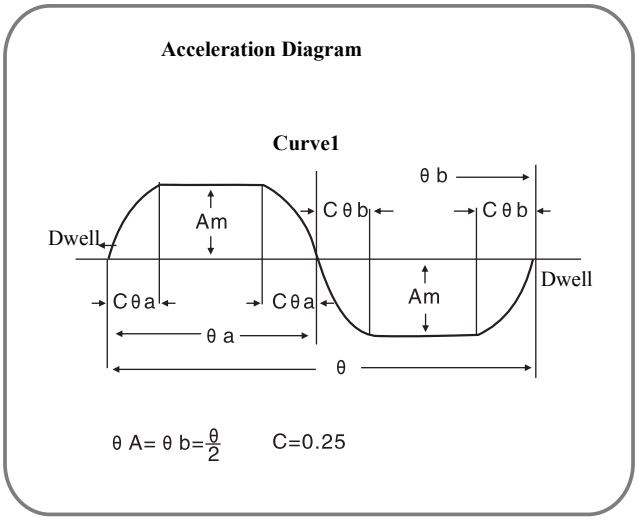
3.Double Stationary Asymmetric Curve

4.Single Stationary Curve

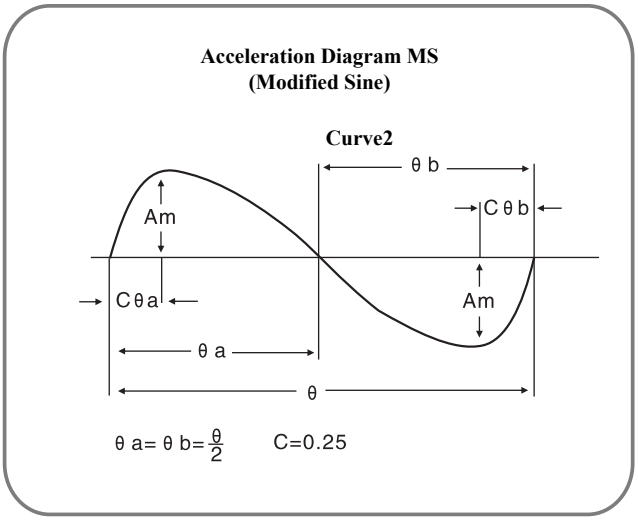
5.Non-stationary Curve



Pic.2



Pic.3



Pic.4

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

Vm..... Maximum velocity

Am..... Maximum acceleration

Jm..... Maximum jerk

If Vm is 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.

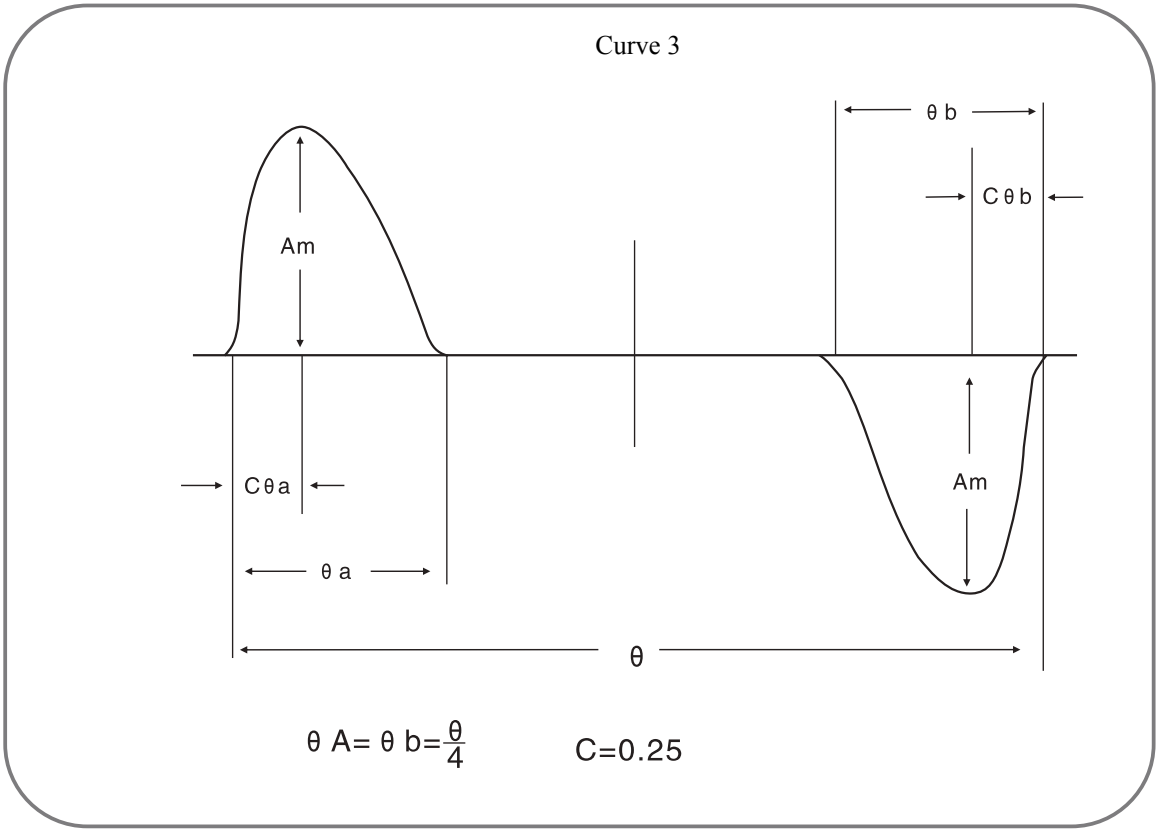
The standard curves for Sango Indexer Drive consists of the following 4 types:

Modified Trapezoid Curve(MT: For high speeds and light loads Pic.3

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

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

Acceleration Diagram(MCV50)

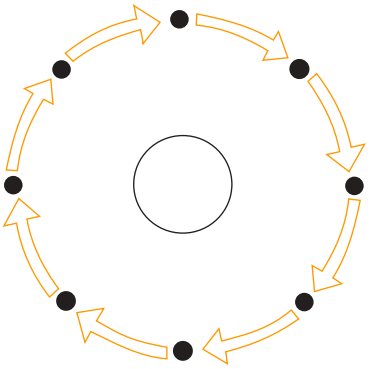


Pic. 5

Overview

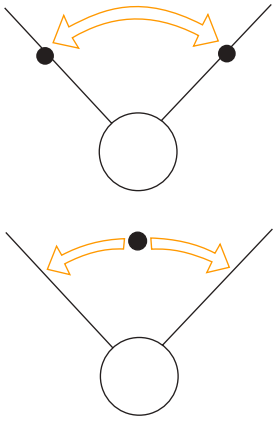
Indexing Drives/Oscillating Drives/Roller Drives

Indexing Drives



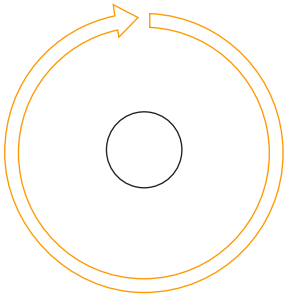
- The indexing drives operate intermittently as follows:
  Dwell→AE Index→AE Dwell→AE Index.
- Dwell: Output shaft stops rotating and cam follower touches the straight part of taper rib of roller gear cam.
- Index: Output shaft rotates and cam follower touches the curve part of taper rib of roller gear 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.

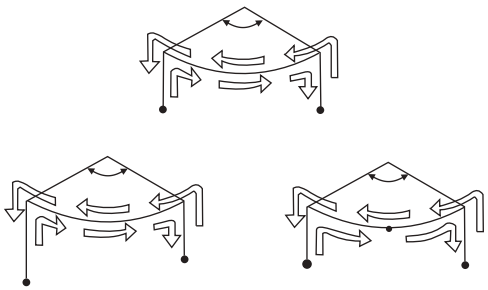
Roller Drives



- 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.

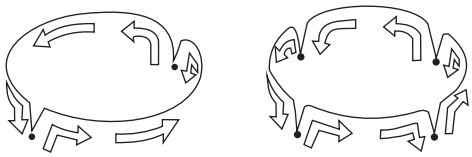
Oscilate Handler/Indexer Handler/Parts Handler

Oscilate Handler



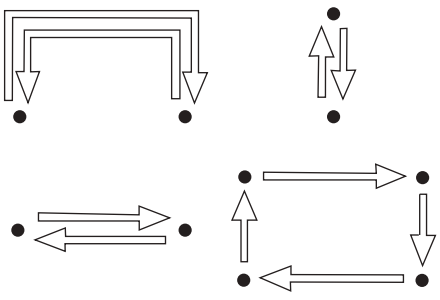
- When oscillating drives are in operation, the rotary input shaft with equal speed shall make the output shaft rotate forward and backward and lift in two dimensions.
- The output shaft can be set to stop at the central point of rotation path while oscillating. The rotary angle degree and lifting capacity 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.

Indexer Handler



- Indexer handlerer 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.
- Indexer handler, applying stereoscopic cams, can provide correct timing. Overlap of rotating and lifting and timing can be set.
- Indexer 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/2D 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.

Model Selection Calculation

Symbol and Its Meanings

a4: Backlash Factor

Am:Max. non-dimensional acceleration

Amax : Max. acceleration (m》 $s^{-2)}$

C : Acceleration coefficient (C≧1)

D : Diameter of gyration (m)

E : Energy of gyrator (kgf · m · rpm^2)

Eo : Energy of gyrator (kgf · m · rad^2)

Ee : Energy of a body for linear motion (kgf · m · s^{-2})

F : Centrifugal force (kgf)

G : Weight (kgf)

GD^2 : Inertia moment (kgf · m^2)

g : Gravity acceleration (m · s^{-2})

I : Polar moment of inertia (kgf · m · $s^{2)}$

K : Radius of gyration (m)

K e : Equivalent radius of gyration for output shaft (m)

L f : Lift factor

L h : Expected life (hr)

M : Mass (kg)

N : Cam shaft speed (rpm)

N o : Initial cam shaft speed (rpm)

P : Stroke (m)

Pa : Average motor power (kw)

Ps : Peak motor power

Q m : Max. cam shaft torque coefficient

R : Follower pitch radius (m)

r : Speed ratio

S : No. of station

T c : Cam shaft torque (kgf · m)

T d : Start/stop torque (kgf · m)

T f : Friction torque (kgf · m)

T i : Inertia torque (kgf · m)

T t : Total torque required for output shaft (kgf · m)

T w : Work torque (kgf · m)

T x : Cam shaft friction torque (kgf · m)

Ve : Linear velocity (m · s^{-1})

Vm : Max. non-dimensional velocity

Vmax : Max. linear velocity (m · s^{-1})

W : Weight (kg)

α : Functional angle (deg)

θ : Index period (deg)

μ : Coefficient of friction

Ω : Angular velocity (rad · s^{-1})

Ω : Angular acceleration (rad · s^{-2})

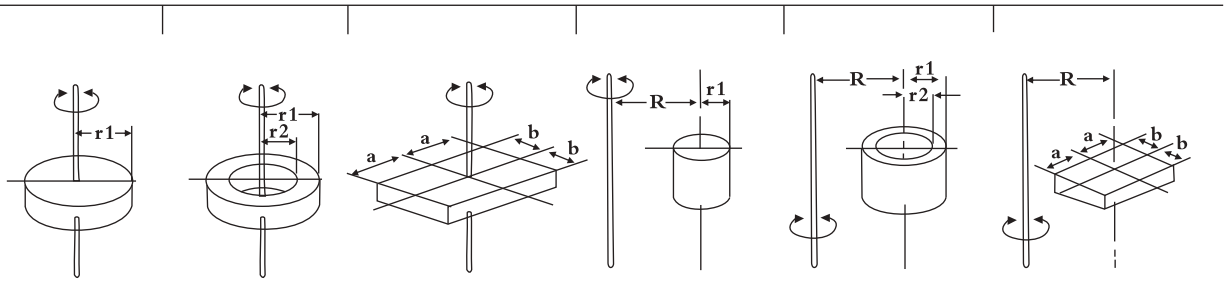
Table 1. Life Factor Lf and Expected Life Lh

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	10.6	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 2. Specifications of Motion Curve

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

Table 3. Radius of Gyration K



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

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.

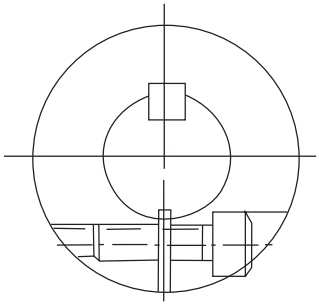


Figure: Ratio Fixing

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

Overload Protective Device 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.

Lubrication & Maintenance

Lubrication & Maintenance

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

Table 4. Viscosity of Lubrication

Cam Shaft Speed N(rpm)	0~20	20~100	100~200	200~300	300~400	>400
Viscosity cst/40℃	>680	680~460	460~360	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 5. Recommended Lubricant for Use

Viscosity cst/37℃	Supplier		
	EssoStandard	Shell	Mobil
>600	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

Notes for Lubricant Oil Selection

A) 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 drive.
B) This machine uses Petro China #90 oil. (Viscosity is equivalent to680~ 460)
C) The addition of appropriate extreme pressure additives in the lubricating oil can increase the strength of the oil film, prevent corrosion, rust, and improve the stability of the oil, which is of great help to the improvement of the sliding effect.
D) The extreme pressure 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

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.

Notes for Lubricant Oil Replacement

A) Periodic Lubricant replacement
1.First time : After 500~1000 hours continuous running (about 2~4 months)
2.Second time: after the first replacement , at every 3000 hours(about 6~12 months) of operation.
B) To replace the lubricating oil, please make sure that the lubrication is clean and the oil filling hole is wiped clean to prevent moisture and impurities from entering.
C) The temperature rise increases the internal pressure of the mailbox and causes the oil to leak. Regularly clean the oil hole, screw, vent hole, check the oil pipe, and replenish the lubricating oil.

To Maintain the Accuracy Factor

The Size of Table

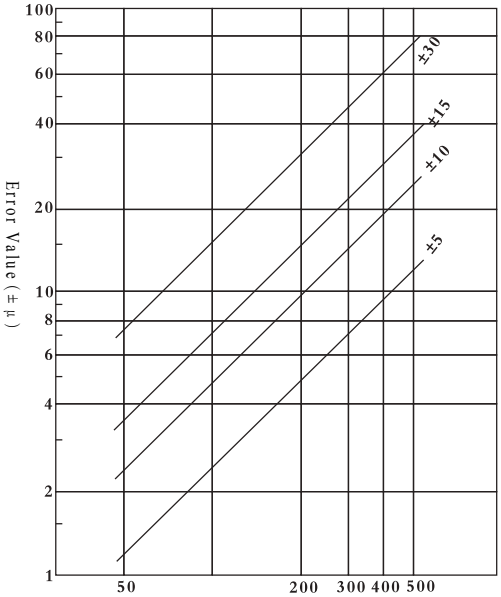
To install a table on the output shaft, the size of table shall be based on the permitted output torque load for the Torque Te.
While high precision is required, the Torque Te shall be 2-3 times larger than the permitted output torque load; therefore, the twist of the output shaft needs to be reduced.
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	110	140	180	250
200	250	315	400	500	625	800	1000

Indexer Precision

Sango indexer 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.



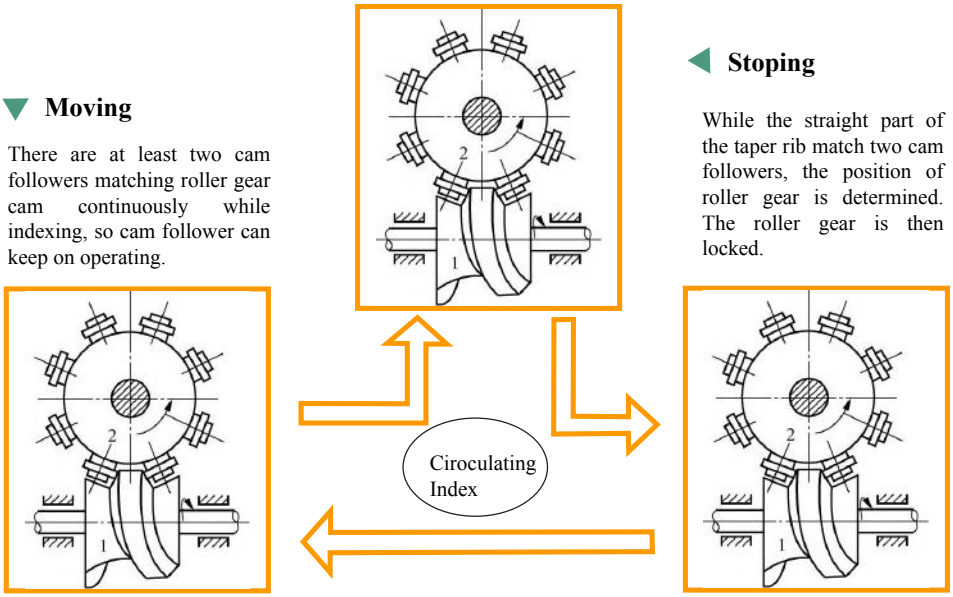
Relationship Between Angle Error and Radius Error

Moving

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

Stoping

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.



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.

Cam curve characteristic speed, acceleration, and input torque have a great impact on the accuracy and life of the cam segmentation mechanism. Selecting the appropriate cam curve is an important consideration for the mechanism.

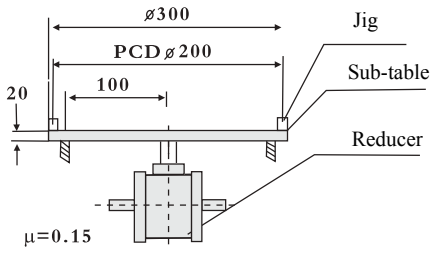
Generally speaking, the commonly used cam curves are modified sine, modified trapezoid, modified constant velocity. The selection principles are as follows (refer to the figure above)

1. Continuous speed (including start and end)
2. Continuous acceleration (including start and end)
3. The maximum values of Am, Vm, and manual driving torque Qm [A*(V)m] should be minimized as much as possible.
4. When operating at high speeds with light loads, choose M.S and M.T (Am small/, Vm small)
5. At low speeds and heavy loads, choose M.S and M.C.V (Am large/, Vm small)
6. When the speed or load situation is unclear, choose M.S as the most appropriate choice.

Use Examples and Calculation

Ex.(1) When applying the sub-table

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



(Fig-1)

1. Number of index stop : S=6
2. Time ratio in move : Dwell for one rotation of cam
3. Revolution of input shaft : N=80rpm
4. Cam curve : Modified Sine curve
5. Size of sub-table : ø300 x t20
6. Weight of jig : 3 kg/set
7. Weight of workpiece : 0.25kg/piece
8. Rotary table is held with its bottom sliding surface to
9. support loaded weight.(effective radius R=100mm)
10. Jigsare fixed on P.C.D. ø200

Solution

1-1 Numbers of index stop: S=6

1-2 Time Ratio in rotation /dwell 1:2, there for index angle

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

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

1-4 Cam Curve as Modified , therefore :Vm=1.76 ,Am=5.53, Qm=0.99

1-5 Loading Torque: Tt

(1) Inertia Torque: Tt

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

$$W_1 = \frac{\pi}{4} \times 30^2 \times 2 \times 7.8 \times \frac{1}{1000} = 11.026\ (kg)$$

$W_2 = 3 \times 6 = 18(kg)$

$W_3 = 0.25 \times 6 = 1.5(kg)$

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

$$I_1 = \frac{W_1 R^2}{2G} = \frac{11.026 \times 0.15^2}{2 \times 980} = 0.0126(kg \cdot cm \cdot s^2)$$

$$I_2 = \frac{W_1 R e^2}{G} = \frac{18 \times 0.1^2}{9.8} = 0.018(kg \cdot cm \cdot s^2)$$

$$I_3 = \frac{W_1 R e^2}{G} = \frac{1.5 \times 0.1^2}{9.8} = 0.0015(kg \cdot cm \cdot s^2)$$

(C) Total Inertia moment (I) to be:

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

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

$$\alpha = Am \times \frac{2\pi}{N} \times \left(\frac{360}{\theta h} \times \frac{n}{60}\right)^2 = 5.53 \times \frac{2\pi}{6} \times \left(\frac{360}{120} \times \frac{80}{60}\right)^2 = 92.66\ (rad/s^2)$$

(E) Inertia torque(Ti) to be:

$Ti = I \cdot a$ $\quad Ti = 0.032 \times 92.66 = 2.965\ (kg \cdot cm)$

(2) Friction torque(Tf) to be:

$Tf = \mu \cdot W \cdot R = 0.15 \times (11.026+18+1.5) \times 0.1 = 0.458(kg.m)$

(3) Working torque(Tw) to be:

No work during indexing , therefore : Tw=0

(4) Loading torque (Tt) from above to be:

$Tt = Ti + Tf + Tw = 2.965+0.458+0=3.423\ (kg \cdot cm)$

Vm: Max. non-dimensional velocity

Am: Max. non-dimensional acceleration

Qm: Max. cam shaft torque coefficient

α:Functional angle (deg)

θh:Index period (deg)

μ:Coefficient of friction

r: Speed ratio

Ω:Angular velocity (rad · s^{-1})

Ω:Angular acceleration (rad · s^{-2})

1-6 Actual loading torque:Te

$Te = Tt \cdot fc = 3.423 \times 1.5 = 5.135\ (kg \cdot m)$

1-7 Actual loading torque:Te Factor of safety load fc as fc=1.5

$$Tc = \frac{360}{\theta h \cdot N} \times Qm \times Te + Tca = \frac{360}{120 \times 6} \times 0.99 \times 5.135 = 2.54\ (kg \cdot m)$$

1-8 Input shaft torque:Tc Note: Loading torque against input shaft Tca is regarded as 0, therefore Tca=0

$$P = \frac{Tc \times n}{716 \times n}\ (HP) \text{ or } P = \frac{Tc \times n}{975 \times n} \qquad Thp = \frac{Tc \times n}{716 \times n}(HP) \text{ or } P = \frac{Tc \times n}{975 \times n}$$

if efficiency n =60% then

$$P = \frac{2.54 \times 80}{716 \times 0.6} = 0.47\ (HP) \quad P = \frac{2.54 \times 80}{975 \times 0.6} = 0.34\ (KW)$$

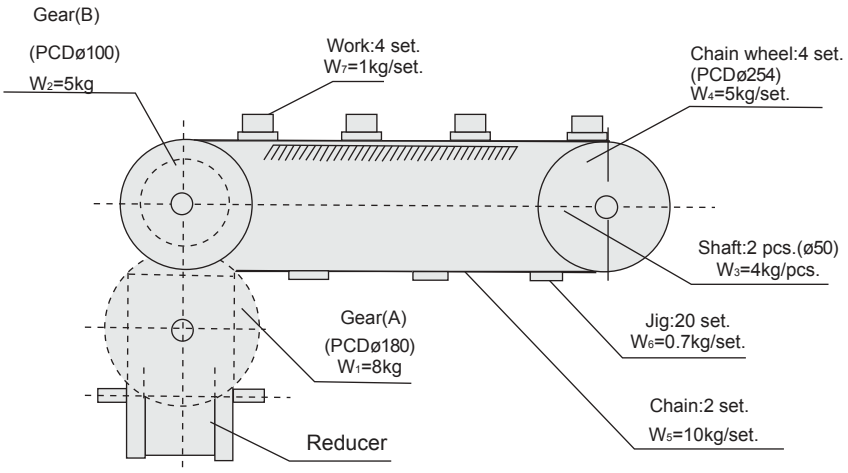
In fact, this value is regarded as its peak, therefore 1/2 of this value shall be provided.

1-9 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.

Use Examples and Calculation

EX.(2) When applying to drive a conveyor

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.



1.Traverse pitch on conveyor : 239mm

2.Indexing cam angle : $\theta h = 120^{\circ}$

3.Driven 2 seconds for 1 cycle

4.Reduction ratio : $i = \frac{180}{100} = (\frac{n}{m})$

5.Cam curve : Modified Sine

Note Dc : pitch diameter of conveyor sprocket (cm)

Pc : traverse pitch on conveyor (cm)

R: velocity ratio

Solution

2-1 Number of index stop N: $N=\frac{\pi.Dc.r}{Pc}=\frac{\pi x25.4x1.8}{23.9}=6$

2-2 Revolution of input shaft to be provide 2seconds as 1 cycles

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

2-3 Cam curve as modified trapezoid, therefore:Vm =1.76, Am=5.53, Qm=0.99

2-4 Loading Torque:Tt

(1)InertiaTorque:Ti

(a)Weight of drive gear W1 =8kg , and P.C.D = ϕ 180, then the inertia moment on drive gear (IA)

$IA=(I_1)=\frac{W_1\cdot R^2}{2G}=\frac{8X9^2}{2X980}=0.331\ (kg\cdot cm\cdot s^2)$

(b)Inertia moment on conveyor to be:

(1)Inertia moment on driven gear =(I2)

$I_2=\frac{W_2(R^2+r^2)}{2G}=\frac{5(5^2+2.5^2)}{2X980}=0.08\ (kg\cdot cm\cdot s^2)$

(2)Inertia moment of shaft(I3) :

$I_3=\frac{W_3\cdot R^2}{2G}=\frac{4^2X2.5^2}{2X980}X2=0.026\ (kg\cdot cm\cdot s^2)$

(3)Inertia moment of sprocket(I4) :

$I_4=\frac{W_4(R^2+r^2)}{2G}=\frac{5X(12.7^2+2.5^2)}{2X980}=1.71\ (kg\cdot cm\cdot s^2)$

(4)Inertia moment of Chain(I5) :

$I_5=\frac{W_5\cdot Re^2}{G}=\frac{10X12.7}{980}X2=3.29\ (kg\cdot cm\cdot s^2)$

(5)Inertia moment of jig (I6) :

$I_6=\frac{W_6\cdot Re^2}{G}=\frac{0.7X12.7^2}{980}X10=2.3\ (kg\cdot cm\cdot s^2)$

(6)Inertia moment of workpiece (I7) :

$I_7=\frac{W_7\cdot Re^2}{G}=\frac{1X12.7^2}{980}X4=0.66\ (kg\cdot cm\cdot s^2)$

(7)Therefore, total Inertia moment on conveyor side (IB):

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

$=0.08+0.026+1.71+3.29+2.3+0.65=8.056\ (kg\cdot cm\cdot s^2)$

(c)Effective inertia moment on conveyor side(IBe):

$Ibe=IB(\frac{n}{m})^2=8.065X(\frac{180}{100})^2=26.10\ (kg\cdot cm\cdot s^2)$

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

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

(e)Output shaft biggest angular acceleration(α)

$\alpha=Am\frac{2\pi}{N}(\frac{360}{\theta h}X\frac{n}{60})^2=5.53X\frac{2\pi}{6}(\frac{360}{120}X\frac{30}{60})^2=13.02\ (rad\cdot s^2)$

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

$Ti=I\cdot\alpha=26.43X13.02=344.12\ (kg\cdot cm)$

2-5 Friction Torque: Tf

(a)Friction torque on conveyor side (Tf):

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

$Tf=\mu\cdot W\cdot R=0.15X(\frac{10}{2}+\frac{0.7X20}{2}+\frac{10X2}{2})X12.7=41.9\ (kg\cdot cm)$

(2)Effective friction torque on conveyor side (Tfe):

$Tfe=Tf(\frac{n}{m})=41.9X\frac{180}{100}=75.43\ (kg\cdot cm)$

2-6 Working Torque(Tw):

No work during indexing , therefore: Tw=0

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

$Tt=Ti+Tf+Tw=344.12+75.43+0=419.55\ (kg\cdot cm)=4.19\ (kg\cdot cm)$

Notes: Be sure that all values is either (cm) or (m) to avoid mistake

2-8 Provided the factor of safety load fc=2, actual loading torque

$Te=Tt\cdot Tc=4.19x2=8.38$

2-9 Input shaft torque (Tc):

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

Notes: Provide any torque against cam shaft Tca is regard as 0

$Tc=\frac{360}{6}X\frac{1}{120}X0.99X8.38+0=4014$

2-10 Necessary power(P):

$P=\frac{Tc\cdot n}{716\cdot n}(HP)\ 或\overset{Or}{P}=\frac{Tc\cdot n}{975\cdot n}(KW)$

Provided efficiency n=60%

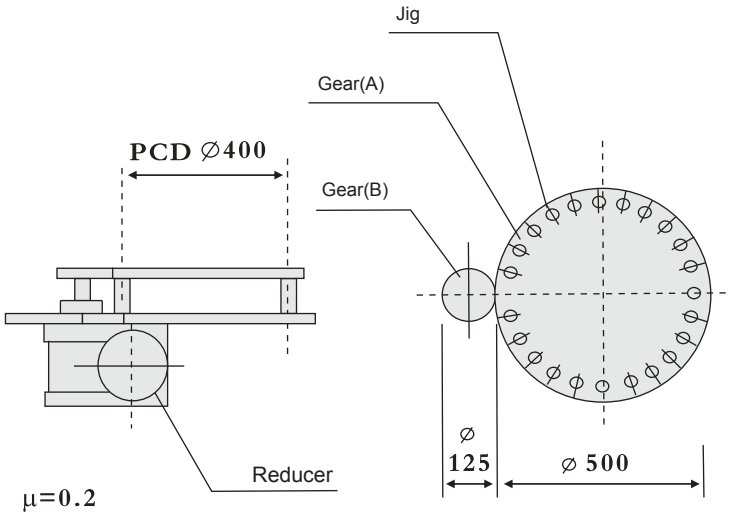
$P=\frac{4.41X30}{716X0.6}=0.28(HP)\ 或\overset{Or}{P}=\frac{4.41X30}{975X0.6}=0.212(KW)$

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

2-11From 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.

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



- 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： N=6

1-2 Indexing Angle： $\theta h=120^{\circ}$

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

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

1-5 Load torque :Tt

(1) Inertial torque(T1)

(a) Gear A: I1, Gear B: I2,Jig :I3

$I_1=\frac{WR^2}{2G}=\frac{3X0.0625^2}{2X9.8}=0.00059\ (kg\cdot cm\cdot s^2)$

$I_2=\frac{WRe^2}{2G}=\frac{20X0.25^2}{2X9.8}=0.063\ (kg\cdot cm\cdot s^2)$

$I_3=\frac{WR^2}{2G}=\frac{120X0.2^2}{9.8}=0.48\ (kg\cdot cm\cdot s^2)$

(b) Output shaft biggest angular acceleration(α)

$\alpha_1=AmX\frac{2\pi}{N}\ X\ (\frac{360}{\theta h}X\frac{n}{60})^2=5.53X\frac{2\pi}{6}X\ (\frac{360}{120}X\frac{80}{60})^2=92.66\ (rad/s^2)$

$\alpha_2=AmX\frac{2\pi}{N}X\ (\frac{360}{\theta h}X\frac{n}{60})^2=5.53X\ \frac{2\pi}{24}\ X\ (\frac{360}{120}X\frac{80}{60})^2=23.66\ (rad/s^2)$

$Ti_1=I_1\cdot\ \alpha_1 \qquad Ti_1=0.00059X92.66=0.054\ (kg\cdot m)$

$Ti_2=\ (I_2+I_3)\ \ (\frac{N}{N1})^2\alpha_2\ (\frac{N1}{N})=(0.063+0.48)\ X\ (\frac{6}{24})^2X23.16X\ (\frac{24}{6})=3.14\ (kg\cdot m)$

$Ti=Ti_1+Ti_2=0.054+3.14=3.19\ (kg\cdot m)$

(2) Friction Torque： Tf

$Tf=U.W.R.\ (\frac{N}{N1})=0.2X\ (120+20)\ X0.2X\ (120+20)\ X0.2X\ (\frac{6}{24})=3.4\ (kg\cdot m)$

(3) Working Torque(Tw):No work during indexing , therefore: Tw=0

From the above, loading torque(Tt)

Tt==Ti+Tf+Tw=3.19+1.4+0=4.59(kg.m)

1-6 Actual loading torque Te , Provided the factor of safety load fc=1.5,

$Te=Tt\cdot fc=4.59X1.5=6.885\ (kg\cdot m)$

1-7 Input shaft torque (Tc): Note:Provide any torque against cam shaft Tca is regard as 0

$Tc=\frac{360}{\theta h\cdot N}$, $Qm\cdot Te+Tca=\frac{360}{6X120}X0.99X6.885=3.4$

1-8 Necessary power(P):

$Tc=\frac{TcXn}{716Xn}\ (HP)或P=\frac{TcXn}{975Xn}\ (KW)$

Provided efficiency n=60% $Tc=\frac{3.4X80}{716X0.6}=0.63\ (HP)$ 或$P=\frac{3.4X80}{975X0.6}=0.46\ (KW)$

1-8 In fact, this value is regarded as its peak , therefore 1/2 if this vale shall be provided

1-9 Select suitable cam index

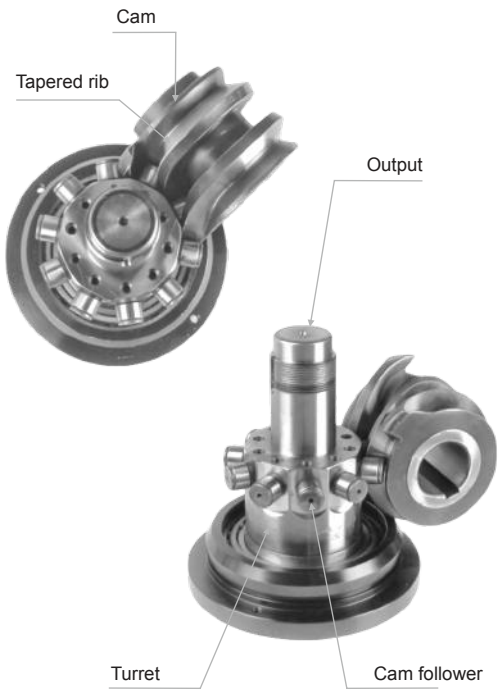
From the above, revolution of input shaft as 80 rpm and you can choose from catalog whose output torque is higher than the calculated torque (Te).

Therefore, Te = 6.885(kg.m)leads to select RU-80ds as a result.

Model Code

80	DF	08	120	2	R	S3	VW	1	X
a	b	C_1	C_2	d	e	f	g	h	i

a Size	b Type	c_1 No of stops	c_2 Index Period (θh)	d Motion Curve	e Hand of Cam
80 80mm	DF Type	08 8stop	120 120°	2 MS Curve	R Dwell Right Hand Cam
Center Distance 25D/32D/38D/45D/60D/70D/80D/110D/140D/180D/250D/350D	DS Shaft Type DF Flange Type DE Flange Shaft Type DT Table Type	Number of stops of the Indexing Drive 2.3.4.5.6.8.10.12.16 Customized specification 20.24.30.32.36.40.48	Cam rotation period (during which the output moves.) 90°/120° 150°/180° 210°/240° 270°/300°	1 2 3 Are available	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. Right Hand Cam: 1D well R, 2D well R2, 3D well R3, 4D well R4 Left Hand Cam: 1D well L, 2D well L2, 3D well L3, 4D well L4



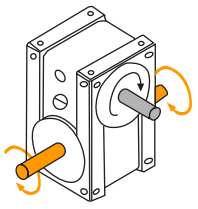
1 Modified Trapezoid

2 Modified Sine

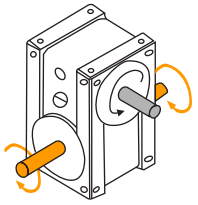
3 Modified Constant Velocity50

Input Output

R、R2、R3、R4、 Right Hand Cam



L、L2、L3、L4、 Left Hand Cam



Optional Order

Hollow Output (which is available on sizes60DHF-350DHF). Hollow output is used to connect the electrical cables and pneumatic tubing. Advise required hole diameter before order. If none specified, solid output will be supplied.

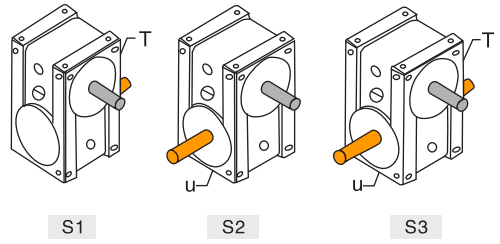
How To Order

• 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, 4 types of motion curves (MT, MS, MCV50, RBS) can be ordered as standard.

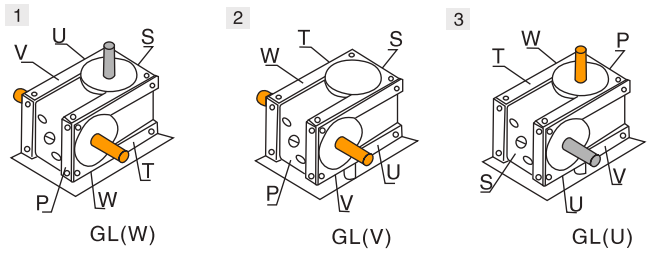
Model Code

f Input Shaft Projection	g Mounting Holes	h Mounting Position	i Special Instructions
S3 Both T face and U face	VW	I	X
S1 Only T surface side S2 Only U surface side S3 Both T and U surface side are avaiable	Mounting holes on surfaces V and W come automatically. In addition, mounting holes on the other surfaces（P,S,T,U）are available as standard.	Mounting position as shown below.	Include the symbol"X" in case of special instructions. Standard (No symbols) X Special Instructions

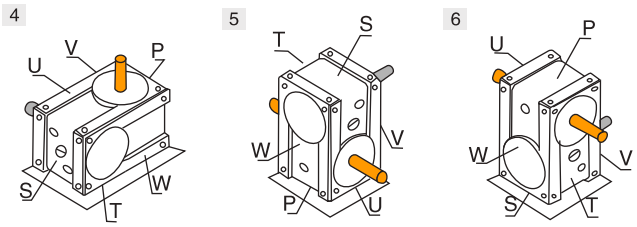
S1 S2 S3



S1 S2 S3



GL(W) GL(V) GL(U)



GL(T) GL(P) GL(S)

Shaft Type

Flange Type

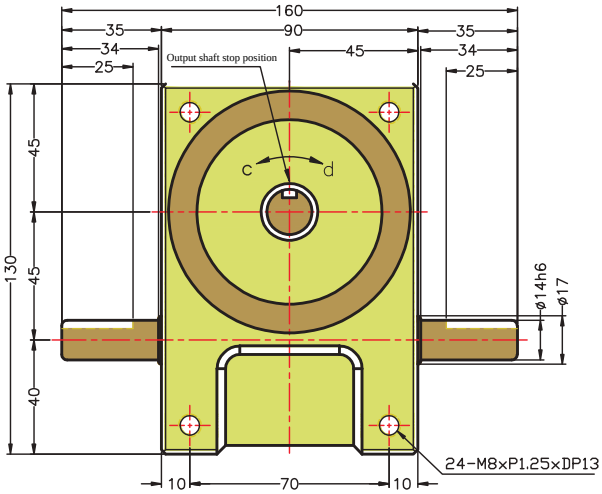
Flange Shaft Type

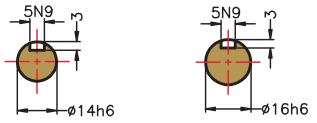
Table Type

Shaft Model

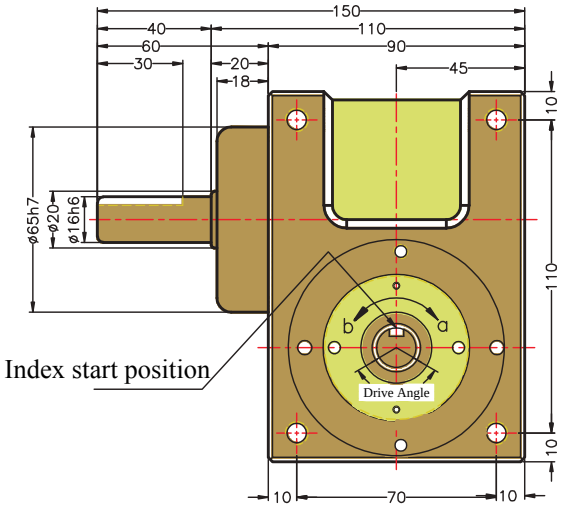
(45DS,60DS,63DS,70DS,80DS,83DS,100DS,110DS,125DS,140DS,180DS)

45DS





Input shaft　　Output shaft

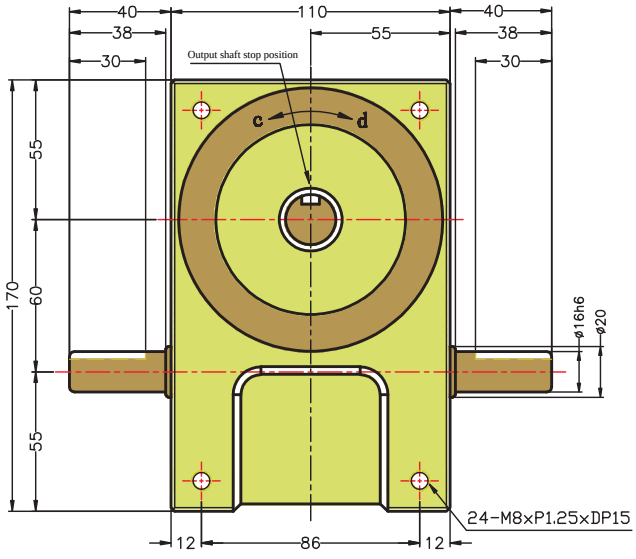


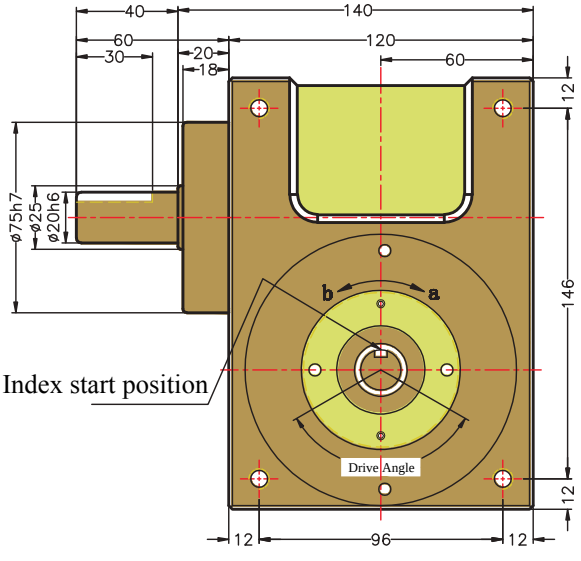
Technical Parameter

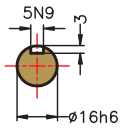
Items	Symbol	Unit	Value	Items	Symbol	Unit	Value	Items	Symbol	Unit	Value
Allowable thrust load on output shaft	C1	kgf	80	Allowable thrust load on input shaft	C3	kgf	85	GD2 of input shaft (Note1)	C6	$kgf-m^2$	3.2×10^{-5}
Allowable radial load on output shaft	C2	kgf	72.5	Max. repetitive bending force on input shaft	C4	kgf	75	Indexing accuracy		sec.	±30
Allowable torque on output shaft	Ts	kgf-m	Refer torque table	Max. repetitive torque on input shaft	C5	kgf-m	4	Weight		kg	7

Note1:GD2 of input shaft is a value in dwell range.
Note2: Value of C1 to C5 are those obtained for safety factor=2.

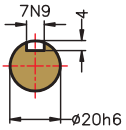
60DS







Input shaft



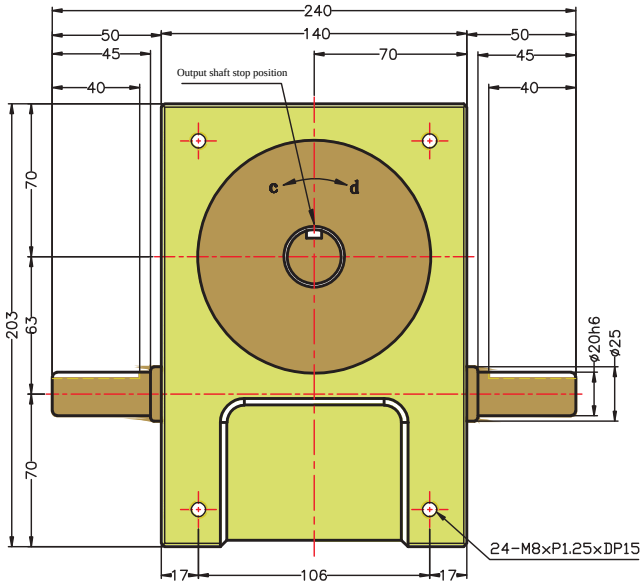
Output shaft

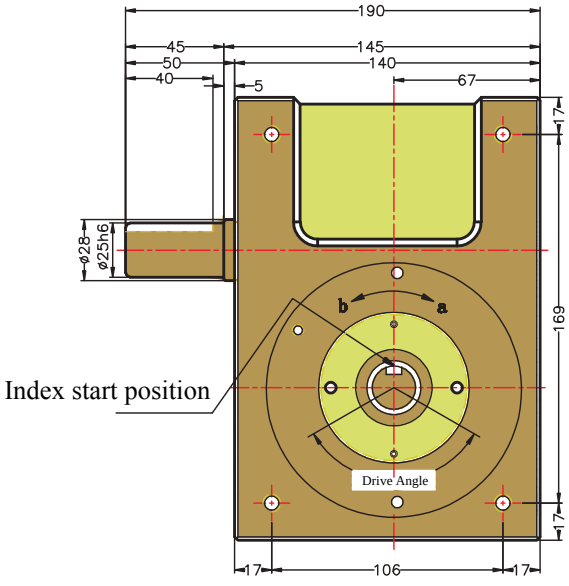
Technical Parameter

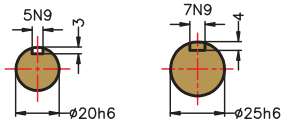
Items	Symbol	Unit	Value	Items	Symbol	Unit	Value	Items	Symbol	Unit	Value
Allowable thrust load on output shaft	C1	kgf	180	Allowable thrust load on input shaft	C3	kgf	100	GD2 of input shaft (Note1)	C6	$kgf-m^2$	$1.9x10^{-3}$
Allowable radial load on output shaft	C2	kgf	150	Max. repetitive bending force on input shaft	C4	kgf	95	Indexing accuracy		sec.	±30
Allowable torque on output shaft	Ts	kgf-m	Refer torque table	Max. repetitive torque on input shaft	C5	kgf-m	6	Weight		kg	13

Note1:GD2 of input shaft is a value in dwell range.
Note2: Value of C1 to C5 are those obtained for safety factor=2.

63DS







Input shaft

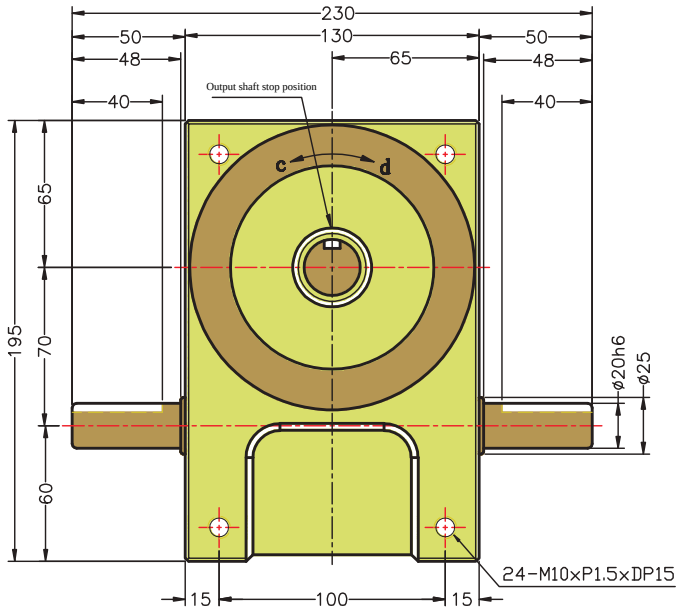
Output shaft

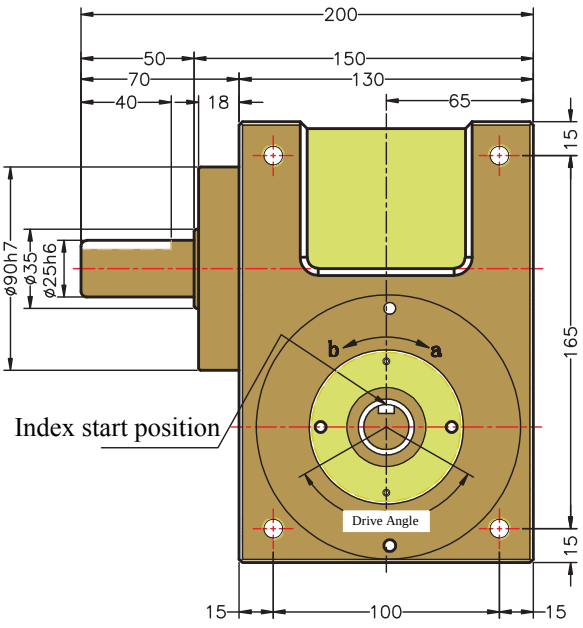
Technical Parameter

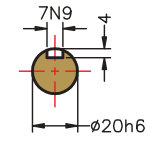
Items	Symbol	Unit	Value	Items	Symbol	Unit	Value	Items	Symbol	Unit	Value
Allowable thrust load on output shaft	C1	kgf	180	Allowable thrust load on input shaft	C3	kgf	100	GD2 of input shaft (Note1)	C6	$kgf-m^2$	$1.9x10^{-3}$
Allowable radial load on output shaft	C2	kgf	150	Max. repetitive bending force on input shaft	C4	kgf	95	Indexing accuracy		sec.	±30
Allowable torque on output shaft	Ts	kgf-m	Refer torque table	Max. repetitive torque on input shaft	C5	kgf-m	6	Weight		kg	15

Note1:GD2 of input shaft is a value in dwell range.
Note2: Value of C1 to C5 are those obtained for safety factor=2.

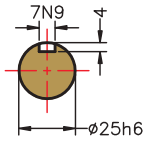
70DS







Input shaft



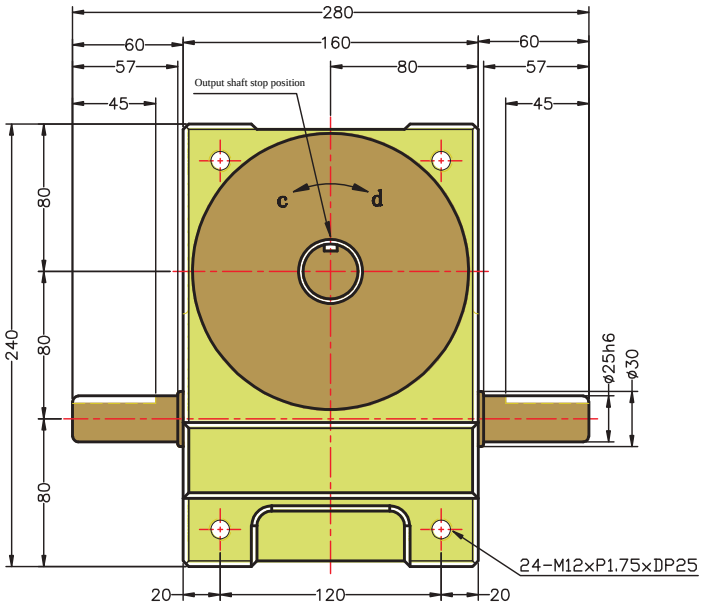
Output shaft

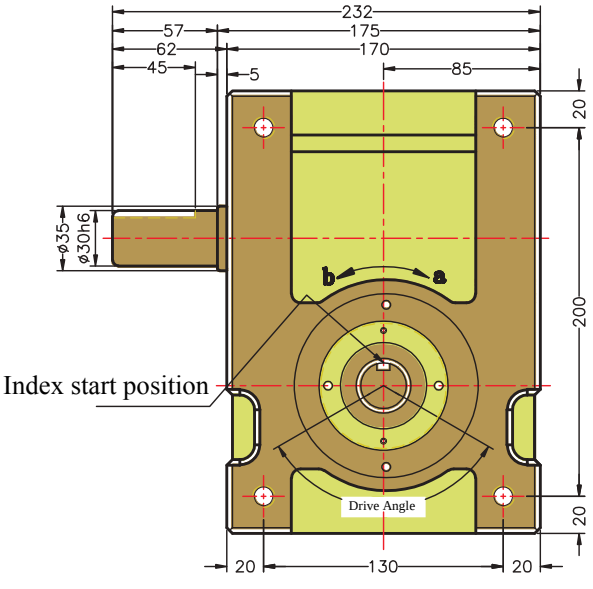
Technical Parameter

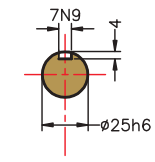
Items	Symbol	Unit	Value	Items	Symbol	Unit	Value	Items	Symbol	Unit	Value
Allowable thrust load on output shaft	C1	kgf	220	Allowable thrust load on input shaft	C3	kgf	150	GD2 of input shaft (Note1)	C6	$kgf-m^2$	$6x10^{-3}$
Allowable radial load on output shaft	C2	kgf	220	Max. repetitive bending force on input shaft	C4	kgf	110	Indexing accuracy		sec.	±30
Allowable torque on output shaft	Ts	kgf-m	Refer torque table	Max. repetitive torque on input shaft	C5	kgf-m	9.5	Weight		kg	18

Note1:GD2 of input shaft is a value in dwell range.
Note2: Value of C1 to C5 are those obtained for safety factor=2.

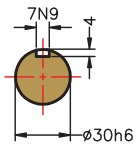
80DS







Input shaft



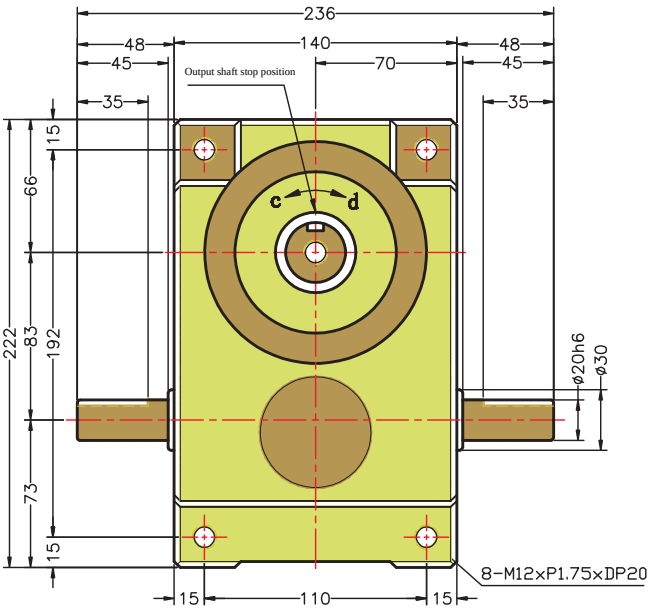
Output shaft

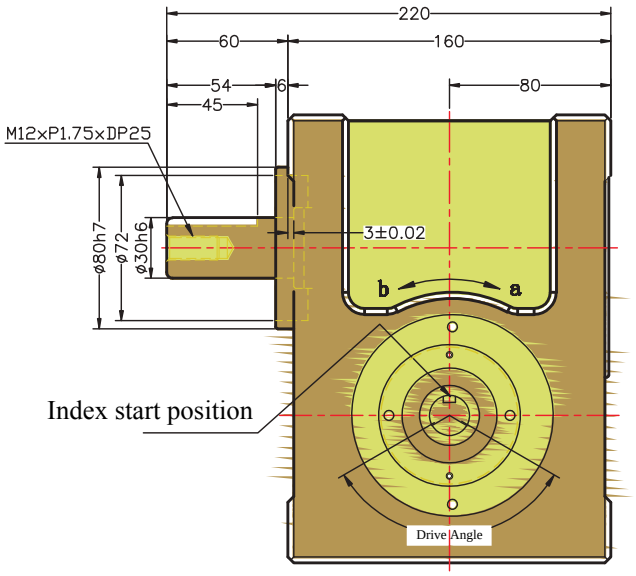
Technical Parameter

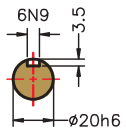
Items	Symbol	Unit	Value	Items	Symbol	Unit	Value	Items	Symbol	Unit	Value
Allowable thrust load on output shaft	C1	kgf	220	Allowable thrust load on input shaft	C3	kgf	210	GD2 of input shaft (Note1)	C6	$kgf-m^2$	$9x10^{-3}$
Allowable radial load on output shaft	C2	kgf	220	Max. repetitive bending force on input shaft	C4	kgf	190	Indexing accuracy		sec.	±30
Allowable torque on output shaft	Ts	kgf-m	Refer torque table	Max. repetitive torque on input shaft	C5	kgf-m	18.5	Weight		kg	32

Note1:GD2 of input shaft is a value in dwell range.
Note2: Value of C1 to C5 are those obtained for safety factor=2.

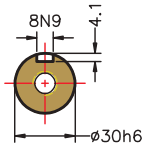
83DS







Input shaft



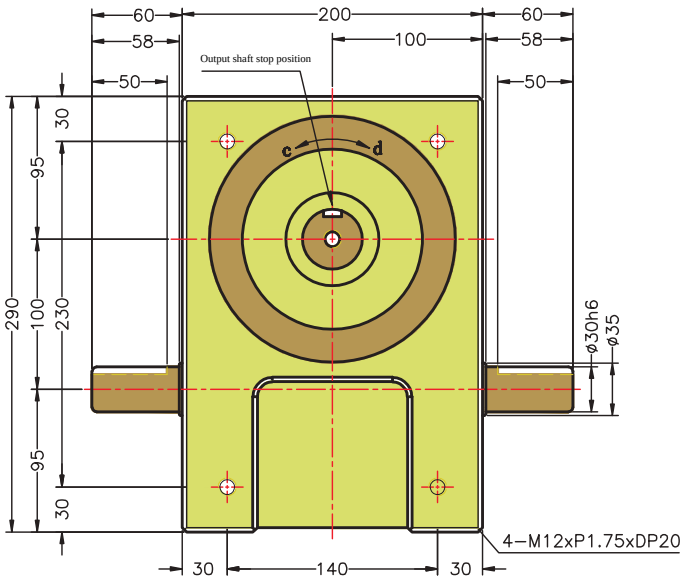
Output shaft

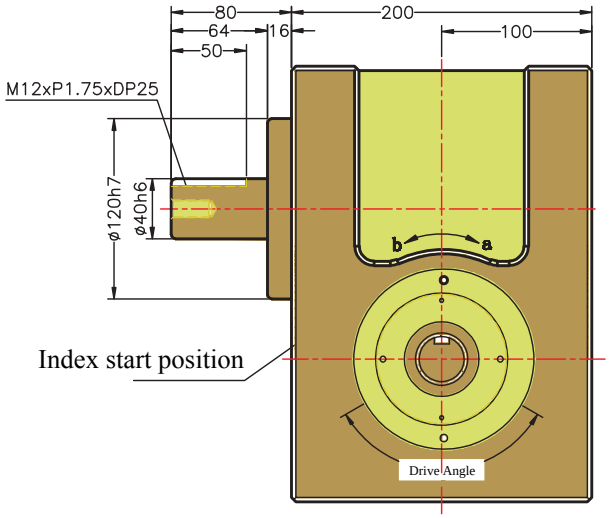
Technical Parameter

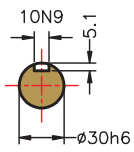
Items	Symbol	Unit	Value	Items	Symbol	Unit	Value	Items	Symbol	Unit	Value
Allowable thrust load on output shaft	C1	kgf	330	Allowable thrust load on input shaft	C3	kgf	350	GD2 of input shaft (Note1)	C6	$kgf-m^2$	$9x10^{-3}$
Allowable radial load on output shaft	C2	kgf	420	Max. repetitive bending force on input shaft	C4	kgf	260	Indexing accuracy		sec.	±30
Allowable torque on output shaft	Ts	kgf-m	Refer torque table	Max. repetitive torque on input shaft	C5	kgf-m	25	Weight		kg	26.5

Note1:GD2 of input shaft is a value in dwell range.
Note2: Value of C1 to C5 are those obtained for safety factor=2.

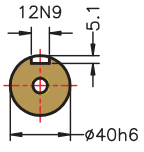
100DS







Input shaft



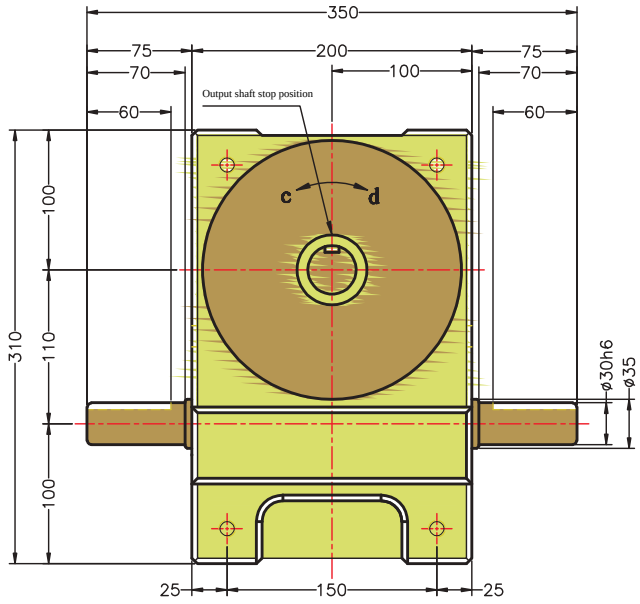
Output shaft

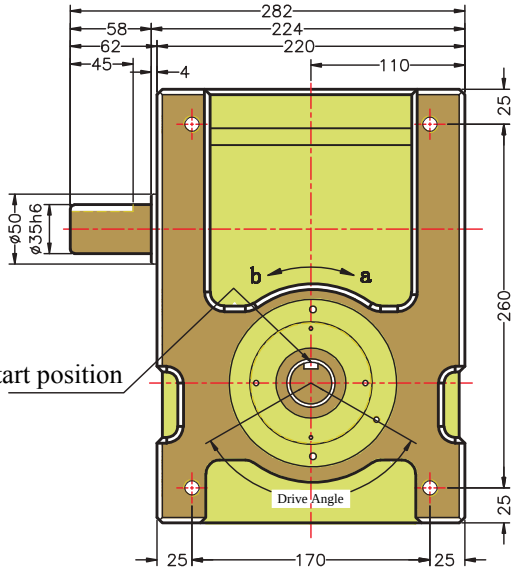
Technical Parameter

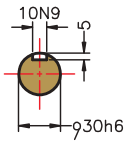
Items	Symbol	Unit	Value	Items	Symbol	Unit	Value	Items	Symbol	Unit	Value
Allowable thrust load on output shaft	C1	kgf	400	Allowable thrust load on input shaft	C3	kgf	300	GD2 of input shaft (Note1)	C6	$kgf-m^2$	4×10^{-2}
Allowable radial load on output shaft	C2	kgf	450	Max. repetitive bending force on input shaft	C4	kgf	200	Indexing accuracy		sec.	±30
Allowable torque on output shaft	Ts	kgf-m	Refer torque table	Max. repetitive torque on input shaft	C5	kgf-m	26	Weight		kg	50

Note1:GD2 of input shaft is a value in dwell range.
Note2: Value of C1 to C5 are those obtained for safety factor=2.

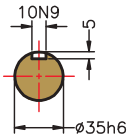
110DS







Input shaft



Output shaft

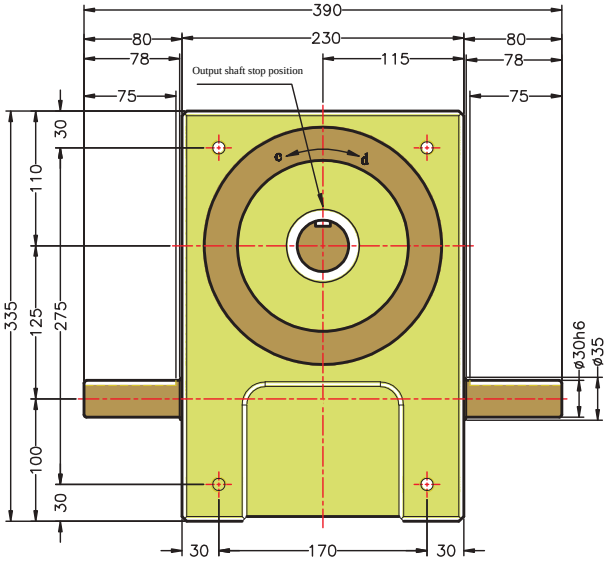
Technical Parameter

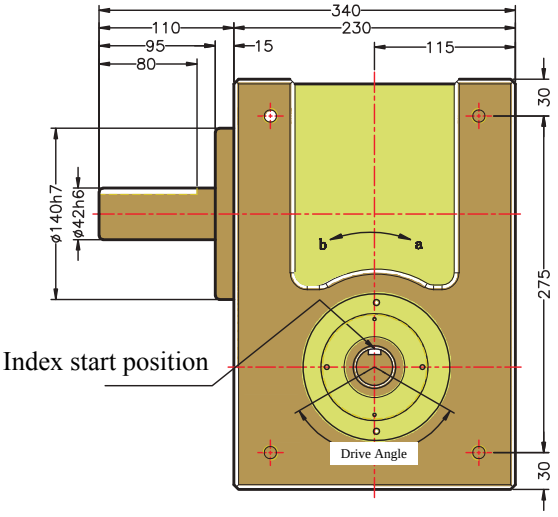
65

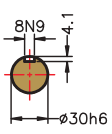
Items	Symbol	Unit	Value	Items	Symbol	Unit	Value	Items	Symbol	Unit	Value
Allowable thrust load on output shaft	C1	kgf	500	Allowable thrust load on input shaft	C3	kgf	360	GD2 of input shaft (Note1)	C6	$kgf-m^2$	2.8×10^{-2}
Allowable radial load on output shaft	C2	kgf	550	Max. repetitive bending force on input shaft	C4	kgf	290	Indexing accuracy		sec.	±30
Allowable torque on output shaft	Ts	kgf-m	Refer torque table	Max. repetitive torque on input shaft	C5	kgf-m	32	Weight		kg	65

Note1:GD2 of input shaft is a value in dwell range.
Note2: Value of C1 to C5 are those obtained for safety factor=2.

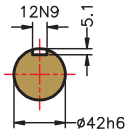
125DS







Input shaft



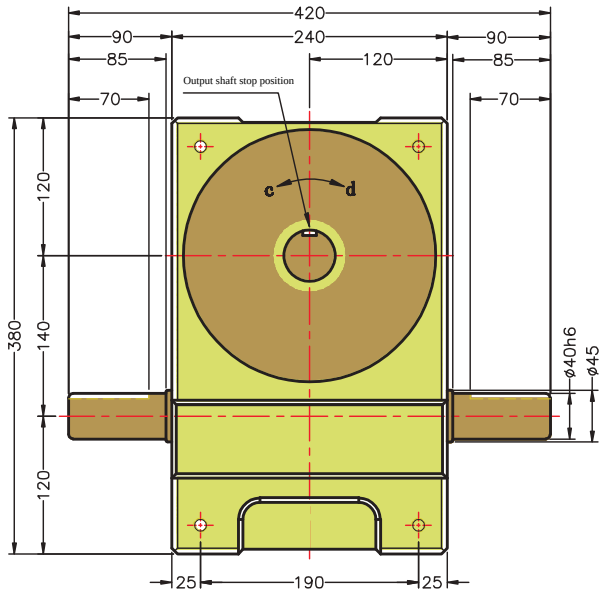
Output shaft

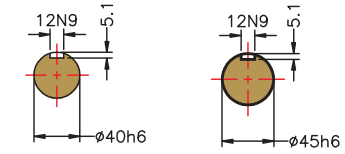
Technical Parameter

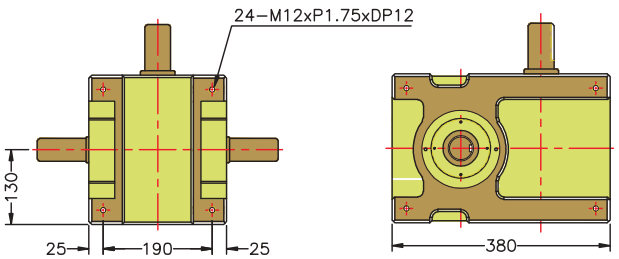
Items	Symbol	Unit	Value	Items	Symbol	Unit	Value	Items	Symbol	Unit	Value
Allowable thrust load on output shaft	C1	kgf	600	Allowable thrust load on input shaft	C3	kgf	400	GD2 of input shaft (Note1)	C6	kgf-m^2	0.02
Allowable radial load on output shaft	C2	kgf	630	Max. repetitive bending force on input shaft	C4	kgf	420	Indexing accuracy		sec.	±30
Allowable torque on output shaft	Ts	kgf-m	Refer torque table	Max. repetitive torque on input shaft	C5	kgf-m	50	Weight		kg	75

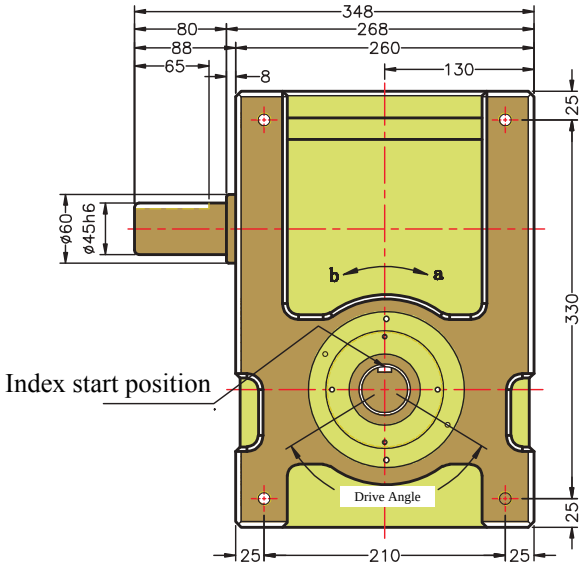
Note1:GD2 of input shaft is a value in dwell range.
Note2: Value of C1 to C5 are those obtained for safety factor=2.

140DS







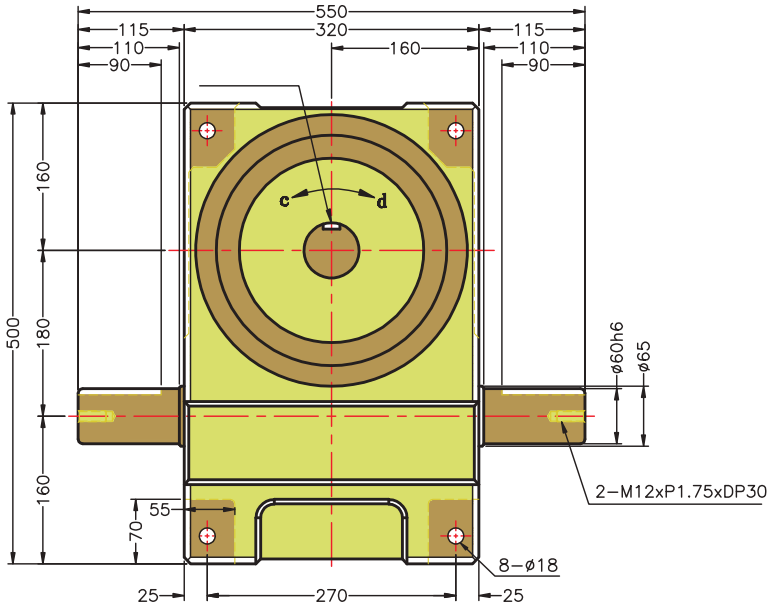


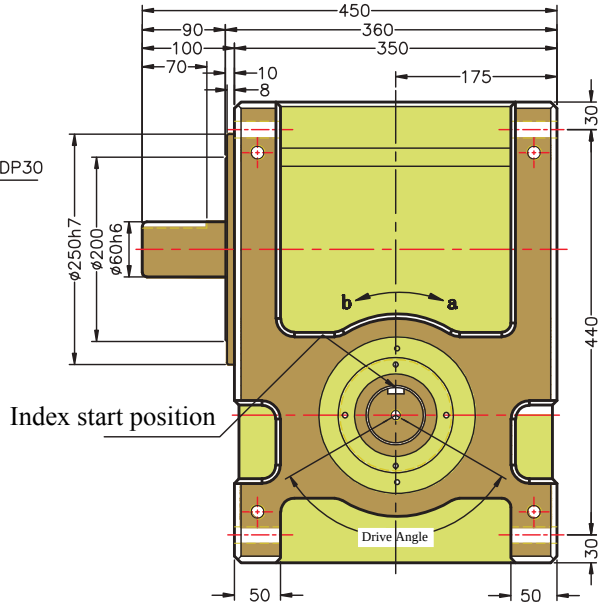
Technical Parameter

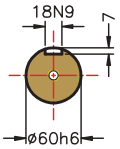
Items	Symbol	Unit	Value	Items	Symbol	Unit	Value	Items	Symbol	Unit	Value
Allowable thrust load on output shaft	C1	kgf	730	Allowable thrust load on input shaft	C3	kgf	440	GD2 of input shaft (Note1)	C6	kgf−m^2	0.11
Allowable radial load on output shaft	C2	kgf	860	Max. repetitive bending force on input shaft	C4	kgf	560	Indexing accuracy		sec.	±30
Allowable torque on output shaft	Ts	kgf−m	Refer torque table	Max. repetitive torque on input shaft	C5	kgf−m	75	Weight		kg	90

Note1:GD2 of input shaft is a value in dwell range.
Note2: Value of C1 to C5 are those obtained for safety factor=2.

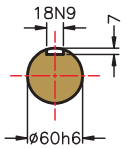
180DS







Input shaft



Output shaft

Technical Parameter

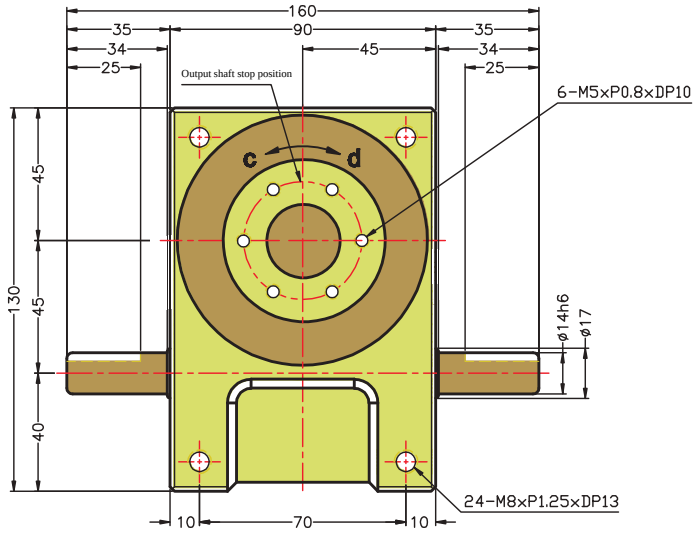
Items	Symbol	Unit	Value	Items	Symbol	Unit	Value	Items	Symbol	Unit	Value
Allowable thrust load on output shaft	C1	kgf	1200	Allowable thrust load on input shaft	C3	kgf	590	GD2 of input shaft (Note1)	C6	kgf−m²	0.39
Allowable radial load on output shaft	C2	kgf	1500	Max. repetitive bending force on input shaft	C4	kgf	1045	Indexing accuracy		sec.	±30
Allowable torque on output shaft	Ts	kgf−m	Refer torque table	Max. repetitive torque on input shaft	C5	kgf−m	147	Weight		kg	220

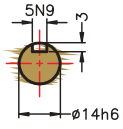
Note1:GD2 of input shaft is a value in dwell range.
Note2: Value of C1 to C5 are those obtained for safety factor=2.

Flange Model

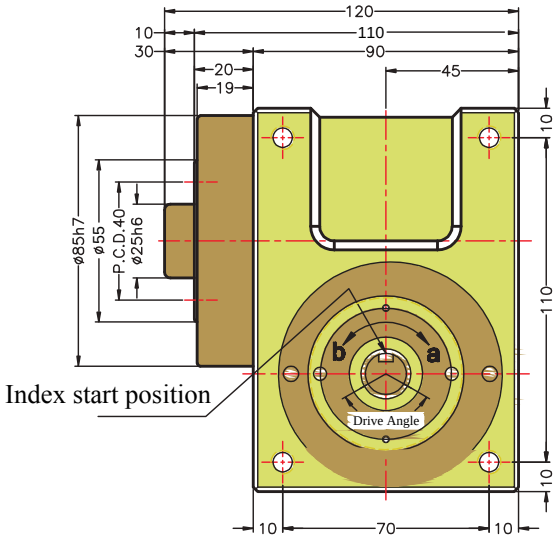
(45DF,60DF,70DF,80DF,100DS,110DF,140DF,180DF,250DF)

45DF





Input shaft



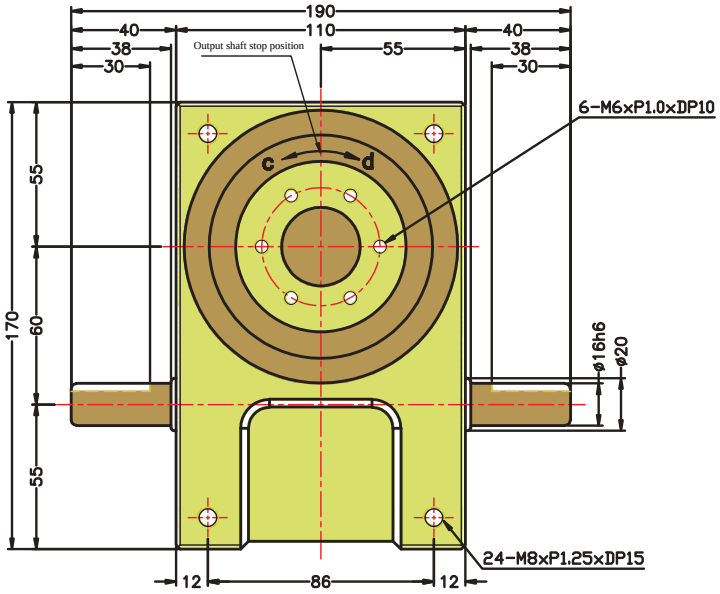
Index start position

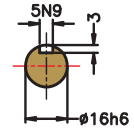
Technical Parameter

Items	Symbol	Unit	Value	Items	Symbol	Unit	Value	Items	Symbol	Unit	Value
Allowable thrust load on output shaft	C1	kgf	130	Allowable thrust load on input shaft	C3	kgf	85	GD2 of input shaft (Note1)	C6	$kgf-m^2$	3.2×10^{-4}
Allowable radial load on output shaft	C2	kgf	140	Max. repetitive bending force on input shaft	C4	kgf	110	Indexing accuracy		sec.	±30
Allowable torque on output shaft	Ts	kgf-m	Refer torque table	Max. repetitive torque on input shaft	C5	kgf-m	4	Weight		kg	7

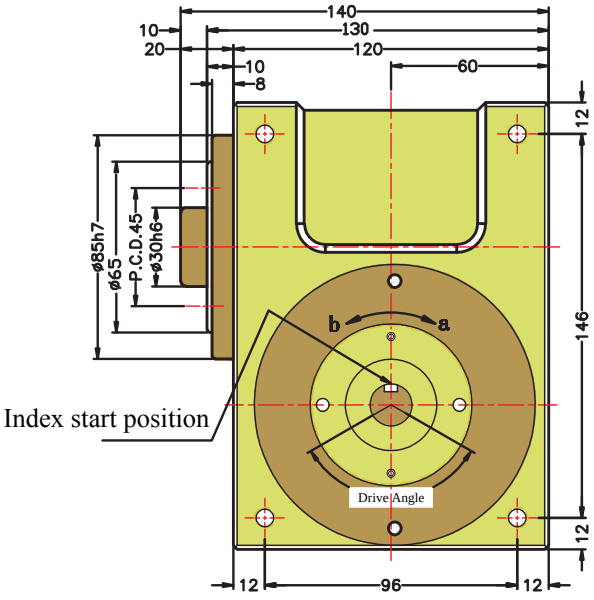
Note1:GD2 of input shaft is a value in dwell range.
Note2: Value of C1 to C5 are those obtained for safety factor=2.

60DF





Input shaft



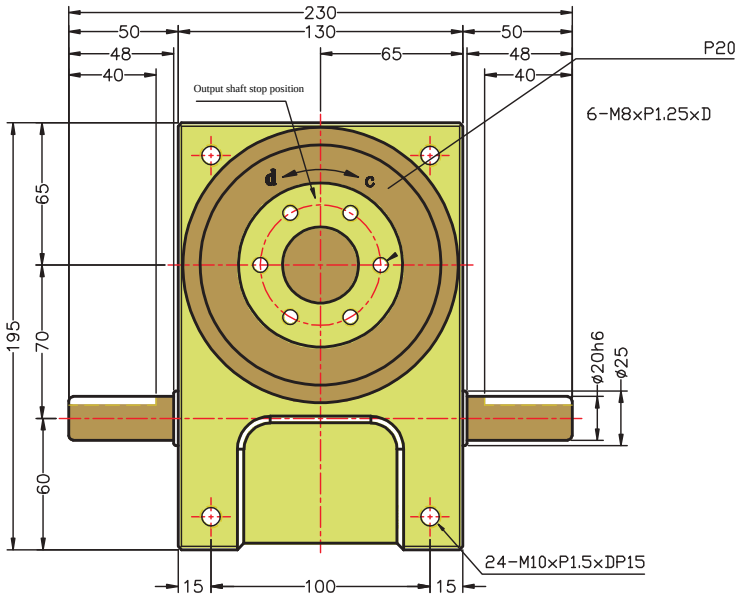
Index start position

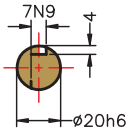
Technical Parameter

Items	Symbol	Unit	Value	Items	Symbol	Unit	Value	Items	Symbol	Unit	Value
Allowable thrust load on output shaft	C1	kgf	140	Allowable thrust load on input shaft	C3	kgf	100	GD2 of input shaft (Note1)	C6	$kgf-m^2$	1.9×10^{-3}
Allowable radial load on output shaft	C2	kgf	142	Max. repetitive bending force on input shaft	C4	kgf	150	Indexing accuracy		sec.	±30
Allowable torque on output shaft	Ts	kgf-m	Refer torque table	Max. repetitive torque on input shaft	C5	kgf-m	6	Weight		kg	13

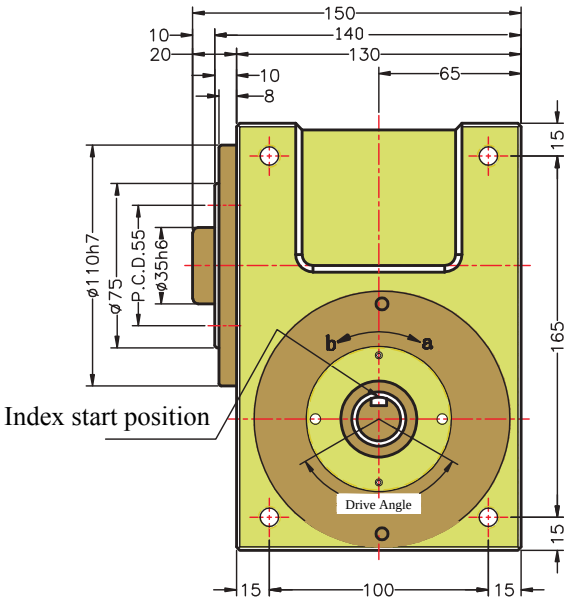
Note1:GD2 of input shaft is a value in dwell range.
Note2: Value of C1 to C5 are those obtained for safety factor=2.

70DF





Input shaft

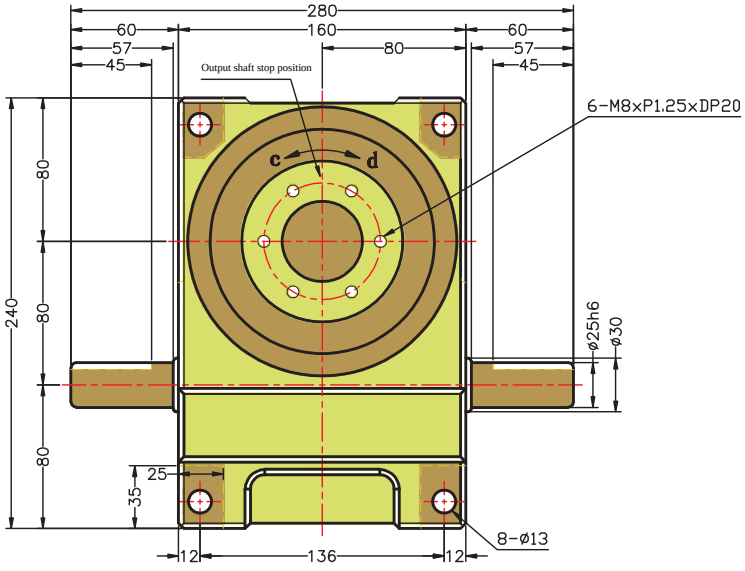


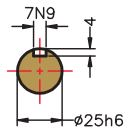
Technical Parameter

Items	Symbol	Unit	Value	Items	Symbol	Unit	Value	Items	Symbol	Unit	Value
Allowable thrust load on output shaft	C1	kgf	220	Allowable thrust load on input shaft	C3	kgf	150	GD2 of input shaft (Note1)	C6	$kgf-m^2$	6×10^{-3}
Allowable radial load on output shaft	C2	kgf	300	Max. repetitive bending force on input shaft	C4	kgf	110	Indexing accuracy		sec.	±30
Allowable torque on output shaft	Ts	kgf-m	Refer torque table	Max. repetitive torque on input shaft	C5	kgf-m	9.5	Weight		kg	18

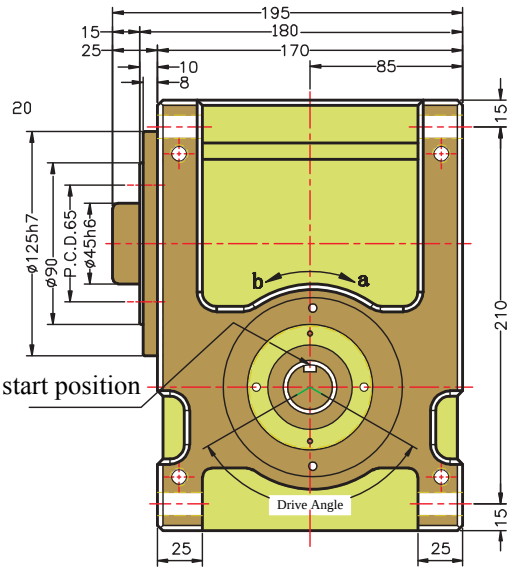
Note1:GD2 of input shaft is a value in dwell range.
Note2: Value of C1 to C5 are those obtained for safety factor=2.

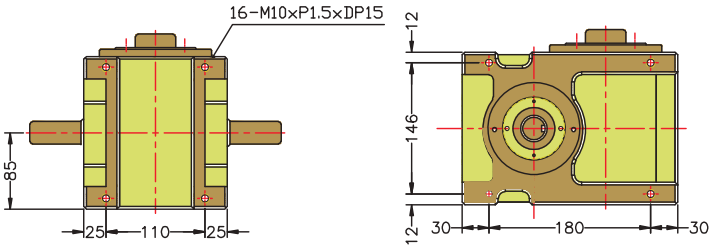
80DF





Input shaft



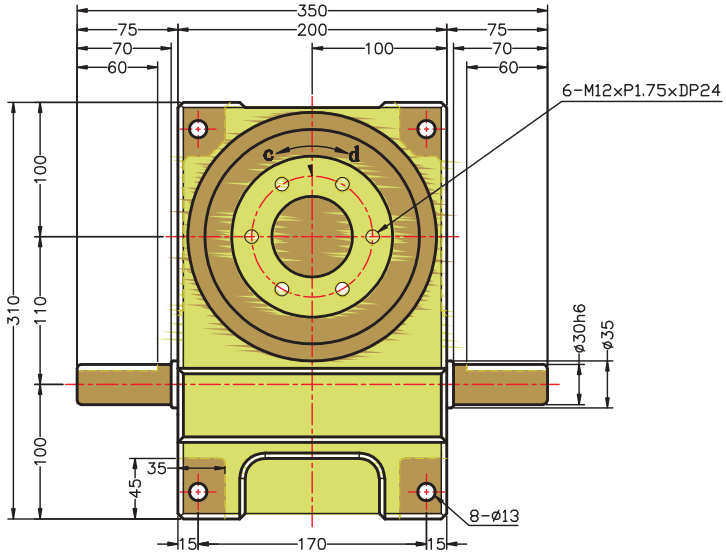


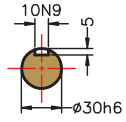
Technical Parameter

Items	Symbol	Unit	Value	Items	Symbol	Unit	Value	Items	Symbol	Unit	Value
Allowable thrust load on output shaft	C1	kgf	330	Allowable thrust load on input shaft	C3	kgf	350	GD2 of input shaft (Note1)	C6	$kgf-m^2$	$9x10^{-3}$
Allowable radial load on output shaft	C2	kgf	420	Max. repetitive bending force on input shaft	C4	kgf	260	Indexing accuracy		sec.	±30
Allowable torque on output shaft	Ts	kgf-m	Refer torque table	Max. repetitive torque on input shaft	C5	kgf-m	25	Weight		kg	32

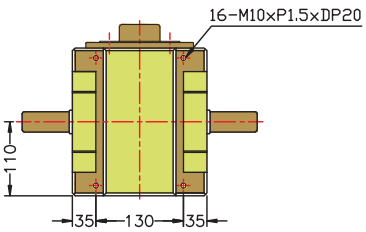
Note1:GD2 of input shaft is a value in dwell range.
Note2: Value of C1 to C5 are those obtained for safety factor=2.

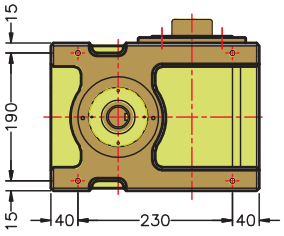
110DF

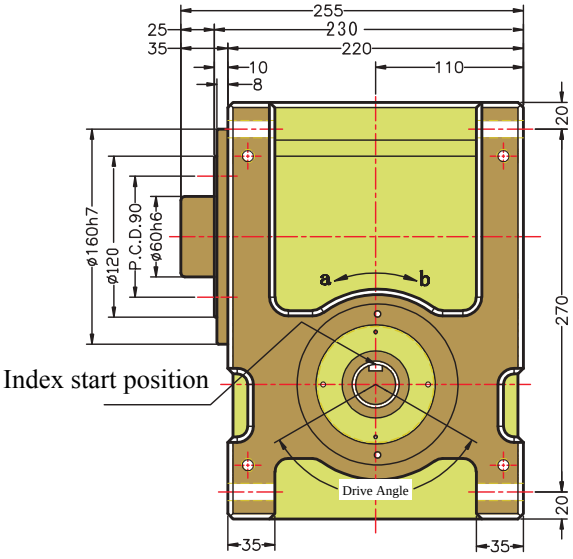




Input shaft







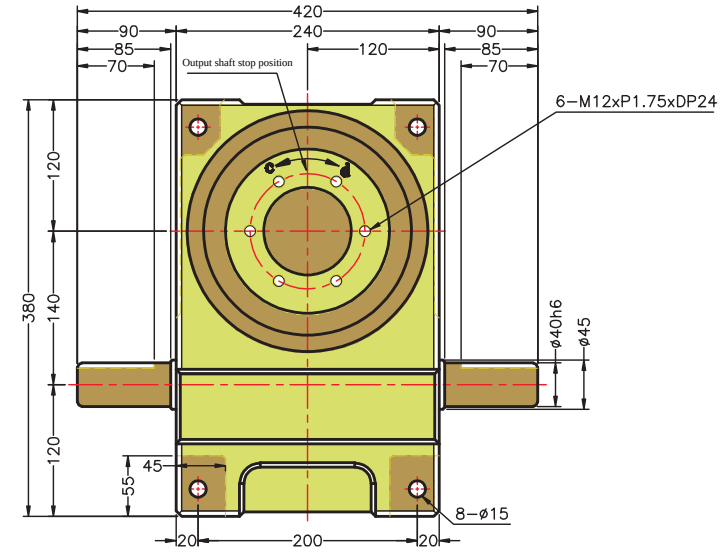
Index start position

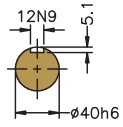
Technical Parameter

Items	Symbol	Unit	Value	Items	Symbol	Unit	Value	Items	Symbol	Unit	Value
Allowable thrust load on output shaft	C1	kgf	560	Allowable thrust load on input shaft	C3	kgf	480	GD2 of input shaft (Note1)	C6	kgf-m^2	2.8×10^{-2}
Allowable radial load on output shaft	C2	kgf	700	Max. repetitive bending force on input shaft	C4	kgf	415	Indexing accuracy		sec.	±30
Allowable torque on output shaft	Ts	kgf-m	Refer torque table	Max. repetitive torque on input shaft	C5	kgf-m	40	Weight		kg	65

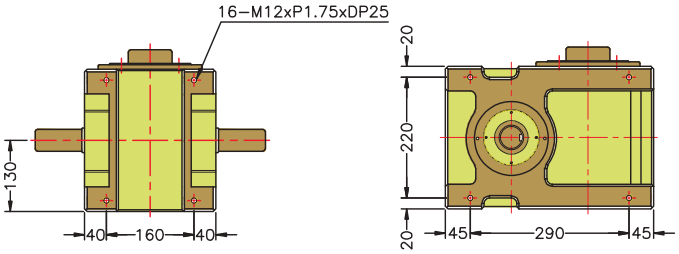
Note1:GD2 of input shaft is a value in dwell range.
Note2: Value of C1 to C5 are those obtained for safety factor=2.

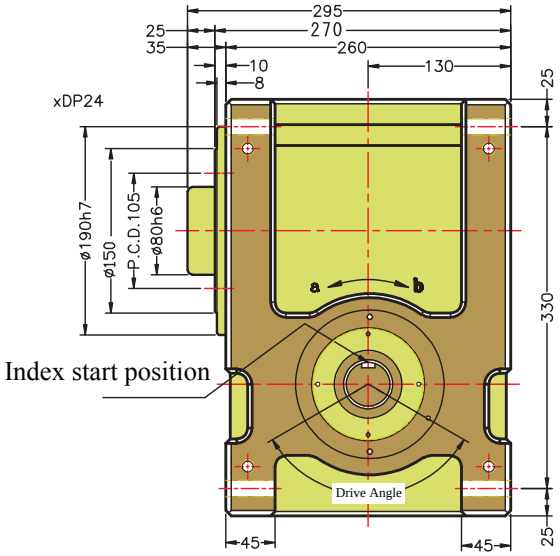
140DF





Input shaft



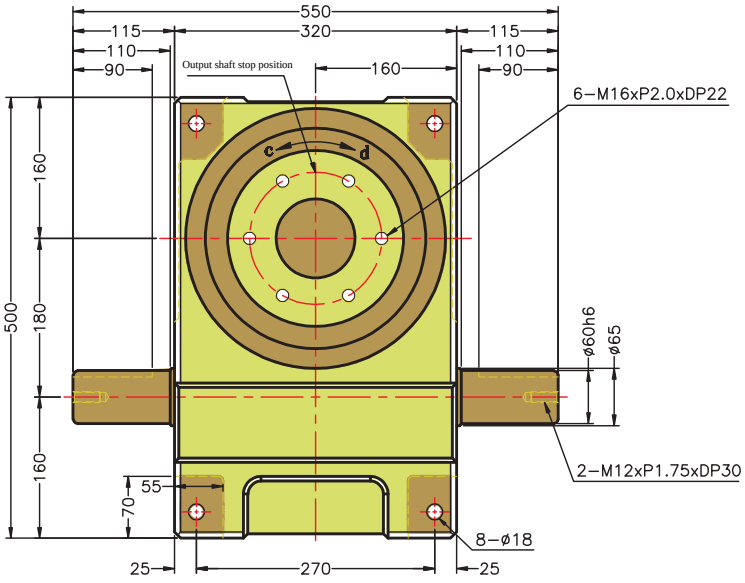


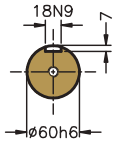
Technical Parameter

Items	Symbol	Unit	Value	Items	Symbol	Unit	Value	Items	Symbol	Unit	Value
Allowable thrust load on output shaft	C1	kgf	560	Allowable thrust load on input shaft	C3	kgf	480	GD2 of input shaft (Note1)	C6	$kgf-m^2$	2.8×10^{-2}
Allowable radial load on output shaft	C2	kgf	700	Max. repetitive bending force on input shaft	C4	kgf	415	Indexing accuracy		sec.	±30
Allowable torque on output shaft	Ts	kgf-m	Refer torque table	Max. repetitive torque on input shaft	C5	kgf-m	40	Weight		kg	65

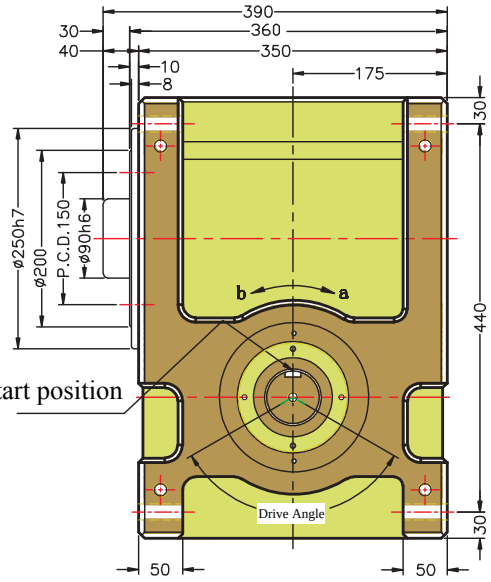
Note1:GD2 of input shaft is a value in dwell range.
Note2: Value of C1 to C5 are those obtained for safety factor=2.

180DF

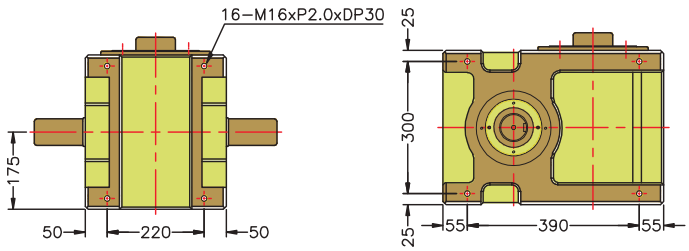




Input shaft



Index start position

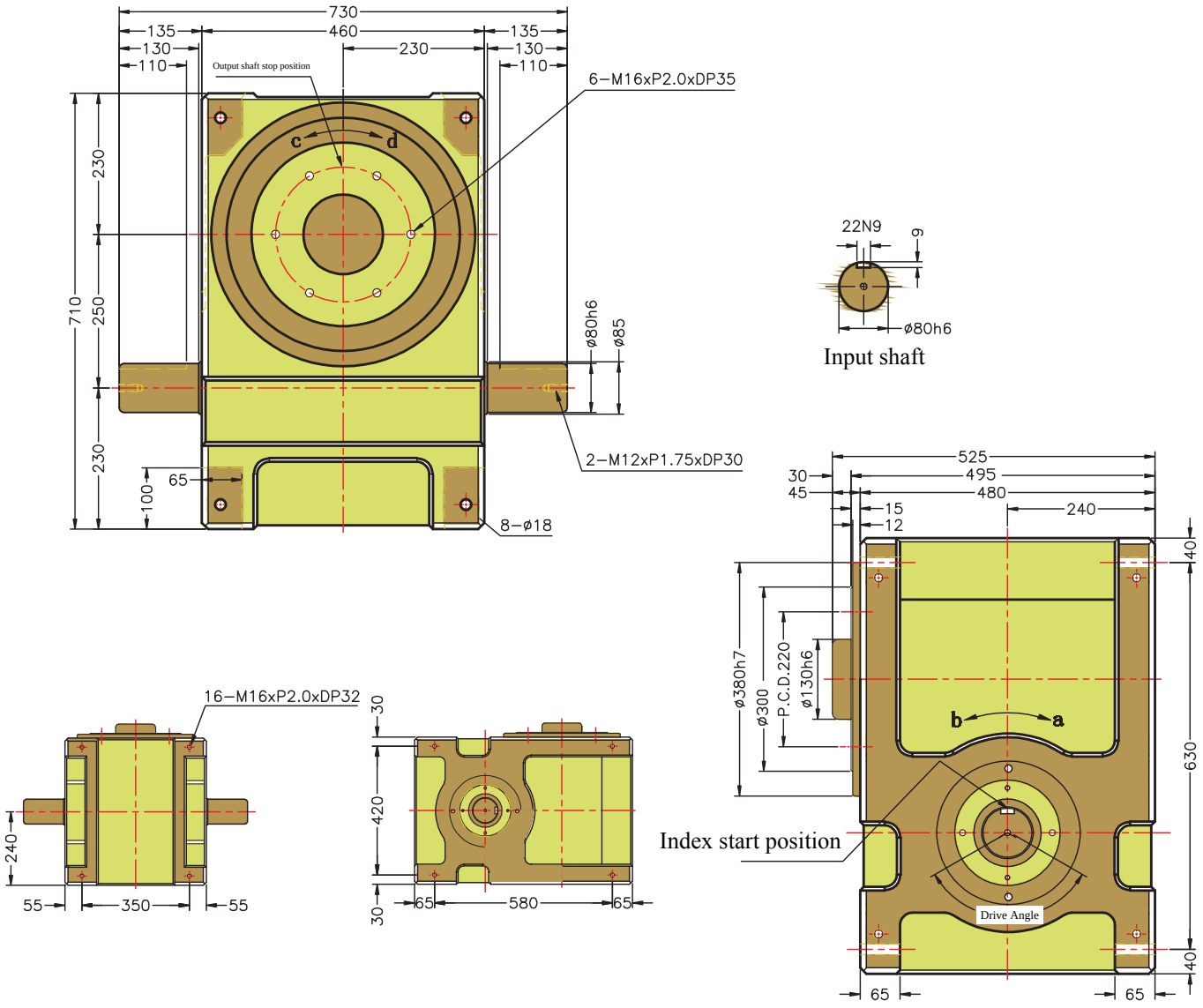


Technical Parameter

Items	Symbol	Unit	Value	Items	Symbol	Unit	Value	Items	Symbol	Unit	Value
Allowable thrust load on output shaft	C1	kgf	1200	Allowable thrust load on input shaft	C3	kgf	1100	GD2 of input shaft (Note1)	C6	kgf−m^2	0.39
Allowable radial load on output shaft	C2	kgf	1500	Max. repetitive bending force on input shaft	C4	kgf	1960	Indexing accuracy		sec.	±30
Allowable torque on output shaft	Ts	kgf−m	Refer torque table	Max. repetitive torque on input shaft	C5	kgf−m	340	Weight		kg	220

Note1:GD2 of input shaft is a value in dwell range.
Note2: Value of C1 to C5 are those obtained for safety factor=2.

250DF



Technical Parameter

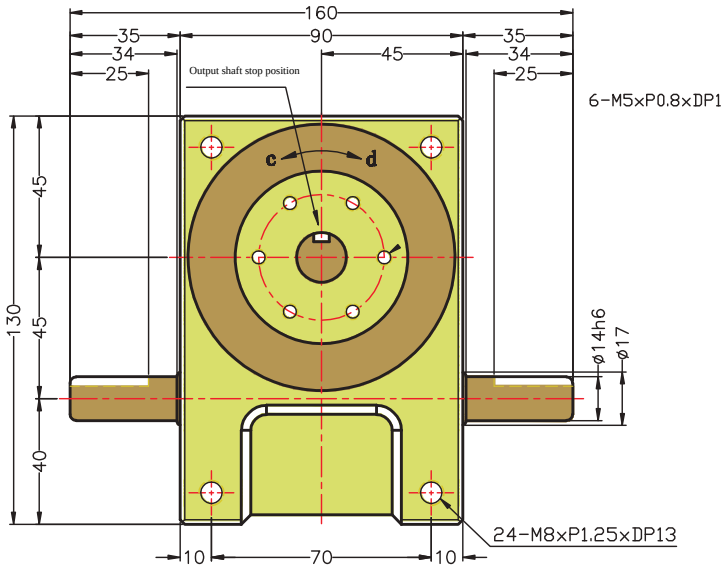
Items	Symbol	Unit	Value	Items	Symbol	Unit	Value	Items	Symbol	Unit	Value
Allowable thrust load on output shaft	C1	kgf	3200	Allowable thrust load on input shaft	C3	kgf	1550	GD2 of input shaft (Note1)	C6	kgf−m^2	1.98
Allowable radial load on output shaft	C2	kgf	4150	Max. repetitive bending force on input shaft	C4	kgf	3800	Indexing accuracy		sec.	±30
Allowable torque on output shaft	Ts	kgf−m	Refer torque table	Max. repetitive torque on input shaft	C5	kgf−m	780	Weight		kg	685

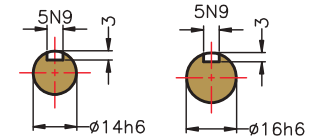
Note1:GD2 of input shaft is a value in dwell range.
Note2: Value of C1 to C5 are those obtained for safety factor=2.

Flange Shaft Model

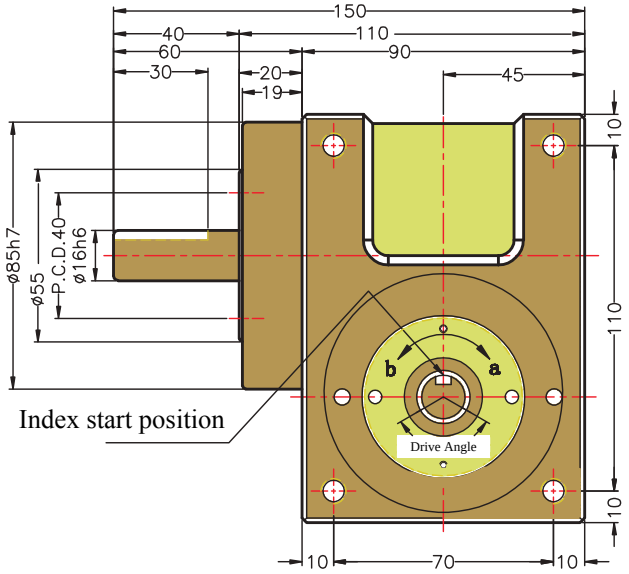
(45DE,60DE,70DE,80DE,110DE,
140DE,180DE)

45DE





Input shaft　　Output shaft



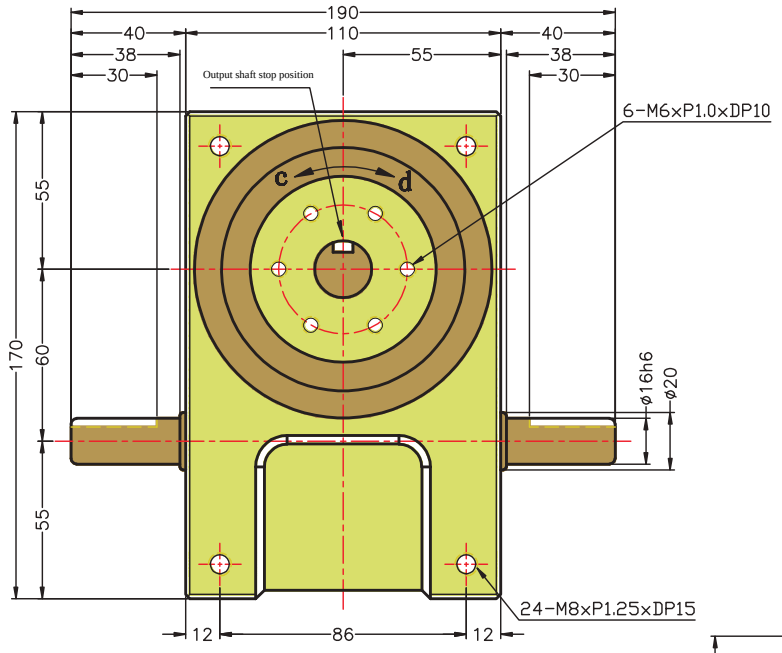
Index start position

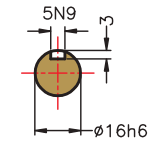
Technical Parameter

Items	Symbol	Unit	Value	Items	Symbol	Unit	Value	Items	Symbol	Unit	Value
Allowable thrust load on output shaft	C1	kgf	130	Allowable thrust load on input shaft	C3	kgf	85	GD2 of input shaft (Note1)	C6	kgf-m^2	3.2×10^{-4}
Allowable radial load on output shaft	C2	kgf	140	Max. repetitive bending force on input shaft	C4	kgf	110	Indexing accuracy		sec.	±30
Allowable torque on output shaft	Ts	kgf-m	Refer torque table	Max. repetitive torque on input shaft	C5	kgf-m	4	Weight		kg	7

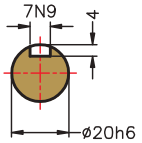
Note1:GD2 of input shaft is a value in dwell range.
Note2: Value of C1 to C5 are those obtained for safety factor=2.

60DE

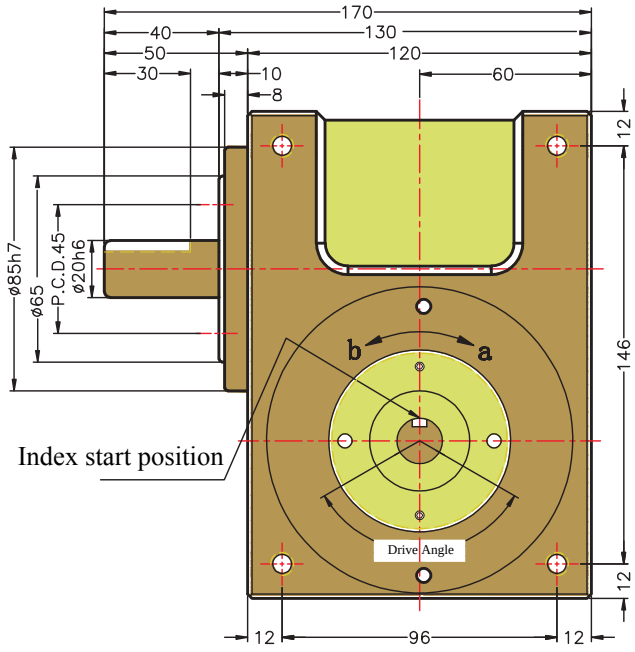




Input shaft



Output shaft



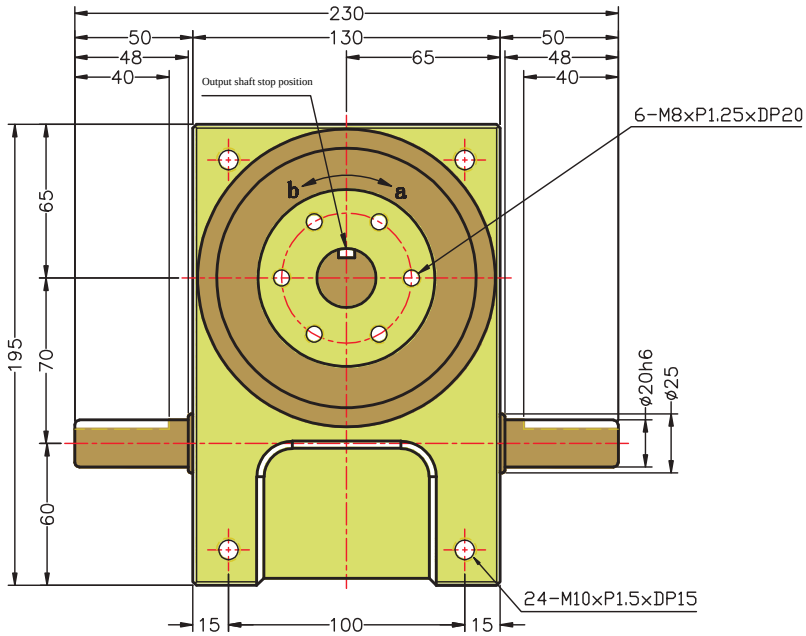
Index start position

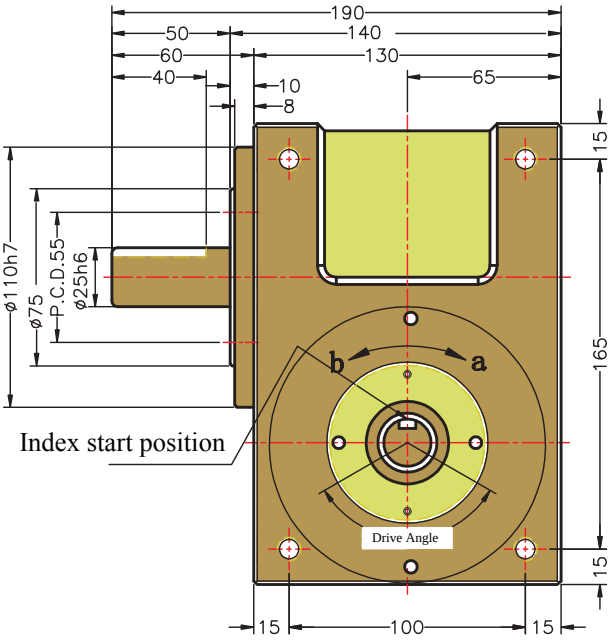
Technical Parameter

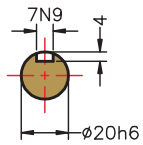
Items	Symbol	Unit	Value	Items	Symbol	Unit	Value	Items	Symbol	Unit	Value
Allowable thrust load on output shaft	C1	kgf	140	Allowable thrust load on input shaft	C3	kgf	100	GD2 of input shaft (Note1)	C6	$kgf-m^2$	1.9×10^{-3}
Allowable radial load on output shaft	C2	kgf	142	Max. repetitive bending force on input shaft	C4	kgf	150	Indexing accuracy		sec.	±30
Allowable torque on output shaft	Ts	kgf-m	Refer torque table	Max. repetitive torque on input shaft	C5	kgf-m	6	Weight		kg	13

Note1:GD2 of input shaft is a value in dwell range.
Note2: Value of C1 to C5 are those obtained for safety factor=2.

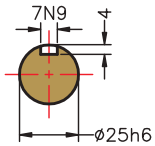
70DE







Input shaft



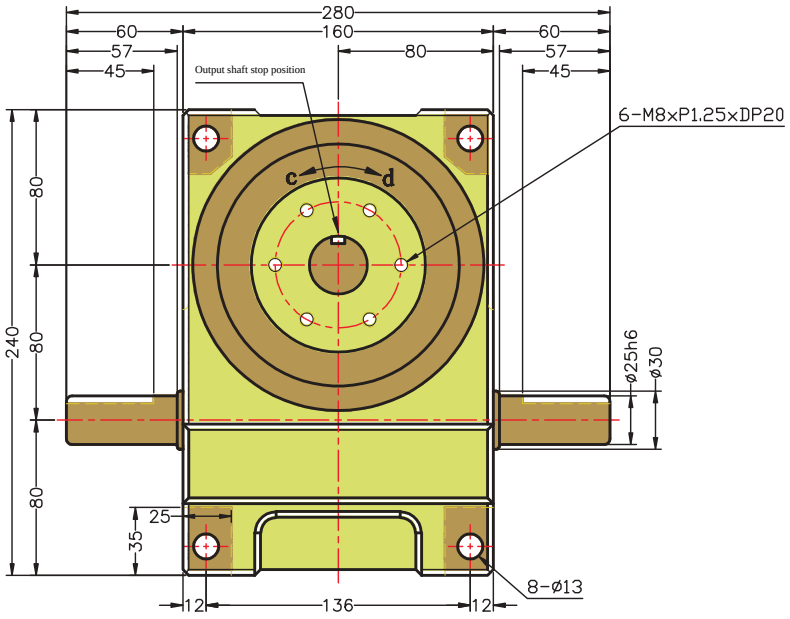
Output shaft

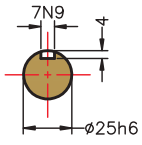
Technical Parameter

Items	Symbol	Unit	Value	Items	Symbol	Unit	Value	Items	Symbol	Unit	Value
Allowable thrust load on output shaft	C1	kgf	220	Allowable thrust load on input shaft	C3	kgf	150	GD2 of input shaft (Note1)	C6	$kgf-m^2$	$6x10^{-3}$
Allowable radial load on output shaft	C2	kgf	300	Max. repetitive bending force on input shaft	C4	kgf	110	Indexing accuracy		sec.	±30
Allowable torque on output shaft	Ts	kgf-m	Refer torque table	Max. repetitive torque on input shaft	C5	kgf-m	9.5	Weight		kg	18

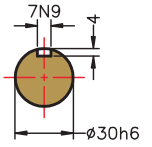
Note1:GD2 of input shaft is a value in dwell range.
Note2: Value of C1 to C5 are those obtained for safety factor=2.

80DE

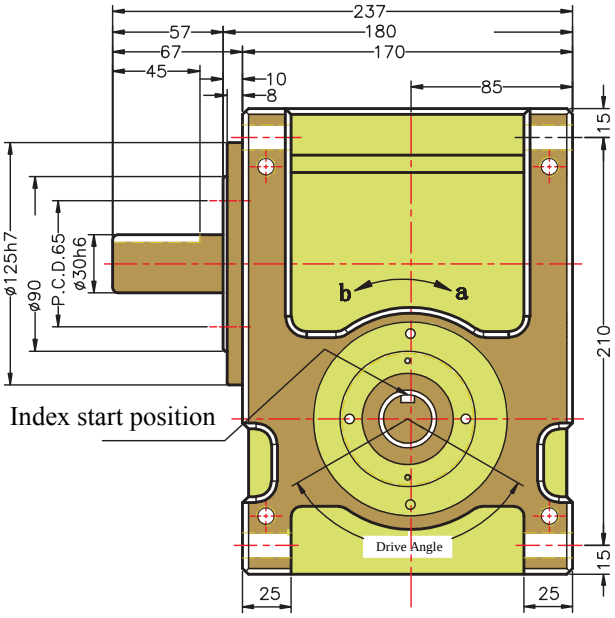


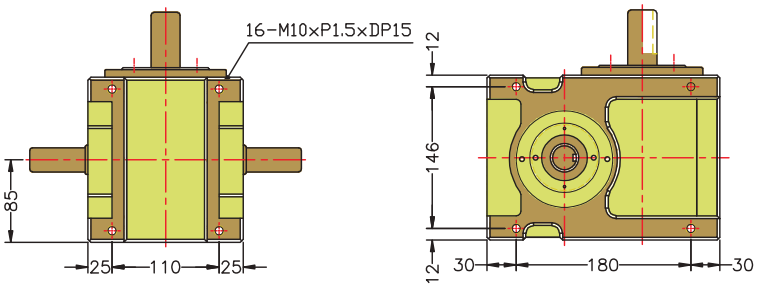


Input shaft



Output shaft



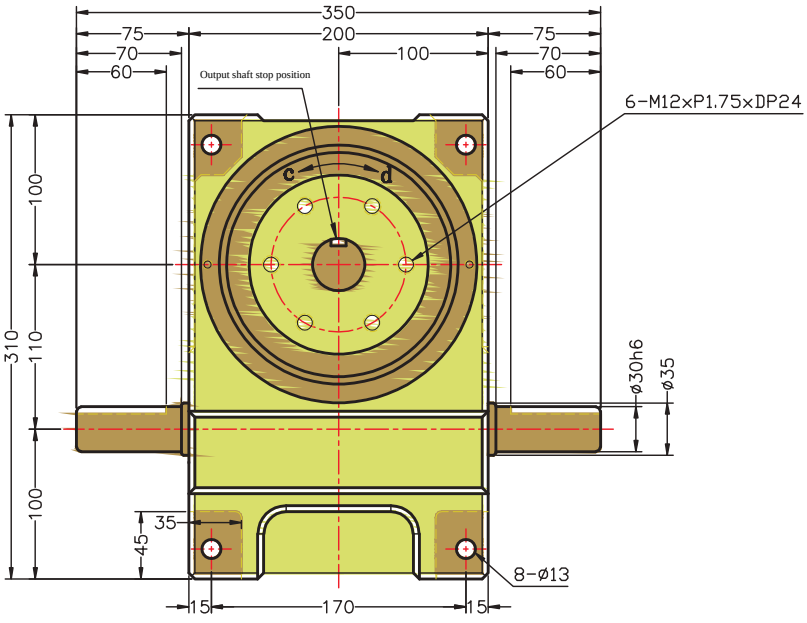


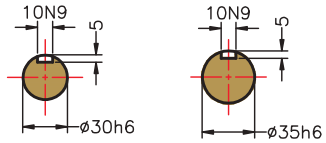
Technical Parameter

Items	Symbol	Unit	Value	Items	Symbol	Unit	Value	Items	Symbol	Unit	Value
Allowable thrust load on output shaft	C1	kgf	330	Allowable thrust load on input shaft	C3	kgf	350	GD2 of input shaft (Note1)	C6	$kgf-m^2$	9×10^{-3}
Allowable radial load on output shaft	C2	kgf	420	Max. repetitive bending force on input shaft	C4	kgf	260	Indexing accuracy		sec.	±30
Allowable torque on output shaft	Ts	kgf-m	Refer torque table	Max. repetitive torque on input shaft	C5	kgf-m	18.5	Weight		kg	32

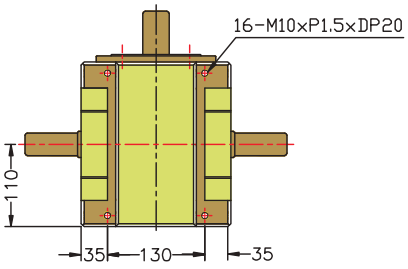
Note1:GD2 of input shaft is a value in dwell range.
Note2: Value of C1 to C5 are those obtained for safety factor=2.

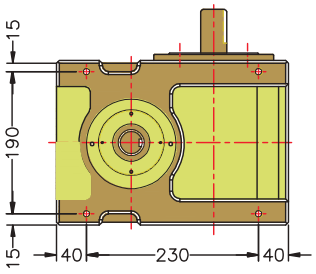
110DE

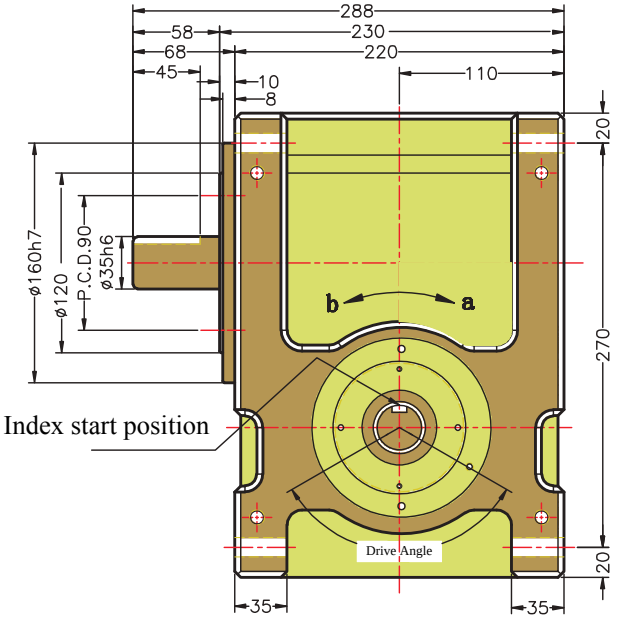




Input shaft Output shaft





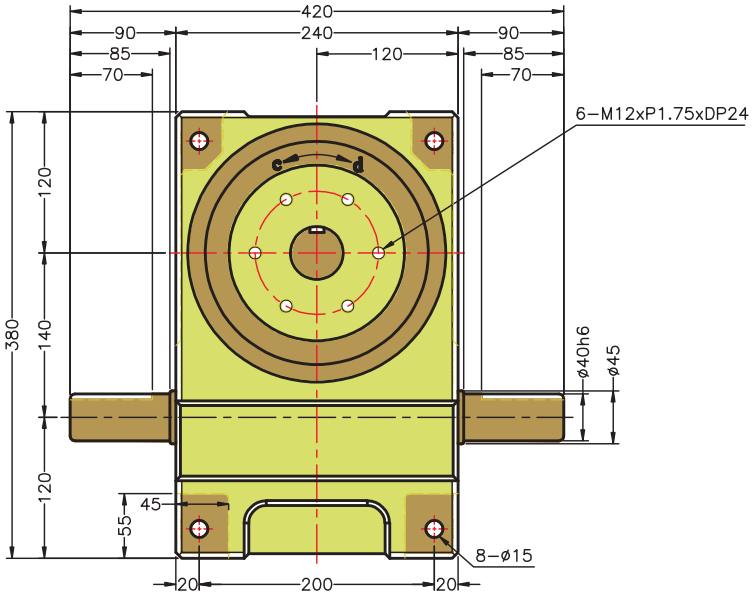


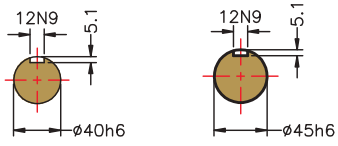
Technical Parameter

Items	Symbol	Unit	Value	Items	Symbol	Unit	Value	Items	Symbol	Unit	Value
Allowable thrust load on output shaft	C1	kgf	560	Allowable thrust load on input shaft	C3	kgf	480	GD2 of input shaft (Note1)	C6	kgf-m^2	2.8×10^{-2}
Allowable radial load on output shaft	C2	kgf	700	Max. repetitive bending force on input shaft	C4	kgf	415	Indexing accuracy		sec.	±30
Allowable torque on output shaft	Ts	kgf-m	Refer torque table	Max. repetitive torque on input shaft	C5	kgf-m	40	Weight		kg	65

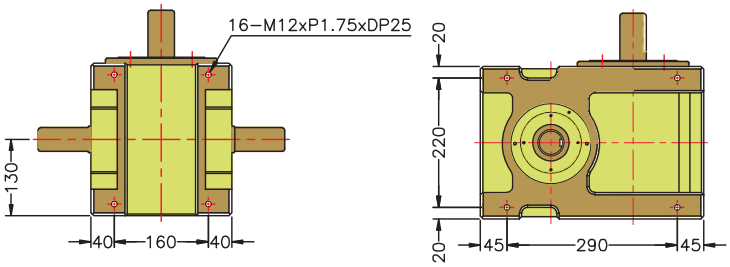
Note1:GD2 of input shaft is a value in dwell range.
Note2: Value of C1 to C5 are those obtained for safety factor=2.

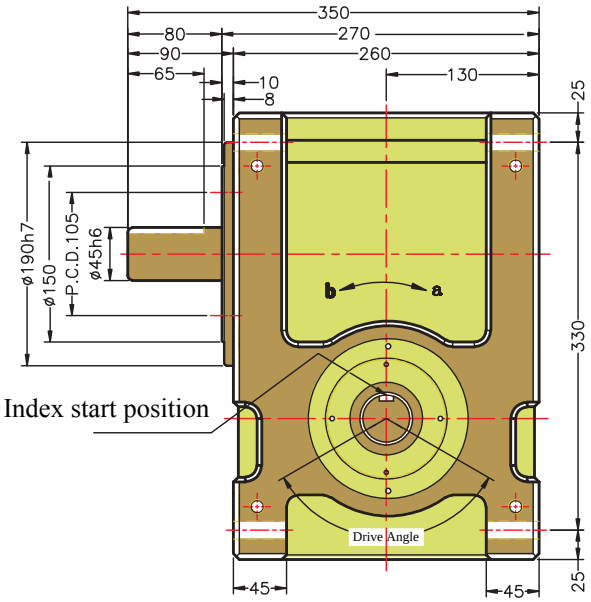
140DE





Input shaft　　Output shaft



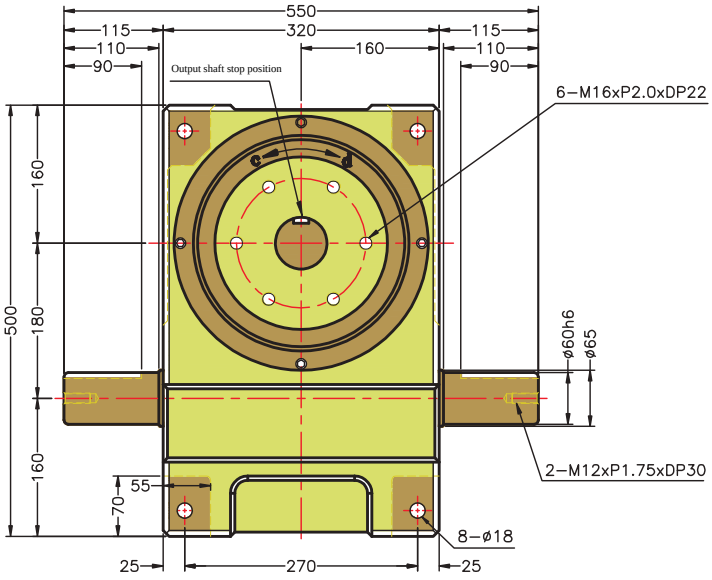


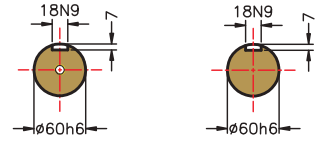
Technical Parameter

Items	Symbol	Unit	Value	Items	Symbol	Unit	Value	Items	Symbol	Unit	Value
Allowable thrust load on output shaft	C1	kgf	760	Allowable thrust load on input shaft	C3	kgf	550	GD2 of input shaft (Note1)	C6	kgf−m^2	0.11
Allowable radial load on output shaft	C2	kgf	1000	Max. repetitive bending force on input shaft	C4	kgf	710	Indexing accuracy		sec.	±30
Allowable torque on output shaft	Ts	kgf−m	Refer torque table	Max. repetitive torque on input shaft	C5	kgf−m	75	Weight		kg	90

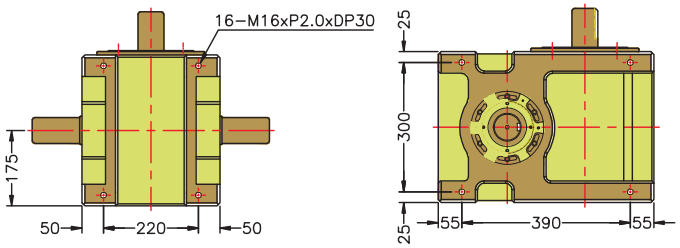
Note1:GD2 of input shaft is a value in dwell range.
Note2: Value of C1 to C5 are those obtained for safety factor=2.

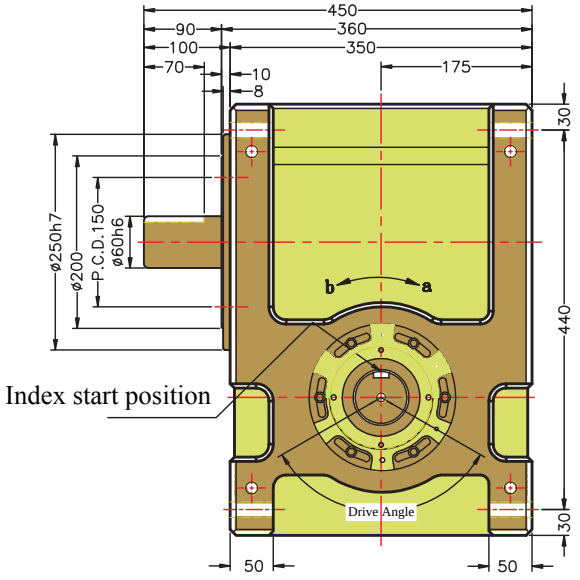
180DE





Input shaft　　Output shaft





Technical Parameter

Items	Symbol	Unit	Value	Items	Symbol	Unit	Value	Items	Symbol	Unit	Value
Allowable thrust load on output shaft	C1	kgf	1200	Allowable thrust load on input shaft	C3	kgf	1100	GD2 of input shaft (Note1)	C6	kgf−m^2	0.39
Allowable radial load on output shaft	C2	kgf	1500	Max. repetitive bending force on input shaft	C4	kgf	1960	Indexing accuracy		sec.	±30
Allowable torque on output shaft	Ts	kgf−m	Refer torque table	Max. repetitive torque on input shaft	C5	kgf−m	340	Weight		kg	220

Note1:GD2 of input shaft is a value in dwell range.
Note2: Value of C1 to C5 are those obtained for safety factor=2.

DS.DF.DE

Stop S	Index Period θ	Code	Static Torque Ts kgf-m	Net Dynamic Torque to (kgf-m) Indexes per min.N(rpm) 50	100	150	200
2	150	25D	0.11	0.05	0.04	0.04	0.03
		32D	0.27	0.13	0.10	0.09	0.08
	180	25D	0.11	0.06	0.05	0.04	0.04
		32D	0.27	0.15	0.12	0.10	0.09
	210	25D	0.11	0.07	0.05	0.04	0.04
		32D	0.27	0.17	0.13	0.11	0.10
	240	25D	0.11	0.07	0.06	0.05	0.04
		32D	0.27	0.18	0.14	0.12	0.10
	270	25D	0.11	0.07	0.60	0.05	0.05
		32D	0.27	0.19	0.15	0.12	0.11
		38D	0.67	0.21	0.17	0.15	0.14
	300	25D	0.21	0.12	0.09	0.08	0.07
		32D	0.48	0.27	0.21	0.18	0.16
		38D	0.71	0.21	0.17	0.15	0.14
3	120	25D	0.11	0.06	0.05	0.39	0.35
		32D	0.27	0.15	0.11	0.97	0.88
	150	25D	0.11	0.69	0.52	0.45	0.40
		32D	0.27	0.17	0.13	0.11	0.99
	180	25D	0.11	0.08	0.07	0.05	0.04
		32D	0.27	0.19	0.14	0.12	0.11
		38D	0.67	0.25	0.20	0.18	0.16
	210	25D	0.21	0.12	0.09	0.08	0.07
		32D	0.48	0.27	0.21	0.18	0.16
		38D	0.73	0.26	0.21	0.19	0.17
	240	25D	0.21	0.14	0.10	0.09	0.08
		32D	0.48	0.30	0.23	0.20	0.18
		38D	0.96	0.33	0.27	0.24	0.22
	270	25D	0.21	0.14	0.11	0.10	0.09
		32D	0.76	0.50	0.38	0.33	0.29
		38D	1.04	0.34	0.28	0.25	0.22
4	90	25D	0.14	0.08	0.06	0.05	0.04
	120	32D	0.11	0.07	0.05	0.05	0.04
		38D	0.14	0.09	0.07	0.06	0.05
	150	25D	0.15	0.08	0.06	0.05	0.05
		32D	0.27	0.15	0.11	0.10	0.09
	180	25D	0.15	0.09	0.07	0.06	0.05
		32D	0.27	0.17	0.13	0.11	0.10
		38D	0.79	0.32	0.26	0.23	0.21
	210	25D	0.21	0.14	0.11	0.09	0.08
		32D	0.48	0.32	0.24	0.21	0.19
		38D	0.85	0.33	0.27	0.23	0.22
	240	25D	0.21	0.15	0.11	0.10	0.09
		32D	0.48	0.34	0.26	0.22	0.20
		38D	0.89	0.33	0.27	0.24	0.22
	270	25D	0.21	0.16	0.12	0.10	0.09
		32D	0.48	0.36	0.28	0.24	0.22
		38D	0.93	0.33	0.27	0.24	0.21
6	60	25D	0.11	0.06	0.04	0.04	0.03
		32D	0.27	0.15	0.11	0.09	0.08
	90	25D	0.11	0.07	0.06	0.05	0.04
		32D	0.28	0.18	0.14	0.12	0.11
		38D	0.67	0.34	0.27	0.24	0.22

Stop S	Index Period θ	Code	Static Torque Ts kgf-m	Net Dynamic Torque to (kgf-m) Indexes per min.N(rpm) 50	100	150	200
6		25D	0.29	0.18	0.13	0.11	0.10
	120	32D	0.76	0.45	0.34	0.30	0.26
		38D	0.96	0.45	0.36	0.32	0.30
	150	25D	0.38	0.26	0.20	0.17	0.15
		32D	0.76	0.51	0.39	0.33	0.30
		38D	0.10	0.48	0.39	0.34	0.32
	180	25D	0.38	0.28	0.21	0.18	0.16
		32D	0.76	0.55	0.42	0.36	0.32
		38D	0.89	0.78	0.63	0.56	0.51
	210	25D	0.38	0.30	0.23	0.19	0.14
		32D	0.76	0.59	0.45	0.38	0.34
		38D	2.00	0.79	0.64	0.57	0.52
	240	25D	0.38	0.31	0.24	0.20	0.18
		32D	0.75	0.61	0.47	0.40	0.36
		38D	2.09	0.79	0.64	0.57	0.52
	270	25D	0.38	0.31	0.24	0.20	0.19
		32D	0.75	0.63	0.48	0.41	0.37
		38D	2.15	0.78	0.64	0.56	0.52
8	90	25D	0.21	0.12	0.10	0.08	0.07
		32D	0.548	0.29	0.22	0.19	0.17
		38D					
	120	25D	0.21	0.15	0.11	0.10	0.09
		32D	0.48	0.33	0.26	0.22	0.19
		38D					
	150	25D	0.21	0.16	0.12	0.11	0.94
		32D	0.48	0.37	0.28	0.24	0.21
		32D					
	180	25D	0.21	0.17	0.13	0.11	0.10
		32D	0.48	0.39	0.30	0.25	0.23
		38D					
	210	25D	0.21	0.17	0.14	0.12	0.10
		32D	0.48	0.40	0.31	0.26	0.24
		38D					
	240	25D	0.21	0.18	0.14	0.12	0.10
		32D	0.48	0.42	0.31	0.27	0.24
		38D	1.20	0.53	0.43	0.38	0.35
	270	25D	0.21	0.19	0.14	0.12	0.11
		32D	0.48	0.43	0.33	0.28	0.25
		38D	1.22	0.52	0.42	0.37	0.34
12	60	32D	0.18	0.11	0.09	0.07	0.06
	90	32D	0.18	0.13	0.10	0.09	0.08
		38D	0.25	0.16	0.13	0.11	0.10
	120	32D	0.18	0.15	0.11	0.10	0.09
		38D	1.05	0.60	0.49	0.43	0.40
	150	32D	0.18	0.16	0.12	0.10	0.09
		38D	1.15	0.61	0.50	0.44	0.40
	180	32D	0.18	0.16	0.12	0.10	0.09
		38D	1.21	0.61	0.50	0.44	0.40
	210	32D	0.18	0.16	0.12	0.11	0.10
		38D	1.25	0.60	0.49	0.44	0.40
	240	32D	0.18	0.17	0.13	0.11	0.10
		38D	1.28	0.60	0.48	0.43	0.39
	270	32D	0.18	0.17	0.13	0.11	0.10
		38D	1.30	0.58	0.47	0.42	0.39

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

DS.DF.DE

Stop S	Index Period θ	Code	Static Torque Ts kgf-m	Net Dynamic Torque to (kgf-m) Indexes per min.N(rpm) 50	100	150	200	300	400	500	700	Cam Shaft Riction Torque Tx (kgf-m)
2	270	45D	1.22	0.48	0.39	0.35	0.32	0.28	0.26	0.24		0.12
		60D	4.34	1.41	1.15	1.02	0.93	0.83	0.76	0.71	0.64	0.22
		70D	11.3	4.3	3.5	3.1	2.9	2.5	2.3	2.2	2.0	0.5
		80D	20.2	7.8	6.4	5.6	5.2	4.6	4.2	3.9	3.6	0.8
		110D	49.8	19.0	15.4	13.7	12.5	11.1	10.2	9.5		1.6
		140D	80.4	28.6	23.2	20.6	18.9	16.7	15.3			2.3
		180D	175.4	62.9	51.1	45.2	41.5	36.7				4.1
		250D	377.2	136.1	110.5	97.9	89.8					7.2
		350D	916.3	307.7	264.0	233.8						14.0
3	180	45D	1.22	0.58	0.47	0.42	0.38	0.34	0.31	0.29		0.12
		60D	4.34	1.70	1.38	1.22	1.12	0.99	0.91	0.85	0.77	0.22
		70D	11.3	5.2	4.2	3.7	3.4	3.0	2.8	2.6	2.4	0.5
		80D	20.2	9.4	7.7	6.8	6.2	5.5	5.0	4.7		0.8
		110D	49.8	22.8	18.5	16.4	15.0	18.3	12.2			1.6
		140D	80.4	34.3	27.9	24.7	22.6	20.0	18.4			2.3
		180D	175.4	75.4	61.3	54.3	49.8	44.1				4.1
		250D	377.2	163.3	132.7	117.5	107.8					7.2
		350D	916.3	369.3	316.9	280.6						14.0
	270	45D	3.10	1.23	1.00	0.88	0.81	0.72	0.66	0.61	0.56	0.12
		60D	12.26	4.30	3.49	3.09	2.84	2.51	2.31	2.16	1.95	0.28
		70D	15.5	5.9	4.8	4.3	3.9	3.5	3.2	3.0	2.7	0.4
		80D	25.3	9.3	7.6	6.7	6.2	5.5	5.0	4.7	4.2	0.7
		110D	61.8	22.5	18.3	16.2	14.8	13.1	12.1	11.3		1.3
		140D	97.6	33.5	27.2	24.1	22.1	19.6	17.9	16.8		1.9
		180D	251.9	93.7	76.1	67.4	61.8	54.7	50.2			4.0
		250D	588.0	230.5	187.3	165.8	152.1	134.7				7.0
		350D	145.8	496.7	426.2	377.3	346.1					13.4
4	180	45D	1.17	0.53	0.43	0.38	0.35	0.31	0.28	0.27		0.09
		60D	2.06	0.81	0.66	0.59	0.54	0.48	0.44	0.41		0.13
		70D	12.6	5.7	4.6	4.1	0.38	3.3	3.1	2.9		0.4
		80D	21.7	10.1	8.2	7.3	6.7	5.9	5.4	5.1	4.6	0.7
		110D	48.2	22.4	18.2	16.1	14.8	13.1	12.0	11.2		1.2
		140D	74.5	32.4	26.4	23.3	21.4	19.0	17.4			1.7
		180D	149.2	66.0	53.6	47.5	43.5	38.6				3.0
		250D	327.0	152.3	123.7	109.6	100.5					5.3
		350D	806.8	359.6	308.5	273.2						9.9
	270	45D	1.75	0.71	0.57	0.51	0.47	0.41	0.38	0.35	0.32	0.10
		60D	5.42	1.90	1.54	1.36	1.25	1.11	1.02	0.95	0.86	8.18
		70D	14.8	5.5	4.5	3.9	3.6	3.2	2.9	2.7	2.5	0.3
		80D	25.7	9.7	7.9	7.0	6.4	5.7	5.2	4.9	4.4	0.6
		110D	56.9	21.5	17.5	15.5	14.2	12.6	11.5	10.8	9.8	1.0
		140D	86.5	31.0	25.1	22.3	20.4	18.1	16.6	15.5		1.4
		180D	239.2	93.4	75.9	67.2	61.6	54.6	50.1	46.8		3.2
		250D	528.5	210.1	170.7	151.1	138.6	122.8				5.5
		350D	1284.7	484.8	415.9	368.3	337.8					10.6
5	180	45D	1.15	0.57	0.41	0.32	0.27	0.21	0.19			0.07
		60D	1.76	0.69	0.56	0.50	0.45	0.40	0.37	0.35		0.10
		70D	5.0	2.3	1.9	1.6	1.5	1.3	1.2	1.1		0.3
		80D	22.8	8.6	8.6	7.8	7.1	6.3	5.8	5.4	4.9	0.6
		110D	36.3	16.6	13.5	11.9	10.9	9.7	8.9	8.3		0.9
		140D	46.0	19.0	15.5	13.7	12.6	11.1	10.2			1.1
		180D	108.7	46.3	37.6	33.3	30.5	27.0				2.2
		250D	312.7	145.2	118.0	104.4	95.8					4.3
		350D	717.3	313.0	268.6	237.8						7.9
	270	45D	1.15	0.61	0.54	0.47	0.37	0.31	0.23			0.07
		60D	2.37	0.84	0.68	0.61	0.56	0.49	0.45	0.42	0.38	0.11
		70D	5.7	2.1	1.7	1.5	1.4	1.3	1.1	1.1	1.0	0.2
		80D	26.3	9.2	8.3	7.4	6.8	6.0	5.5	5.1	4.6	0.5
		110D	41.2	15.6	12.7	11.2	10.3	9.1	8.4	7.8	7.1	0.8
		140D	75.8	27.7	22.5	19.9	18.3	16.2	14.8	13.9		1.2

Stop S	Index Period θ	Code	Static Torque Ts kgf-m	Net Dynamic Torque to (kgf-m) Indexes per min.N(rpm) 50	100	150	200	300	400	500	700	Cam Shaft Riction Torque Tx (kgf-m)
5	270	180D	148.0	55.0	44.7	39.6	36.3	32.1	29.5	27.6		2.2
		250D	425.6	169.1	137.3	121.6	111.6	98.8				4.3
		350D	1067.8	401.6	344.5	305.0	279.8					8.0
6	90	45D	1.22	0.79	0.64	0.57	0.52	0.46	0.43			0.12
		60D	4.34	2.32	1.88	1.67	1.53	1.35	1.24	1.16		0.22
		70D	12.5	8.2	6.7	5.9	5.4	4.8	4.4	4.1		0.5
		80D	20.2	12.9	10.5	9.3	8.5	7.5	6.9	6.4		0.8
		110D	49.8	31.1	25.3	22.4	20.6	18.2				1.6
		140D	80.4	46.9	38.1	33.7	30.9	27.4				2.3
		180D	175.4	103.1	83.7	74.1	68.0					4.1
		250D	377.2	233.1	181.2	160.5						7.2
		350D	916.3	504.5	432.8							14.0
	120	45D	2.92	1.68	1.37	1.21	1.11	0.98	0.90	0.84	0.76	0.12
		60D	11.69	5.77	4.83	4.27	3.92	3.47	3.18	2.98	2.69	0.30
		70D	14.6	8.2	6.6	5.9	5.4	4.8	4.4	4.1	3.7	0.5
		80D	35.1	20.0	16.3	14.4	13.2	11.7	10.7	10.0	9.1	0.9
		110D	60.7	32.9	26.7	23.7	21.7	19.2	17.6	16.5		1.4
		140D	115.7	60.3	49.0	43.4	39.8	35.2	32.3			2.3
		180D	238.5	129.0	104.8	92.8	85.1	75.3				4.2
		250D	550.0	315.5	256.3	226.9	208.2					7.4
		350D	1072.6	500.7	429.6	308.4						12.3
	150	45D	3.26	1.66	1.35	1.20	1.10	0.97	0.89	0.83	0.75	0.11
		60D	12.73	5.80	4.71	4.17	3.83	3.39	3.11	2.91	2.63	0.27
		70D	16.1	8.0	6.5	5.8	5.3	4.7	4.3	4.0	3.6	0.4
		80D	38.8	19.7	16.0	14.2	13.0	11.5	10.6	9.9	8.9	0.9
		110D	66.9	32.3	26.2	23.2	21.3	18.9	17.3	16.2		1.3
		140D	126.0	58.9	47.8	42.3	38.8	34.4	31.6	29.5		2.1
		180D	263.0	126.6	102.9	91.1	83.6	74.0	67.9			3.8
		250D	620.6	313.5	254.6	225.5	206.8					6.8
		350D	1518.2	672.6	577.0	510.9	468.7					12.9
	180	45D	3.50	1.63	1.32	1.17	1.08	0.95	0.87	0.82	0.74	0.11
		60D	13.43	5.64	4.58	4.06	3.72	3.30	3.02	2.83	2.56	0.26
		70D	17.2	7.8	6.4	5.6	5.2	4.6	4.2	3.9	3.6	0.4
		80D	41.4	19.3	15.7	13.9	12.7	11.3	10.3	9.7	8.7	0.8
		110D	85.9	39.3	31.9	28.3	25.9	23.0	21.1	19.7	17.8	1.4
		140D	133.0	57.3	46.5	41.2	37.8	33.4	30.7	28.7		2.0
		180D	375.5	176.6	143.5	127.0	116.5	103.2	94.7	88.5		4.3
		250D	873.9	425.4	345.5	305.9	280.7	248.5				8.0
		350D	1734.4	728.9	625.3	553.7	507.9					13.0
	210	45D	3.68	1.60	1.30	1.15	1.06	0.93	0.85	0.80	0.72	0.10
		60D	13.91	5.48	4.45	3.94	3.62	3.20	2.94	2.75	2.48	0.25
		70D	17.9	7.6	6.2	5.5	5.0	4.5	4.1	3.8	3.5	0.4
		80D	43.3	18.8	15.3	13.5	12.4	11.0	10.1	9.4	8.5	0.8
		110D	89.5	38.3	31.1	27.6	25.3	22.4	20.5	19.2	17.4	1.4
		140D	137.7	55.6	45.2	40.0	36.7	35.5	29.8	27.9	25.2	1.9
		180D	392.5	172.4	140.1	124.0	113.8	100.7	92.4	86.4		4.1
		250D	926.0	418.1	339.6	300.7	275.8	244.2	224.1			7.6
		350D	1812.2	711.4	610.3	540.4	495.7					12.4
	240	45D	3.80	1.56	1.27	1.12	1.03	0.91	0.84	0.78	0.71	0.10
		60D	14.25	5.33	4.33	3.83	3.52	3.11	2.86	2.67	2.42	0.24
		70D	18.5	7.5	6.1	5.4	4.9	4.4	4.0	3.7	3.4	0.4
		80D	44.6	18.4	14.9	13.2	12.1	10.7	9.8	9.2	8.3	0.7
		110D	92.2	37.4	30.3	26.9	24.6	21.8	20.0	18.7	16.9	1.3
		140D	141.1	54.1	43.9	38.9	35.7	31.6	29.0	27.1	24.5	1.8
		180D	404.8	168.3	136.7	121.0	111.0	98.3	90.2	84.3	76.2	4.0
		250D	965.3	410.1	333.1	295.0	270.6	239.6	219.8			7.3
		350D	1868.7	694.0	595.4	527.2	483.6					11.9
	270	45D	3.90	1.52	1.24	1.10	1.01	0.89	0.82	0.76	0.69	0.10
		60D	14.50	5.19	4.22	3.73	3.42	3.03	2.78	2.60	2.35	0.23
		70D	18.8	7.3	5.9	5.2	4.8	4.2	3.9	3.6	3.3	0.4
		80D	45.6	17.9	14.6	12.9	11.8	10.5	9.6	9.0	8.1	0.7

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

DS.DF.DE

Stop S	Index Period θ	Code	Static Ts kgf-m	Net Dynamic Torque to (kgf-m) Indexes per min.N(rpm) 50	100	150	200	300	400	500	700	Cam Shaft Riction Torque Tx (kgf-m)
6	270	110D	94.1	36.4	29.6	26.2	24.0	21.3	19.5	18.3	16.5	1.3
		140D	143.6	52.7	42.8	37.9	34.8	30.8	28.2	26.4	23.9	1.8
		180D	414.0	164.2	133.4	118.1	108.4	96.0	88.0	82.3	74.4	3.8
		250D	995.3	402.0	326.5	289.1	265.2	234.8	215.4	201.5		7.1
		350D	1910.6	677.4	581.2	514.6	472.0					11.6
	300	45D	3.97	1.49	1.21	1.07	0.98	0.87	0.80	0.75	0.68	0.10
		60D	14.68	5.06	4.11	3.64	3.34	2.96	2.71	2.54	2.29	0.23
		70D	19.1	7.1	5.8	5.1	4.7	4.1	3.8	3.6	3.2	0.3
		80D	46.4	17.5	14.2	12.6	11.6	10.2	9.4	8.8	7.9	0.7
		110D	95.6	35.6	28.9	25.6	23.5	20.8	19.1	17.8	16.1	1.3
		140D	145.4	51.4	41.7	36.9	33.19	30.0	27.5	25.7	23.3	1.7
		180D	421.0	160.5	130.3	115.4	105.9	93.7	86.0	80.4	72.7	3.8
		250D	1018.5	394.0	320.0	283.4	259.9	230.2	211.1	197.5		6.9
		350D	1942.4	661.8	567.7	502.7	461.1					11.3
	330	45D	4.03	1.46	1.18	1.05	0.96	0.85	0.78	0.73	0.66	0.09
		60D	14.82	4.94	4.01	3.55	3.26	2.89	2.65	2.48	2.24	0.22
		70D	19.4	6.9	5.6	5.0	4.6	4.1	3.7	3.5	3.1	0.3
		80D	47.0	17.1	13.9	12.3	11.3	10.0	9.2	8.6	7.8	0.7
		110D	96.7	34.8	28.2	25.0	22.9	20.3	18.6	17.4	15.8	1.2
		140D	146.8	5.2	40.7	36.1	33.1	29.3	26.9	25.1	22.7	1.7
		180D	426.4	156.9	127.5	112.9	103.5	91.7	84.1	78.7	71.1	3.7
		250D	1036.8	386.3	313.8	277.8	254.9	225.7	207.0	193.6		6.8
		350D	1966.9	647.5	555.2	491.6	451.0					11.1
8	90	45D	1.50	0.96	0.78	0.69	0.63	0.56	0.51	0.48		0.09
		60D	2.06	1.11	0.90	0.80	0.73	0.65	0.60	0.56		0.13
		70D	12.6	6.9	6.3	5.6	5.2	4.6	4.2	3.9	3.5	0.4
		80D	21.5	11.4	11.4	10.2	9.4	8.3	7.6	7.1		0.7
		110D	48.2	30.6	24.8	22.0	20.2	17.9	16.4			1.2
		140D	74.5	44.3	36.0	31.9	29.2	25.9				1.7
		180D	149.2	90.2	73.2	64.8	59.5					3.0
		250D	327.0	208.1	169.0	149.7						5.3
		350D	806.8	491.2	421.4							9.9
	120	45D	2.15	1.25	1.02	0.90	0.83	0.73	0.67	0.63	0.57	0.10
		60D	5.29	2.65	2.15	1.91	1.75	1.55	1.42	1.33	1.20	0.18
		70D	14.2	7.4	6.2	5.5	5.0	4.4	4.1	3.8	3.5	0.4
		80D	24.7	11.9	11.0	9.7	8.9	7.9	7.2	6.8	6.1	0.6
		110D	54.7	29.9	24.3	21.5	19.7	17.5	16.0	15.0		1.1
		140D	86.6	45.6	37.1	32.8	30.1	26.7	24.5	22.9		1.6
		180D	167.3	87.6	71.2	63.0	57.8	51.2				2.8
		250D	503.2	290.2	235.7	208.7	191.4					5.7
		350D	1218.7	668.2	573.2	507.6	465.6					11.0
	150	45D	2.33	1.22	0.99	0.88	0.81	0.71	0.65	0.61	0.55	0.09
		60D	5.52	2.53	2.06	1.82	1.67	1.48	1.36	1.27	1.15	0.17
		70D	15.2	7.4	6.0	5.3	4.9	4.3	3.9	3.7	3.3	0.3
		80D	26.5	12.3	10.6	9.4	8.6	7.7	7.0	6.6	5.9	0.6
		110D	58.7	29.0	23.5	20.8	19.1	16.9	15.5	14.5		1.0
		140D	92.2	44.1	35.8	31.7	29.1	25.7	23.6	32.1		1.4
		180D	246.6	125.5	102.0	90.3	82.8	73.3	67.3	62.9		3.1
		250D	549.1	283.5	230.3	203.9	187.0	165.6				5.3
		350D	1399.2	655.0	562.0	497.6	456.5					10.3
	180	45D	2.44	1.18	0.96	0.85	0.78	0.69	0.63	0.59	0.54	0.09
		60D	5.66	2.43	1.97	1.75	1.60	1.42	1.30	1.22	1.10	0.17
		70D	16.8	8.0	6.5	5.8	5.3	4.7	4.3	4.0	3.6	0.3
		80D	30.4	14.7	11.9	10.5	9.7	8.6	7.9	7.3	6.6	0.6
		110D	74.3	35.7	29.0	25.7	23.6	20.9	19.1	17.9	16.2	1.1
		140D	113.4	51.4	41.8	37.0	33.9	30.0	27.5	25.8	23.3	1.6
		180D	257.3	121.4	98.6	87.3	80.1	70.9	65.1	60.9		2.9
		250D	739.7	373.0	303.0	268.3	246.1	217.9	199.9			5.8
		350D	1824.3	859.8	737.6	653.2	559.1			0.58		11.1
	210	45D	2.52	1.15	0.93	0.83	0.76	0.67	0.62		0.52	0.09
8	210	60D	5.75	2.33	1.90	1.68	1.54	1.36	1.25	1.17	1.06	0.16
		70D	17.3	7.7	6.3	5.6	5.1	4.5	4.2	3.9	3.5	0.3
		80D	31.3	14.2	11.5	10.2	9.4	8.3	7.6	7.1	6.4	0.6
		110D	76.5	34.6	28.1	24.9	22.8	20.2	18.5	17.3	15.7	1.1
		140D	115.9	49.6	40.3	35.7	32.7	29.0	26.6	24.9	22.5	1.5
		180D	264.5	117.5	95.5	84.5	77.5	68.7	63.0	58.9		2.6
		250D	767.6	362.8	294.7	261.0	239.4	212.0	194.4			5.9
		350D	2036.0	932.2	799.7	708.1	649.6					11.5
	240	45D	2.58	1.12	0.91	0.80	0.74	0.65	0.60	0.56	0.51	0.09
		60D	5.81	2.25	1.83	1.62	1.49	1.32	1.21	1.13	1.02	0.16
		70D	17.6	7.5	6.1	5.4	5.0	4.4	4.0	3.8	3.4	0.3
		80D	31.9	13.8	11.2	9.9	9.1	8.0	7.4	6.9	6.2	0.6
		110D	77.9	33.5	27.2	24.1	22.1	19.6	18.0	16.8	15.2	1.0
		140D	117.7	48.0	39.0	34.5	31.7	28.1	25.7	24.1	21.8	1.5
		180D	316.4	138.7	112.7	99.8	91.5	81.0	74.3	69.5	62.8	3.1
		250D	787.6	353.1	286.8	254.0	233.0	206.3	189.2	177.0		5.5
		350D	2095.3	908.5	779.4	690.2	633.1					11.1
	270	45D	2.62	1.09	0.88	0.78	0.72	0.63	0.58	0.54	0.49	0.08
		60D	5.85	2.18	1.77	1.57	1.44	1.28	1.17	1.09	0.99	0.16
		70D	17.8	7.3	5.9	5.2	4.8	4.3	3.9	3.7	3.3	0.3
		80D	32.3	13.4	10.9	9.6	8.8	7.8	7.2	6.7	6.1	0.6
		110D	79.0	32.6	26.5	23.4	21.5	19.0	17.5	16.3	14.8	1.0
		140D	118.9	46.6	37.9	33.5	30.7	27.2	25.0	23.4	21.1	1.4
		180D	320.6	134.8	109.5	96.9	88.9	78.7	72.2	67.6	61.1	3.0
		250D	802.2	344.0	279.4	247.4	226.9	200.9	184.3	172.4		5.3
		350D	2139.1	886.1	760.2	673.1	617.5					10.9
	300	45D	2.65	1.06	0.86	0.76	0.70	0.62	0.57	0.53	0.48	0.08
		60D	5.88	2.12	1.72	1.53	1.40	1.24	1.14	1.06	0.96	0.15
		70D	18.0	7.1	5.8	5.1	4.7	4.1	3.8	3.6	3.2	0.3
		80D	32.6	13.0	10.6	9.4	8.6	7.6	7.0	6.5	5.9	0.6
		110D	79.8	31.7	25.8	22.8	20.9	18.5	17.0	15.9	14.4	1.0
		140D	119.8	45.3	36.8	32.6	29.9	26.5	24.3	22.7	20.5	1.4
		180D	323.7	131.2	106.6	94.4	86.6	76.7	70.3	65.8	59.5	3.0
		250D	813.2	335.5	272.5	241.3	221.4	196.0	179.8	168.2		5.2
		350D	2172.2	865.1	742.2	857.2	602.9					10.6
	330	45D	2.67	1.03	0.84	0.74	0.68	0.60	0.55	0.52	0.47	0.08
		60D	5.90	2.07	1.68	1.49	1.36	1.21	1.11	1.04	0.94	0.15
		70D	18.1	6.9	5.6	5.0	4.6	4.0	3.7	3.5	3.1	0.3
		80D	32.9	12.7	10.3	9.1	8.4	7.4	6.8	6.4	5.8	0.5
		110D	80.4	31.0	25.1	22.3	20.4	18.1	16.6	15.5	14.0	1.0
		140D	120.5	44.2	35.9	31.8	29.1	25.8	23.7	22.1	20.0	1.4
		180D	326.1	128.0	104.0	92.1	84.4	74.8	68.6	64.1	58.0	2.9
		250D	821.6	327.8	266.2	235.7	216.2	191.5	175.6	164.3		5.1
		350D	2197.6	845.7	725.5	642.6	589.3					10.5
10	90	45D	1.15	0.65	0.52	0.4	0.33	0.29	0.24	0.21		0.08
		60D	17.6	0.94	0.76	0.68	0.62	0.55	0.50	0.47		0.10
		70D	25.0	3.0	2.5	2.2	2.0	1.8	1.6	1.5		0.3
		80D	22.7	8.4	8.4	8.4	8.4	8.3	7.6	7.1	6.4	0.6
		110D	36.2	22.3	18.1	16.1	14.7	13.1	12.0			0.9
		140D	46.0	26.0	21.1	18.7	17.2	15.2				1.1
		180D	108.7	63.2	51.4	45.5	41.7					2.2
		250D	312.7	198.4	161.1	142.7						4.3
		350D	717.3	427.6	366.9	324.8						7.9
	120	45D	1.15	0.7	0.62	0.49	0.41	0.33	0.29	0.25		0.07
		60D	2.33	1.18	0.96	0.85	0.78	0.69	0.63	0.59	0.54	0.12
		70D	5.5	2.9	2.4	2.1	1.9	1.7	1.6	1.5	1.3	0.3
		80D	25.0	8.8	8.8	8.8	8.8	8.0	7.3	6.9	6.2	0.6
		110D	39.7	21.4	17.4	15.4	14.2	12.5	11.5	10.8		0.8
		140D	73.8	38.7	31.4	27.8	25.5	22.6	20.7	19.4		1.2
		180D	144.1	76.8	62.4	55.2	50.7	44.9				2.3

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

DS.DF.DE

Stop S	Index Period θ	Code	Static Torque Ts kgf-m	Net Dynamic Torque to (kgf-m) Indexes per min.N(rpm) 50	100	150	200	300	400	500	700	Cam Shaft Riction Torque Tx (kgf-m)
10	120	250D	410.8	235.1	190.9	169.1	155.1					4.5
		350D	1028.1	557.6	478.4	423.6	388.6					8.3
	150	45D	1.3	0.69	0.59	0.45	0.38	0.31	0.27	0.22		0.06
		60D	2.40	1.12	0.91	0.81	0.74	0.65	0.60	0.56	0.51	0.11
		70D	5.7	2.8	2.3	2.0	1.8	1.6	1.5	1.4	1.3	0.2
		80D	26.4	9.0	9.0	9.0	8.7	7.7	7.0	6.6	5.9	0.5
		110D	41.7	20.6	16.7	14.8	13.6	12.0	11.0	10.3		0.8
		140D	77.3	37.0	30.1	26.6	24.4	21.6	19.8	18.6		1.1
		180D	151.1	73.5	59.7	52.9	48.5	43.0	39.4			2.2
		250D	437.2	226.8	184.2	163.1	149.6	132.5				4.2
		350D	1099.1	539.2	462.6	409.6	375.8					7.8
	180	45D	1.35	0.63	0.54	0.43	0.36	0.29	0.25	0.2		0.06
		60D	2.44	1.07	0.87	0.77	0.71	0.63	0.57	0.54	0.48	0.11
		70D	5.9	2.7	2.2	1.9	1.8	1.6	1.4	1.3	1.2	0.2
		80D	27.2	9.2	9.2	9.1	8.3	7.4	6.8	6.3	5.7	0.5
		110D	42.9	19.7	16.0	14.2	13.0	11.5	10.6	9.9	8.9	0.7
		140D	79.5	35.6	28.9	25.6	23.5	20.8	19.1	17.8	16.1	1.1
		180D	191.7	90.7	73.7	65.3	59.9	53.0	48.6	45.5		2.4
		250D	453.9	218.8	177.7	157.4	144.4	127.8				4.0
		350D	1505.3	726.8	623.6	552.1	506.5					9.2
	210	45D	1.4	0.61	0.52	0.4	0.33	0.27	0.21	0.18		0.06
		60D	2.47	1.03	0.83	0.74	0.68	0.60	0.55	0.51	0.47	0.11
		70D	6.0	2.6	2.1	1.9	1.7	1.5	1.4	1.3	1.2	0.2
		80D	27.7	9.3	9.3	8.7	8.0	7.1	6.5	6.1	5.5	0.5
		110D	43.6	19.0	15.4	13.7	12.5	11.1	10.2	9.5	8.6	0.7
		140D	80.9	34.2	27.8	24.6	22.6	20.0	18.3	17.2	15.5	1.1
		180D	194.9	87.4	71.0	62.8	57.6	51.0	46.8	43.8		2.3
		250D	625.3	300.6	244.1	216.2	198.3	175.6	181.1			4.6
		350D	1549.1	704.0	604.0	534.8	490.6					9.0
	240	45D	1.45	0.59	0.48	0.37	0.3	0.27	0.21	0.18		0.06
		60D	2.49	0.99	0.80	0.71	0.65	0.58	0.53	0.50	0.45	0.11
		70D	6.0	2.5	2.0	1.8	1.6	1.5	1.3	1.2	1.1	0.2
		80D	28.1	9.3	9.3	8.5	7.8	6.9	6.3	5.9	5.3	0.5
		110D	44.2	18.4	14.9	13.2	12.1	10.7	9.9	9.2	8.3	0.7
		140D	81.8	33.1	26.9	23.8	21.8	19.3	17.7	16.6	15.0	1.0
		180D	197.1	84.4	68.6	50.7	55.7	49.3	45.2	42.3	38.2	2.2
		250D	636.1	291.2	236.6	209.5	192.1	170.1	158.1	146.0		4.5
		350D	1579.7	683.0	585.9	518.8	475.9					8.7
	270	45D	1.5	0.56	0.45	0.34	0.3	0.26	0.2	0.17		0.06
		60D	2.50	0.96	0.78	0.69	0.63	0.56	0.51	0.48	0.43	0.10
		70D	6.1	2.4	2.0	1.7	1.6	1.4	1.3	1.2	1.1	0.2
		80D	28.3	9.4	9.3	8.2	7.5	6.7	6.1	5.7	5.2	0.5
		110D	44.6	17.8	14.5	12.8	11.8	10.4	9.5	8.9	8.1	0.7
		140D	82.5	32.1	26.0	23.1	21.2	18.7	17.2	16.1	14.5	1.0
		180D	198.6	81.8	66.4	58.8	54.0	47.8	43.8	41.0	37.1	2.2
		250D	643.9	282.8	229.7	203.4	186.6	165.2	151.6	141.8		4.4
		350D	1601.7	663.9	569.5	504.3	482.8					8.6
	300	45D	1.52	0.54	0.43	0.33	0.29	0.25	0.2	0.16		0.06
		60D	2.51	0.93	0.76	0.67	0.61	0.54	0.50	0.47	0.42	0.10
		70D	6.1	2.3	1.9	1.7	1.5	1.4	1.3	1.2	1.1	0.2
		80D	28.5	9.4	9.0	8.0	7.3	6.5	5.9	5.6	5.0	0.5
		110D	44.8	17.3	14.1	12.5	11.4	10.1	9.3	8.7	7.8	0.7
		140D	83.0	31.2	25.3	22.4	20.6	18.2	16.7	15.6	14.1	1.0
		180D	199.8	79.5	64.6	57.2	52.4	46.4	42.6	39.8	36.0	2.2
		250D	649.6	275.3	223.6	198.0	181.6	160.8	147.5	138.0		4.4
		350D	1618.0	646.5	554.6	491.1	450.5					8.4
	330	45D	1.52	0.51	0.41	0.3	0.28	0.23	0.19	0.15		0.06
		60D	2.51	0.90	0.73	0.65	0.60	0.53	0.48	0.45	0.41	0.10
		70D	6.1	2.3	1.9	1.6	1.5	1.3	1.2	1.1	1.0	0.2
		80D	28.7	9.4	8.8	7.8	7.1	6.3	5.8	5.4	4.9	0.5
10	330	110D	45.0	16.9	13.7	12.1	11.1	9.9	9.0	8.5	7.6	0.7
		140D	83.3	30.4	24.7	21.8	20.0	17.7	16.3	15.2	13.8	1.0
		180D	200.6	77.4	62.9	55.7	51.1	45.2	41.5	38.8	35.1	2.1
		250D	653.9	268.4	218.0	193.0	177.1	156.8	143.8	134.5		4.3
		350D	1630.4	630.7	541.0	479.1	439.5					8.3
12	90	45D	0.5	0.31	0.21	0.19	0.15	0.13				0.06
		60D	0.94	0.49	0.40	0.35	0.32	0.29	0.26			0.09
		70D	2.7	1.6	1.3	1.1	1.1	0.9	0.9			0.2
		80D	24.3	8.7	8.7	8.7	8.7	8.7	8.4	7.9	7.1	0.6
		110D	35.5	16.8	16.8	15.9	14.6	12.9	11.8			0.8
		140D	48.3	27.9	22.7	20.1	18.4	16.3				1.0
		180D	110.9	65.7	53.3	47.2	43.3	38.4				2.0
		250D	246.7	151.7	123.3	109.1						3.4
		350D	777.5	480.0	411.8	364.6						7.4
	120	45D	1.42	0.8	0.6	0.51	0.45	0.4	0.36			0.06
		60D	1.91	0.96	0.78	0.69	0.63	0.56	0.51	0.48	0.43	0.09
		70D	2.8	1.5	1.2	1.1	1.0	0.9	0.8	0.8		0.2
		80D	26.1	9.0	9.0	9.0	9.0	8.7	8.0	7.5	6.8	0.5
		110D	38.4	17.5	17.1	15.2	13.9	12.3	11.3	10.6		0.7
		140D	51.4	26.4	21.5	19.0	17.4	15.4	14.2			0.9
		180D	118.2	62.2	50.5	44.7	41.0	36.3	33.6			1.9
		250D	367.6	211.5	171.8	152.1	139.6					3.7
		350D	856.4	462.1	396.4	351.0	322.0					6.9
	150	45D	1.42	0.75	0.56	0.49	0.4	0.37	0.31			0.06
		60D	1.95	0.91	0.74	0.65	0.60	0.53	0.49	0.45	0.41	0.09
		70D	2.9	1.4	1.2	1.0	0.9	0.8	0.8	0.7		0.2
		80D	27.2	9.2	9.2	9.2	9.2	8.3	7.6	7.1	0.65	0.5
		110D	40.0	17.9	16.3	14.5	13.3	11.7	10.8	10.1		0.7
		140D	53.0	25.1	20.4	18.1	16.6	14.7	13.5	12.6		0.9
		180D	126.7	62.6	50.9	45.0	41.3	36.6	33.6			1.9
		250D	385.0	202.5	164.4	145.6	133.6	118.3				3.6
		350D	902.1	443.5	380.5	336.9	309.1					6.6
	180	45D	1.42	0.71	0.54	0.47	0.4	0.35	0.3			0.06
		60D	1.97	0.86	0.70	0.62	0.57	0.50	0.46	0.43	0.39	0.09
		70D	3.0	1.4	1.1	1.0	0.9	0.8	0.7	0.7	0.6	0.2
		80D	27.8	9.3	9.3	9.3	9.0	8.0	7.3	6.8	6.2	0.5
		110D	40.9	18.1	15.6	13.9	12.7	11.3	10.3	9.7	8.7	0.7
		140D	79.3	37.2	30.2	26.7	24.5	21.7	19.9	18.6	16.8	1.0
		180D	157.1	75.3	61.2	54.2	49.7	44.0	40.3	37.7		2.0
		250D	395.5	194.3	157.8	139.7	128.2	113.5				3.4
		350D	1179.3	567.5	466.9	431.1	395.4					7.2
	210	45D	1.42	0.69	0.51	0.45	0.39	0.33	0.29			0.06
		60D	1.99	0.83	0.67	0.60	0.55	0.48	0.44	0.41	0.37	0.09
		70D	3.0	1.3	1.1	0.9	0.9	0.8	0.7	0.7	0.6	0.2
		80D	28.2	9.4	9.4	9.4	8.7	7.7	7.0	6.6	5.9	0.5
		110D	41.5	18.2	15.1	13.3	12.2	10.8	9.9	9.3	8.4	0.7
		140D	80.1	35.7	29.0	25.7	23.6	20.9	19.1	17.9	16.2	1.0
		180D	159.0	72.3	58.7	52.0	47.7	42.3	38.8	36.2		2.0
		250D	474.9	229.1	186.1	164.8	151.1	113.8	122.8			3.8
		350D	1202.0	547.0	469.3	415.5	381.2					7.1
	240	45D	1.5	0.61	0.50	0.43	0.36	0.3	0.27			0.06
		60D	2.00	0.80	0.65	0.57	0.53	0.47	0.43	0.40	0.36	0.09
		70D	3.0	1.3	1.0	0.9	0.8	0.7	0.7	0.6	0.6	0.2
		80D	28.5	9.4	9.4	9.1	8.4	7.4	6.8	6.4	5.7	0.5
		110D	41.9	17.9	14.5	12.9	11.8	10.5	9.6	9.0	8.1	0.6
		140D	80.7	34.4	28.0	24.8	22.7	20.1	18.4	17.3	15.6	1.0
		180D	160.2	69.8	56.7	50.2	46.0	40.8	37.4	35.0	31.6	1.9
		250D	480.4	221.4	179.8	159.2	146.1	129.3	118.6	111.0		3.7
		350D	1217.5	528.9	453.8	401.8	368.6					6.9
	270	45D	1.55	0.58	0.49	0.4	0.35	0.29	0.25			0.06
		60D	2.01	0.77	0.63	0.55	0.51	0.45	0.41	0.39	0.35	0.09

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

DS.DF.DE

Stop S	Index Period θ	Code	Static Torque Ts kgf-m	Net Dynamic Torque to (kgf-m) Indexes per min.N(rpm) 50	100	150	200	300	400	500	700	Cam Shaft Riction Torque Tx (kgf-m)
12	270	70D	3.1	1.2	1.0	0.9	0.8	0.7	0.7	0.6	0.6	0.2
		80D	28.6	9.4	9.4	8.8	8.1	7.2	6.6	6.1	5.6	0.5
		110D	46.4	20.0	16.2	14.4	13.2	11.7	10.7	10.0	9.0	0.7
		140D	81.2	33.3	27.1	24.0	22.0	19.5	17.9	16.7	15.1	1.0
		180D	161.1	67.5	54.8	48.8	44.6	39.4	36.2	33.8	30.6	1.9
		250D	484.4	214.6	174.3	154.3	141.6	125.3	115.0	107.5		3.7
		350D	1228.4	512.8	440.0	389.6	357.4					6.8
	300	45D	1.55	0.52	0.47	0.38	0.33	0.27	0.24			0.06
		60D	2.01	0.75	0.61	0.54	0.49	0.44	0.40	0.37	0.34	0.09
		70D	3.1	1.2	1.0	0.9	0.8	0.7	0.6	0.6	0.5	0.2
		80D	28.8	9.4	9.4	8.6	7.9	7.0	6.4	6.0	5.4	0.5
		110D	46.6	19.4	15.8	14.0	12.8	11.3	10.4	9.7	8.8	0.7
		140D	81.5	32.3	28.3	23.3	21.3	18.9	17.3	16.2	14.7	1.0
		180D	161.8	65.6	53.2	47.1	43.3	38.3	35.1	32.9	29.7	1.9
		250D	487.2	208.5	169.4	150.0	137.6	121.8	111.7	104.5		3.6
		350D	1236.4	498.5	427.7	378.7	347.4					6.7
	330	45D	1.55	0.51	0.45	0.35	0.31	0.25	0.22			0.06
		60D	2.01	0.73	0.59	0.52	0.48	0.42	0.39	0.36	0.33	0.09
		70D	3.1	1.2	0.9	0.8	0.8	0.7	0.6	0.6	0.5	0.2
		80D	28.9	9.5	9.4	8.3	7.7	6.8	6.2	5.8	5.3	0.5
		110D	46.8	18.9	15.3	13.6	12.5	11.0	10.1	9.5	8.6	0.7
		140D	81.7	31.5	25.6	22.6	20.8	18.4	16.9	15.8	14.3	1.0
		180D	162.3	63.8	51.8	45.9	42.1	37.3	35.2	32.0	28.9	1.9
		250D	489.4	203.1	165.0	146.1	134.0	118.6	108.8	110.8		3.6
		350D	1242.5	485.6	416.6	368.9	338.4					6.7
16	※ 90	45D	1.5	0.7	0.51	0.43	0.4	0.35				0.1
		60D	2.06	1.11	0.90	0.80	0.73	0.65				0.13
		70D	12.6	6.9	6.3	5.6	5.2	4.6	4.2	.3.9		0.4
		80D	21.5	11.4	11.4	10.2	9.4	8.3	7.6			0.7
	90	110D	36.2	12.5	12.5	12.5	12.5	12.5	12.2	11.4		0.7
		140D	46.3	20.8	20.8	19.6	17.9	15.9	14.6			0.9
		180D	65.9	37.6	30.5	27.0	24.8					1.4
		250D	178.6	108.6	88.2	78.1						2.5
		350D	543.4	323.1	277.2	245.5						5.2
	※ 120	45D	1.67	0.98	0.79	0.70	0.6	0.57	0.52	0.49		0.10
		60D	5.29	2.65	2.15	1.91	1.75	1.55	1.42	1.33	1.20	0.18
		70D	15.1	8.6	7.0	6.2	5.6	5.0	4.6	4.3	3.9	0.4
		80D	24.8	12.2	11.4	10.1	9.2	8.2	7.5	7.0		0.6
	120	110D	38.1	12.8	12.8	12.8	12.8	12.5	11.4	10.7		0.7
		140D	48.1	21.1	20.6	18.3	16.8	14.8	13.6	12.7		0.8
		180D	68.5	35.2	28.6	25.3	23.2	20.5				1.4
		250D	288.5	128.1	104.0	92.1	84.5					2.7
		350D	679.1	372.4	319.4	282.9	259.5					5.5
	※ 150	45D	1.81	0.95	0.77	0.68	0.63	0.55	0.51	0.48		0.09
		60D	5.52	2.53	2.06	1.82	1.67	1.48	1.36	1.27	1.15	0.17
		70D	16.1	8.3	6.7	6.0	5.5	4.8	4.4	4.2	3.8	0.4
		80D	26.9	12.7	11.1	9.8	9.0	8.0	7.3	6.8	6.2	0.6
	150	110D	39.1	13.0	13.0	13.0	13.0	11.8	10.8	10.1	9.2	0.6
		140D	48.9	21.3	19.5	17.2	15.8	14.0	12.8	12.0		0.8
		180D	69.8	33.2	27.0	23.9	21.9	19.4	17.8			1.3
		250D	234.9	121.5	98.7	87.4	80.1	71.0				2.6
		350D	700.3	353.6	303.4	268.6	246.4					5.3
	※ 180	45D	1.90	0.92	0.75	0.66	0.61	0.54	0.49	0.46	0.42	0.09
		60D	5.66	2.43	1.97	1.75	1.60	1.42	1.30	1.22	1.10	0.17
		70D	16.8	8.0	6.5	5.8	5.3	4.7	4.3	4.0	3.6	0.3
		80D	31.4	15.6	12.7	11.3	10.3	9.1	8.4	7.8	7.1	0.6
	180	110D	39.6	13.1	13.1	13.1	12.7	11.3	10.3	9.7	8.7	0.6
		140D	49.4	21.4	18.5	16.4	15.0	13.3	12.2	11.4	10.3	0.8
		180D	104.5	49.6	40.3	35.6	32.7	29.0	26.6	24.8		1.5
		250D	295.1	149.1	121.1	107.3	98.4	87.1				2.8

Stop 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)
16	180	350D	712.7	337.7	289.8	256.6	235.4					5.2
	※ 210	45D	1.96	0.89	0.73	0.64	0.59	0.52	0.48	0.45	0.41	0.09
		60D	5.75	2.33	1.90	1.68	1.54	1.36	1.25	1.17	1.06	0.16
		70D	17.3	7.7	6.3	5.6	5.1	8.9	8.2	7.6	3.5	0.3
		80D	32.5	15.2	12.4	10.9	10.0	8.9	8.2	7.6	6.9	0.6
	210	110D	40.0	13.2	13.2	13.2	12.2	10.8	9.9	9.3	8.4	0.6
		140D	49.7	21.5	17.7	15.7	14.4	12.8	11.7	10.9	9.9	0.8
		180D	105.2	47.5	38.6	34.1	31.3	27.7	25.4	23.8		1.5
		250D	297.9	143.1	116.2	102.9	94.4	83.6	76.7			2.7
		350D	720.4	324.2	278.2	246.3	225.9					5.1
	※ 240	45D	2.01	0.87	0.71	0.62	0.57	0.51	0.47	0.44	0.39	0.09
		60D	5.81	2.25	1.83	1.62	1.49	1.32	1.21	1.13	1.02	0.16
		70D	17.6	7.5	6.1	5.4	5.0	4.4	4.0	3.8	3.4	0.3
		80D	33.4	14.8	12.0	10.6	9.8	8.6	7.9	7.4	6.7	0.6
	240	110D	40.2	13.2	13.2	12.8	11.7	10.4	9.5	8.9	8.1	0.6
		140D	49.9	21.0	17.1	15.1	13.9	12.3	11.3	10.5	9.5	0.7
		180D	105.7	45.7	37.1	32.9	30.2	26.7	24.5	22.9	20.7	1.5
		250D	299.7	137.9	112.0	99.2	91.0	80.5	73.9			2.7
		350D	725.6	312.6	268.2	237.5	217.9					5.0
	※ 270	45D	2.04	0.84	0.69	0.61	0.56	0.49	0.45	0.42	0.38	0.08
		60D	5.85	2.18	1.77	1.57	1.44	1.28	1.17	1.09	0.99	0.16
		70D	17.8	7.3	5.9	5.2	4.8	4.3	3.9	3.7	3.3	0.3
		80D	33.9	14.4	11.7	10.4	9.5	8.4	7.7	7.2	6.5	0.6
	270	110D	40.4	13.2	13.2	12.4	11.4	10.1	9.2	8.6	7.8	0.6
		140D	50.1	20.3	16.5	14.6	13.4	11.9	10.9	10.2	9.2	0.7
		180D	106.0	44.2	35.9	31.8	29.2	25.8	23.7	22.1	20.0	1.4
		250D	301.0	133.4	108.3	95.9	88.0	77.9	71.5	66.8		2.7
		350D	729.3	302.5	259.5	229.8	210.8					5.0
	※ 300	45D	2.06	0.82	0.67	0.59	0.54	0.48	0.44	0.41	0.37	0.08
		60D	5.88	2.12	1.72	1.53	1.40	1.24	1.14	1.06	0.96	0.15
		70D	18.0	7.1	5.8	5.1	4.7	4.1	3.8	3.6	3.2	0.3
		80D	34.4	14.1	11.4	10.1	9.3	8.2	7.5	7.0	6.4	0.6
	300	110D	40.5	13.2	13.2	12.0	11.0	9.8	9.0	8.4	7.6	0.6
		140D	50.2	19.7	16.0	14.2	13.0	11.5	10.6	9.9	8.9	0.7
		180D	106.3	42.9	34.8	30.8	28.3	25.0	23.0	21.5	19.4	1.4
		250D	302.0	129.4	105.1	93.1	85.4	75.6	69.4	64.9		2.7
		350D	731.9	293.6	351.9	223.1	204.6					4.9
	※ 330	45D	2.08	0.80	0.65	0.58	0.53	0.47	0.43	0.40	0.36	0.8
		60D	5.90	2.07	1.68	1.49	1.36	1.21	1.11	1.04	1.94	0.15
		70D	18.1	6.9	5.6	5.0	4.6	4.0	3.7	3.5	3.1	0.3
		80D	34.7	13.7	11.1	9.9	9.1	8.0	7.4	6.9	6.2	0.5
	330	110D	40.6	13.3	13.2	11.7	10.7	9.5	8.7	8.1	7.4	0.6
		140D	80.2	19.2	15.6	13.8	12.7	11.2	10.3	9.6	8.7	0.7
		180D	106.4	41.7	33.9	30.3	27.5	24.4	22.3	20.9	18.9	1.4
		250D	302.7	125.9	102.3	90.6	83.1	73.6	67.5	63.1		2.6
		350D	733.8	285.7	245.1	217.0	199.1					4.9
20	※ 90	45D	1.15	0.65	0.52	0.4	0.33	0.29				0.08
		60D	1.76	0.94	0.76	0.68	0.62	0.55				0.10
		70D	5.0	3.0	2.5	2.2	2.0	1.8	1.6			0.3
		80D	22.8	8.6	8.6	8.6	8.6	8.6	7.9	7.4		0.6
		110D	36.2	22.3	18.1	16.1	14.7	13.1				0.9
		140D	46.0	26.0	21.1	18.7	17.2					1.1
		180D	108.7	63.2	51.4	45.5	41.7					2.2
		250D	312.7	198.4	161.1							4.3
		350D	717.3	427.6	366.9							7.9
	※ 120	45D	1.15	0.7	0.62	0.49	0.42	0.33	0.29	0.25		0.07
		60D	2.33	1.18	0.96	0.85	0.78	0.69	0.63	0.59		0.12
		70D	5.5	2.9	2.4	2.1	1.9	1.7	1.6	1.5		0.3
		80D	25.4	9.1	9.1	9.1	9.1	8.3	7.6	7.2	6.5	0.6
		110D	39.7	21.4	17.4	15.4	14.2	12.5				0.8

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

DS.DF.DE

Stop S	Index Period θ	Code	Static Torque Ts kgf-m	Net Dynamic Torque to (kgf-m) Indexes per min.N(rpm) 50	100	150	200	300	400	500	700	Cam Shaft Riction Torque Tx (kgf-m)
20	※ 120	140D	73.8	38.7	31.4	27.8	25.5	22.6				1.2
		180D	144.1	76.8	62.4	55.2	50.7					2.3
		250D	410.8	235.1	190.9	169.1						4.5
		350D	1028.1	537.6	478.4	423.6						8.3
	※ 150	45D	1.3	0.69	0.59	0.45	0.38	0.31	0.27	0.22		0.06
		60D	2.40	1.12	0.91	0.81	0.74	0.65	0.60	0.56		0.11
		70D	5.7	2.8	2.3	2.0	1.8	1.6	1.5	1.4		0.2
		80D	27.0	9.4	9.4	9.4	9.1	8.0	7.4	6.9	6.2	0.5
		110D	41.7	20.6	16.7	14.8	13.6	12.0	11.0			0.8
		140D	77.3	37.0	30.1	26.6	24.4	21.6	19.8			1.1
		180D	151.1	73.5	59.7	52.9	48.5	43.0				2.2
		250D	437.2	226.8	84.2	163.1	149.6					4.2
		350D	1099.1	539.2	462.6	409.6						7.8
	※ 180	45D	1.35	0.63	0.54	0.43	0.36	0.29	0.25	0.2		0.06
		60D	2.44	1.07	0.87	0.77	0.71	0.63	0.57	0.54	0.48	0.11
		70D	5.9	2.7	2.2	1.9	1.8	1.6	1.4	1.3	1.2	0.2
		80D	28.0	9.5	9.5	9.5	8.7	7.7	7.1	6.6	6.0	0.5
		110D	42.9	19.7	16.0	14.2	13.0	11.5	10.6	9.9		0.7
		140D	79.5	35.6	28.9	25.6	23.5	20.8	19.1	17.8		1.1
		180D	191.7	90.7	73.7	65.3	59.9	53.0	48.6			2.4
		250D	453.9	218.8	177.7	157.4	144.4					4.0
		350D	1505.3	726.8	623.6	552.1	506.5					9.2
	※ 210	45D	14	0.61	0.52	0.4	0.33	0.27	0.21	0.18		0.06
		60D	2.47	1.03	0.83	0.74	0.68	0.60	0.55	0.51	0.47	0.11
		70D	6.0	2.6	2.1	1.9	1.7	1.5	1.4	1.3	1.2	0.2
		80D	2.87	9.6	9.6	9.2	8.4	7.5	6.9	6.4	5.8	0.5
		110D	43.6	19.0	15.4	13.7	12.5	11.1	10.2	9.5		0.7
		140D	80.9	34.2	27.8	24.6	22.6	20.0	18.3	17.2		1.1
		180D	194.9	87.4	71.0	62.8	57.6	51.0	48.8			2.3
		250D	625.3	300.6	244.1	216.2	198.3	175.6				4.6
		350D	1549.1	704.0	604.0	534.8	490.6					9.0
	※ 240	45D	1.45	0.59	0.48	0.37	0.3	0.27	0.21	0.18		0.06
		60D	2.49	0.99	0.80	0.71	0.65	0.58	0.53	0.50	0.45	0.11
		70D	6.0	2.5	2.0	1.8	1.6	1.5	1.3	1.2	1.1	0.2
		80D	29.1	9.7	9.7	8.9	8.2	7.2	6.6	6.2	5.6	0.5
		110D	44.2	18.4	14.9	13.2	12.1	10.7	9.9	9.2		0.7
		140D	81.8	33.1	26.9	23.8	21.8	19.3	17.7	16.6		1.0
		180D	197.1	84.4	68.6	60.7	55.7	49.3	45.2	42.3		2.2
		250D	363.1	291.2	236.6	209.5	192.1	170.1				4.5
		350D	1579.7	683.0	585.9	518.8	475.9					8.7
	※ 270	45D	1.5	0.56	0.45	0.34	0.3	0.26	0.2	0.17		0.06
		60D	2.50	0.96	0.78	0.69	0.63	0.56	0.51	0.48	0.43	0.10
		70D	6.1	2.4	2.0	1.7	1.6	1.4	1.3	1.2	1.1	0.2
		80D	29.4	9.8	9.8	8.7	7.9	7.0	6.4	6.0	5.5	0.5
		110D	44.6	17.8	14.5	12.8	11.8	10.4	9.5	8.9	8.4	0.7
		140D	82.5	32.1	26.0	23.1	21.2	18.7	17.2	16.1	14.5	1.0
		180D	198.6	81.8	66.4	58.8	54.0	47.8	43.8	41.0		2.2
		250D	643.9	232.8	229.7	203.4	186.6	165.2	151.6			4.4
		350D	1601.7	663.9	569.5	504.3	462.6					8.6
	※ 300	45D	1.52	0.54	0.43	0.33	0.29	0.25	0.2	0.16		0.06
		60D	2.51	0.93	0.76	0.67	0.61	0.54	0.50	0.47	0.42	0.10
		70D	6.1	2.3	1.9	1.7	1.5	1.4	1.3	1.2	1.1	0.2
		80D	29.7	9.8	9.5	8.4	7.7	6.8	6.3	5.9	5.3	0.5
		110D	44.8	17.3	14.1	12.5	11.4	10.1	9.3	8.7	7.8	0.7
		140D	83.0	31.2	25.3	22.4	20.6	18.2	16.7	15.6	14.1	1.0
		180D	199.8	79.5	64.6	57.2	52.4	46.4	42.6	39.8		2.2
		250D	649.6	275.3	223.6	198.0	181.6	160.8	147.5			4.4
		350D	1618.0	646.5	554.6	491.1	450.5					8.4
	※ 330	45D	1.52	0.51	0.41	0.3	0.28	0.23	0.19	0.15		0.06
		60D	2.51	0.90	0.73	0.65	0..60	0.53	0.48	0.45	0.41	0.10
		70D	6.1	2.3	1.9	1.6	1.5	1.3	1.2	1.1	1.0	0.2
20	※ 330	80D	29.8	9.8	9.3	8.2	7.5	6.7	6.1	5.7	5.2	0.5
		110D	45.0	16.9	13.7	12.1	11.1	9.9	9.0	8.5	7.6	0.7
		140D	83.3	30.4	24.7	21.8	20.0	17.7	16.3	15.2	13.8	1.0
		180D	200.6	77.4	62.9	55.7	51.1	45.2	41.5	38.8		2.1
		250D	653.9	268.4	218.0	193.0	177.1	156.8	143.8			4.3
		350D	1630.4	630.7	541.0	479.1	439.5					8.3
24	※ 90	45D	0.5	0.31	0.21	0.19	0.15	0.13				0.06
		60D	0.94	0.49	0.40	0.35	0.32	0.29				0.09
		70D	2.7	1.6	1.3	1.1	1.1	0.9				0.2
		80D	24.5	8.9	8.9	8.9	8.9	8.9	8.8	8.2		0.6
		110D	35.5	16.8	16.8	15.9	14.6	12.9				0.8
		140D	48.3	27.9	22.7	20.1	18.4					1.0
		180D	110.9	65.7	53.3	47.2	43.3					2.0
		250D	246.7	151.7	123.3							3.4
		350D	777.5	480.0	411.8							7.4
	※ 120	45D	1.42	0.8	0.6	0.51	0.45	0.4	0.36			0.06
		60D	0.98	0.46	0.37	0.33	0.30	0.27	0.25			0.09
		70D	2.8	1.5	1.2	1.1	1.0	0.9	0.8			0.2
		80D	26.8	9.3	9.3	9.3	9.3	9.2	8.4	7.9	7.1	0.5
		110D	38.4	17.5	17.1	15.2	13.9	12.3	11.3			0.7
		140D	51.4	26.4	21.5	19.0	17.4	15.4				0.9
		180D	118.2	62.2	50.5	44.7	41.0					1.9
		250D	367.6	211.5	171.8	152.1	139.6					3.7
		350D	856.4	462.1	396.4	351.0						6.9
	※ 150	45D	1.42	0.75	0.56	0.49	0.4	0.37	0.31			0.06
		60D	1.95	0.91	0.74	0.65	0.60	0.53	0.49	0.45		0.09
		70D	2.9	1.4	1.2	1.0	0.9	0.8	0.8	0.7		0.2
		80D	28.0	9.5	9.5	9.5	9.5	8.8	8.0	7.5	6.8	0.5
		110D	40.0	17.9	16.3	14.5	13.3	11.7	10.8	10.1		0.7
		140D	53.0	25.1	20.4	18.1	16.6	14.7	13.5			0.9
		180D	126.7	62.6	50.9	45.0	41.3	36.6				1.9
		250D	385.0	202.5	164.4	145.6	133.6					3.6
		350D	902.1	443.5	380.5	336.9						6.6
	※ 180	45D	1.42	0.71	0.54	0.47	0.4	0.35	0.3			0.06
		60D	1.97	0.86	0.70	0.62	0.57	0.50	0.46	0.43	0.39	0.09
		70D	3.0	1.4	1.1	1.0	0.9	0.8	0.7	0.7		0.2
		80D	28.8	9.7	9.7	9.7	9.5	8.4	7.7	7.2	6.5	0.5
		110D	40.9	18.1	15.6	13.9	12.7	11.3	10.3	9.7		0.7
		140D	54.0	24.0	19.5	17.2	15.8	14.0	12.9			0.9
		180D	157.1	75.3	61.2	54.2	49.7	44.0	40.3			2.0
		250D	395.5	194.3	157.8	139.7	128.2					3.4
		350D	1179.3	567.5	486.9	431.1	395.4					7.2
	※ 210	45D	1.42	0.69	0.51	0.45	0.39	0.33	0.29			0.06
		60D	1.99	0.83	0.67	0.60	0.55	0.48	0.44	0.41	0.37	0.09
		70D	3.0	1.3	1.1	0.9	0.9	0.8	0.7	0.7		0.2
		80D	29.2	9.7	9.7	9.7	9.1	8.1	7.4	7.0	6.3	0.5
		110D	41.5	18.2	15.1	13.3	12.2	10.8	9.9	9.3		0.7
		60D	54.6	23.0	18.7	16.6	15.2	13.5	12.3	11.5		0.8
		180D	159.0	72.3	58.7	52.0	47.7	42.3	38.8			2.0
		250D	474.9	229.1	186.6	164.8	151.1	133.8				3.8
		350D	1202.0	547.0	469.3	415.5	381.2					7.1
	※ 240	45D	1.5	0.61	0.50	0.43	0.36	0.3	0.27			0.06
		60D	2.00	0.80	0.65	0.57	0.53	0.47	0.43	0.40	0.36	0.09
		70D	3.0	1.3	1.0	0.9	0.8	0.7	0.7	0.6	0.6	0.2
		80D	29.6	9.8	9.8	9.6	8.8	7.8	7.2	6.7	6.1	0.5
		110D	41.9	17.9	14.5	12.9	11.8	10.5	9.6	9.0	8.1	0.6
		140D	55.0	22.2	18.0	16.0	14.6	13.0	11.9	11.1		0.8
		180D	160.2	69.8	56.7	50.2	46.0	40.8	37.4	35.0		1.9
		250D	480.4	221.4	179.8	159.2	146.1	129.3				3.7
		350D	1217.5	528.9	453.8	401.8	368.6					6.9

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

DS.DF.DE

Stop S	Index Period θ	Code	Static Torque Ts kgf-m	Net Dynamic Torque to (kgf-m) Indexes per min.N(rpm) 50	100	150	200	300	400	500	700	Cam Shaft Riction Torque Tx (kgf-m)
24	※270	45D	1.55	0.58	0.49	0.4	0.35	0.29	0.25			0.06
		60D	2.01	0.77	0.63	0.55	0.51	0.45	0.41	0.39	0.35	0.09
		70D	3.1	1.2	1.0	0.9	0.8	0.7	0.7	0.6	0.6	0.2
		80D	29.8	9.8	9.8	9.3	8.6	7.6	7.0	6.5	5.9	0.5
		110D	42.2	17.3	14.1	12.5	11.4	10.1	9.3	8.7	7.9	0.6
		140D	55.3	21.5	17.5	15.5	14.2	12.6	11.5	10.8		0.8
		180D	161.1	67.5	54.8	48.6	44.6	39.4	36.2	33.8		1.9
		250D	484.4	214.6	174.3	154.3	141.6	125.3	115.0			3.7
		350D	1228.4	512.8	440.0	389.6	357.4					6.8
	※300	45D	1.55	0.52	0.47	0.38	0.33	0.27	0.24			0.06
		60D	2.01	0.75	0.61	0.54	0.49	0.44	0.40	0.37	0.34	0.09
		70D	3.1	1.2	1.0	0.9	0.8	0.7	0.6	0.6	0.5	0.2
		80D	30.0	9.9	9.9	9.1	8.3	7.4	6.8	6.3	5.7	0.5
		110D	42.4	16.8	13.7	12.1	11.1	9.8	9.0	8.4	7.6	0.6
		140D	82.5	32.9	26.7	23.7	21.7	19.2	17.6	16.5	14.9	1.0
		180D	161.8	65.6	53.2	47.1	43.3	38.3	35.1	32.9		1.9
		250D	487.2	208.5	169.4	150.0	137.6	121.8	111.7			3.6
		350D	1236.4	498.5	427.7	378.7	347.4					6.7
	※330	45D	1.55	0.51	0.45	0.35	0.31	0.25	0.22			0.06
		60D	2.01	0.73	0.59	0.52	0.48	0.42	0.39	0.36	0.33	0.09
		70D	3.1	1.2	0.9	0.8	0.8	0.7	0.6	0.6	0.5	0.2
		80D	30.1	9.9	9.9	8.8	8.1	7.2	6.6	6.2	5.6	0.5
		110D	42.6	16.4	13.3	11.8	10.8	9.6	8.8	8.2	7.4	0.6
		140D	82.8	32.0	26.0	23.0	21.1	18.7	17.2	16.0	14.5	1.0
		180D	162.3	63.8	51.8	45.9	42.1	37.3	34.2	32.0		1.9
		250D	489.4	203.1	165.0	146.1	134.0	118.6	108.8			3.6
		350D	1242.5	485.6	416.6	368.9	338.4					6.7
30	●90	45D	1.15	0.65	0.52	0.4	0.33	0.29	0.24	0.21		0.08
		60D	1.76	0.94	0.76	0.68	0.62	0.55	0.50	0.47		0.10
		70D	5.0	3.0	2.5	2.2	2.0	1.8	1.6	1.5		0.3
		80D	22.7	8.4	8.4	8.4	8.4	8.3	7.6	7.1	6.4	0.6
		110D	36.2	22.3	18.1	16.1	14.7	13.1	12.0			0.9
		140D	46.0	20.6	21.1	18.7	17.2	15.2				1.1
		180D	0.87	63.2	51.4	45.5	41.7					2.2
		250D	312.7	198.4	161.1	142.7						4.3
		350D	717.3	427.6	366.9	324.8						7.9
	●120	45D	1.15	0.7	0.62	0.58	0.41	0.33	0.29	0.25		0.07
		60D	2.33	1.18	0.96	0.49	0.78	0.69	0.63	0.59	0.54	0.12
		70D	5.5	2.9	2.4	0.85	1.9	1.7	1.6			0.3
		80D	25.4	9.1	9.1	9.1	9.1	8.3	7.6	7.2		0.6
		110D	39.7	21.4	17.4	15.4	14.2	12.5	11.5	1.08		0.8
		140D	73.8	38.7	31.4	27.8	25.5	22.6	20.7	19.4		1.2
		180D	144.1	76.8	62.4	55.2	50.7	44.9				2.3
		250D	410.8	235.1	190.9	169.1	155.1					4.5
		350D	1028.1	557.6	478.4	423.6	388.6					8.3
	●150	45D	1.3	0.69	0.59	0.45	0.38	0.31	0.27	0.22		0.06
		60D	2.40	1.12	0.91	0.81	0.74	0.65	0.60	0.56	0.51	0.11
		70D	5.7	2.8	2.3	2.0	1.8	1.6	1.5	1.4		0.2
		80D	27.0	9.4	9.4	9.4	9.1	8.0	7.4	6.9	6.2	0.5
		110D	41.7	20.6	16.7	14.8	13.6	12.0	11.0	7.5		0.8
		140D	77.3	37.0	30.1	26.6	24.4	21.6	19.8	10.3		1.1
		180D	15.1	73.5	59.7	52.9	48.5	43.0	39.4	18.6		2.2
		250D	437.2	226.8	184.2	163.1	149.6	132.5				4.2
		350D	1099.1	539.2	462.6	409.6	375.6					7.8
	※180	45D	1.35	0.63	0.54	0.43	0.36	0.29	0.25	0.22		0.06
		60D	2.44	1.07	0.87	0.77	0.71	0.63	0.57	0.54	0.48	0.11
		70D	5.9	2.7	2.2	1.9	1.8	1.6	1.4	1.3		0.2
		80D	28.0	9.5	9.5	9.5	8.7	7.7	7.1	6.6	6.0	0.5
		110D	42.9	19.7	16.0	14.2	13.0	11.5	10.6	9.9	8.9	0.7
		140D	79.5	35.6	28.9	25.6	23.5	20.8	19.1	17.8	16.1	1.1

Stop S	Index Period θ	Code	Static Torque Ts kgf-m	Net Dynamic Torque to (kgf-m) Indexes per min.N(rpm) 50	100	150	200	300	400	500	700	Cam Shaft Riction Torque Tx (kgf-m)
30	●	180D	191.7	90.7	73.7	65.3	59.9	53.0	48.6	45.5		2.4
		250D	453.9	218.8	177.7	157.4	144.4	127.8				4.0
		18D	1505.3	726.8	623.6	552.1	506.5					9.2
	●210	45D	1.4	0.61	0.52	0.4	0.33	0.27	0.21	0.18		0.06
		60D	2.47	1.03	0.83	0.74	0.68	0.60	0.55	0.51	0.47	0.11
		70D	6.0	2.6	2.1	1.9	1.7	1.5	1.4	1.3		0.2
		80D	28.7	9.6	9.6	9.2	8.4	7.5	6.9	6.4	5.8	0.5
		110D	43.6	19.0	15.4	13.7	12.5	11.1	10.2	9.5	8.6	0.7
		140D	80.9	34.2	27.8	24.6	22.6	20.0	18.3	17.2	15.5	1.1
		180D	194.9	87.4	71.0	62.8	57.6	51.0	46.8	43.8		2.3
		250D	625.3	300.6	244.1	216.2	198.3	175.6	161.1			4.6
		350D	1549.1	704.0	604	534.8	490.6					9.0
	●240	45D	1.45	0.59	0.48	0.37	0.3	0.27	0.21	0.18		0.06
		60D	2.49	0.99	0.80	0.71	0.65	0.58	0.53	0.50	0.45	0.11
		70D	6.0	2.5	2.0	1.8	1.6	1.5	1.3	1.2	1.1	0.2
		80D	29.1	9.7	9.7	8.9	8.2	7.2	6.6	6.2	5.6	0.5
		110D	44.2	18.4	14.9	13.2	12.1	10.7	9.9	9.2	8.3	0.7
		140D	81.8	33.1	26.9	23.8	21.8	19.3	17.7	16.6	15.0	1.0
		180D	197.1	84.4	68.6	60.7	55.7	49.3	45.2	42.3	38.2	2.2
		250D	636.1	291.2	236.6	209.5	192.1	170.1	156.1	146.0		4.5
		350D	1579.7	683.0	585.9	518.8	475.9					8.7
	●270	45D	1.5	0.56	0.45	0.34	0.3	0.26	0.2	0.17		0.06
		60D	2.50	0.96	0.78	0.69	0.63	0.56	0.51	0.48	0.43	0.10
		70D	6.1	2.4	2.0	1.7	1.6	1.4	1.3	1.2	1.1	0.2
		80D	29.4	9.8	9.8	8.7	7.9	7.0	6.4	6.0	5.5	0.5
		110D	44.6	17.8	14.5	12.8	11.8	10.4	9.5	8.9	8.1	0.7
		140D	82.5	32.1	26.0	23.1	21.2	18.7	17.2	16.1	14.5	1.0
		180D	198.6	81.8	66.4	58.8	54.0	47.8	43.8	41.0	37.1	2.2
		250D	643.9	282.8	229.7	203.4	186.6	165.2	151.6	141.8		4.4
		350D	1601.7	663.9	569.5	504.3	426.6					8.6
	●300	45D	1.52	0.54	0.43	0.33	0.29	0.25	0.2	0.16		0.06
		60D	2.51	0.93	0.76	0.67	0.61	0.54	0.50	0.47	0.42	0.10
		70D	6.1	2.3	1.9	1.7	1.5	1.4	1.3	1.2	1.1	0.2
		80D	29.7	9.8	9.5	8.4	7.7	6.8	6.3	5.9	5.3	0.5
		110D	44.8	17.3	14.1	12.5	11.4	10.1	9.3	8.7	7.8	0.7
		140D	83.0	31.2	25.3	22.4	20.6	18.2	16.7	15.6	14.1	1.0
		180D	199.8	79.5	64.6	57.2	52.4	46.4	42.6	39.8	36.0	2.2
		250D	649.6	275.3	223.6	198.0	181.6	160.8	147.5	138.0		4.4
		350D	1618	646.5	554.6	491.1	450.5					8.4
	●330	45D	1.52	0.51	0.41	0.3	0.28	0.23	0.19	0.15		0.06
		250D	2.51	0.90	0.73	0.65	0.60	0.53	0.48	0.45	0.41	0.10
		70D	6.1	2.3	1.9	1.6	1.5	1.3	1.2	1.1	1.0	0.2
		80D	29.8	9.8	9.3	8.2	7.5	6.7	6.1	5.7	5.2	0.5
		110D	45.0	16.9	13.7	12.1	11.1	9.9	9.0	8.5	7.6	0.7
		140D	83.3	30.4	24.7	21.8	20.0	17.7	16.3		13.8	1.0
		180D	200.6	77.4	62.9	55.7	51.1	45.2	41.5	38.8	35.1	2.1
		250D	653.9	268.4	218.0	193.0	177.1	156.8	143.	134.5		4.3
		350D	1630.4	630.7	541.0	497.1	439.5	439.5				8.8
32	☆90	80D	21.5	11.4	11.4	10.2	9.4	8.3	7.6			0.7
	●※98	110D	36.2	12.5	12.5	12.5	12.5	12.5				0.7
		140D	46.3	20.8	20.8	19.6	17.9	15.9				0.9
		180D	65.9	37.6	30.5	27.0	24.8					1.4
		250D	178.6	108.6	88.2							2.5
		350D	543.4	323.1	277.2							5.2
	☆120	80D	23.4	8.7	8.7	8.7	8.2	7.3	6.7			0.6
	※120	110D	38.1	12.8	12.8	12.8	12.8	12.5	11.4			0.7
		140D	48.1	21.1	20.6	18.3	16.8	14.8	13.6			0.8
		180D	68.5	35.2	28.6	25.3	23.2					1.4
		250D	228.5	128.1	104.0	92.1						2.7
		350D	679.1	372.4	319.4	282.9	259.5					5.5

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

DS.DF.DE

Stop S	Index Period θ	Code	Static Torque Ts kgf-m	Net Dynamic Torque to (kgf-m) Indexes per min.N(rpm) 50	100	150	200	300	400	500	700	Cam Shaft Riction Torque Tx (kgf-m)
32	☆150	80D	26.9	12.7	11.1	9.8	9.0	8.0	7.3	6.8		0.6
	※150	110D	39.1	13.0	13.0	13.0	13.0	11.8	10.8	10.1		0.6
		140D	48.9	21.3	19.5	17.2	15.8	14.0	12.8			0.8
		180D	69.8	33.2	27.0	23.9	21.9	19.4				1.3
		250D	234.9	121.5	98.7	87.4	80.1					2.6
		350D	700.3	353.6	303.4	268.6						5.8
	☆180	80D	31.4	15.6	12.7	11.3	10.3	9.1	8.4	7.8		0.6
	※180	110D	39.6	13.1	13.1	13.1	12.7	11.3	10.3	9.7		0.6
		140D	49.4	21.4	18.5	16.5	15.0	13.3	12.2	11.4		0.8
		180D	104.5	49.6	40.3	35.6	32.7	29.0	26.6			1.5
		250D	295.1	149.1	121.1	107.3	98.4					2.8
		350D	712.7	337.7	289.8	256.6	235.4					5.2
	☆210	80D	32.5	15.2	12.4	10.9	10.0	8.9	8.2	7.6	6.9	0.6
	※210	110D	40.0	13.2	13.2	13.2	12.2	10.8	9.9	9.3	8.4	0.6
		140D	49.7	21.5	17.7	15.7	14.4	12.8	11.7	10.9		0.8
		180D	105.2	47.5	38.6	34.1	31.3	27.7	25.4			1.5
		250D	297.9	143.1	116.2	102.9	94.4	83.6				2.7
		350D	720.4	324.2	278.2	246.3	225.9					5.1
	☆240	80D	33.4	14.8	12.0	10.6	9.8	8.6	7.9	7.4	6.7	0.6
	※240	110D	40.2	13.2	13.2	12.8	11.7	10.4	9.5	8.9	8.1	0.6
		140D	49.9	21.0	17.1	15.1	13.9	12.3	11.3	10.5		0.7
		180D	105.7	45.7	37.1	32.9	30.2	26.7	24.5	22.9		1.5
		250D	299.7	137.9	112.0	99.2	91.0	80.5				2.7
		350D	725.6	312.6	268.2	237.5	217.9					5.0
	☆270	80D	33.9	14.4	11.7	10.4	9.5	8.4	7.7	7.2	6.5	0.6
	※270	110D	40.4	13.2	13.2	12.4	11.4	10.1	9.2	8.6	7.8	0.6
		140D	50.1	20.3	16.5	14.6	13.4	11.9	10.9	10.2	9.2	0.7
		180D	106.0	44.2	35.9	31.8	29.2	25.8	23.7	22.1		1.4
		250D	301.0	133.4	108.3	95.9	88.0	77.9				2.7
		350D	729.3	302.5	259.5	229.8	210.8					5.0
	☆300	80D	34.4	14.1	11.4	10.1	9.3	8.2	7.5	7.0	6.4	0.6
	※300	110D	40.2	13.2	13.2	12.0	11.0	9.8	9.0	8.4	7.6	0.6
		140D	50.0	19.7	16.0	14.2	13.0	11.5	10.6	9.9	8.9	0.7
		180D	106.3	42.9	34.8	40.8	28.3	25.0	23.0	21.5		1.4
		250D	302.0	129.4	105.1	93.1	85.4	75.6	69.4			2.7
		350D	731.9	293.6	251.9	223.1	204.6					4.9
	☆330	80D	34.7	13.7	11.1	9.9	9.1	8.0	7.4	6.9	6.2	0.5
	※330	110D	40.6	13.3	13.2	11.7	10.7	9.5	8.7	8.1	7.4	0.6
		140D	50.2	19.2	15.6	13.8	12.7	11.2	10.3	9.6	8.7	0.7
		180D	106.4	41.7	33.9	30.0	27.5	24.4	22.3	20.9		1.4
		250D	302.7	125.9	102.3	90.6	83.1	73.6	67.5			2.6
		350D	733.8	285.7	245.1	217.1	199.1					4.9
36	● 90	70D	2.7	1.6	1.3	1.1	1.1	0.9	0.9			0.2
		80D	24.5	8.9	8.9	8.9	8.9	8.9	8.8	8.2		0.6
		110D	35.5	16.8	16.8	15.9	14.6					0.8
		140D	48.3	27.9	22.7	20.1	18.4					1.0
		180D	110.9	65.7	53.3	47.2	43.3	38.4				2.0
		250D	246.7	151.7	123.3	109.1						3.4
		350D	777.5	480.0	411.8	364.6						7.4
	● 120	70D	2.8	1.5	1.2	1.1	1.0	0.9				0.2
		80D	26.8	9.3	9.3	9.3	9.3	9.2	8.4	7.9		0.5
		110D	38.4	17.5	17.1	15.2	13.9	12.3				0.7
		140D	51.4	26.4	21.5	19.0	17.4	15.4				0.9
		180D	118.2	62.2	50.5	44.7	41.0	36.3				1.9
		250D	367.6	211.5	171.81521.1	139.6						3.7
		350D	856.4	462.1	396.4	351.0	322.0					6.9
	● 150	70D	2.9	1.4	1.2	1.0	0.9	0.8	0.8			0.2
		80D	28.0	9.5	9.5	9.5	9.5	8.8	8.0	7.5	6.8	0.5

Stop S	Index Period θ	Code	Static Torque Ts kgf-m	Net dynamic torque to (kgf-m) Indexes per min.N(rpm) 50	100	150	200	300	400	500	700	Cam Shaft Riction Torque Tx (kgf-m)
36	● 150	110D	40.0	17.9	16.3	14.5	13.3	11.7	10.8			0.7
		140D	53.0	25.1	20.4	18.1	16.6	14.7				0.9
		180D	126.7	62.6	50.9	45.0	41.3	36.6	33.6			1.9
		250D	385.0	202.5	164.4	145.6	133.6	118.3				3.6
		350D	902.1	443.5	380.5	336.9	309.1					6.6
	● 180	70D	3.0	1.4	1.1	1.0	0.9	0.8	0.7			0.2
		80D	28.8	9.7	9.7	9.7	9.5	8.4	7.7	7.2	6.5	0.5
		110D	40.9	18.1	15.6	13.9	12.7	11.3	10.3			0.7
		140D	54.0	24.0	19.5	17.2	15.8	14.	12.9			0.9
		180D	157.1	75.3	61.2	54.2	49.7	44.0	40.3	37.7		2.0
		250D	395.5	194.3	157.8	139.7	128.2	113.5				3.4
		350D	1179.3	567.5	486.9	431.1	395.4					7.2
	● 210	70D	3.0	1.3	1.1	0.9	0.9	0.8	0.7	0.7		0.2
		80D	29.2	9.7	9.7	9.7	9.1	8.1	7.4	7.0	6.3	0.5
		110D	41.5	18.2	15.1	13.3	12.2	10.8	9.9	9.3		0.7
		140D	54.6	23.0	18.7	16.6	15.2	13.5	12.3			0.8
		180D	159.0	72.3	58.7	52.0	47.7	42.3	38.8	36.2		2.0
		250D	474.9	229.1	186.1	164.8	151.1	133.8	122.8			3.8
		350D	1202.0	547.0	469.3	415.5	381.2					7.1
	● 240	70D	3.0	1.3	1.0	0.9	0.8	0.7	0.7	0.6		0.2
		80D	29.6	9.8	9.8	9.6	8.8	7.8	7.2	6.7	6.1	0.5
		110D	41.9	17.9	14.5	12.9	11.8	10.5	9.6	9.0		0.6
		140D	55.0	22.2	18.0	16.0	14.6	13.0	11.9	11.1		0.8
		180D	160.2	69.8	56.7	50.2	46.0	40.8	37.4	35.0	31.6	1.9
		250D	480.4	221.4	179.8	159.2	146.1	129.3	118.6	111.0		3.7
		350D	1217.5	528.9	453.8	401.8	368.6					6.9
	● 270	70D	3.1	1.2	1.0	0.9	0.8	0.7	0.7	0.6		0.2
		80D	29.8	9.8	9.8	9.3	8.6	7.6	7.0	6.5	5.9	0.5
		110D	42.2	17.3	14.1	12.5	11.4	10.1	9.3	8.7		0.6
		140D	55.3	21.5	17.5	15.5	14.2	12.6	11.5	10.8		0.8
		180D	161.1	67.5	54.8	48.6	44.6	39.4	36.2	33.8	30.6	1.9
		250D	484.4	214.6	174.3	154.3	141.6	125.3	115.0	107.5		3.7
		350D	1228.4	512.8	440.0	389.6	357.4					6.8
	● 300	70D	3.1	1.2	1.0	0.9	0.8	0.7	0.6	0.6	0.5	0.2
		80D	30.0	9.9	9.9	9.1	8.3	8.0	6.8	6.3	5.7	0.5
		110D	42.4	16.8	13.7	12.1	11.1	9.2	9.0	8.4	7.6	0.6
		140D	82.5	32.9	26.7	23.7	21.7	19.2	17.6	16.5	14.9	1.0
		180D	161.8	65.6	53.2	47.1	43.3	38.3	35.1	32.9	29.7	1.9
		250D	487.2	208.5	169.4	50.0	137.6	121.8	111.7	104.5		3.6
		350D	1236.4	498.5	427.7	378.7	347.4					6.7
	● 330	70D	3.1	1.2	0.9	0.8	0.8	0.7	0.6	0.6	0.5	0.2
		80D	30.1	9.9	9.9	8.8	8.1	7.2	6.6	6.2	5.6	0.5
		110D	42.6	16.4	13.3	11.8	10.8	9.6	8.8	8.2	7.4	0.6
		140D	82.8	32.0	26.0	23.0	21.1	18.7	17.2	16.0	14.5	1.0
		180D	162.3	63.8	51.8	45.9	42.1	37.3	34.2	32.0	28.9	1.9
		250D	489.4	203.1	165.0	146.1	134.0	118.6	108.8	101.8		3.6
		350D	1242.5	485.6	416.6	368.9	338.4					4.3
40	☆ 90	70D	5.0	3.0	2.5	2.2	2.0	1.8	1.6	1.5		0.3
		80D	22.7	8.4	8.4	8.4	8.4	8.3	7.6	7.1	6.4	0.6
		110D	36.2	22.3	18.1	16.1	14.7	8.9				0.9
		140D	46.0	26.0	21.1	18.7	17.2	15.2	12.0			1.1
		180D	108.7	63.2	51.4	45.5	41.7					2.2
		250D	312.7	198.4	161.1	142.7						4.3
		350D	717.3	427.6	366.9	324.8						7.9
	☆ 120	70D	5.5	2.9	2.4	2.1	1.9	1.7				0.3
		80D	25.4	9.1	9.1	9.1	9.1	8.3	7.6	7.2		0.6
		110D	39.7	21.1	17.4	15.4	14.2	9.7				0.8
		140D	73.8	38.7	31.4	27.8	25.5					1.2

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

DS.DF.DE

Stop 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)
40	☆ 120	180D	144.1	76.8	62.4	55.2	50.7	44.9				2.3
		250D	410.8	235.1	190.9	169.1	155.1					4.5
		350D	1028.1	557.6	478.4	423.6	388.6					8.3
	☆ 150	70D	5.7	2.8	2.3	2.0	1.8	1.6	1.5			0.2
		80D	27.0	9.4	9.4	9.4	9.1	8.0	7.4	6.9		0.5
		110D	41.7	20.6	16.7	14.8	13.6	12.0				0.8
		140D	77.3	37.0	30.1	26.6	24.4	21.6				1.1
		180D	151.1	73.5	59.7	52.9	48.5	43.0	39.4			2.2
		250D	437.2	226.8	184.2	163.1	149.6	132.5				4.2
		350D	1099.1	539.2	462.6	409.6	375.8					7.8
	☆ 180	70D	5.9	2.7	2.2	1.9	1.8	1.6	1.4	1.3		0.2
		80D	28.0	9.5	9.5	9.5	8.7	7.7	7.1	6.6	6.0	0.5
		110D	42.9	19.7	16.0	14.2	13.0	11.5	10.6			0.7
		140D	79.5	35.6	28.9	25.6	23.5	20.8				1.1
		180D	191.7	90.7	73.7	65.3	59.9	53.0	48.6	45.5		2.4
		250D	453.9	218.8	177.7	157.4	144.4	127.8				4.0
		350D	1505.3	726.8	623.6	552.1	506.5					9.2
	☆ 210	70D	6.0	2.6	2.1	1.9	1.7	1.5	1.4	1.3		0.2
		80D	28.7	9.6	9.6	9.2	8.4	7.5	6.9	6.4	5.8	0.5
		110D	43.6	19.0	15.4	13.7	12.5	11.1	10.2			0.7
		140D	80.9	34.2	27.8	24.6	22.6	20.0	18.3			1.1
		180D	194.9	87.4	71.0	62.8	57.6	51.0	46.8	43.8		2.3
		250D	625.3	300.6	244.1	216.2	198.3	175.6	161.1			4.6
		350D	1549.1	704.0	604.0	534.8	490.6					9.0
	☆ 240	70D	6.0	2.5	2.0	1.8	1.6	1.5	1.3	1.2		0.2
		80D	29.1	9.7	9.7	8.9	8.2	7.2	6.6	6.2	5.6	0.5
		110D	44.2	18.4	14.9	13.2	12.1	10.7	9.9	9.2		0.7
		140D	81.8	33.1	26.9	23.8	21.8	19.3	17.7			1.0
		180D	197.1	84.4	68.6	60.7	55.7	49.3	45.2	42.3	38.2	2.2
		250D	636.1	291.1	236.6	209.5	192.1	170.1	156.1	146.0		4.5
		350D	1579.7	683.0	585.9	518.8	475.9					8.7
	☆ 270	70D	6.1	2.4	2.0	1.7	1.6	1.4	1.3	1.2	1.1	0.2
		80D	29.4	9.8	9.8	8.7	7.9	7.0	6.4	6.0	5.5	0.5
		110D	44.6	17.8	14.5	12.8	11.8	10.4	9.5	8.9		0.7
		140D	82.5	32.1	26.0	23.1	21.2	18.7	17.2	16.1		1.0
		180D	198.6	81.8	66.4	58.8	54.0	47.8	43.8	41.0	37.1	2.2
		250D	643.9	282.8	229.7	203.4	186.6	165.2	151.6	141.8		4.4
		350D	1601.9	663.9	569.5	504.3	462.6					8.6
	☆ 300	70D	6.1	2.3	1.9	1.7	1.5	1.4	1.3	1.2	1.1	0.2
		80D	29.7	9.8	9.5	8.4	7.7	6.8	6.3	5.9	5.3	0.5
		110D	44.8	17.3	14.1	12.5	11.4	10.1	9.3	8.7		0.7
		140D	83.0	31.2	25.3	22.4	20.6	18.2	16.7	15.6		1.0
		180D	199.8	79.5	64.6	57.2	52.4	46.4	42.6	39.8	36.0	2.2
		250D	649.6	275.3	223.6	198.0	181.6	160.8	147.5	138.0		4.4
		350D	1618.0	646.5	554.6	491.1	450.5					8.4
	☆ 330	70D	6.1	2.3	1.9	1.6	1.5	1.3	1.2	1.1	1.0	0.2
		80D	29.8	9.8	9.3	8.2	7.5	6.7	6.1	5.7	5.2	0.5
		110D	45.0	16.9	13.7	12.1	11.1	9.9	9.0	8.5		0.7
		140D	83.3	30.4	24.7	21.8	20.0	17.7	16.3	15.2		1.0
		180D	200.6	77.4	62.9	55.7	51.1	45.2	41.5	38.8	35.1	2.1
		250D	653.9	268.4	218.0	193.0	177.1	156.8	143.8	134.5		4.3
		350D	1630.4	630.7	541.0	479.1	439.5					8.3
	☆ 90	70D	2.7	1.6	1.3	1.1	1.1	0.9	0.9			0.2
		80D	24.3	8.7	8.7	8.7	8.7	8.7	8.4	7.9	7.1	0.6
	● 90	110D	36.2	12.5	12.5	12.5	12.5	12.5				0.7
		140D	46.3	20.8	20.8	19.6	17.9					0.9
		180D	110.9	65.7	53.3	47.2	43.3	38.4				2.0
		250D	246.7	151.7	123.3	109.1						3.4
		350D	777.5	480.0	411.8	364.6						7.4

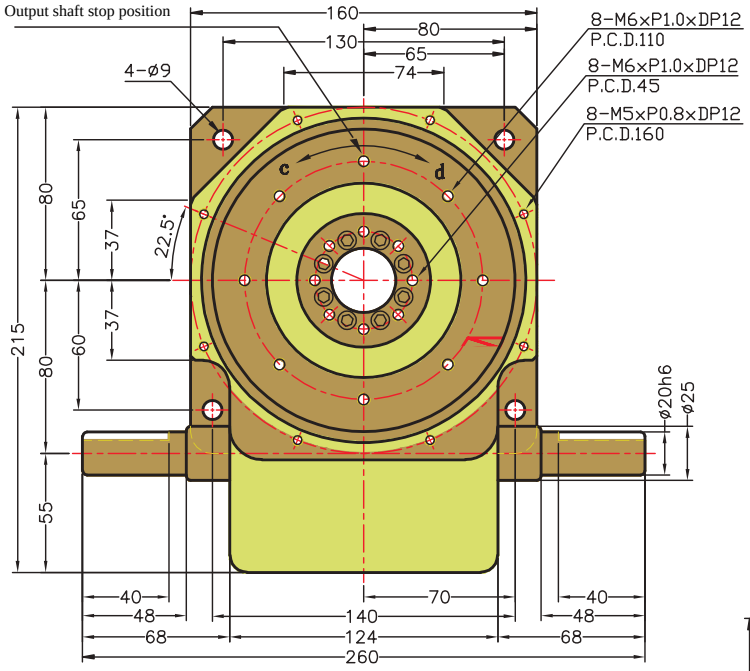
Stop S	Index Period θ	Code	Static Torque Ts kgf-m	Net Dynamic Torque to (kgf-m) Indexes per min.N(rpm) 50	100	150	200	300	400	500	700	Cam Shaft Riction Rorque Tx (kgf-m)
48	☆ 120	70D	2.8	1.5	1.2	1.1	1.0	0.9				0.2
		80D	26.8	9.3	9.3	9.3	9.3	9.2	8.4	7.9		0.5
	● 120	110D	38.1	12.8	12.8	12.8	12.8	12.5	11.4			0.7
		140D	48.1	21.1	20.6	18.3	16.8	14.8				0.8
		180D	118.2	62.2	50.5	44.7	41.0	36.3				1.9
		250D	367.6	211.5	171.8	152.1	139.6					3.7
		350D	856.4	462.1	396.4	351.0	322.0					6.9
	☆ 150	70D	2.9	1.4	1.2	1.0	0.9	0.8				0.2
		80D	28.0	9.5	9.5	9.5	9.5	8.8	8.0	7.5		0.5
	● 150	110D	39.1	13.0	13.0	13.0	13.0	11.8	10.8			0.6
		140D	48.9	21.3	19.5	17.2	15.8	14.0				0.8
		180D	126.7	62.6	50.9	45.0	41.3	36.6	33.6			1.9
		250D	385.0	202.5	164.4	145.6	133.6	118.3				3.6
		350D	902.1	443.5	380.5	336.9	309.1					6.6
	☆ 180	70D	3.0	1.4	1.1	1.0	0.9	0.8	0.7			0.2
		80D	28.8	9.7	9.7	9.7	9.5	8.4	7.7	7.2	6.5	0.5
	● 180	110D	39.6	13.1	13.1	13.1	12.7	11.3	10.3	9.7		0.6
		140D	49.4	21.4	18.5	16.4	15.0	13.3	12.2			0.8
		180D	157.1	75.3	61.2	54.2	49.7	44.0	40.3	37.7		2.0
		250D	395.3	194.3	157.8	139.7	128.2	113.5				3.4
		350D	1179.5	567.5	486.9	431.1	395.4					7.2
	☆ 210	70D	3.0	1.3	1.1	0.9	0.9	0.8	0.7			0.2
		80D	29.2	9.7	9.7	9.7	9.1	8.1	7.4	7.0	6.3	0.5
	● 210	110D	40.0	13.2	13.2	13.2	12.2	10.8	9.9	9.3		0.6
		140D	49.7	21.5	17.7	15.7	14.4	12.8	11.7	10.9		0.8
		180D	159.0	72.3	58.7	52.0	47.7	42.3	38.8	36.2		2.0
		250D	474.9	229.1	186.1	164.8	151.1	133.8	122.8			3.8
		350D	1202.0	547.0	469.3	415.5	381.2					7.1
	☆ 240	70D	3.0	1.3	1.0	0.9	0.8	0.7	0.7	0.6		0.2
		80D	29.6	9.8	9.8	9.6	8.8	7.8	7.2	6.7	6.1	0.5
	● 240	110D	40.2	13.2	13.2	12.8	11.7	10.4	9.5	8.9		0.6
		140D	49.9	21.0	17.1	15.1	13.9	12.3	11.3	10.5		0.7
		180D	160.2	69.8	56.7	50.2	46.0	40.8	37.4	35.0	31.6	1.9
		250D	480.4	221.4	179.8	159.2	146.1	129.3	118.6	111.0		3.7
		350D	1217.5	528.9	453.8	401.8	368.6					6.9
	☆ 270	70D	3.1	1.2	1.0	0.9	0.8	0.7	0.7	0.6		0.2
		80D	29.8	9.8	9.8	9.3	8.6	7.6	7.0	6.5	5.9	0.5
	● 270	110D	40.4	13.2	13.2	12.4	11.4	10.1	9.2	8.6	7.8	0.6
		140D	50.1	20.3	16.5	14.6	13.4	11.9	10.9	10.2		0.7
		180D	161.1	67.5	54.8	48.6	44.6	39.4	36.2	33.8	30.6	1.9
		250D	484.4	214.6	174.3	154.3	141.6	125.3	115.0	107.5		3.7
		350D	1228.4	512.8	440.0	389.6	357.4					6.8
	☆ 300	70D	3.1	1.2	1.0	0.9	0.8	0.7	0.6	0.6		0.2
		80D	30.0	9.9	9.9	9.1	8.3	7.4	6.8	6.3	5.7	0.5
	● 300	110D	40.5	13.2	13.2	12.0	11.0	9.8	9.0	8.4	7.6	0.6
		140D	50.2	19.7	16.0	14.2	13.0	11.5	10.6	9.9		0.7
		180D	161.8	65.6	53.2	47.1	43.3	38.3	35.1	32.9	29.7	1.9
		250D	467.2	208.5	169.4	150.0	137.6	121.8	111.7	104.5		3.6
		350D	1236.4	498.5	427.7	378.7	347.4					6.7
	☆ 330	70D	3.1	1.2	0.9	0.8	0.8	0.7	0.6	0.6		0.2
		80D	30.1	9.9	9.9	8.8	8.1	7.2	6.6	6.2	5.6	0.5
	● 330	110D	40.6	13.3	13.2	11.7	10.7	9.5	8.7	8.1	7.4	0.6
		140D	50.2	19.2	15.6	13.8	12.7	11.2	10.3	9.6	8.7	0.7
		180D	162.3	63.8	51.8	45.9	42.1	37.3	34.2	32.0	28.9	1.9
		250D	487.2	203.1	165.0	146.1	134.0	118.6	108.8	101.8		3.6
		350D	1242.5	485.6	416.6	368.9	338.4					6.7

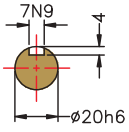
PS:O:1DWELL ※:2DWELL ●:3DWELL ☆:4DWELL

Table Model

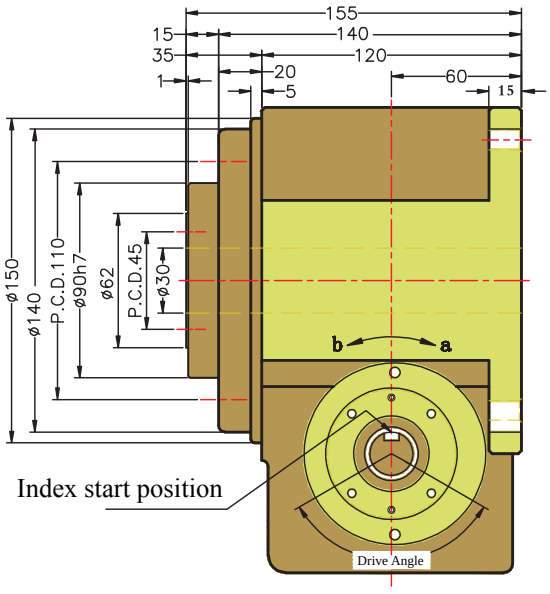
(80DT,110DT,140DF,180DT,210DT,250DT,350DT,450DT)

80DT





Input shaft



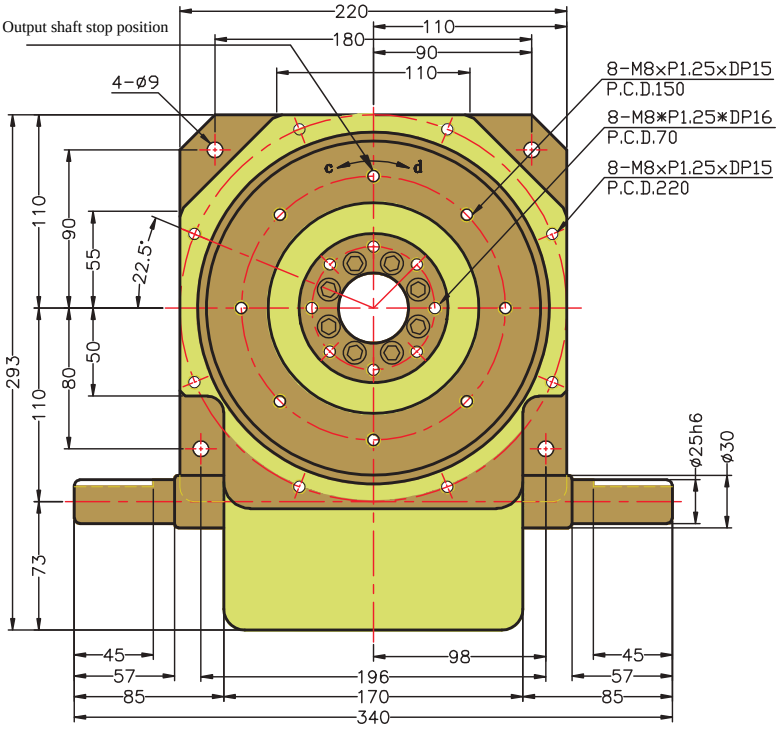
Index start position

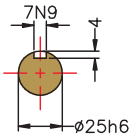
Technical Parameter

Items	Symbol	Unit	Value	Items	Symbol	Unit	Value	Items	Symbol	Unit	Value
Allowable thrust load on output shaft	C1	kgf	520	Allowable thrust load on input shaft	C3	kgf	220	GD2 of input shaft (Note1)	C6	kgf-m^2	0.03
Allowable radial load on output shaft	C2	kgf	220	Max. repetitive bending force on input shaft	C4	kgf	160	Indexing accuracy		sec.	±30
Allowable torque on output shaft	Ts	kgf-m	Refer torque table	Max. repetitive torque on input shaft	C5	kgf-m	9.5	Weight		kg	20

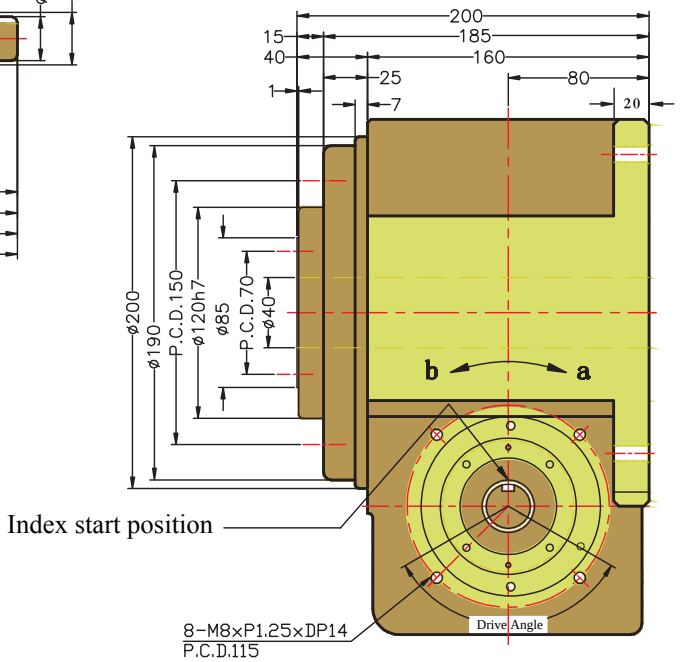
Note1:GD2 of input shaft is a value in dwell range.
Note2: Value of C1 to C5 are those obtained for safety factor=2.

110DT





Input shaft

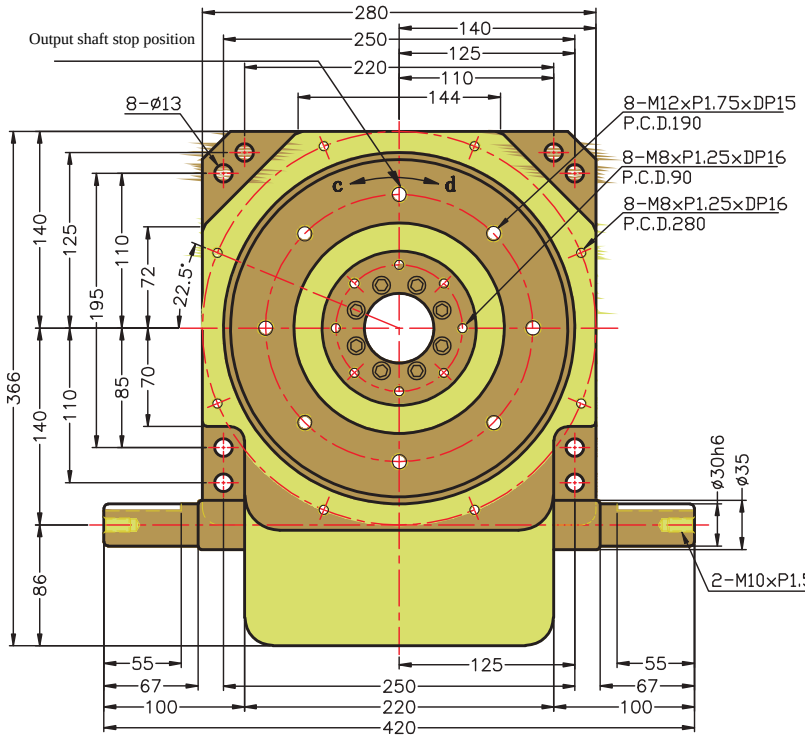


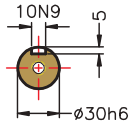
Technical Parameter

Items	Symbol	Unit	Value	Items	Symbol	Unit	Value	Items	Symbol	Unit	Value
Allowable thrust load on output shaft	C1	kgf	860	Allowable thrust load on input shaft	C3	kgf	300	GD2 of input shaft (Note1)	C6	kgf-m^2	0.11
Allowable radial load on output shaft	C2	kgf	420	Max. repetitive bending force on input shaft	C4	kgf	250	Indexing accuracy		sec.	±30
Allowable torque on output shaft	Ts	kgf-m	Refer torque table	Max. repetitive torque on input shaft	C5	kgf-m	25	Weight		kg	50

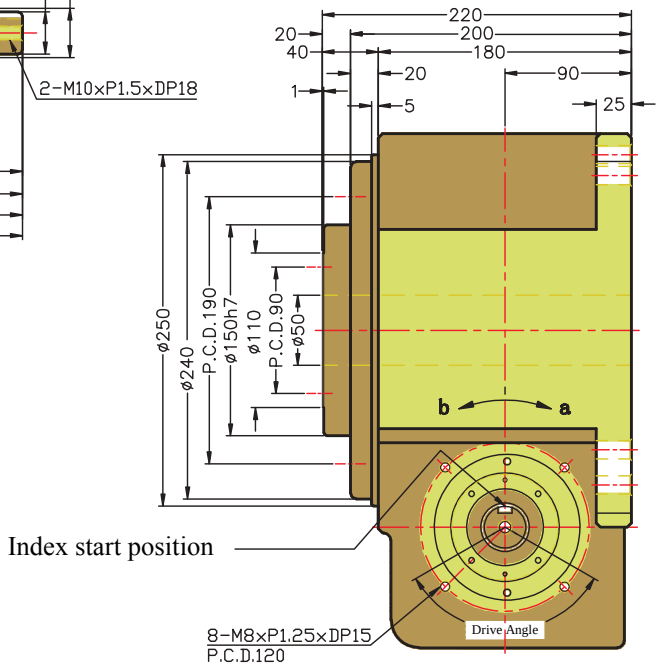
Note1:GD2 of input shaft is a value in dwell range.
Note2: Value of C1 to C5 are those obtained for safety factor=2.

140DT





Input shaft



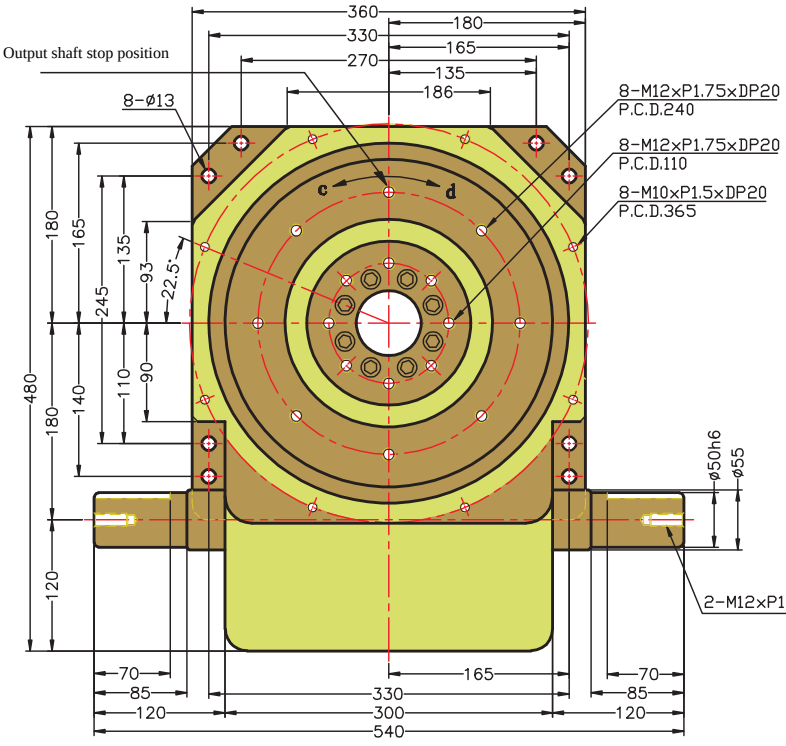
Index start position

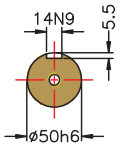
Technical Parameter

Items	Symbol	Unit	Value	Items	Symbol	Unit	Value	Items	Symbol	Unit	Value
Allowable thrust load on output shaft	C1	kgf	1050	Allowable thrust load on input shaft	C3	kgf	500	GD2 of input shaft (Note1)	C6	kgf-m^2	0.07
Allowable radial load on output shaft	C2	kgf	720	Max. repetitive bending force on input shaft	C4	kgf	350	Indexing accuracy		sec.	±30
Allowable torque on output shaft	Ts	kgf-m	Refer torque table	Max. repetitive torque on input shaft	C5	kgf-m	53	Weight		kg	85

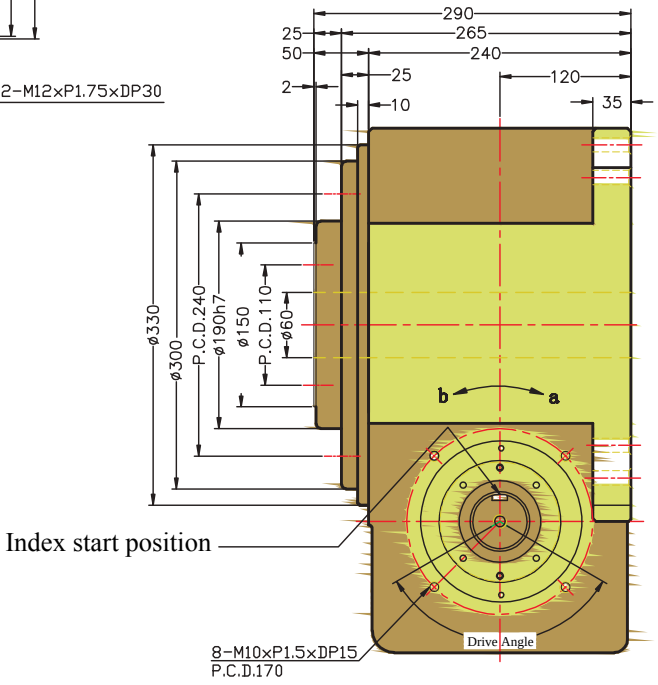
Note1:GD2 of input shaft is a value in dwell range.
Note2: Value of C1 to C5 are those obtained for safety factor=2.

180DT





Input shaft



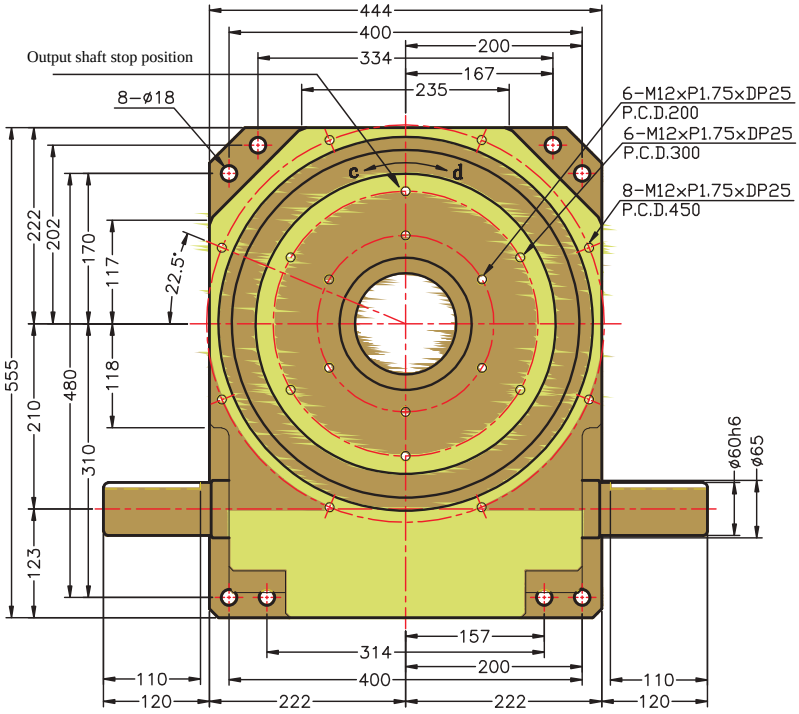
Index start position

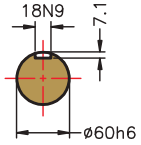
Technical Parameter

Items	Symbol	Unit	Value	Items	Symbol	Unit	Value	Items	Symbol	Unit	Value
Allowable thrust load on output shaft	C1	kgf	1500	Allowable thrust load on input shaft	C3	kgf	1200	GD2 of input shaft (Note1)	C6	$kgf-m^2$	0.23
Allowable radial load on output shaft	C2	kgf	1100	Max. repetitive bending force on input shaft	C4	kgf	960	Indexing accuracy		sec.	±30
Allowable torque on output shaft	Ts	kgf-m	Refer torque table	Max. repetitive torque on input shaft	C5	kgf-m	220	Weight		kg	190

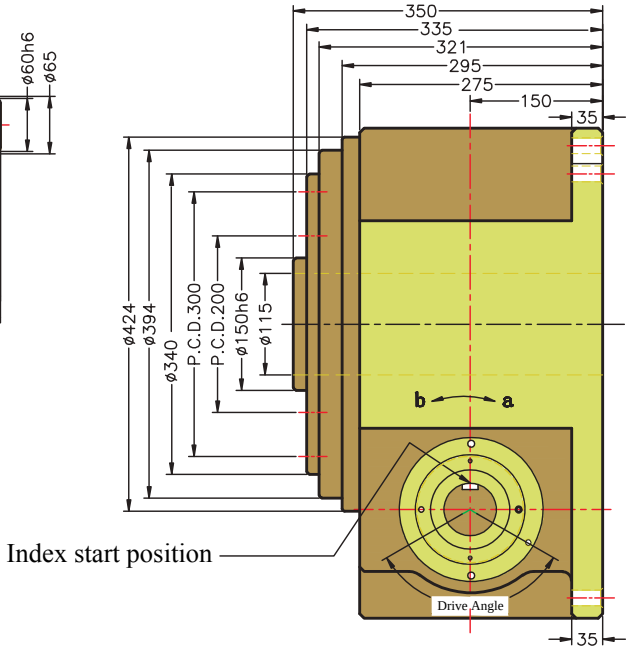
Note1:GD2 of input shaft is a value in dwell range.
Note2: Value of C1 to C5 are those obtained for safety factor=2.

210DT





Input shaft



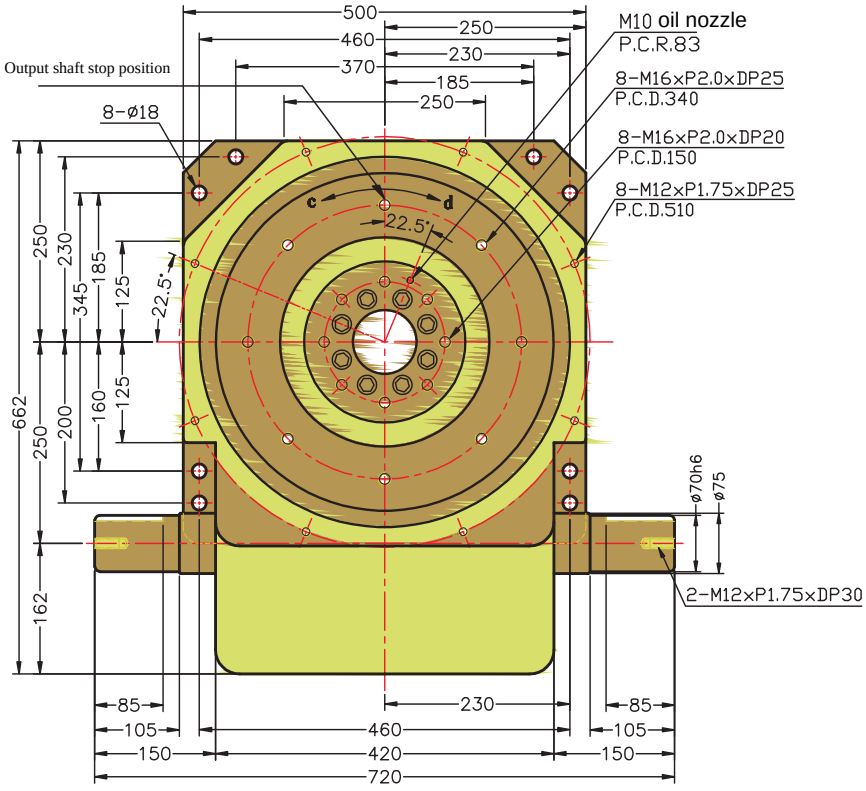
Index start position

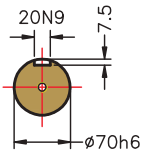
Technical Parameter

Items	Symbol	Unit	Value	Items	Symbol	Unit	Value	Items	Symbol	Unit	Value
Allowable thrust load on output shaft	C1	kgf	1950	Allowable thrust load on input shaft	C3	kgf	1570	GD2 of input shaft (Note1)	C6	kgf-m^2	0.62
Allowable radial load on output shaft	C2	kgf	1520	Max. repetitive bending force on input shaft	C4	kgf	1130	Indexing accuracy		sec.	±30
Allowable torque on output shaft	Ts	kgf-m	Refer torque table	Max. repetitive torque on input shaft	C5	kgf-m	460	Weight		kg	450

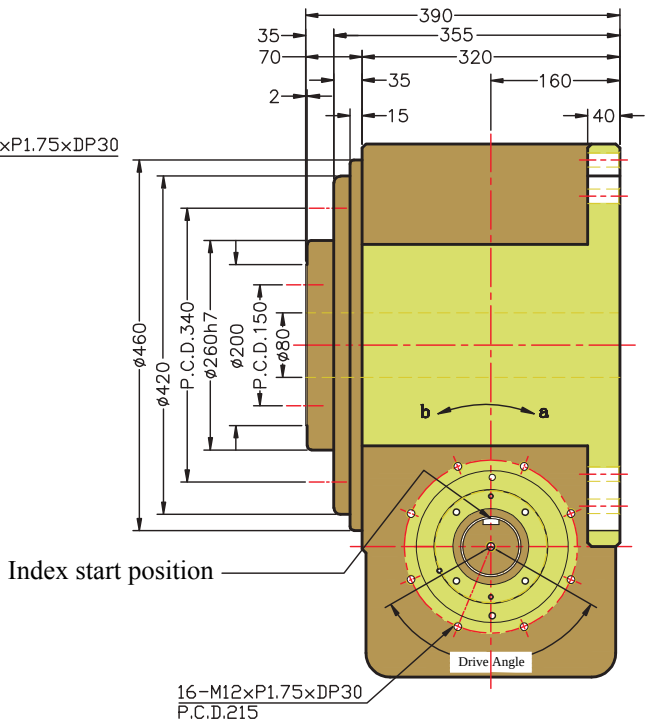
Note1:GD2 of input shaft is a value in dwell range.
Note2: Value of C1 to C5 are those obtained for safety factor=2.

250DT





Input shaft



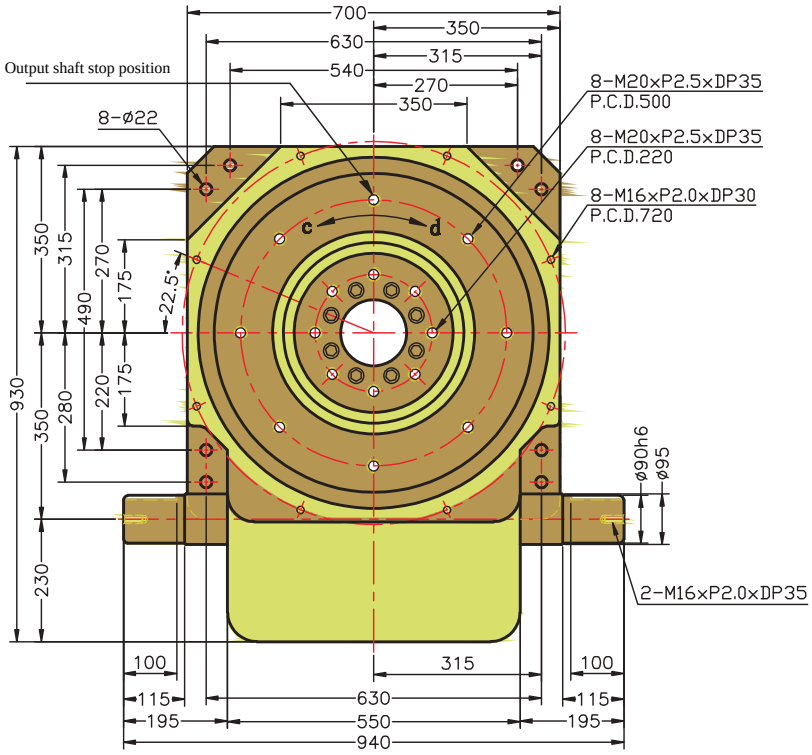
Index start position

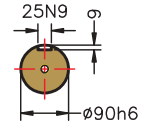
Technical Parameter

Items	Symbol	Unit	Value	Items	Symbol	Unit	Value	Items	Symbol	Unit	Value
Allowable thrust load on output shaft	C1	kgf	2500	Allowable thrust load on input shaft	C3	kgf	1900	GD2 of input shaft (Note1)	C6	kgf-m^2	0.86
Allowable radial load on output shaft	C2	kgf	1800	Max. repetitive bending force on input shaft	C4	kgf	2250	Indexing accuracy		sec.	±30
Allowable torque on output shaft	Ts	kgf-m	Refer torque table	Max. repetitive torque on input shaft	C5	kgf-m	670	Weight		kg	500

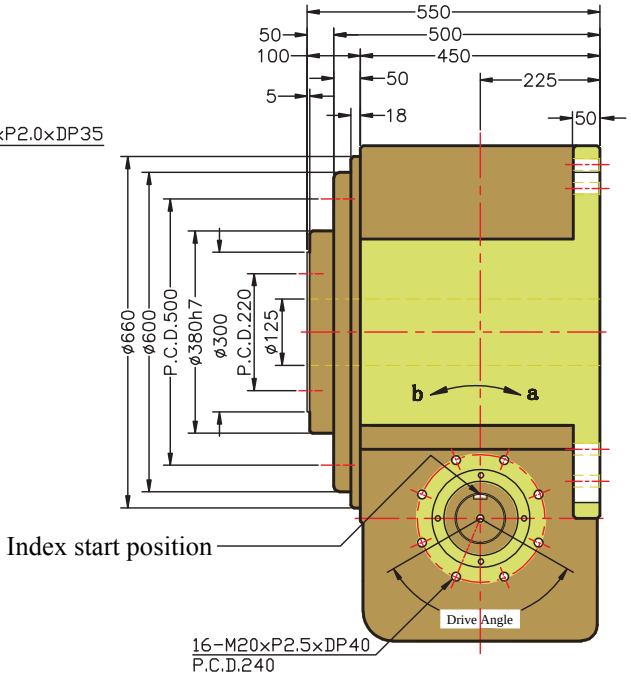
Note1:GD2 of input shaft is a value in dwell range.
Note2: Value of C1 to C5 are those obtained for safety factor=2.

350DT





Input shaft

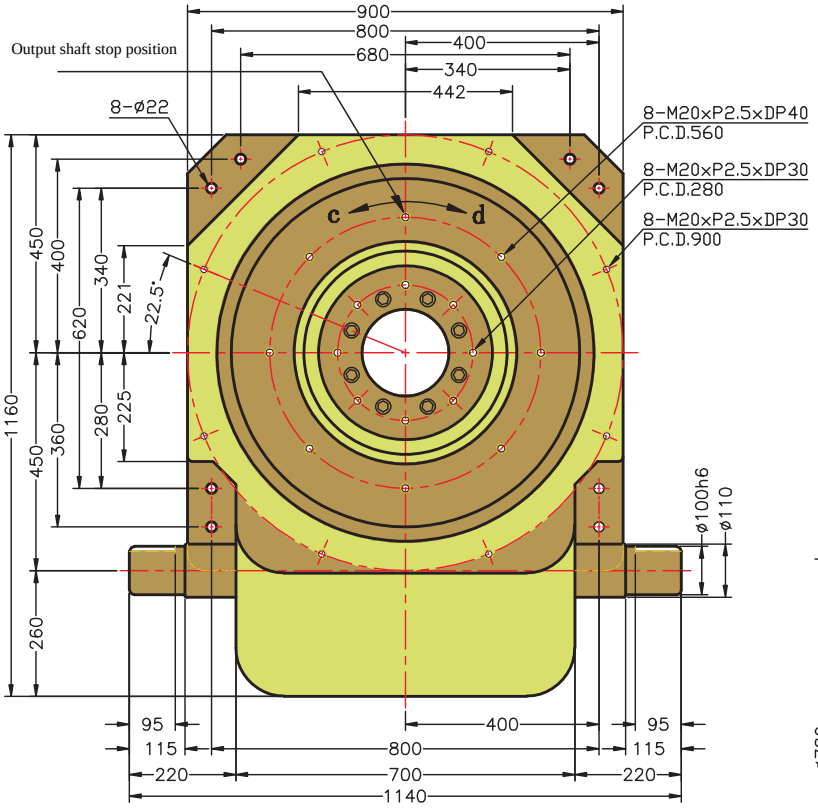


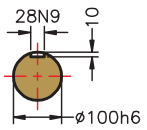
Technical Parameter

Items	Symbol	Unit	Value	Items	Symbol	Unit	Value	Items	Symbol	Unit	Value
Allowable thrust load on output shaft	C1	kgf	4500	Allowable thrust load on input shaft	C3	kgf	2800	GD2 of input shaft (Note1)	C6	kgf-m^2	2.7
Allowable radial load on output shaft	C2	kgf	3300	Max. repetitive bending force on input shaft	C4	kgf	3800	Indexing accuracy		sec.	±20
Allowable torque on output shaft	Ts	kgf-m	Refer torque table	Max. repetitive torque on input shaft	C5	kgf-m	1000	Weight		kg	1200

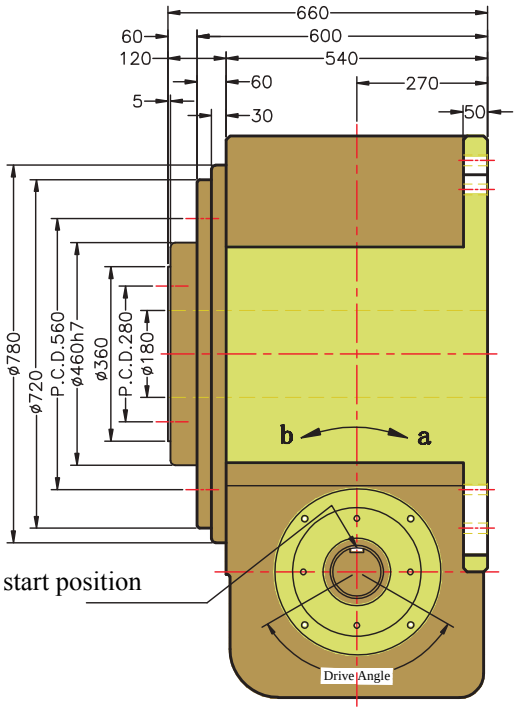
Note1:GD2 of input shaft is a value in dwell range.
Note2: Value of C1 to C5 are those obtained for safety factor=2.

450DT





Input shaft



Index start position

Technical Parameter

Items	Symbol	Unit	Value	Items	Symbol	Unit	Value	Items	Symbol	Unit	Value
Allowable thrust load on output shaft	C1	kgf	6500	Allowable thrust load on input shaft	C3	kgf	3300	GD2 of input shaft (Note1)	C6	kgf-m^2	10.27
Allowable radial load on output shaft	C2	kgf	4500	Max. repetitive bending force on input shaft	C4	kgf	4500	Indexing accuracy		sec.	±30
Allowable torque on output shaft	Ts	kgf-m	Refer torque table	Max. repetitive torque on input shaft	C5	kgf-m	1300	Weight		kg	2240

Note1:GD2 of input shaft is a value in dwell range.
Note2: Value of C1 to C5 are those obtained for safety factor=2.

DT

Stop S	Index Period θ	Code	Static Torque Ts kgf-m	Net Dynamic Torque to (kgf-m) Indexes per min.N(rpm) 50	100	150	200	300	400	500	Cam Shaft Riction Torque Tx (kgf-m)
4	270	80DT	30.5	11.3	9.7	8.1	7.3	6.1	5.2		0.9
		110DT	56.9	24.5	19.9	17.6	16.2	14.3	13.1	12.3	1.0
		140DT	104.6	50.0	40.6	36.0	33.0	29.2	26.8		1.7
		180DT	230.4	110.2	89.5	79.3	72.7	64.4	59.1		3.2
		250DT	527.6	218.7	177.6	157.3	144.3				5.5
		350DT	1262.3	510.6	438.1	387.9	355.8				10.6
	300	80DT	32.1	11.0	9.4	7.9	7.0	5.8	5.0		0.9
		110DT	59.9	24.3	19.8	17.5	16.1	14.2	13.0	12.2	1.0
		140DT	111.4	50.0	40.6	36.0	33.0	29.2	26.8	25.1	1.7
		180DT	244.9	110.1	89.4	79.2	72.6	64.3	59.0		3.1
		250DT	551.9	216.7	176.0	155.9	143.0	126.6		5.3	5.3
		350DT	1697.0	681.5	584.7	517.7	474.9				11.7
	330	80DT	35.6	10.7	9.4	7.6	6.8	5.6	5.0		0.9
		110DT	62.5	24.1	19.6	17.4	15.9	14.1	12.9	12.1	1.0
		140DT	117.3	49.9	40.5	35.9	32.9	29.1	26.7	25.0	1.6
		180DT	257.6	109.7	89.1	78.9	72.4	64.1	58.8	55.0	3.0
		250DT	728.3	291.3	236.6	209.5	192.2	170.1			6.0
		350DT	1772.6	676.9	580.7	514.2	471.7				11.4
5	180	80DT	21.5	7.3	6.0	5.1	4.2	4.0			0.9
		110DT	32.2	16.1	13.1	11.6	10.6	9.4			0.8
		140DT	43.9	22.2	18.0	15.9	14.6	13.0	11.9		1.1
		180DT	102.3	55.3	44.9	39.8	36.5	32.3	29.6	27.7	2.2
		250DT	310.0	151.1	122.7	108.7					4.3
		350DT	698.8	328.7	282.0						7.9
	210	80DT	22.7	7.3	6.0	5.0	4.0	3.8			0.7
		110DT	35.0	16.0	13.0	11.5	10.6	9.4	8.6		0.8
		140DT	70.2	34.6	28.1	24.9	22.8	20.2			1.2
		180DT	135.5	69.2	56.2	49.8	45.6	40.4			2.4
		250DT	333.9	149.7	121.6	107.7	98.8				4.1
		350DT	963.1	441.1	378.5	355.1					8.6
	240	80DT	25.2	8.5	7.1	6.2	5.7	5.1			0.7
		110DT	41.0	18.3	14.9	13.2	12.1	10.7	9.8	9.2	0.8
		140DT	75.4	34.5	28.0	24.8	22.8	20.1	18.5		1.2
		180DT	146.0	69.0	56.0	49.6	45.5	40.3			2.3
		250DT	414.1	180.6	146.7	129.9	119.1				4.5
		350DT	1027.3	437.7	375.5	332.5					8.3
	270	80DT	26.0	8.1	6.5	5.8	5.5	4.8			0.7
		110DT	43.0	18.1	14.7	13.0	12.0	10.6	9.7	9.1	0.8
		140DT	96.4	44.0	35.7	31.6	29.0	25.7	23.6	22.0	1.3
		180DT	193.3	88.8	72.2	63.9	58.6	51.9	47.6		2.5
		250DT	432.0	178.0	144.6	128.0	117.4				4.3
		350DT	1401.3	593.5	509.2	450.8	413.6				9.9
	300	80DT	27.8	8.0	6.4	5.7	5.0	4.5			0.7
		110DT	44.7	17.9	14.5	12.9	11.8	10.4	9.6	9.0	0.8
		140DT	100.9	43.6	35.4	31.3	28.8	25.5	23.4	21.8	1.3
		180DT	202.2	88.0	71.5	63.3	58.1	51.4	47.2		2.4
		250DT	446.3	175.3	142.4	126.1	115.7	102.4			4.2
		350DT	1458.4	586.6	503.3	445.6	408.8				9.7
	330	80DT	28.3	7.9	6.4	5.6	4.9	4.3			0.7
		110DT	46.0	17.6	14.3	12.7	11.6	10.3	9.5	8.8	0.8
		140DT	108.7	45.4	36.8	32.6	29.9	26.5	24.3	22.7	1.3
		180DT	209.7	87.1	70.8	62.7	57.5	50.9	46.7	43.7	2.4
		250DT	612.9	244.8	198.8	176.0	161.5	143.0	131.2		4.9
		350DT	1505.5	579.2	496.9	440.0	403.6				9.4
6	180	80DT	23.1	7.7	6.2	5.4	4.6	4.1			0.7
		110DT	35.5	18.0	14.8	13.1	12.0	10.6	9.7		0.8
		140DT	48.9	25.3	20.5	18.2	16.7	14.8			1.0
		180DT	111.3	59.3	48.1	42.6	39.1				2.0
		250DT	248.2	116.7	94.8	83.9					7.4
		350DT	770.5	371.8	319.0	282.5					7.4
	210	80DT	24.2	7.7	6.0	5.3	4.4	4.0			0.7
		110DT	38.1	18.0	14.6	12.9	11.9	10.5	9.6	9.0	0.7
6	210	140DT	52.8	25.1	20.4	18.0	16.5	14.6			1.0
		180DT	120.5	58.9	47.8	42.4	38.9	34.4			1.9
		250DT	359.3	167.8	136.3	120.7	110.7				3.9
		350DT	826.1	367.6	315.4	279.3					7.1
	240	80DT	25.0	7.4	6.0	5.3	4.4	4.0			0.7
		110DT	40.1	17.7	14.4	12.8	11.7	10.4	9.5	8.9	0.7
		140DT	82.2	38.5	31.3	27.7	25.4	22.5	20.6		1.1
		180DT	132.7	61.8	50.2	44.4	40.8	36.1			2.0
		250DT	375.6	164.8	133.9	118.6	108.8				3.7
		350DT	869.4	362.3	310.8	275.2					6.9
	270	80DT	27.2	8.4	7.0	6.2	5.7	5.0			0.7
		110DT	45.8	20.1	16.3	14.5	13.3	11.8	10.8	10.1	0.8
		140DT	85.8	38.0	30.8	27.3	25.1	22.2	20.3	19.0	1.1
		180DT	138.9	61.0	49.6	43.9	40.3	35.6	32.7		1.9
		250DT	388.1	161.8	131.4	116.3	106.7	94.5			3.6
		350DT	1150.8	481.7	413.2	365.9	335.7				7.7
	300	80DT	28.9	8.1	6.8	6.0	5.4	4.7			0.7
		110DT	47.1	19.8	16.1	14.2	13.1	11.6	10.6	9.9	0.7
		140DT	88.8	37.4	30.4	26.9	24.7	21.9	20.1	18.8	1.1
		180DT	173.6	75.4	61.3	54.2	49.8	44.1	40.4		2.1
		250DT	468.6	194.1	157.7	139.6	128.1	113.4			4.0
		350DT	1186.3	473.8	406.5	359.9	330.2				7.5
	330	80DT	29.7	8.0	6.6	5.7	4.9	4.5			0.7
		110DT	48.2	19.5	15.8	14.0	12.8	11.4	10.4	9.7	0.7
		140DT	91.2	36.9	29.9	26.5	24.3	21.5	19.7	18.5	1.1
		180DT	178.7	74.4	60.4	53.5	49.1	43.4	39.8	37.3	2.1
		250DT	477.9	190.5	154.7	137.0	125.7	111.3			4.0
		350DT	1214.7	465.9	399.7	354.0	324.7				7.4
8	150	80DT	32.1	14.7	11.9	10.5	9.7	8.6	7.9		0.8
		110DT	59.9	33.2	27.0	23.9	21.9	19.4	17.8	16.7	1.0
		140DT	111.4	68.3	55.5	49.1	45.1	39.9	36.6		1.7
		180DT	244.9	150.4	122.2	108.2	99.2	87.9	80.6		3.1
		250DT	551.9	296.0	240.5	212.9	195.3				5.3
		350DT	1697	931.0	798.7	707.3	648.8				11.7
	180	80DT	33.4	16.8	14.2	13.1	11.5	10.5	9.1		0.8
		110DT	78.4	42.2	34.3	30.3	27.8	24.6	22.6	21.1	1.1
		140DT	122.6	67.8	55.1	48.8	44.7	39.6	36.3	34.0	1.6
		180DT	315.3	181.7	147.6	130.7	119.9	106.2	97.4	91.1	3.3
		250DT	751.0	393.6	319.7	283.1	259.7	229.9			5.8
		350DT	1737.4	917.2	768.9	696.7	639.1				11.1
	210	80DT	37.1	15.2	13.6	12.6	12.0	10.0	8.1		0.8
		110DT	82.8	41.4	33.6	29.8	27.3	24.2	22.2	20.7	1.1
		140DT	163.7	86.7	70.6	62.5	57.3	50.8	46.6	43.5	1.7
		180DT	336.6	179.3	145.6	128.9	118.3	104.7	96.1	89.8	3.2
		250DT	786.5	384.6	312.4	276.6	253.7	224.7			5.6
		350DT	2077.6	997.8	856.0	758.0	695.3				11.5
	240	80DT	38.9	14.8	13.1	12.5	11.7	9.2	7.6		0.8
		110DT	86.1	40.6	32.9	29.2	26.8	23.7	21.7	20.3	1.0
		140DT	171.6	85.5	69.4	61.5	56.4	49.9	45.8	42.8	1.7
		180DT	353.0	176.4	143.2	126.8	116.3	103.0	94.5	88.4	3.1
		250DT	812.4	375.5	305.0	270.1	247.8	219.4	201.2		5.5
		350DT	2159.0	977.2	838.4	742.4	681.0				11.1
	270	80DT	41.0	14.3	12.8	12.1	11.0	8.8	7.0		0.8
		110DT	88.6	39.7	32.3	28.6	26.2	23.2	21.3	19.9	1.0
		140DT	177.9	84.0	68.2	60.4	55.4	49.1	45.0	42.1	1.7
		180DT	365.7	173.3	140.7	124.6	114.3	101.2	92.8	86.8	3.0
		250DT	831.7	366.8	297.9	263.8	242.0	214.3	196.6		5.3
		350DT	2220.6	956.7	820.7	726.7	666.6				10.9
	300	80DT	43.5	13.8	12.1	11.6	10.5	8.1	6.5		0.8
		110DT	90.5	38.9	31.6	28.0	25.7	22.7	20.8	19.5	1.0
		140DT	182.7	82.5	67.0	59.3	54.4	48.2	44.2	41.3	1.6
		180DT	375.7	170.1	138.2	122.4	112.3	99.4	91.2	85.3	3.0

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

DT

Stop S	Index Period θ	Code	Static Torque Ts kgf-m	Net Dynamic Torque to (kgf-m) Indexes per min.N(rpm) 50	100	150	200	300	400	500	Cam Shaft Riction Torque Tx (kgf-m)
8	300	250DT	846.4	358.5	291.2	257.8	236.5	209.4	192.1	179.9	2.2
		350DT	2268.1	936.8	803.7	711.6	625.8				10.6
	330	80DT	45.1	13.4	11.2	10.3	9.7	7.7	5.9		0.8
		110DT	92.0	38.1	31.0	27.4	25.1	22.3	20.4	19.1	1.0
		140DT	186.6	81.0	65.8	58.3	53.4	47.3	43.4	40.6	1.6
		180DT	383.6	167.1	135.7	120.2	110.2	97.6	89.5	83.7	2.9
		250DT	1123.8	485.6	394.4	349.3	320.4	283.7	260.2	243.4	6.4
		350DT	2305.2	917.8	787.4	697.2	639.5				10.5
10	150	80DT	24.0	7.8	6.5	5.6	4.6	4.4	4.0		0.7
		110DT	44.7	24.4	19.8	17.6	16.1	14.3	13.1	12.2	0.9
		140DT	180.9	59.5	48.4	42.8	39.3	34.8	31.9		1.3
		180DT	202.2	120.3	97.7	86.5	79.3	70.3	64.4		2.4
		250DT	446.3	239.5	194.5	172.2	158.0				4.2
		350DT	1458.4	801.4	687.5	608.8	558.4				9.7
	180	80DT	26.1	8.1	6.7	5.6	4.5	4.5	4.1		0.7
		110DT	69.5	37.5	30.5	27.0	24.7	21.9	20.1	18.8	0.8
		140DT	111.9	61.2	49.7	44.0	40.4	35.8	32.8	30.7	1.3
		180DT	216.0	117.7	95.6	84.6	77.6	68.7	63.1		2.4
		250DT	626.1	329.2	267.4	236.8	217.2	192.3			4.8
		350DT	1544.6	780.8	669.9	593.1	544.1				9.2
	210	80DT	30.1	9.2	7.6	6.6	5.9	5.4	4.6		0.7
		110DT	72.2	36.5	29.6	26.2	24.1	21.3	19.6	18.3	0.9
		140DT	141.3	75.2	61.1	54.1	49.6	44.0	40.3	37.7	1.5
		180DT	309.0	169.9	138.0	122.2	112.1	99.3	91.1	85.2	2.7
		250DT	646.1	319.3	259.4	229.7	210.7	186.6	171.1		4.6
		350DT	2063.8	1028.2	882.1	781.1	716.5				10.2
	240	80DT	33.7	8.8	7.5	6.4	5.7	5.2	4.4		0.7
		110DT	74.1	35.5	28.9	25.6	23.4	20.8	19.0	17.8	0.9
		140DT	145.9	73.4	59.7	52.8	48.5	42.9	39.4	36.8	1.4
		180DT	320.0	166.1	135.0	119.5	109.6	97.1	89.0	83.3	2.6
		250DT	660.1	310.1	251.9	223.0	204.6	181.2	166.2		4.5
		350DT	2122.3	1001.8	859.4	761.0	698.1				10.0
	270	80DT	35.2	8.6	7.3	6.2	5.5	5.0	4.1		0.7
		110DT	75.5	34.6	28.1	24.9	22.8	20.2	18.6	17.3	0.8
		140DT	149.3	71.7	58.2	51.6	47.3	41.9	38.4	35.9	1.4
		180DT	328.2	162.4	131.9	116.8	107.2	94.9	87.0	81.4	2.6
		250DT	670.3	301.7	245.0	217.0	199.0	176.2	161.7		4.4
		350DT	2165.5	976.8	838.0	742.0	680.6				9.8
	300	80DT	36.5	8.4	7.1	6.0	5.3	4.8	3.9		0.7
		110DT	76.6	33.8	27.4	24.3	22.3	19.7	18.1	16.9	0.8
		140DT	151.9	70.1	56.9	50.4	46.2	40.9	37.6	35.1	1.4
		180DT	334.5	158.9	129.0	114.3	104.8	92.8	85.1	79.6	2.6
		250DT	677.9	293.9	238.7	211.4	193.9	171.7	157.5	147.3	4.4
		350DT	2198.0	953.4	818.0	724.3	664.4				9.6
	330	80DT	38.1	8.1	6.9	5.7	4.9	4.3	3.6		0.7
		110DT	77.4	33.0	26.8	23.7	21.8	19.3	17.7	16.5	0.8
		140DT	153.9	68.6	55.7	49.3	45.2	40.0	36.7	34.4	1.4
		180DT	398.4	189.4	153.9	136.3	125.0	110.7	101.5	94.9	2.9
		250DT	683.7	286.8	233.0	206.3	189.2	167.6	153.7	143.8	4.3
		350DT	2223.0	931.8	799.4	707.9	649.3				9.5
12	150	380DT	22.1	8.0	6.2	5.8	4.9	4.5	3.7		0.6
		110DT	47.1	27.0	22.0	19.4	17.8	15.8	14.5	13.5	0.7
		140DT	88.8	51.1	41.5	36.8	33.7	29.9	27.4		1.1
		180DT	173.6	103.0	83.7	74.1	68.0	60.2	55.2		2.1
		250DT	468.6	265.2	215.4	190.7	174.9	154.9			4.0
		350DT	1186.3	647.3	555.3	491.7	451.0				7.5
	180	80DT	23.5	8.5	6.8	6.0	5.2	4.8	4.1		0.6
		110DT	49.1	26.1	21.2	18.8	17.2	15.3	14.0	13.1	0.7
		140DT	93.2	49.6	40.3	35.7	32.7	29.0	26.6	24.8	1.0
		180DT	227.4	130.3	105.9	93.7	86.0	76.1	69.8	65.3	2.3
		250DT	485.5	255.5	207.6	183.8	168.6	149.3			4.0
		350DT	1237.8	626.0	537.0	475.5	436.2				7.2

Stop S	Index Period θ	Code	Static Torque Ts kgf-m	Net Dynamic Torque to (kgf-m) Indexes per min.N(rpm) 50	100	150	200	300	400	500	Cam Shaft Riction Torque Tx (kgf-m)
12	210	80DT	29.0	8.2	6.8	6.1	5.2	4.8	4.1		0.6
		110DT	50.5	25.3	20.5	18.2	16.7	14.8	13.5	12.7	0.7
		140DT	117.32	62.0	50.4	44.6	40.9	36.2	33.2	31.1	1.2
		180DT	235.3	126.6	102.8	91.0	83.5	73.9	67.8	63.4	2.2
		250DT	496.6	246.8	200.4	177.5	162.8	144.2	132.2		3.8
		350DT	1272.2	605.9	519.9	460.3	422.2				7.1
	240	80DT	30.2	8.3	6.5	5.7	4.9	4.2	3.8		0.6
		110DT	51.4	24.5	19.9	17.6	16.2	14.3	13.1	12.3	0.7
		140DT	119.9	60.2	48.9	43.3	39.7	35.2	32.3	30.2	1.2
		180DT	240.8	123.0	99.9	88.5	81.2	71.9	65.9	61.7	2.2
		250DT	504.2	238.9	194.0	171.8	157.6	139.6	128.0		3.7
		350DT	1296.2	587.6	504.1	446.4	409.5				6.9
	270	80DT	31.5	9.2	8.0	7.1	6.3	5.6	4.3		0.6
		110DT	52.0	23.8	19.3	17.1	15.7	13.9	12.8	11.9	0.7
		140DT	126.4	62.2	50.5	44.7	41.0	36.3	33.3	31.2	1.2
		180DT	244.8	119.7	97.3	86.1	79.0	70.0	64.2	60.0	2.1
		250DT	509.6	231.8	188.3	166.7	153.0	135.4	124.2		3.7
		350DT	1313.5	571.0	489.9	433.7	397.9				6.8
	300	80DT	32.7	8.4	6.7	5.9	5.1	4.4	4.0		0.6
		110DT	52.5	23.2	18.8	16.7	15.3	13.5	12.4	11.6	0.7
		140DT	127.9	60.6	49.2	43.6	40.0	35.4	32.5	30.4	1.2
		180DT	247.8	116.7	94.8	84.0	77.0	68.2	62.6	58.5	2.1
		250DT	513.6	225.5	183.2	162.2	148.8	131.7	120.8	113.0	3.6
		350DT	1326.3	555.9	476.9	422.3	387.4				6.7
	330	80DT	33.2	8.2	6.4	5.3	4.8	4.0	3.6		0.6
		110DT	52.9	22.6	18.4	16.3	14.9	13.2	12.1	11.3	0.7
		140DT	129.0	59.2	48.0	42.5	39.0	34.6	31.7	29.6	1.2
		180DT	250.1	114.0	92.6	82.0	75.2	66.6	61.1	57.1	2.1
		250DT	516.7	219.8	178.5	158.1	145.0	128.4	117.8	110.2	3.6
		350DT	1748.1	745.9	639.9	566.6	519.8				8.1
15	90	80DT	17.0	4.8	3.1	2.0	1.6	1.2	1.0		0.6
		110DT	37.0	13.6	13.6	13.6	13.6	13.6	13.6		0.7
		140DT	49.6	24.5	24.5	24.5	22.7				0.9
		180DT	102.6	73.4	59.6	52.8	48.4				1.7
		250DT	216.5	139.4	113.3	100.3					2.9
		350DT	637.2	411.6	353.1						6.0
	120	80DT	18.1	5.1	3.3	2.3	1.8	1.3	1.1		0.6
		110DT	40.5	14.2	14.2	14.2	14.2	14.2	13.0	12.2	0.7
		140DT	60.5	38.3	31.1	27.6	25.3	22.4			0.9
		180DT	114.3	71.1	57.7	51.1	46.9	41.5			1.6
		250DT	233.3	132.8	107.8	95.5	87.6				2.7
		350DT	696.0	394.6	338.5	299.7					5.6
	150	80DT	18.9	5.4	3.5	2.6	2.1	1.6	1.3		0.6
		110DT	42.6	14.6	14.6	14.6	14.6	13.6	12.5	11.7	0.6
		140DT	64.0	36.9	30.0	26.5	24.3	21.6	19.8		0.9
		180DT	147.5	87.8	71.3	63.2	57.9	51.3	47.1		1.7
		250DT	301.7	164.4	133.5	118.2	108.5				2.9
		350DT	729.3	377.7	324.1	286.9					5.4
	180	80DT	23.2	6.8	5.0	3.7	3.1	2.7	2.4		0.6
		110DT	46.4	20.6	20.4	18.0	16.5	14.6	13.4	12.6	0.6
		140DT	66.2	35.5	28.9	25.6	23.4	20.8	19.0	17.8	0.8
		180DT	153.0	84.7	68.8	60.9	55.9	49.5	45.4	42.4	1.7
		250DT	308.5	157.4	127.9	133.2	103.8	92.0			2.8
		350DT	749.5	362.6	311.0	275.4	252.6				5.2
	210	80DT	24.5	6.7	4.8	3.8	3.0	2.5	2.0		0.6
		110DT	47.3	20.8	19.6	17.4	15.9	14.1	12.9	12.1	0.6
		140DT	67.7	34.3	27.9	24.7	22.6	20.0	18.4	17.2	0.8
		180DT	156.6	81.8	66.5	58.9	54.0	47.8	43.8	41.0	1.7
		250DT	312.8	151.3	122.9	108.9	99.9	88.4			2.8
		350DT	1023.0	493.2	423.1	374.7	343.7				6.0
	240	80DT	26.1	6.8	4.8	3.7	3.1	2.4	2.2		0.6
		110DT	47.8	20.9	19.0	16.8	15.4	13.6	12.5	11.7	0.6

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

DT

Stop 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	Torque	Stop 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)
15	240	140DT	68.7	33.2	27.0	23.9	21.9	19.4	17.8	16.6	0.8	16	270	250DT	318.8	144.9	117.7	104.2	95.6	84.6	77.6		2.7
		180DT	159.1	79.2	64.4	57.0	52.3	46.3	42.5	39.7	1.7			350DT	1048.2	473.6	406.3	359.8	330.1				5.8
		250DT	315.8	146.1	118.7	105.1	96.4	85.3	78.3		2.7		300	80DT	23.2	5.6	3.8	2.7	1.8	1.6	1.1		0.6
		350DT	1035.4	476.7	409.0	362.1	322.2				5.9			110DT	46.0	15.1	15.1	14.5	13.3	11.8	10.8	10.1	0.6
	270	80DT	27.5	7.2	5.3	4.4	3.4	2.7	2.4		0.6			140DT	70.2	32.1	26.1	23.1	21.2	18.8	17.2	16.1	0.8
		110DT	48.2	21.0	18.4	16.3	14.9	13.2	12.1	11.3	0.6			180DT	169.1	81.3	66.1	58.5	53.7	47.5	43.6	40.8	1.7
		140DT	69.4	32.2	26.2	23.2	21.2	18.8	17.3	16.1	0.8			250DT	320.1	140.7	114.2	101.2	92.8	82.2	75.4		2.7
		180DT	167.0	81.5	66.2	58.6	53.8	47.6	43.7	40.9	1.7			350DT	1053.9	460.2	394.8	349.6	320.7				5.7
		250DT	317.8	141.5	114.9	101.7	93.3	82.6	75.8		2.7		330	80DT	23.4	5.7	3.9	2.8	1.8	1.5	1.0		0.6
		350DT	1044.1	462.1	396.4	351.0	322.0				5.8			110DT	46.2	15.2	15.2	14.1	12.9	11.5	10.5	9.8	0.6
	300	80DT	28.1	7.5	5.5	4.5	3.6	2.8	2.5		0.6			140DT	70.5	31.3	25.4	22.5	20.6	18.3	16.8	15.7	0.8
		110DT	48.5	21.1	17.9	15.8	14.5	12.9	11.8	11.0	0.6			180DT	170.0	79.3	64.4	57.0	52.3	46.3	42.5	39.7	1.7
		140DT	69.9	31.3	25.4	22.5	20.7	18.3	16.8	15.7	0.8			250DT	321.1	136.9	111.2	98.5	90.3	80.0	73.4	68.6	2.6
		180DT	168.3	79.3	64.4	57.0	52.3	46.3	42.5	39.7	1.7			350DT	1058.2	488.1	384.4	340.4	31.2				5.7
		250DT	319.3	137.4	111.6	98.8	90.6	80.3	73.6		2.7	20	※90	80DT	19.0	6.2	4.8	3.9	3.0	2.6	2.0		0.7
		350DT	1050.6	449.1	385.3	341.2	312.9				5.8			110DT	14.8	11.3	9.2	8.1	7.5	6.6			0.4
	330	80DT	28.7	7.5	5.6	4.4	3.5	2.7	2.4		0.6		90	140DT	52.0	18.5	18.5	18.5	18.5	18.5			0.8
		110DT	48.8	21.1	17.4	15.4	14.1	12.5	11.5	10.7	0.6			180DT	77.8	54.8	44.5	39.4	36.2				1.4
		140DT	70.3	30.5	24.8	21.9	20.1	17.8	16.4	15.3	0.8			250DT	185.7	120.5	97.8	86.6					2.3
		180DT	169.4	77.3	62.8	55.6	51.0	45.2	41.4	38.7	1.7			350DT	432.9	268.9	230.7	218.4					4.3
		250DT	320.4	133.7	108.6	96.2	88.2	78.1	71.7	67.0	2.6		※120	80DT	20.5	6.4	5.0	4.2	3.3	2.9	2.3		0.7
		350DT	1055.4	437.4	375.3	332.3	304.8				5.7			110DT	16.2	10.8	8.8	7.8	7.2	6.3	5.8		0.4
16	90	80DT	16.2	4.1	3.0	2.2	1.4	0.9	0.7		0.6		120	140DT	55.8	19.1	19.1	19.1	19.1	19.1	18.3		0.7
		110DT	37.9	13.7	13.7	13.7	13.7	13.7	13.7		0.7			180DT	83.4	52.1	42.3	37.5	34.4	30.4			1.3
		140DT	50.9	24.8	24.8	24.8	23.6	20.9			0.9			250DT	194.5	113.1	91.8	81.3	74.6				2.2
		180DT	105.5	76.2	61.9	54.8	50.3				1.7			350DT	627.9	369.6	317.1	280.8					4.8
		250DT	220.8	144.0	117.0	103.6					2.8		※150	80DT	24.0	7.8	6.5	5.6	4.6	4.4	4.0		0.7
		350DT	652.0	425.9	365.4						5.9			110DT	17.0	10.4	8.4	7.5	6.9	6.1	5.6		0.4
	120	80T	16.4	4.3	3.1	2.3	1.5	1.0	0.8		0.6			140DT	57.9	19.5	19.5	19.5	19.5	19.0	17.4	16.3	0.7
		110DT	41.2	14.3	14.3	14.3	14.3	14.3	13.4	12.6	0.7			180DT	86.5	49.6	40.3	35.7	32.7	29.0			1.3
		140DT	61.6	39.6	32.2	28.5	26.1	23.1	21.2		0.9			250DT	207.6	114.3	92.8	82.2	75.4				2.2
		180DT	116.5	73.4	59.7	52.8	48.5	42.9			1.6			350DT	646.3	350.7	300.9	266.4	244.4				4.6
		250DT	236.3	136.7	111.0	98.3	90.2				2.7		※180	80DT	26.1	8.1	6.7	5.6	4.5	4.5	4.1		0.7
		350DT	706.7	406.7	349.0	309.0					5.3			110DT	17.5	10.0	8.1	7.2	6.6	5.8	5.4	5.0	0.4
	150	80DT	16.4	4.5	3.3	2.4	1.8	1.3	1.0		0.6		180	140DT	62.0	27.2	27.2	24.6	22.6	20.0	18.3	17.2	0.8
		110DT	43.1	14.6	14.6	14.6	14.6	14.0	12.9	12.0	0.6			180DT	130.5	74.3	60.4	53.5	49.1	43.4	39.8	37.3	1.5
		140DT	64.9	38.0	30.9	27.3	25.1	22.2	20.4		0.9			250DT	210.4	108.9	88.5	78.3	71.8	63.6			2.2
		180DT	149.6	90.5	73.5	65.1	59.7	52.9	48.5		1.7			350DT	657.1	334.8	287.2	254.3	233.3				4.5
		250DT	304.3	168.9	137.2	121.4	111.4				2.9		※210	80DT	30.1	9.2	7.6	6.6	5.9	5.4	4.6		0.7
		350DT	737.1	388.5	333.3	295.1	270.7				5.8			110DT	17.9	9.6	7.8	6.9	6.3	5.6	5.2	4.8	0.4
	180	80DT	20.2	5.2	3.5	2.5	1.9	1.4	1.1		0.6		210	140DT	62.8	27.4	26.7	23.6	21.7	19.2	17.6	16.5	0.7
		110DT	44.2	14.8	14.8	14.8	14.8	13.4	12.3	11.5	0.6			180DT	132.2	71.5	58.1	51.4	47.2	41.8	38.3	35.8	1.4
		140DT	66.9	36.5	29.7	26.3	24.1	21.3	19.6	18.3	0.8			250DT	212.1	104.4	84.8	75.1	68.9	61.0			2.2
		180DT	154.6	87.2	70.8	62.7	57.5	50.9	46.7	43.7	1.7			350DT	663.8	321.3	275.7	244.1	223.9				4.5
		250DT	310.5	161.5	131.2	116.1	106.5	94.3			2.8		※240	80DT	33.7	8.8	7.5	6.4	5.7	5.2	4.4		0.7
		350DT	755.4	372.4	319.5	282.9	259.5				5.2			110DT	18.1	9.3	7.6	6.7	6.1	5.4	5.0	4.7	0.4
	210	80DT	21.0	5.5	3.6	2.7	2.0	1.6	1.3		0.6		240	140DT	63.3	27.5	25.8	22.8	20.9	18.5	17.0	15.9	0.7
		110DT	44.9	15.0	15.0	15.0	14.6	12.9	11.9	11.1	0.6			180DT	133.4	69.0	56.0	49.6	45.5	40.3	37.0	34.6	1.4
		140DT	68.2	35.2	28.6	25.3	23.2	20.6	18.9	17.7	0.8			250DT	213.2	100.6	81.7	72.3	66.4	58.8			2.1
		180DT	157.9	84.1	68.3	60.5	55.5	49.1	45.1	42.2	1.7			350DT	668.3	309.7	265.7	235.3	215.8				4.4
		250DT	314.3	155.1	126.0	111.6	102.3	90.6			2.7		※270	80DT	35.2	8.6	7.3	6.2	5.5	5.0	4.1		0.7
		350DT	1029.3	506.1	434.2	384.5	352.7				5.9			110DT	18.2	9.0	7.3	6.5	5.9	5.3	4.8	4.5	0.4
	240	80DT	22.1	5.5	3.6	2.7	2.0	1.7		1.2	0.6		270	140DT	63.7	27.6	24.9	22.1	20.3	17.9	16.4	15.4	0.7
		110DT	45.4	15.0	15.0	15.0	14.1	12.5	11.5	10.7	0.6			180DT	134.3	66.8	54.3	48.0	44.1	39.0	35.8	33.5	1.4
		140DT	69.1	34.1	27.7	24.5	22.5	19.9	18.3	17.1	0.8			250DT	214.0	97.3	79.0	70.0	64.2	56.8	52.1		2.1
		180DT	160.2	81.4	66.1	58.5	53.7	47.5	43.6	40.8	1.6			350DT	671.4	299.7	257.1	227.7	208.8				4.4
		250DT	316.9	149.7	121.6	107.6	98.7	87.4	80.2		2.7		※300	80DT	36.5	8.4	7.1	6.0	5.3	4.8	3.9		0.7
		350DT	1040.4	488.8	419.4	371.4	340.7				5.9			110DT	18.3	8.8	7.1	6.3	5.8	5.1	4.7	4.4	0.4
	270	80DT	22.9	5.6	4.9	2.6	1.9	1.5	1.0		0.6		300	140DT	63.9	27.7	24.2	21.4	19.7	17.4	16.0	14.9	0.7
		110DT	45.8	15.1	15.1	14.9	13.7	12.1	11.1	10.4	0.6			180DT	134.9	64.9	52.7	46.6	42.8	37.9	34.8	32.5	1.4
		140DT	69.7	33.0	26.8	23.8	21.8	19.3	17.7	16.6	0.8			250DT	214.6	94.4	76.6	67.9	62.3	55.1	50.6		2.1
		180DT	167.8	83.7	67.9	60.2	55.2	48.9	44.8	41.9	1.7			350DT	673.7	290.8	249.5	220.9	202.7				4.4

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

DT

Stop S	Index Period θ	Code	Static Torque Ts kgf-m	Net Dynamic Torque to (kgf-m) Indexes per min.N(rpm) 50	100	150	200	300	400	500	Cam Shaft Riction Torque Tx (kgf-m)
20	※330	80DT	38.1	8.1	6.9	5.7	4.9	4.3	3.6		0.7
	※330	110DT	18.4	8.5	6.9	6.1	5.6	5.0	4.6	4.3	0.3
	※330	140DT	64.1	27.7	23.6	20.9	19.1	16.9	15.6	14.5	0.7
	※330	180DT	135.3	63.1	51.3	45.4	41.7	36.9	33.8	31.6	1.4
	※330	250DT	215.0	91.8	74.6	66.0	60.6	53.6	49.2		2.1
	※330	350DT	675.4	263.0	242.8	215.0	197.2				4.3
24	※90	80DT	18.2	4.9	3.1	2.2	1.7				0.6
	90	110DT	7.9	5.9	4.8	4.2	3.9				0.4
	90	140DT	54.6	18.9	18.9	18.9	18.9	18.9			0.8
	90	180DT	72.9	32.9	32.9	32.9	32.5				1.3
	90	250DT	107.2	65.7	53.3	47.2	43.3	38.4			1.7
	90	350DT	361.1	224.2	192.3						3.8
	※120	80DT	18.2	5.0	3.1	2.3	1.8				0.6
	120	110DT	8.5	5.6	4.6	4.0	3.7	3.3			0.3
	120	140DT	57.5	19.4	19.4	19.4	19.4	19.4	19.4		0.7
	120	180DT	76.1	33.7	33.7	33.2	30.4	26.9			1.2
	120	250DT	162.7	94.7	76.9	68.1	62.5				1.9
	120	350DT	375.9	209.8	180.0	159.4					3.7
	※150	80DT	22.1	8.0	6.2	5.8	4.9	4.5	3.7		0.6
	150	110DT	8.8	5.3	4.3	3.8	3.5	3.1	2.9		0.3
	150	140DT	59.1	19.7	19.7	19.7	19.7	19.7	18.7	17.5	0.7
	150	180DT	77.8	34.0	34.0	31.4	28.8	25.5	23.4		1.2
	150	250DT	165.3	89.3	72.5	64.2	58.9				1.9
	150	350DT	476.9	257.0	220.4	195.2	179.1				3.9
	※180	80DT	23.5	8.5	6.8	6.0	5.2	4.8	4.1		0.6
	180	110DT	17.9	10.7	8.7	7.7	7.1	6.3	5.7	5.4	0.4
	180	140DT	60.0	19.8	19.8	19.8	19.8	19.4	17.8	16.7	0.7
	180	180DT	78.7	34.2	33.7	29.9	27.4	24.3	22.3		1.2
	180	250DT	166.7	84.9	68.9	61.0	56.0	49.6			1.9
	180	350DT	482.2	244.6	209.9	185.8	170.5				3.9
	※210	80DT	29.0	8.2	6.8	6.1	5.2	4.8	4.1		0.6
	210	110DT	18.1	10.3	8.4	7.4	6.8	6.0	5.5	5.2	0.4
	210	140DT	60.5	19.9	19.9	19.9	19.9	18.6	17.1	16.0	0.7
	210	180DT	79.3	34.4	32.3	28.6	26.3	23.3	21.3	19.9	1.2
	210	250DT	167.6	81.3	66.0	58.4	53.6	47.5			1.8
	210	350DT	485.4	234.4	201.1	178.0	163.3				3.8
	※240	80DT	30.2	8.3	6.5	5.7	4.9	4.2	3.8		0.6
	240	110DT	18.3	9.9	8.1	7.2	6.6	5.8	5.3	5.0	0.4
	240	140DT	60.9	20.0	20.0	20.0	20.0	18.0	16.5	15.4	0.7
	240	180DT	79.7	34.4	31.1	27.6	25.3	22.4	20.5	19.2	1.2
	240	250DT	168.2	78.2	63.5	56.3	51.6	45.7			1.8
	240	350DT	487.6	225.7	193.6	171.4	157.2				3.8
	※270	80DT	31.5	9.2	8.0	7.1	6.3	5.8	4.3		0.6
	270	110DT	18.4	9.6	7.8	6.9	6.4	5.6	5.2	4.8	0.3
	270	140DT	61.2	20.0	20.0	20.0	19.6	17.4	15.9	14.9	0.7
	270	180DT	79.9	34.5	30.1	26.7	24.5	21.7	19.9	18.6	1.2
	270	250DT	168.7	75.6	61.4	54.4	49.9	44.2	40.5		1.8
	270	350DT	489.1	218.1	187.2	165.7	152.0				3.8
	※300	80DT	32.7	8.4	6.7	5.9	5.1	4.4	4.0		0.6
	300	110DT	18.5	9.4	7.6	6.7	6.2	5.5	5.0	4.7	0.3
	300	140DT	61.3	20.1	20.1	20.1	19.0	16.9	15.5	14.5	0.7
	300	350DT	80.1	34.5	29.2	25.9	23.7	21.0	19.3	18.0	1.2
	300	250DT	169.0	73.3	59.5	52.7	48.4	42.8	39.3		1.8
	300	350DT	490.2	211.6	181.5	160.7	147.4				3.8
30	※330	80DT	33.2	8.2	6.4	5.3	4.8	4.0	3.6		0.6
	330	110DT	18.6	9.1	7.4	6.5	6.0	5.3	4.9	4.6	0.3
	330	140DT	61.5	20.1	20.1	20.1	18.5	16.4	15.0	14.1	0.7
	330	180DT	80.3	34.6	28.4	25.2	23.1	20.4	18.7	17.5	1.2
	330	250DT	169.2	71.3	57.9	51.3	47.0	41.6	38.2		1.8
	330	350DT	491.0	205.8	176.6	156.3	143.4				3.7
	90	80DT	17.0	4.8	3.1	2.0	1.6	1.2	1.0		0.6
	90	110DT	37.0	13.6	13.6	13.6	13.6				0.7
30	※90	140DT	49.6	24.5	24.5	24.5	22.7				0.9
	※90	180DT	102.6	73.4	29.6	52.8					1.7
	※90	250DT	216.5	139.4	113.3						2.9
	※90	350DT	637.2	411.6							6.0
30	※120	80DT	18.1	5.1	3.3	2.3	1.8	1.3	1.1		0.6
	※120	110DT	40.5	14.2	14.2	14.2	14.2	14.2			0.7
	※120	140DT	60.5	38.3	31.1	27.6	25.3				0.9
	※120	180DT	114.3	71.1	57.7	51.1	46.9				1.6
	※120	250DT	233.3	132.8	107.8	95.5					2.7
	※120	350DT	696.0	394.6	338.5						5.6
	※150	80DT	18.9	5.4	3.5	2.6	2.1	1.6	1.3		0.6
	※150	110DT	42.6	14.6	14.6	14.6	14.6	13.6	12.5	12.6	0.6
	※150	140DT	64.0	36.9	30.0	26.5	24.3	21.6			0.9
	※150	180DT	147.5	87.8	71.3	63.2	57.9	51.3			1.7
	※150	250DT	301.7	164.4	133.5	118.2	108.5				2.9
	※150	350DT	729.3	377.7	324.1						5.4
	※180	80DT	23.2	6.8	5.0	3.7	3.1	2.7	2.4		0.6
	※180	110DT	46.4	20.6	20.4	18.0	16.5	14.6	13.4	12.1	0.6
	※180	140DT	66.2	35.5	28.9	25.6	23.4	20.8	19.0		0.8
	※180	180DT	153.0	84.7	68.8	60.9	55.9	49.5			1.7
	※180	250DT	308.5	157.4	127.9	113.2	103.8				2.8
	※180	350DT	749.5	362.6	311.0	275.4					5.2
	※210	80DT	24.5	6.7	4.8	3.8	3.0	2.5	2.0		0.6
	※210	110DT	47.3	20.8	19.6	17.4	15.9	14.1	12.9	11.7	0.6
	※210	140DT	67.7	34.3	27.9	24.7	22.6	20.0	18.4	18.6	0.8
	※210	180DT	156.6	81.8	66.5	58.9	54.0	48.8	43.8		1.7
	※210	250DT	312.8	151.3	122.9	108.9	99.9				2.8
	※210	350DT	1023.0	493.2	423.1	374.7	343.7				6.0
	※240	80DT	26.1	6.8	4.8	3.7	3.1	2.4	2.2		0.6
	※240	110DT	47.8	20.9	19.0	16.8	15.4	13.6	12.5	11.3	0.6
	※240	140DT	68.7	33.2	27.0	23.9	21.9	19.4	17.8	16.1	0.8
	※240	180DT	159.1	79.2	64.4	57.0	52.3	46.3	42.5	40.9	1.7
	※240	250DT	315.8	146.1	118.7	105.1	96.4				2.7
	※240	350DT	1035.4	467.7	409.0	362.1	332.2				5.9
	※270	80DT	27.5	7.2	5.3	4.4	3.4	2.7	2.4		0.6
	※270	110DT	48.2	21.0	18.4	16.3	14.9	13.2	12.1	11.0	0.6
	※270	140DT	69.4	32.2	26.2	23.2	21.2	18.8	17.3	15.7	0.8
	※270	180DT	167.0	81.5	66.2	58.6	53.8	47.6	43.7	39.7	1.7
	※270	250DT	317.8	141.5	114.9	101.7	93.3	82.6			2.7
	※270	350DT	1044.1	462.1	396.4	351.0	322.0				5.8
	※300	80DT	28.1	7.5	55	5.4	3.6	2.8	2.5		0.6
	※300	110DT	48.5	21.1	17.9	15.8	14.5	12.9	11.8	10.7	0.6
	※300	140DT	69.9	31.3	25.4	22.5	20.7	18.3	16.8	15.3	0.8
	※300	180DT	168.3	79.3	64.4	57.0	52.3	46.3	42.5	38.7	1.7
	※300	250DT	319.3	137.4	111.6	98.8	90.6	80.3			2.7
	※300	350DT	1050.6	449.1	385.3	341.2	312.9				5.8
	※330	80DT	28.7	7.5	5.6	4.4	3.5	2.7	2.4		0.6
	※330	110DT	48.8	21.1	17.4	15.4	14.1	12.5	11.5		0.6
	※330	140DT	70.3	30.5	24.8	21.9	20.1	17.8	16.4		0.8
	※330	180DT	169.4	77.3	62.8	55.6	51.0	45.2	41.4		1.7
	※330	250DT	320.4	133.7	108.6	96.2	88.2	78.1			2.6
	※330	350DT	1055.4	473.4	375.3	332.3	304.8				5.7
32	※90	80DT	16.2	4.1	3.0	2.2	1.4	0.9	0.7		0.6
	※90	110DT	37.9	13.7	13.7	13.7	13.7	13.7			0.7
	※90	140DT	50.9	24.8	24.8	24.8	23.6				0.9
	※90	180DT	105.5	76.2	61.9	54.8	50.3				1.7
	※90	250DT	220.8	144.0	117.0						2.8
	※90	350DT	652.0	425.9	365.4						5.9
	※120	80DT	16.4	4.3	3.1	2.3	1.5	1.0	0.8		0.6
	※120	110DT	41.2	14.3	14.3	14.3	14.3	14.3	13.4		0.7
	※120	140DT	61.6	39.6	32.2	28.5	26.1	23.1			0.9
	※120	180DT	116.5	73.4	59.7	52.8	48.5				1.6

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

DT

Stop S	Index Period θ	Code	Static Torque Ts kgf-m	Net dynamic torque to (kgf-m) Indexes per min.N(rpm) 50	100	150	200	300	400	500	Cam Shaft Riction Torque Tx (kgf-m)
32	※120	250DT	236.3	136.7	111.0	98.3					2.7
		350DT	706.7	406.5	349.0						5.5
	※150	80DT	16.4	4.5	3.3	2.4	1.8	1.3	1.0		0.6
		110DT	43.1	14.6	14.6	14.6	14.6	14.0	12.9		0.6
		140DT	64.9	38.0	38.0	27.3	25.1	22.2			0.9
		180DT	149.6	90.5	90.5	65.1	59.7	52.9			1.7
		250DT	304.3	168.9	168.9	121.4	111.4				2.9
		350DT	737.1	308.5	333.3	295.1					5.3
	※180	80DT	20.2	5.2	3.5	2.5	1.9	1.4	1.1		0.6
		110DT	44.2	14.8	14.8	14.8	14.8	13.4	12.3	11.5	0.6
		140DT	66.9	36.5	29.7	26.3	24.1	21.3	19.6		0.8
		180DT	154.6	87.2	70.8	62.7	57.5	50.9			1.7
		250DT	310.5	161.5	131.2	116.1	106.5				2.8
		350DT	755.4	372.4	319.5	282.9					5.2
	※210	80DT	21.0	5.5	3.6	2.7	2.0	1.6	1.3		0.6
		110DT	44.9	15.0	15.0	15.0	14.6	12.9	11.9	11.1	0.6
		140DT	68.2	35.2	28.6	25.3	23.2	20.6	18.9		0.8
		180DT	157.9	84.1	68.3	60.5	55.5	49.1	45.1		1.7
		250DT	314.3	155.1	126.0	111.6	102.3				2.7
		350DT	1029.3	506.1	434.2	394.5	352.7				5.9
	※240	80DT	22.1	5.5	3.6	2.7	2.0	1.7	1.2		0.6
		110DT	45.4	15.0	5.0	15.0	14.1	12.6	11.5	10.7	0.6
		140DT	69.1	34.1	27.7	24.5	22.5	19.9	18.3	17.1	0.8
		180DT	160.2	81.4	66.1	58.5	53.7	47.5	43.6		1.6
		250DT	316.9	149.7	121.6	107.6	98.7	87.4			2.7
		350DT	1040.4	488.8	419.4	371.4	340.7				5.9
	※270	80DT	22.9	5.6	4.9	2.6	1.9	1.5	1.0		0.6
		110DT	45.8	15.1	15.1	14.9	13.7	12.1	11.1	10.4	0.6
		140DT	69.7	33.0	26.8	23.8	21.8	19.3	17.7	16.6	0.8
		180DT	167.8	83.7	67.9	60.2	55.2	48.9	44.8	41.9	1.7
		250DT	318.8	144.9	117.7	104.2	95.6	84.6			2.7
		350DT	1048.2	473.6	406.3	359.8	330.1				5.8
	※300	80DT	23.2	5.6	3.8	2.7	1.8	1.6	1.1		0.6
		110DT	46.0	15.1	15.1	14.5	13.3	11.8	10.8	10.1	0.6
		140DT	70.2	32.1	26.1	23.1	21.2	18.8	17.2	16.1	0.8
		180DT	169.1	81.3	66.1	58.5	53.7	47.5	43.6	40.8	1.7
		250DT	320.1	140.7	114.2	101.2	92.8	82.2			2.7
		350DT	1048.2	473.5	406.6	359.8	330.1				5.8
	※330	80DT	23.4	5.7	3.9	2.8	1.8	1.5	1.0		0.6
		110DT	46.2	15.2	15.2	14.1	12.9	11.5	10.5	9.8	0.6
		140DT	70.5	31.3	25.4	22.5	20.6	18.3	16.8	15.7	0.8
		180DT	170.0	79.3	64.4	57.0	52.3	46.3	42.5	39.7	1.7
		250DT	321.1	136.9	111.2	98.5	90.3	80.0			2.6
		350DT	1058.2	448.1	384.4	340.4	312.2				5.7
40	※90	80DT	19.0	6.2	4.8	3.9	3.0	2.6	2.0		0.7
	※90	110DT	14.8	11.3	9.2	8.1	7.5				0.4
		140DT	52.0	18.5	18.5	18.5	18.5				0.8
		180DT	77.8	54.8	44.5	39.4					1.4
		250DT	185.7	12.5	97.8						2.3
		350DT	432.9	268.9							4.3
	※120	80DT	20.5	6.4	5.0	4.2	3.3	2.9	2.3		0.7
	※120	110DT	16.2	10.8	8.8	7.8	7.2	6.3			0.4
		140DT	55.8	19.1	19.1	19.1	19.1	19.1			0.8
		180DT	83.4	52.1	42.3	37.5	34.4				1.3
		250DT	194.5	113.1	91.8	81.3					2.2
		350DT	627.9	369.6	317.1						4.8
	※150	80DT	24.0	7.8	6.5	5.6	4.6	4.4	4.0		0.7
	※150	110DT	17.0	10.4	8.4	7.5	6.9	6.1			0.4
		140DT	57.9	19.5	19.5	19.5	19.5	19.0			0.7
		180DT	86.5	49.6	40.3	35.7	32.7				1.3
		250DT	207.6	114.3	92.8	82.2	75.4				2.2
		350DT	646.3	350.7	300.9	284.9					4.6

Stop S	Index Period θ	Code	Static Torque Ts kgf-m	Net dynamic torque to (kgf-m) Indexes per min.N(rpm) 50	100	150	200	300	400	500	Cam Shaft Riction Torque Tx (kgf-m)
	☆180	80DT	26.1	8.1	6.7	5.6	4.5	4.5	4.1		0.7
	※180	110DT	17.5	10.0	8.1	7.2	6.6	5.8	5.4		0.4
		140DT	62.0	27.2	27.2	24.6	22.6	20.0	18.3		0.8
		180DT	130.5	74.3	60.4	53.5	19.1	43.4	39.8		1.5
		250DT	210.4	108.9	88.5	78.3	71.8				2.2
		350DT	657.1	334.8	287.2	254.3					4.5
	※210	80DT	30.1	9.2	7.6	6.6	5.9	5.4	4.6		0.7
	※210	110DT	17.9	9.6	7.8	6.9	6.3	5.6	5.2		0.4
		140DT	62.8	27.4	26.7	23.6	21.7	19.2	17.6	16.5	0.7
		180DT	132.2	71.5	58.1	51.4	47.2	41.8	38.3		1.4
		250DT	212.1	104.4	84.8	75.1	68.9				2.2
		350DT	663.8	321.3	275.7	244.1	223.9				4.5
	※240	80DT	33.7	8.8	7.5	6.4	5.7	5.2	4.4		0.7
	※240	110DT	18.1	9.3	7.6	6.7	6.1	5.4	5.0	4.7	0.4
		140DT	63.3	27.5	25.8	22.8	20.9	18.2	17.0	15.9	0.7
		180DT	133.4	69.0	56.0	49.6	45.5	40.3	37.0	34.6	1.4
		250DT	213.2	100.6	81.7	72.3	66.4				2.1
		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
	※270	110DT	18.2	9.0	7.3	6.5	5.9	5.3	4.8	4.5	0.4
		140DT	63.7	27.6	24.9	22.1	20.3	17.9	16.4	15.4	0.7
		180DT	134.3	66.8	54.3	48.0	44.1	39.0	35.8	33.5	1.4
		250DT	214.0	97.3	79.0	70.0	64.2	56.8			2.1
		350DT	671.4	299.7	257.1	227.7	208.8				4.4
	☆300	80DT	36.5	8.4	7.1	6.0	5.3	4.8	3.9		0.7
	※300	110DT	18.3	8.8	7.1	6.3	5.8	5.1	4.7	4.4	0.4
		140DT	63.9	27.7	24.2	21.4	19.7	17.4	16.0	14.9	0.7
		180DT	134.9	64.9	52.7	46.6	42.8	37.9	34.8	32.5	1.4
		250DT	214.6	94.4	76.6	67.9	62.3	55.1			2.1
		350DT	673.7	290.8	249.5	220.9	202.7				4.4
	☆330	80DT	38.1	8.1	6.9	5.7	4.9	4.3	3.6		0.7
	※330	110DT	18.4	8.5	6.9	6.1	5.6	5.0	4.6	4.3	0.3
		140DT	64.1	27.7	23.6	20.9	19.1	16.9	15.5	14.5	0.7
		180DT	135.3	63.1	51.3	45.4	41.7	36.9	33.8	31.6	1.4
		250DT	215.0	91.8	74.6	66.0	60.6	53.6			2.1
		350DT	675.4	283.0	242.8	215.0	197.2				4.3
48	☆90	80DT	18.2	4.9	3.1	2.2	1.7				0.6
	※90	110DT	7.9	5.9	4.8	4.2	3.9				0.4
		140DT	54.6	18.9	18.9	18.9	18.9				0.8
		180DT	72.9	32.9	32.9	32.9	32.5				1.3
		250DT	107.2	65.7	53.3	47.2	43.3				1.7
		350DT	361.1	224.2							3.8
	☆120	80DT	18.2	5.0	3.1	2.3	1.8				0.6
	※120	110DT	8.5	5.6	4.6	4.0	3.7				0.3
		140DT	57.5	19.4	19.4	19.4	19.4	19.4			0.7
		180DT	76.1	33.7	33.7	33.2	30.4				1.2
		250DT	162.7	94.7	76.9	68.1					1.9
		350DT	375.9	209.8	180.0						3.7
	☆150	80DT	22.1	8.0	6.2	5.8	4.9	4.5	3.7		0.6
	※150	110DT	8.8	5.3	4.3	3.8	3.5				0.3
		140DT	59.1	19.7	19.7	19.7	19.7	19.7	19.7	18.7	0.7
		180DT	77.8	34.0	34.0	31.4	28.8				1.2
		250DT	165.3	89.3	72.5	64.2					1.9
		350DT	476.9	257.0	220.4	195.2					0.9
	☆180	80DT	23.5	8.5	6.8	6.0	5.2	4.8	4.1		0.6
	※180	110DT	17.9	10.7	8.7	7.7	7.1	6.3	5.7		0.4
		140DT	60.0	19.8	19.8	19.8	19.8	19.4	17.8		0.7
		180DT	78.7	34.2	33.7	29.9	27.4	24.3			1.2
		250DT	166.7	84.9	68.9	61.0	56.0				1.9
		350DT	482.2	244.6	209.9	185.8					3.9
	☆210	80DT	29.0	8.2	6.8	6.1	5.2	4.8	4.1		0.6
	※210	110DT	18.1	10.3	8.4	7.4	6.8	6.0	5.5		0.4

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

DT

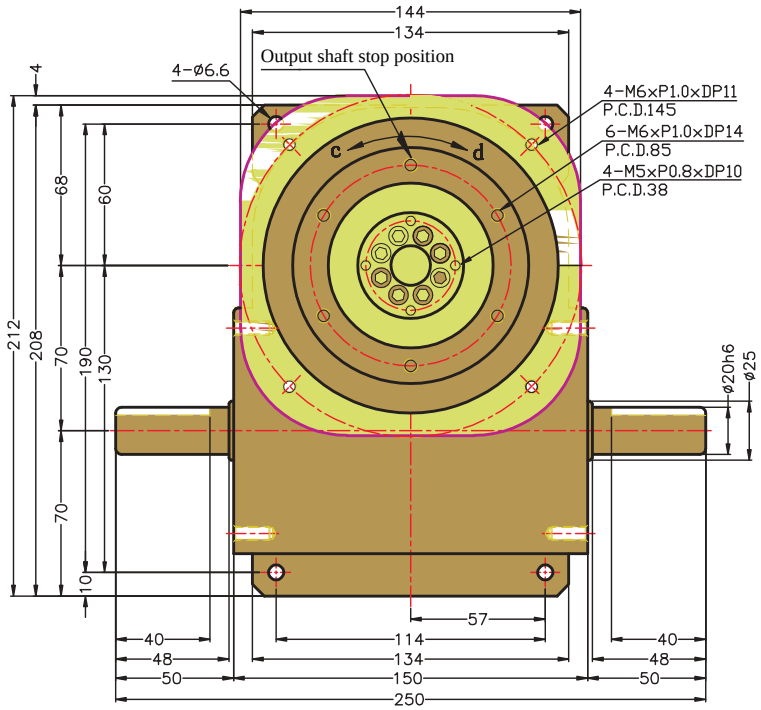
Stop S	Index Period θ	Code	Static Torque Ts kgf-m	Net Dynamic Torque to (kgf-m) Indexes per min.N(rpm) 50	100	150	200	300	400	500	Cam Shaft Riction Torque Tx (kgf-m)
48	※ 210	140DT	60.5	19.9	19.9	19.9	19.9	18.6	17.1		0.7
		180DT	79.3	34.4	32.3	28.6	26.3	23.3			1.2
		250DT	167.6	81.3	66.0	58.4	53.6				1.8
		350DT	485.4	234.4	201.1	178.0	163.3				3.8
	☆240	80DT	30.2	8.3	6.5	5.7	7.2	4.9	4.2	3.8	0.6
	※ 240	110DT	18.3	9.9	8.1	20.0	6.6	5.8	5.3	5.0	0.4
		140DT	60.9	20.0	20.0	27.6	20.0	18.0	16.5	15.4	0.7
		180DT	79.7	34.4	31.1	56.3	25.3	22.4	20.5		1.2
		250DT	168.2	78.2	63.5	171.4	51.6				1.8
		350DT	487.6	225.7	193.6	7.1	157.2				3.8
	☆270	80DT	31.5	9.2	8.0	6.9	6.4	5.6	4.3	4.8	0.6
	※ 270	110DT	18.4	9.6	7.8	20.0	19.6	5.6	5.2	14.9	0.3
		140DT	61.2	20.0	20.0	26.7	24.5	17.4	15.9		0.7
		180DT	79.9	34.5	30.1	54.4	49.9	21.7	19.9		1.2
		250DT	168.7	75.6	61.4	165.7	152.0	44.2			1.8
		350DT	489.1	218.2	187.2	5.9	5.1				3.8
	☆300	80DT	32.7	8.4	6.7	6.7	6.2	4.4	4.0	4.7	0.6
	300	110DT	18.5	9.4	7.6	20.1	19.0	5.5	5.0	14.5	0.3
		140DT	61.3	20.1	20.1	25.9	23.7	16.9	15.5	18.0	0.7
		180DT	80.1	34.5	29.2	52.7	48.4	21.0	19.3		1.2
		250DT	169.0	73.3	59.5	160.7	147.4	42.8			1.8
		350DT	490.2	211.6	181.5	5.3	4.8				3.9
	☆330	80DT	33.2	8.2	6.4	6.5	6.0	4.0	3.6	4.6	0.6
	※ 330	110DT	18.6	9.1	7.4	20.1	18.5	5.3	4.9	14.1	0.3
		140DT	61.5	20.1	20.1	25.2	23.1	16.4	15.0	17.5	0.7
		180DT	80.3	34.6	28.4	51.3	47.0	20.4	18.7		1.2
		250DT	169.2	71.3	57.9	156.3	143.4	41.6			1.8
		350DT	491.0	205.8	176.6	8.1	7.5				3.7
60	● 90	110DT	14.8	11.3	9.2	18.5	18.5				0.4
		140DT	52.0	18.5	18.5	39.4					0.8
		180DT	77.8	54.8	44.5						1.4
		250DT	185.7	120.5	97.8						2.3
		350DT	432.9	268.9							4.3
	● 120	110DT	16.2	10.8	8.8	7.8	7.2				0.4
		140DT	55.8	19.1	19.1	19.1	19.1				0.8
		180DT	83.4	52.1	42.3	37.5	34.4				1.3
		250DT	194.5	113.1	91.8						2.2
		350DT	627.9	369.6	317.1						4.8
	● 150	110DT	17.0	10.4	8.4	7.5	6.9	6.1			0.4
		140DT	57.9	19.5	19.5	19.5	19.5	19.0			0.7
		180DT	86.5	49.6	40.3	35.7	32.7				1.3
		250DT	207.6	114.3	92.8	82.2					2.2
		350DT	646.3	350.7	300.9						4.6
	● 180	110DT	17.5	10.0	8.1	7.2	6.6	5.8			0.4
		140DT	62.0	27.2	27.2	24.6	22.6	20.0			0.8
		180DT	130.5	74.3	60.4	53.5	49.4	43.4			1.5
		250DT	210.4	108.9	88.5	78.3					2.2
		350DT	657.1	334.8	287.2	254.3					4.5
	● 210	110DT	17.9	9.6	7.8	6.9	6.3	5.6	5.2		0.4
		140DT	62.8	27.4	26.7	23.6	21.7	19.2	17.6		0.7
		180DT	132.2	71.5	58.1	51.4	47.2	41.8			1.4
		250DT	212.1	104.4	84.8	75.1	68.9				2.2
		350DT	663.8	321.3	275.7	244.1					4.5
	● 240	110DT	18.1	9.3	7.6	6.7	6.1	5.4	5.0		1.4
		140DT	63.3	27.5	25.8	22.8	20.9	18.5	17.0		0.7
		180DT	133.4	69.0	56.0	49.6	45.5	40.3	37.0		1.4
		250DT	213.2	100.6	81.7	72.3	66.4				2.1
		350DT	668.3	309.7	265.7	235.3					4.4
	● 270	110DT	18.2	9.0	7.3	6.5	5.9	5.3	4.8		0.4
		140DT	63.7	27.6	24.9	22.1	20.3	17.9	16.4	15.4	0.7
		180DT	134.3	66.8	54.3	48.0	44.1	39.0	35.8		1.4
60	● 270	250DT	214.0	97.3	79.0	70.0	64.2				2.1
		350DT	671.4	299.7	257.1	227.7	208.8				4.4
	● 300	110DT	18.3	8.8	7.1	6.3	5.8	5.1	4.7	4.4	0.4
		140DT	63.9	27.7	24.2	21.4	19.7	17.4	16.0	14.9	0.7
		180DT	134.9	64.9	52.7	46.6	42.8	37.9	34.8		1.4
		250DT	214.6	94.4	76.6	67.9	62.3				2.1
		350DT	673.7	290.8	249.5	220.9	202.7				4.4
	● 330	110DT	18.4	8.5	6.9	6.4	5.6	5.0	4.6	4.3	0.3
		140DT	64.1	27.7	23.6	20.9	19.1	16.9	15.5	14.5	0.7
		180DT	135.3	63.1	51.3	45.4	41.7	36.9	33.8	31.6	1.4
		250DT	215.0	91.8	74.6	66.0	60.6	53.6			2.1
		350DT	675.4	283.0	242.8	215.0	197.2				4.3
72	● 90	110DT	7.9	5.9	4.8	4.2					0.4
		140DT	54.6	18.9	18.9	18.9	18.9				0.8
		180DT	72.9	32.9	32.9	32.9					1.3
		250DT	107.2	65.7	53.5	47.2					1.7
		350DT	361.1	224.2							3.8
	● 120	110DT	8.5	5.6	4.6	4.0	3.7				0.3
		140DT	57.5	19.4	19.4	19.4	19.4				0.7
		180DT	76.1	33.7	33.7	33.2	30.4				1.2
		250DT	162.7	94.7	76.9						1.9
		350DT	375.9	209.8							3.7
	● 150	110DT	8.8	5.3	4.3	3.8	3.5				0.3
		140DT	59.1	19.7	19.7	19.7	19.7	19.7			0.7
		180DT	77.8	34.0	34.0	31.4	28.8				1.2
		250DT	165.3	89.3	72.5	64.2					1.9
		350DT	476.9	257.0	220.4						3.9
	● 180	110DT	17.9	10.7	8.7	7.7	7.1	6.3			0.4
		140DT	60.0	19.8	19.8	19.8	19.8	19.4	17.8		0.7
		180DT	78.7	34.2	33.7	29.9	27.4				1.2
		250DT	166.7	84.9	68.9	61.0					1.9
		350DT	482.2	244.6	209.9						3.9
	● 210	110DT	18.1	10.3	8.4	7.4	6.8	6.0	5.5		0.4
		140DT	60.5	19.9	19.9	19.9	19.9	18.6	17.1		0.7
		180DT	79.3	34.4	32.3	28.6	26.3	23.3			1.2
		250DT	167.6	81.3	66.0	58.4	53.6				1.8
		350DT	485.4	234.4	201.1	178.0					3.8
	● 240	110DT	18.3	9.9	8.1	7.2	6.6	5.8	5.3		0.4
		140DT	60.9	20.0	20.0	20.0	20.0	18.0	16.5	15.4	0.7
		180DT	79.7	34.4	31.1	27.6	25.3	22.4			1.2
		250DT	168.2	78.2	63.5	56.3	51.6				1.8
		350DT	487.6	225.7	193.6	171.4					3.8
	● 270	110DT	18.4	9.6	7.8	6.9	6.4	5.6	5.2	4.8	0.3
		140DT	61.2	20.0	20.0	20.0	19.6	17.4	15.9	14.9	0.7
		180DT	79.9	34.5	30.1	26.7	24.5	21.7			1.2
		250DT	168.7	75.6	61.4	54.4	49.9				1.8
		350DT	489.1	218.2	187.2	165.7	152.0				3.8
	● 300	110DT	18.5	9.4	7.6	6.7	6.2	5.5	5.0	4.7	0.3
		140DT	61.3	20.1	20.1	20.1	19.0	16.9	15.5	14.5	0.7
		180DT	80.1	34.5	29.2	25.9	23.7	21.0	19.3		1.2
		250DT	169.0	73.3	59.5	52.7	48.4				1.8
		350DT	490.2	211.6	181.5	160.7	147.4				3.8
	● 330	110DT	18.6	9.1	7.4	6.5	6.0	5.3	4.9	4.6	0.3
		140DT	61.5	20.1	20.1	20.1	18.5	16.4	15.0	14.1	0.7
		180DT	80.3	34.6	28.4	25.2	23.1	20.4	18.7		1.2
		250DT	169.2	71.3	57.9	51.3	47.0	41.6			1.8
		350DT	491.0	205.8	176.6	156.3	143.4				3.7

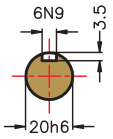
PS: ○:1DWELL ※:2DWELL ● :3DWELL ☆:4DWELL

Ultra Thin Table Model

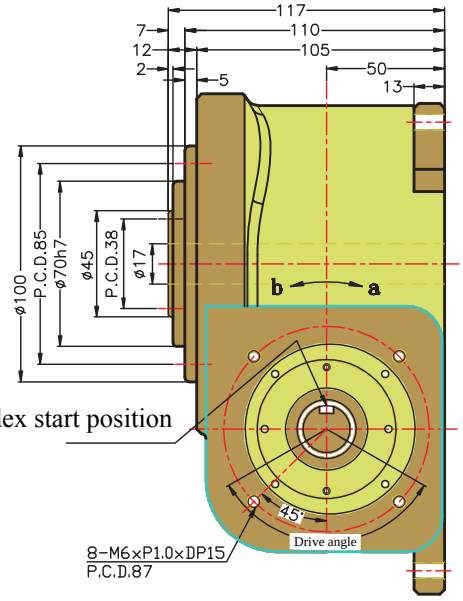
(70DA,90DA,110DA,150DA,190DA,230DA,330DA,450DA)

70DA





Input shaft



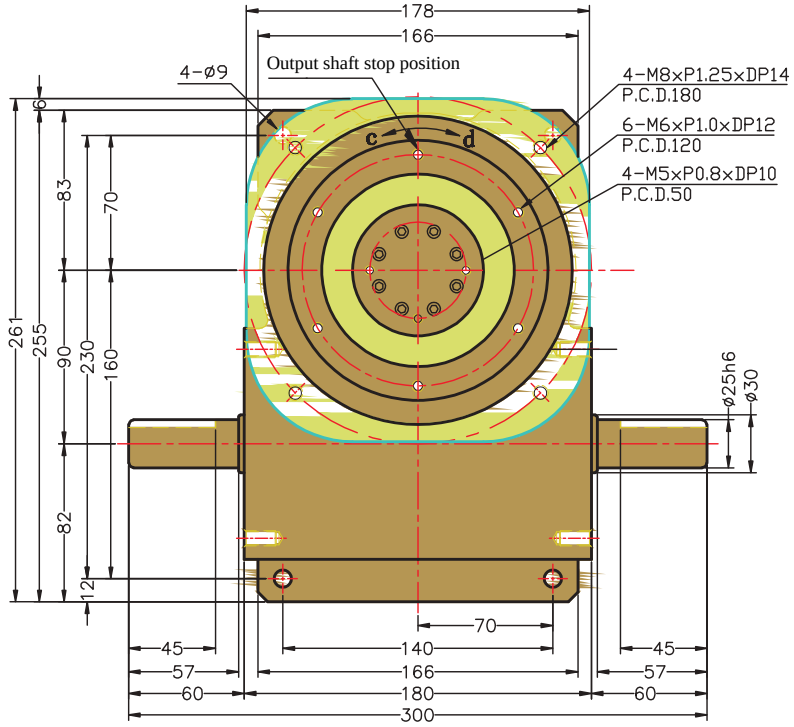
Index start position

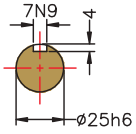
Technical Parameter

Items	Symbol	Unit	Value	Items	Symbol	Unit	Value	Items	Symbol	Unit	Value
Allowable thrust load on output shaft	C1	kgf	316	Allowable thrust load on input shaft	C3	kgf	190	GD2 of input shaft (Note1)	C6	$kgf-m^2$	1.9×10^{-3}
Allowable radial load on output shaft	C2	kgf	142	Max. repetitive bending force on input shaft	C4	kgf	163	Indexing accuracy		sec.	±30
Allowable torque on output shaft	Ts	kgf-m	Refer torque table	Max. repetitive torque on input shaft	C5	kgf-m	9.5	Weight		kg	15

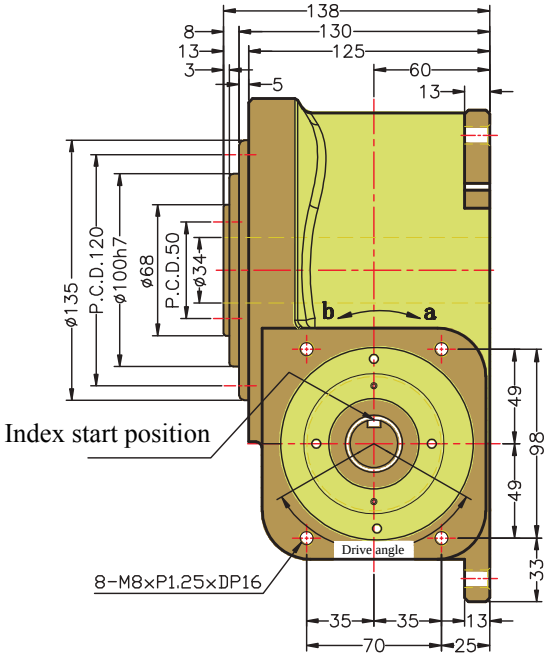
Note1:GD2 of input shaft is a value in dwell range.
Note2: Value of C1 to C5 are those obtained for safety factor=2.

90DA





Input shaft

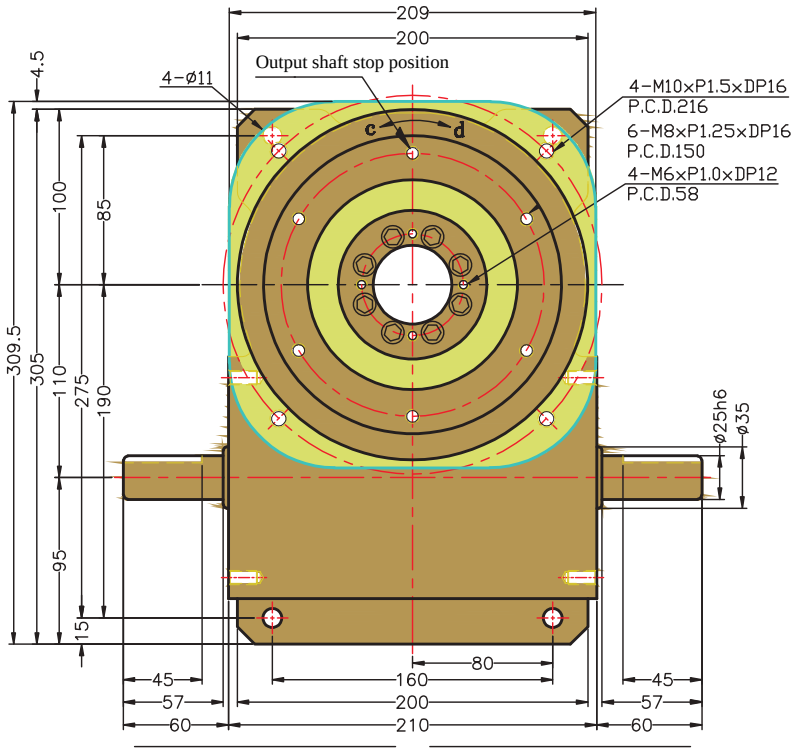


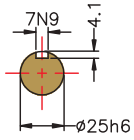
Technical Parameter

Items	Symbol	Unit	Value	Items	Symbol	Unit	Value	Items	Symbol	Unit	Value
Allowable thrust load on output shaft	C1	kgf	500	Allowable thrust load on input shaft	C3	kgf	260	GD2 of input shaft (Note1)	C6	$kgf-m^2$	2.5×10^{-5}
Allowable radial load on output shaft	C2	kgf	215	Max. repetitive bending force on input shaft	C4	kgf	260	Indexing accuracy		sec.	±30
Allowable torque on output shaft	Ts	kgf-m	Refer torque table	Max. repetitive torque on input shaft	C5	kgf-m	25	Weight		kg	28

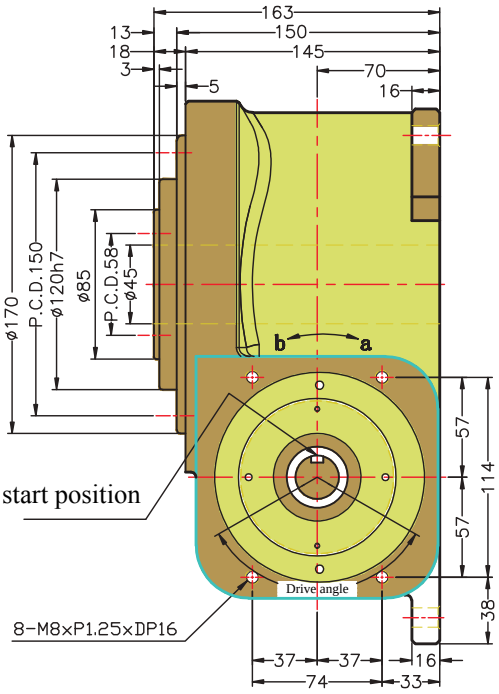
Note1:GD2 of input shaft is a value in dwell range.
Note2: Value of C1 to C5 are those obtained for safety factor=2.

110DA





Input shaft



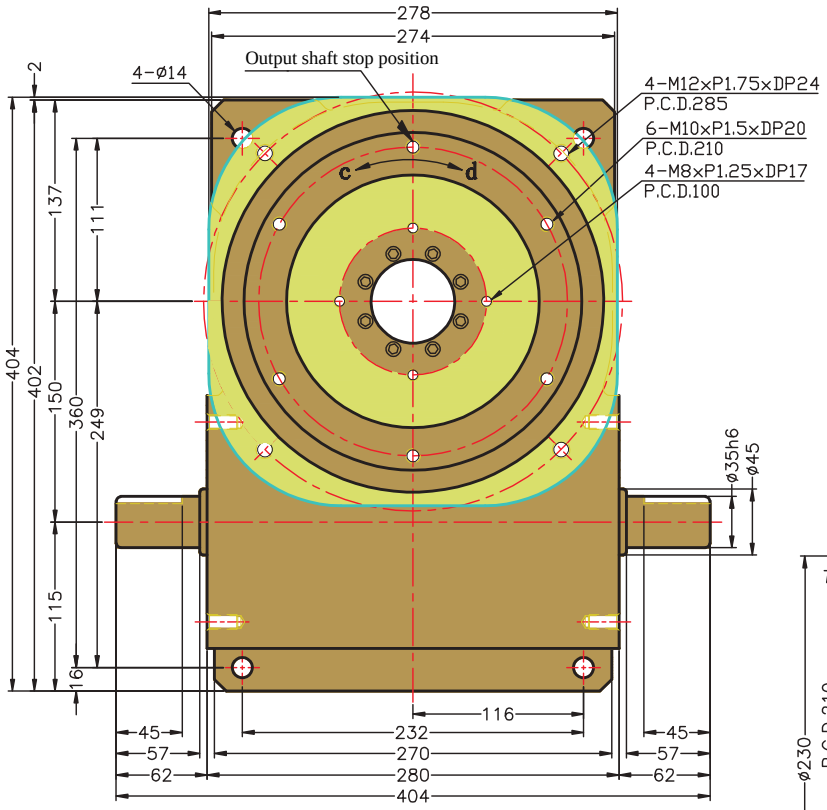
Index start position

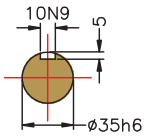
Technical Parameter

Items	Symbol	Unit	Value	Items	Symbol	Unit	Value	Items	Symbol	Unit	Value
Allowable thrust load on output shaft	C1	kgf	700	Allowable thrust load on input shaft	C3	kgf	310	GD2 of input shaft (Note1)	C6	$kgf-m^2$	6×10^{-5}
Allowable radial load on output shaft	C2	kgf	350	Max. repetitive bending force on input shaft	C4	kgf	360	Indexing accuracy		sec.	±30
Allowable torque on output shaft	Ts	kgf-m	Refer torque table	Max. repetitive torque on input shaft	C5	kgf-m	30	Weight		kg	42

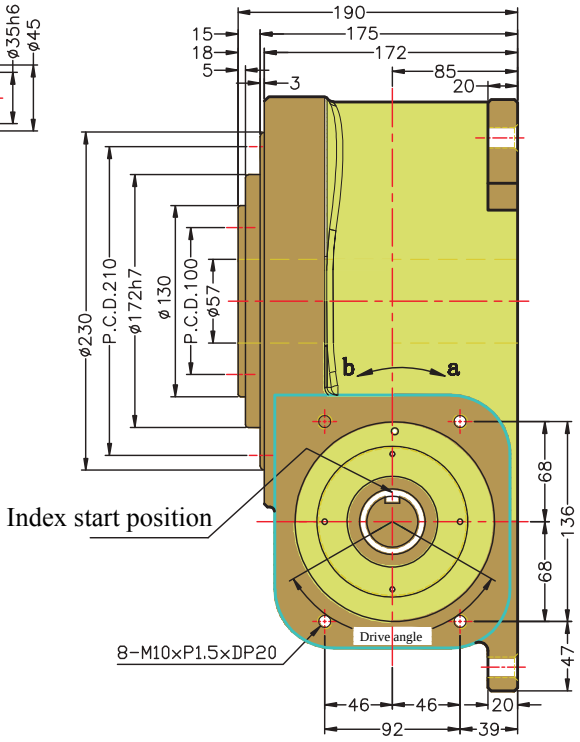
Note1:GD2 of input shaft is a value in dwell range.
Note2: Value of C1 to C5 are those obtained for safety factor=2.

150DA





Input shaft

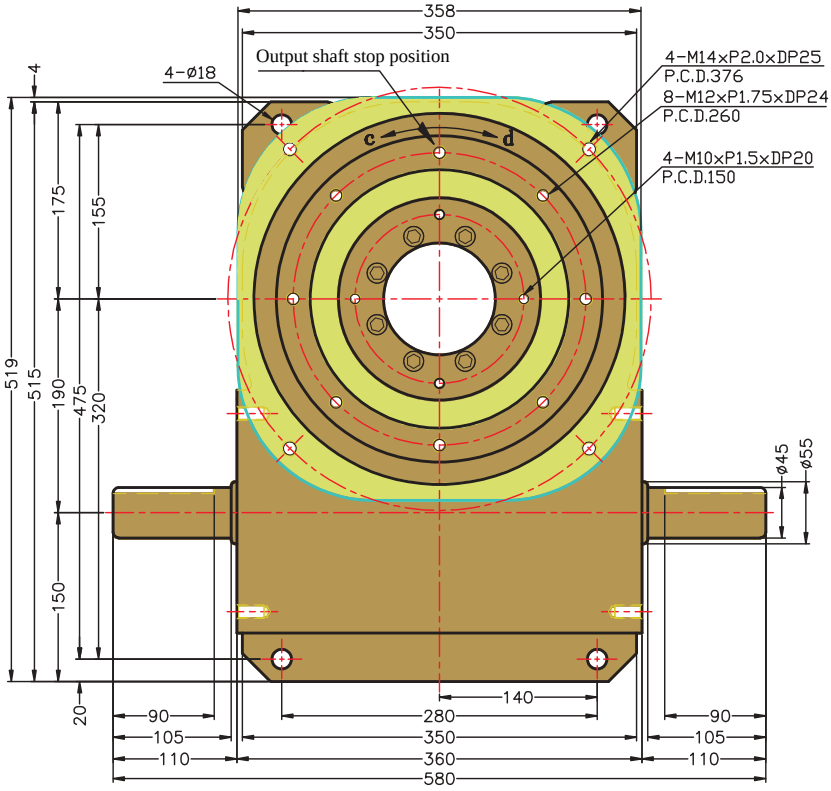


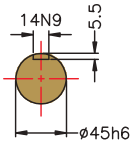
Technical Parameter

Items	Symbol	Unit	Value	Items	Symbol	Unit	Value	Items	Symbol	Unit	Value
Allowable thrust load on output shaft	C1	kgf	1200	Allowable thrust load on input shaft	C3	kgf	410	GD2 of input shaft (Note1)	C6	$kgf-m^2$	2.0×10^{-3}
Allowable radial load on output shaft	C2	kgf	700	Max. repetitive bending force on input shaft	C4	kgf	410	Indexing accuracy		sec.	±30
Allowable torque on output shaft	Ts	kgf-m	Refer torque table	Max. repetitive torque on input shaft	C5	kgf-m	40	Weight		kg	86

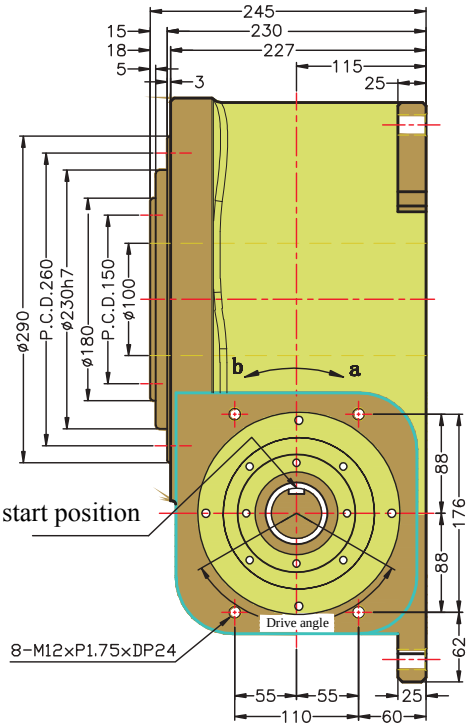
Note1:GD2 of input shaft is a value in dwell range.
Note2: Value of C1 to C5 are those obtained for safety factor=2.

190DA





Input shaft

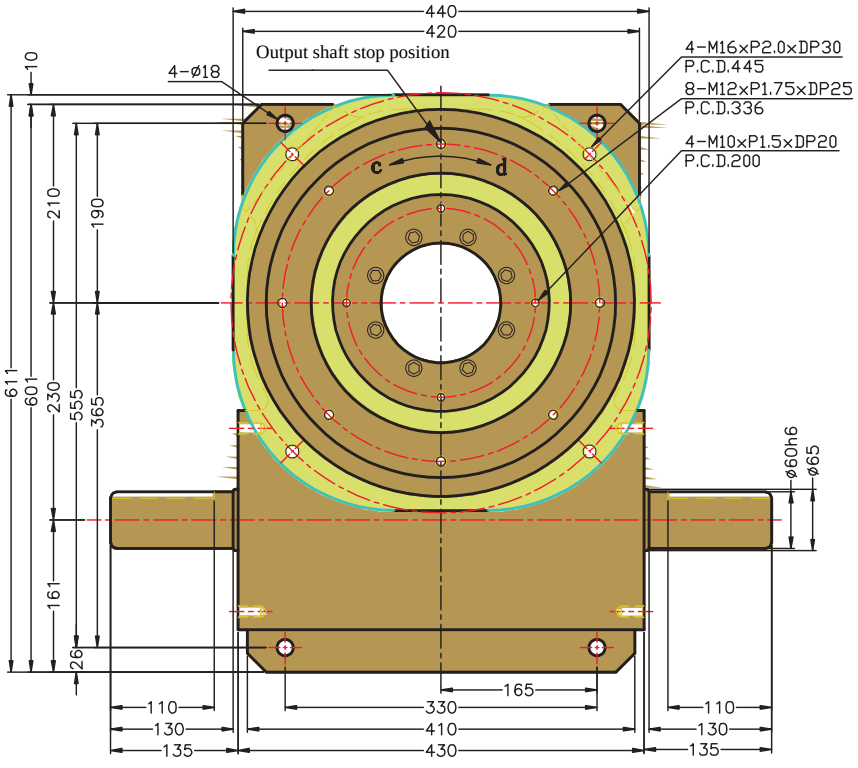


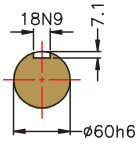
Technical Parameter

Items	Symbol	Unit	Value	Items	Symbol	Unit	Value	Items	Symbol	Unit	Value
Allowable thrust load on output shaft	C1	kgf	1840	Allowable thrust load on input shaft	C3	kgf	510	GD2 of input shaft (Note1)	C6	kgf-m^2	0.105
Allowable radial load on output shaft	C2	kgf	920	Max. repetitive bending force on input shaft	C4	kgf	510	Indexing accuracy		sec.	±30
Allowable torque on output shaft	Ts	kgf-m	Refer torque table	Max. repetitive torque on input shaft	C5	kgf-m	61	Weight		kg	185

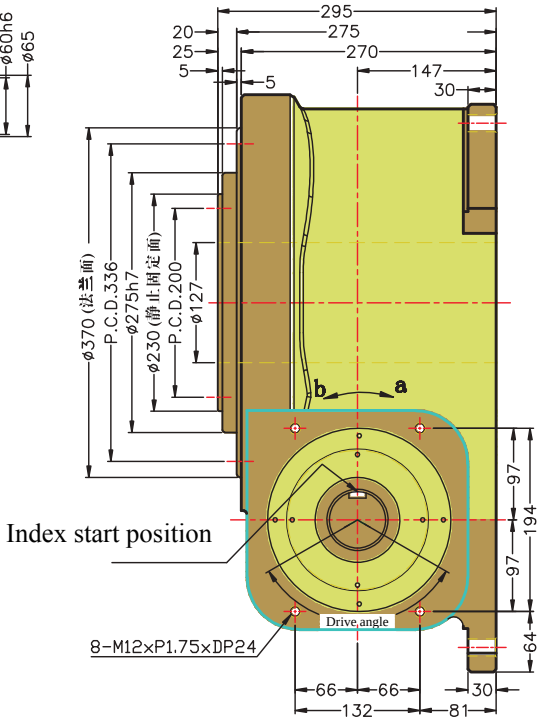
Note1:GD2 of input shaft is a value in dwell range.
Note2: Value of C1 to C5 are those obtained for safety factor=2.

230DA





Input shaft



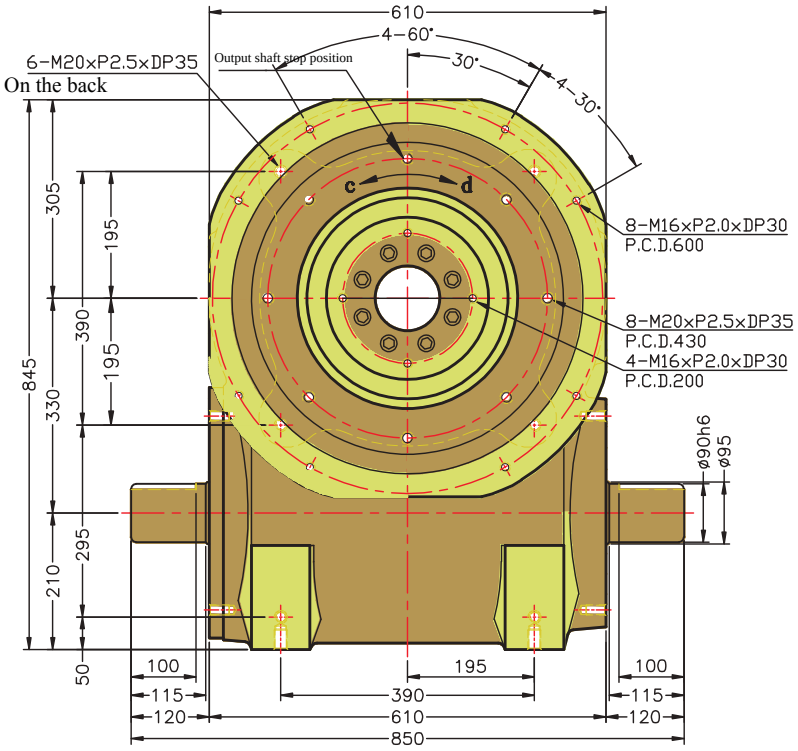
Index start position

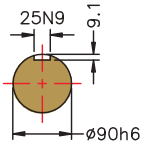
Technical Parameter

Items	Symbol	Unit	Value	Items	Symbol	Unit	Value	Items	Symbol	Unit	Value
Allowable thrust load on output shaft	C1	kgf	2800	Allowable thrust load on input shaft	C3	kgf	650	GD2 of input shaft (Note1)	C6	kgf-m^2	0.136
Allowable radial load on output shaft	C2	kgf	1300	Max. repetitive bending force on input shaft	C4	kgf	650	Indexing accuracy		sec.	±30
Allowable torque on output shaft	Ts	kgf-m	Refer torque table	Max. repetitive torque on input shaft	C5	kgf-m	80	Weight		kg	285

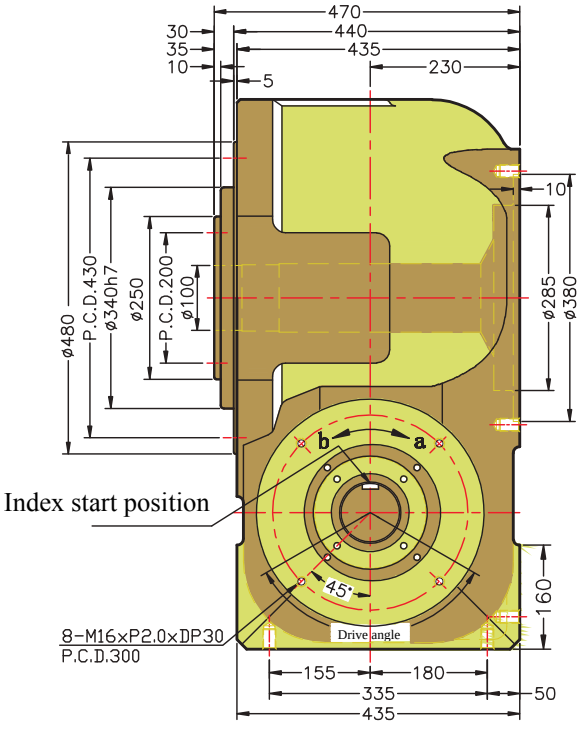
Note1:GD2 of input shaft is a value in dwell range.
Note2: Value of C1 to C5 are those obtained for safety factor=2.

330DA





Input shaft



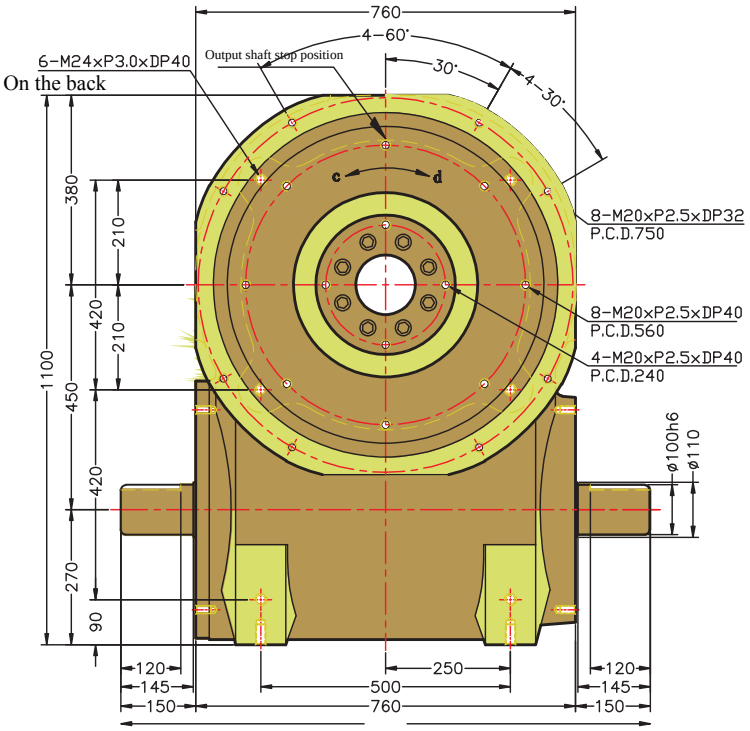
Index start position

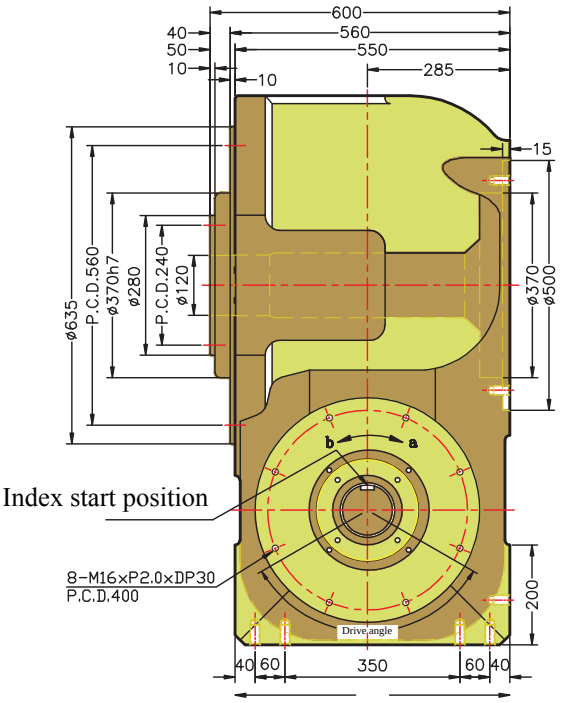
Technical Parameter

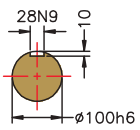
Items	Symbol	Unit	Value	Items	Symbol	Unit	Value	Items	Symbol	Unit	Value
Allowable thrust load on output shaft	C1	kgf	3560	Allowable thrust load on input shaft	C3	kgf	1880	GD2 of input shaft (Note1)	C6	kgf-m^2	1.71
Allowable radial load on output shaft	C2	kgf	3430	Max. repetitive bending force on input shaft	C4	kgf	2150	Indexing accuracy		sec.	±30
Allowable torque on output shaft	Ts	kgf-m	Refer torque table	Max. repetitive torque on input shaft	C5	kgf-m	650	Weight		kg	1000

Note1:GD2 of input shaft is a value in dwell range.
Note2: Value of C1 to C5 are those obtained for safety factor=2.

450DA







Input shaft

Technical Parameter

Items	Symbol	Unit	Value	Items	Symbol	Unit	Value	Items	Symbol	Unit	Value
Allowable thrust load on output shaft	C1	kgf	4850	Allowable thrust load on input shaft	C3	kgf	2460	GD2 of input shaft (Note1)	C6	kgf-m^2	7.9
Allowable radial load on output shaft	C2	kgf	4160	Max. repetitive bending force on input shaft	C4	kgf	2760	Indexing accuracy		sec.	±30
Allowable torque on output shaft	Ts	kgf-m	Refer torque table	Max. repetitive torque on input shaft	C5	kgf-m	860	Weight		kg	1600

Note1:GD2 of input shaft is a value in dwell range.
Note2: Value of C1 to C5 are those obtained for safety factor=2.

DA

Stop S	Index Period θ	Code	Static Torque Ts kgf-m	Net dynamic torque to (kgf-m) Indexes per min.N(rpm) 25	50	75	100	125	150	200	Cam Shaft Riction Torque Tx (kgf-m)
4	270	70DA	20.9	8.2	8.2	8.2	8.2	8.2	8.2	7.7	0.5
		90DA	28.2	19.1	15.5	13.8	12.6	11.8	11.2	10.3	0.7
		110DA	55.2	39.6	32.1	28.4	26.1	24.4	23.1	21.2	1
		150DA	71.2	47	38.2	33.7	31	29	27.4	25.2	1.7
5	240	70DA	8	5.9	4.8	4.2	3.9	3.6	3.4	3.2	0.3
		90DA	31.5	22.4	18.2	16.1	14.8	13.8	13.1	12	0.6
		110DA	37.3	31.3	25.4	22.5	20.7	19.3	18.3	16.8	0.8
		150DA	48.2	49.8	42.2	35	30.4	27.9	26	24.6	1.3
	270	70DA	23.2	8.6	8.6	8.6	8.6	8.6	8.6	8.6	0.5
		90DA	28.2	20.1	16.3	14.8	13.3	12.4	11.8	10.8	0.6
		110DA	61.9	46.5	37.8	33.4	30.7	28.7	27.2	24.9	1
		150DA	78.7	53	43	38.1	34.9	32.7	30.9	28.4	1.5
6	180	70DA	24.3	19.5	16.4	14.5	13.3	12.3	11.8	10.8	0.6
		90DA	45.1	37.4	30.3	26.9	24.7	23.1	21.8	20	0.9
		110DA	69.4	57.6	46.8	41.4	38	35.5	33.6	30.9	1.3
		150DA	66.8	52.2	42.3	37.5	34.4	32.2	30.5	27.9	2.2
	210	70DA	26.2	20	16.2	14.4	13.2	12.3	11.7	10.7	0.5
		90DA	49	37.2	30.2	26.7	24.5	22.9	21.7	19.9	0.9
		110DA	75.3	57.3	46.5	41.2	38	35.5	33.6	30.9	1.3
		150DA	102.8	75	60.9	54	49.5	46.3	43.8	40.2	2.5
	240	70DA	27.7	19.8	16.1	14.2	13	12.2	11.5	10.6	0.6
		90DA	52.1	36.8	29.9	26.5	24.3	22.7	21.5	19.7	0.9
		110DA	88.8	56.7	46.1	40.8	37.4	35	33.1	30.4	1.2
		150DA	110.2	74.6	60.6	53.6	49.2	46	43.6	40	2.4
	270	70DA	28.9	19.5	15.8	14	12.8	12	11.4	10.4	0.5
		90DA	54.6	36.4	29.6	26.2	24	22.5	21.3	19.5	0.8
		110DA	83.9	56.1	45.5	40.3	37	34.6	32.7	30	1.1
		150DA	116.2	74	60.1	53.2	48.8	45.6	43.2	39.6	2.3
8	180	70DA	25.7	9.1	9.1	9.1	9.1	9.1	9.1	9.1	0.4
		90DA	48.8	40.5	31.3	28.9	26.3	22.3	21.2	19.8	0.8
		110DA	76.9	68.6	55.7	49.4	45.3	42.3	40.1	36.8	1.1
		150DA	79.4	85.7	72.7	70.4	59	55.2	52.3	47.9	2
	210	70DA	28.2	12.8	12.8	12.8	12.8	12.8	12.8	12.8	0.4
		90DA	55.3	46.2	37.2	33.2	30.4	28.5	27	24.7	0.8
		110DA	85	71.1	57.7	51.1	46.9	43.9	41.5	38.1	1.1
		150DA	118	104.9	85.2	75.5	69.2	64.8	61.3	56.2	2.3
	240	70DA	28.9	13	13	13	13	13	13	12.5	0.4
		90DA	57.8	45.3	36.8	32.6	29.9	28	26.5	24.3	0.8
		110DA	88.8	69.8	56.7	50.2	46	43.1	40.8	37.4	1.1
		150DA	125	103.4	84	74.4	68.2	63.8	60.4	54	2.3
	270	70DA	29.4	13.1	13.1	13.1	13.1	13.1	13.1	12.1	0.4
		90DA	59.6	44.4	36.1	32	29.3	27.4	26	23.8	0.8
		110DA	91.7	68.4	55.6	49.2	45.1	42.2	40	36.7	1.1
		150DA	128.8	101.7	82.6	73.1	67.1	62.7	59.4	54.5	2.2
10	180	70DA	25.7	9.1	9.1	9.1	9.1	9.1	9.1	9.1	0.4
		90DA	38.5	34.2	27.8	24.6	22.6	21.1	20	18.3	0.6
		110DA	69.2	61.6	50	44.3	40.6	38	36	33	0.9
		150DA	128.8	101.7	82.6	73.1	67.1	62.7	59.4	54.5	1.7
	210	70DA	28.2	12.8	12.8	12.8	12.8	12.8	12.8	12.8	0.4
		90DA	40.1	33.4	27.1	24	22	20.6	19.5	17.9	0.6
		110DA	72.3	60.1	48.8	43.2	39.7	37.1	35.1	32.2	0.9
		150DA	75.1	66.7	54.2	48	44	41.1	39	35.7	1.6
	240	70DA	28.9	13	13	13	13	13	13	12.5	0.4
		90DA	41.3	32.5	26.4	23.4	21.6	20.1	19	17.4	0.6
		110DA	91	76	61.8	54.7	50.2	46.9	44.4	40.7	1.1
		150DA	96.7	84.7	68.8	60.9	55.9	52.3	49.5	45.4	1.8
	270	70DA	29.4	13.1	13.1	13.1	13.1	13.1	13.1	12.1	0.4
		90DA	42.2	31.7	25.8	22.8	20.9	19.6	18.5	17	0.6
		110DA	93.2	74.3	60.3	53.4	49	45.8	43.4	39.8	1.1
		150DA	100.7	83	67.5	59.7	54.8	51.2	48.5	44.5	1.8
12	120	70DA	8.6	7.8	7.4	6.5	6	5.6	5.3	4.9	0.2
		90DA	30.6	27.5	25.1	22.2	20.4	19.1	18.1	16.6	0.6
		110DA	53.5	48.1	48.1	45.8	42	26.2	24.8	22.8	0.7
		150DA									
	150	70DA	9.3	8.4	7.2	6.3	5.8	4.4	5.1	4.7	0.2
		90DA	33.1	29.8	24.4	21.6	19.8	18.5	17.6	16.1	0.6
		110DA	65.6	59	59	52.3	48	29.9	28.3	26	0.7
		150DA	80.1	69.9	56.8	50.3	47.1	36	34	31.2	1.4
	180	70DA	26.9	9.3	9.3	9.3	9.3	9.3	9.3	9.3	0.4
		90DA	36.8	32.7	26.6	23.5	21.6	20.2	19.1	17.5	0.6
		110DA	70.5	63.4	58	51.3	47.1	27.8	27.8	25.5	0.7
		150DA	89	72.7	59.9	52.3	47.9	37.4	35.4	32.5	1.4
	210	70DA	27.7	9.4	9.4	9.4	9.4	9.4	9.4	9.4	0.4
		90DA	38	31.7	25.8	22.8	20.9	19.6	18.5	17	0.6
		110DA	74.1	66.6	56.7	50.2	46.1	28.7	27.2	24.9	0.7
		150DA	93.2	71	577	51.1	46.9	36.5	34.6	31.7	1.4
	240	70DA	28.3	9.5	9.5	9.5	9.5	9.5	9.5	9.5	0.4
		90DA	38.8	31.7	25.8	22.2	20.3	19	18	16.5	0.6
		110DA	76.7	68.3	55.4	49.1	45	28.1	26.6	24.4	0.7
		150DA	119.4	80	65	57.5	52.8	44.9	42.5	39	1.5
	270	70DA	28.7	9.6	9.6	9.6	9.6	9.6	9.6	9.6	0.4
		90DA	39.4	30	24.3	21.3	198	18.5	17.5	16.1	0.6
		110DA	111	62.6	50.9	45.1	41.3	38.7	36.6	33.6	0.8
		150DA	119.4	78.2	63.5	56.2	51.6	43.9	41.5	38.1	1.5
15	150	70DA	5	4.5	4	3.5	3.2	3	2.9	2.6	0.2
		90DA	35.1	31.6	27.3	24.2	22.2	20.8	19.7	18	0.6
		110DA	65.1	58.6	58.6	58.6	54.8	29.6	28	25.7	0.7
		150DA	70.9	63.8	63.8	63.8	62.4	33.7	31.9	29.3	1.2
	180	70DA	5.2	4.7	3.8	3.4	3.1	2.9	2.7	2.5	0.2
		90DA	36.3	32.4	26.3	23.3	21.4	20	18.9	17.4	0.5
		110DA	68.7	61.8	61.8	58.1	53.3	28.8	27.3	25	0.7
		150DA	91.5	77.3	62.8	55.6	51	39.7	37.6	34.5	1.3
	210	70DA	10.5	9.2	7.4	6.6	6	5.7	5.3	4.9	0.2
		90DA	37.1	31.3	25.4	22.5	20.6	19.3	18.3	16.8	0.5
		110DA	71.2	64.1	63.8	56.5	51.8	28	26.5	24.3	0.6
		150DA	94.6	75	60.9	54	49.5	38.6	36.5	33.5	1.3
	240	70DA	10.6	8.9	7.2	6.4	5.8	5.5	5.2	4.8	0.2
		90DA	37.6	30.3	24.6	21.8	20	18.7	17.7	16.2	0.5
		110DA	73	65.7	62.1	54.9	50.4	27.2	25.8	23.6	0.6
		150DA	102	72.9	59.2	52.4	48.1	37.5	35.5	32.5	1.3
	270	70DA	10.7	8.6	7	6.2	5.7	5.3	5	4.6	0.2
		90DA	38	29.4	23.9	21.1	19.4	18.1	17.2	15.7	0.5
		110DA	74.3	66.8	60.4	53.5	49.1	26.5	25.1	23	0.6
		150DA	102	75.2	61.1	54.1	49.6	38.7	36.6	38.1	1.3
16	150	70DA	5	4.5	4	3.5	3.2	3	2.9	2.6	0.2
		90DA	35.5	32	28.2	24.9	22.9	21.4	20.3	18.6	0.5
		110DA	66.5	59.8	59.8	59.8	56.8	30.6	29	26.6	0.7
		150DA	72.6	65.4	65.4	65.4	64.8	35	33.1	30.4	1.3
	180	70DA	5.2	4.7	3.8	3.4	3.1	2.9	2.7	2.5	0.2
		90DA	36.7	33	27.1	24	22	20.6	19.5	17.9	0.5
		110DA	69.8	62.8	62.8	60	55.1	29.7	28.2	25.8	0.6
		150DA	77	69.3	69.3	68.8	63.2	34.1	32.3	29.6	1.3
	210	70DA	5.3	4.5	3.7	3.3	3	2.8	2.7	2.4	0.2
		90DA	37.4	32.1	26.1	23.1	21.2	19.8	18.8	17.2	0.5
		110DA	72.1	64.9	64.9	58.2	53.4	28.8	27.3	25.1	0.6
		150DA	80	72	72	67	61.5	33.2	31.4	28.8	1.3
	※ 210	70DA	29.2	21.4	21.4	21.4	20	18.7	17.7	16.1	0.5
		90DA	37.6	33.9	29.2	25.8	23.7	22.2	21	19.2	0.7
		110DA	85	76.5	71.1	62.9	57.7	54	51.1	46.9	1.1
		150DA	61.6	56.9	50.4	46.2	43.2	43.2	40.9	37.5	1.1

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

DA

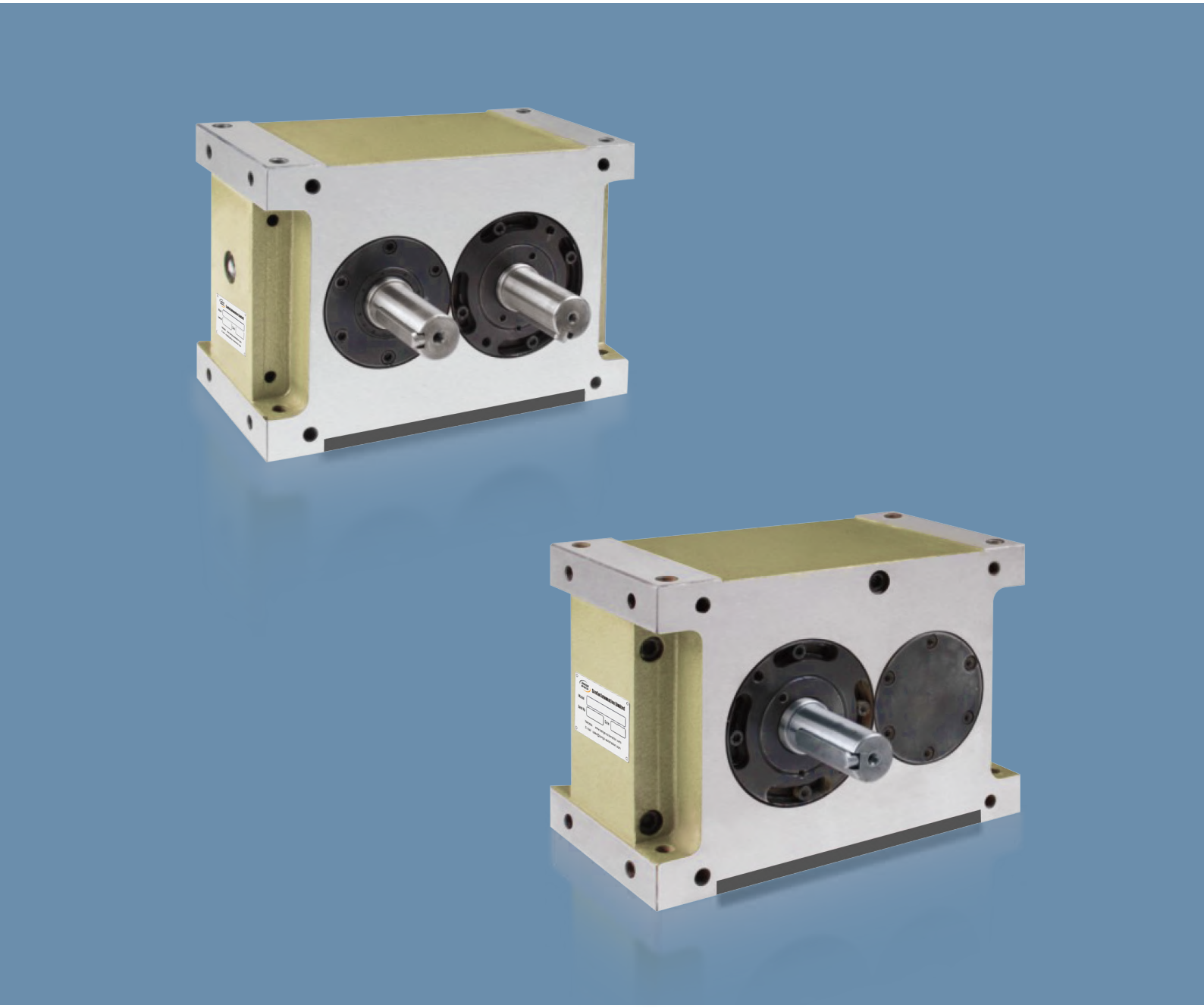
Stop S	Index Period θ	Code	Static Torque Ts kgf-m	Net dynamic torque to (kgf-m) Indexes per min.N(rpm) 25	50	75	100	125	150	200	Cam Shaft Riction Torque Tx (kgf-m)
16	240	70DA	5.4	5.5	3.6	3.2	2.9	2.7	2.6	2.4	0.2
		90DA	37.9	31.1	25.2	22.4	20.5	19.2	18.2	16.6	0.5
		110DA	73.7	66.3	63.9	56.6	51.9	28	26.5	24.3	0.6
		150DA	99.1	74	73.7	65.3	59.9	32.3	30.6	28.1	1.1
	※ 240	70DA	29.4	21.8	21.8	20.5	19.6	18.3	17.3	15.9	0.5
		90DA	39.2	35.2	28.6	25.3	23.2	21.7	20.6	18.9	0.6
		110DA	88.8	79.9	69.8	61.8	56.7	53	50.2	46	1.1
		150DA	90.5	81.5	73	64.7	59.3	55.5	52.5	48.2	1
	270	70DA	5.4	4.3	3.5	3.1	2.8	2.6	2.5	2.3	0.2
		90DA	38.2	30.1	24.5	21.7	19.9	18.6	17.6	16.2	0.5
		110DA	74.9	67.4	62.2	55.1	50.5	27.3	25.8	23.7	0.6
		150DA	991	72.9	59.2	52.5	48.1	37.5	35.5	32.6	1.2
	※ 270	70DA	31.3	22.2	22.2	20.9	19.1	17.9	16.9	15.6	0.5
		90DA	59.6	53.7	44.4	39.4	36.1	33.8	32	29.3	0.8
		110DA	91.7	82.5	68.4	60.6	55.6	52	49.2	45.1	1.1
		150DA	128.7	115.9	101.7	90	82.6	77.2	73.1	67.1	1.2
20	※ 180	70DA	25.7	9.1	9.1	9.1	9.1	9.1	9.1	9.1	0.4
		90DA	38.5	34.6	34.2	30.3	27.8	26	24.6	22.6	0.6
		110DA	69.2	62.3	61.5	54.5	50.5	46.8	44.3	40.6	0.9
		150DA	70.6	63.6	63.6	60	55	51.4	48.7	44.7	1.7
	※ 210	70DA	26.7	9.3	9.3	9.3	9.3	9.3	9.3	9.3	0.4
		90DA	40.1	36.1	33.4	29.5	27.1	25.3	24	22	0.6
		110DA	72.3	65.1	60.1	53.2	48.8	45.7	43.2	39.7	0.9
		150DA	93.6	84.2	84.2	76.4	70.1	65.6	62.1	56.9	1.8
	※ 240	70DA	27.5	9.4	9.4	9.4	9.4	9.4	9.4	9.4	0.4
		90DA	41.3	37.2	32.5	28.8	26.4	24.7	23.4	21.5	0.6
		110DA	91	81.9	76	67.3	61.8	57.8	54.7	50.2	1
		150DA	97.6	87.9	84.7	75	68.8	64.3	60.9	55.9	1.8
	※ 270	70DA	28.7	9.6	9.6	9.6	9.6	9.6	9.6	9.6	0.4
		90DA	42.2	38	31.7	28.1	25.8	24.1	22.8	20.9	0.6
		110DA	93.2	83.9	74.3	65.8	60.3	56.4	53.4	49	1
		150DA	100.7	90.6	83	73.5	67.5	63.1	59.7	54.8	1.8

Stop S	Index Period θ	Code	Static Torque Ts kgf-m	Net dynamic torque to (kgf-m) Indexes per min.N(rpm) 25	50	75	100	125	150	200	Cam Shaft Riction Torque Tx (kgf-m)
24	※ 180	70DA	9.8	8.8	8.5	7.6	6.9	6.5	6.1	5.6	0.2
		90DA	36.8	33.1	32.7	29	26.6	24.8	23.5	21.6	0.6
		110DA	70.5	63.4	63.4	63.2	58	36.1	34.2	31.4	0.7
		150DA	89	80.1	72.7	64.3	59.9	46	43.6	40	1.4
	※ 210	70DA	10.1	9.1	8.3	7.3	6.7	6.3	6	5.5	0.2
		90DA	38	34.2	31.7	28.1	25.8	24.1	22.8	20.9	0.6
		110DA	74.1	66.6	66.6	61.8	56.7	35.4	33.5	30.7	0.7
		150DA	93.2	83.9	71	62.9	57.7	45	42.6	39	1.4
	※ 240	70DA	10.3	9.3	8	7.1	6.5	6.1	5.8	5.3	0.4
		90DA	38.8	34.9	30.8	17.3	25	23.4	22.2	20.3	0.6
		110DA	76.7	69	68.3	60.4	55.4	34.6	32.7	30	0.7
		150DA	96.3	85.4	69.3	61.4	56.3	43.9	41.6	38.1	1.4
	※ 270	70DA	28.7	9.9	9.6	9.6	9.6	9.6	9.6	9.6	0.4
		90DA	39.4	35.5	30	26.5	24.3	22.8	21.6	19.8	0.6
		110DA	111	77.1	62.2	55.5	50.9	47.6	45.1	41.3	0.8
		150DA	119.4	96.2	78.2	69.2	63.5	54	51.1	46.9	1.5
32	※ 180	70DA	5.2	4.7	4.7	4.2	3.8	3.6	3.4	3.1	0.2
		90DA	36.7	33	33	29.5	27.1	25.3	24	22	0.5
		110DA	69.8	62.8	62.8	62.8	62.8	36.3	34.7	31.8	0.6
		150DA	69.3	64.3	64.3	64.3	64.3	40	398	36.5	1.1
	※ 210	70DA	5.3	4.8	4.5	4	3.7	3.4	3.3	3	0.2
		90DA	37.4	33.6	32.1	28.5	26.1	24.4	23.1	21.2	0.5
		110DA	72.1	65.2	64.9	64.7	64.5	35.5	33.6	30.8	0.6
		150DA	80	72	72	72	72	40.9	38.7	35.5	1.1
	※ 240	70DA	5.4	4.9	4.9	3.9	3.6	3.3	3.2	2.9	0.2
		90DA	38	34.1	31.1	27.5	25.3	23.5	22.4	20.5	0.5
		110DA	73.7	66.3	66.3	66.3	66.9	34.5	32.7	30	0.6
		150DA	82.2	74	74	74	74	39.8	37.7	34.6	1.1
	※ 270	70DA	5.4	4.9	4.3	3.8	3.5	3.2	3.1	2.8	0.2
		90DA	38.2	34.4	30.1	26.7	24.5	22.9	21.7	19.9	0.5
		110DA	74.9	67.4	67.4	67.4	62.3	33.6	31.8	29.2	0.6
		150DA	99.1	89.2	72.9	64.6	59.2	46.2	43.7	40.1	1.3

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

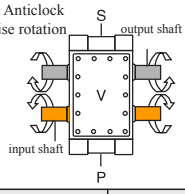
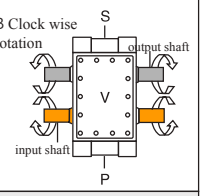
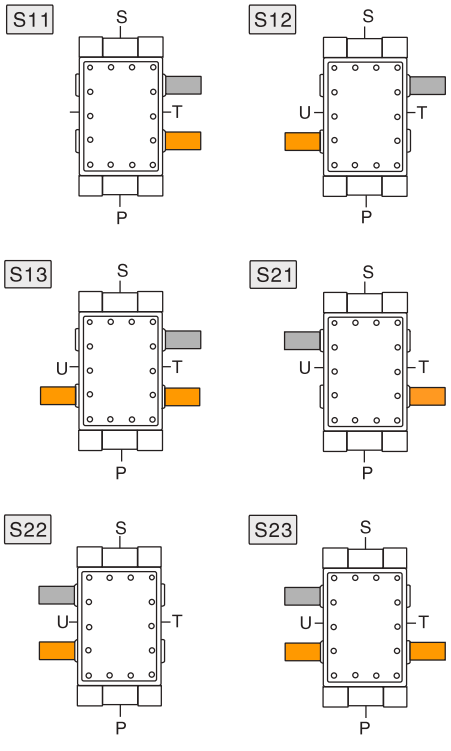
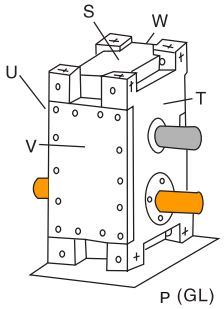
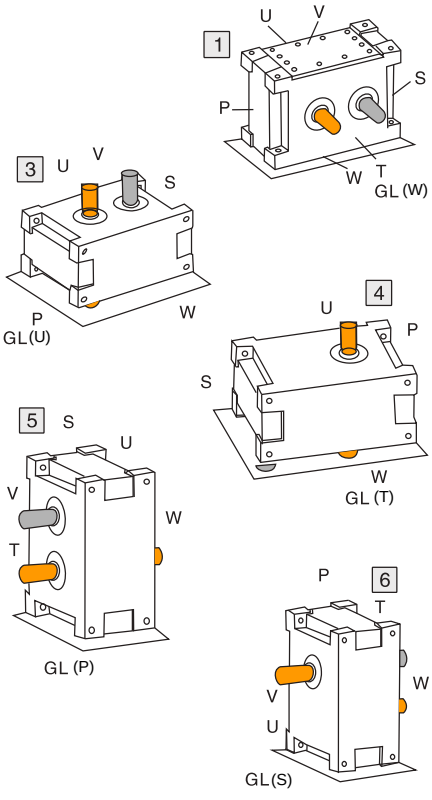
Paradex Model

(PU50,PU60,PU80,PU100,PU125,PU150,PU175,PU225,PU250,PU320)

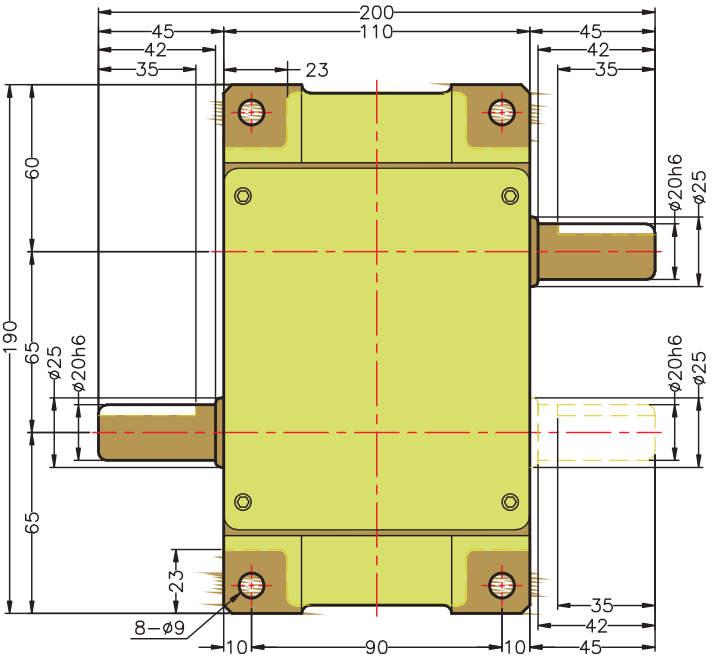


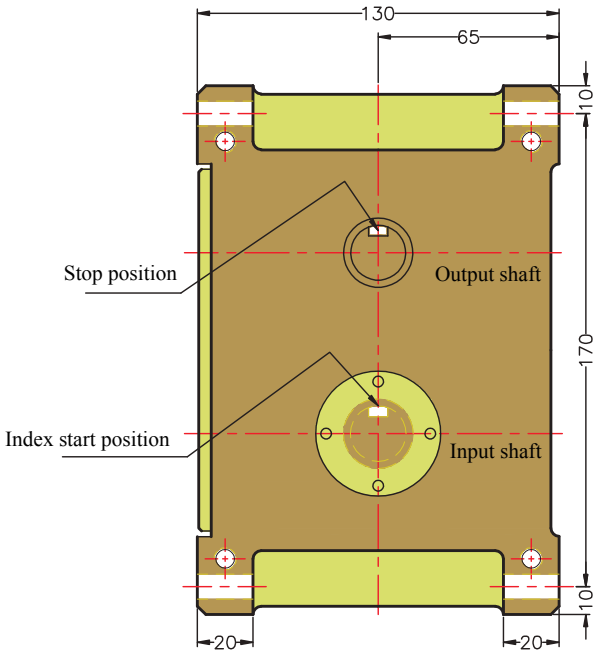
Model Code

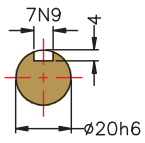
PU100D	01 270	2	A	S12	VW	1	/	X
a	b	c	d	e	f	g	h	i

a Size	b Stop	C Drive Angels(θh)	d Motion Cur	e Head of Cam	
PU100D 100mm	01 L stop	270 270°	2 MS Curve	A Dwell Right Hand Cam	
50D/65D/ 80D/100D/ 125D/150D/ 175D/200D/ 250D/320D/ 225D	Number of stops of the Indexing 1.2.3.4.6.8	Cam rotation period (during which the output moves.) 90°/120°150°/180° 210°/240° 270°/300	1 2 3 4 Curve selcection 1 MT (Modified Traprzoid) 2 MS(Modified Sine) 3 MCV50 (Modified Constant Veiocity 50)	A Anticlock wise rotation  B Clock wise rotation 	
	f Input Shaft Projection		g Mounting Holes	h Mounting Position	i Special Instructions
	S12 Both T and U Surface		VW	1	X
Select the output/ input shaft location of the assembly box S11 Output/ input shaft at plane T S12 Output shaft at plane T, input shaft at plane U S13 Output shaft at plane T, input shaft cross plane T/U S21 Output shaft at plane U,S21 input shaft at plane T S22 Output/ input shaft at plane 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, "VW" 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
Input shaft Output shaft 					

PU65





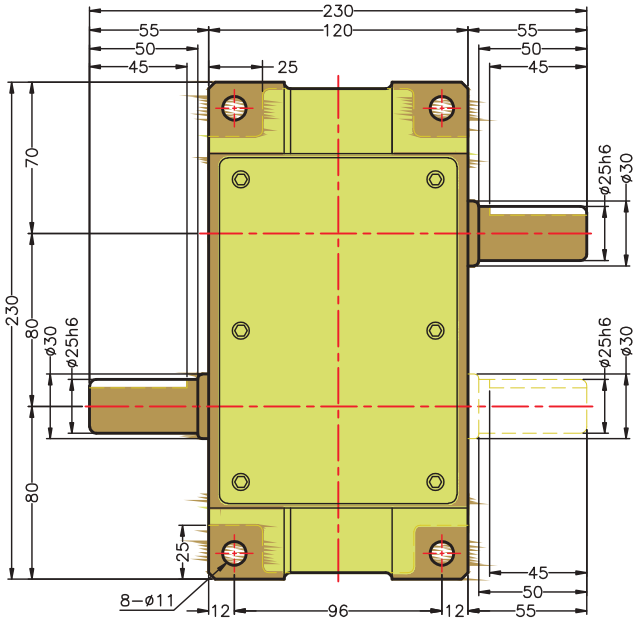


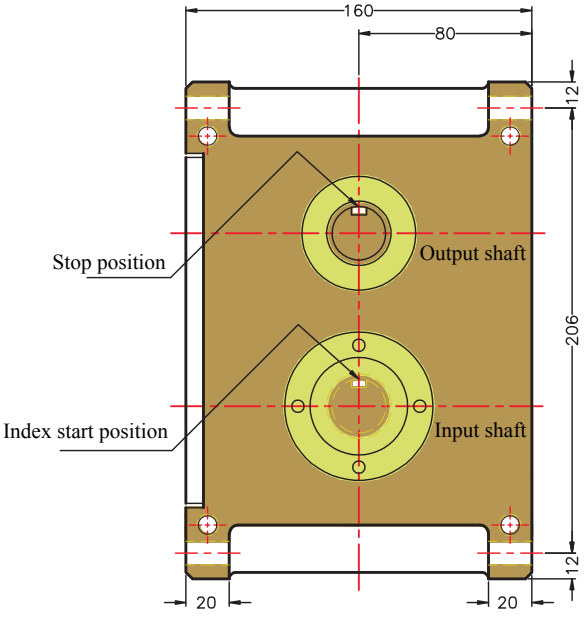
Output / Input shaft

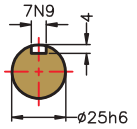
Technical Parameter

Item	Symbol	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	$9.2x10^2$
Input shaft allowable axial stress	P4	kgf	250
Allowable thrust load on input shaft	P5	kgf	160
Allowable torque	P6	kgf-m/rad	11
Input shaft rotary rigid	K2	sec	$9.2x10^2$
1DWELL segmentation accuracy		sec	±60
2DWELL segmentation accuracy		sec	±120
Repeat positioning accuracy		sec	60
Weight		kg	15

PU80





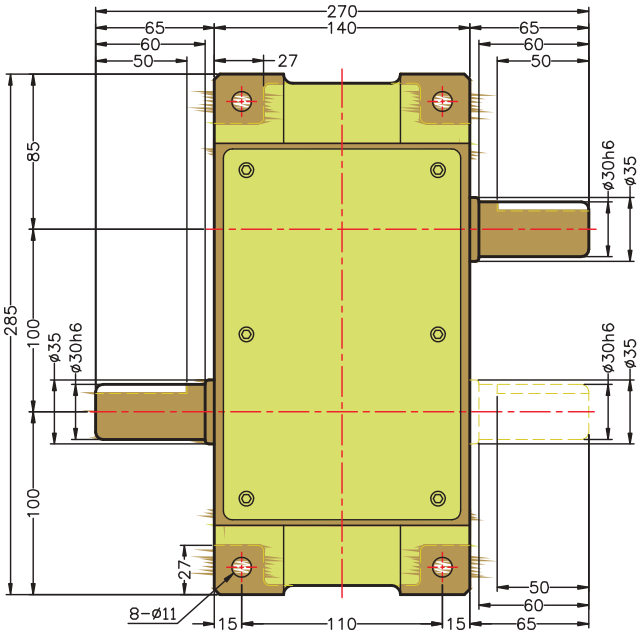


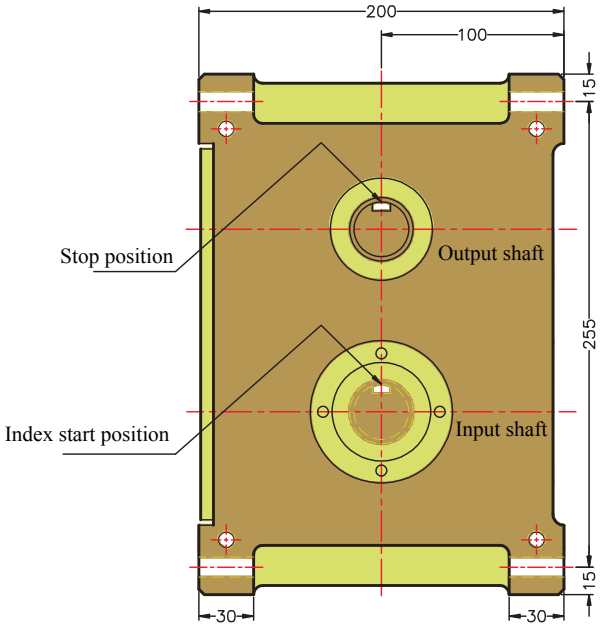
Output / Input shaft

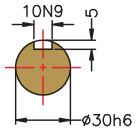
Technical Parameter

Item	Symbol	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/rad	25
Input shaft rotary rigid	K2	sec	1.85×10^3
1DWELL segmentation accuracy		sec	±60
2DWELL segmentation accuracy		sec	±120
Repeat positioning accuracy		sec	60
Weight		kg	20

PU100





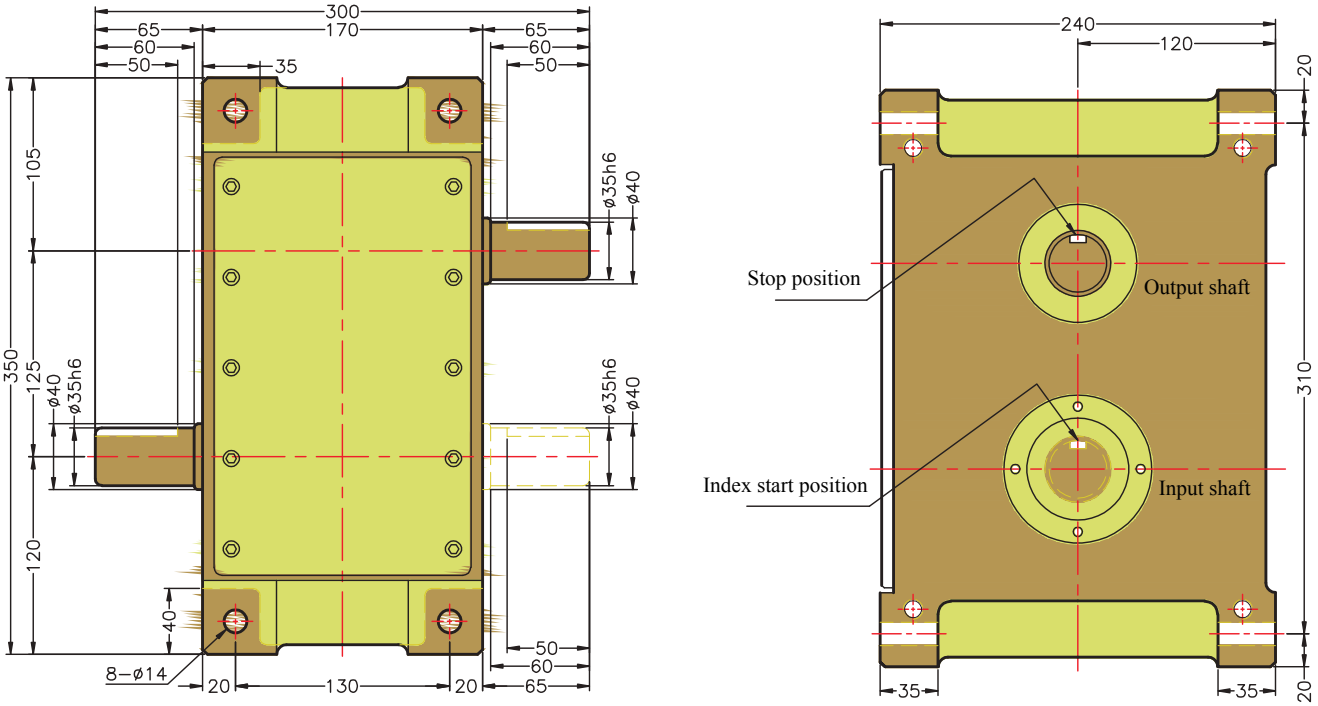


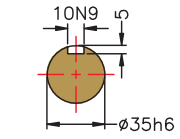
Output / Input shaft

Technical Parameter

Item	Symbol	Unit	Value
Allowable thrust load on output shaft	P1	kgf	480
Allowable radial load on output shaft	P2	kgf	400
Allowable torque on output shaft	Ts	kgf-m	Refer torque table
Output shaft rotary rigid	K1	kgf-m/rad	3.26×10^3
Input shaft allowable axial stress	P4	kgf	480
Allowable thrust load on input shaft	P5	kgf	400
Allowable torque	P6	kgf-m/rad	40
Input shaft rotary rigid	K2	sec	3.26×10^3
1DWELL segmentation accuracy		sec	±60
2DWELL segmentation accuracy		sec	±120
Repeat positioning accuracy		sec	60
Weight		kg	38

PU125



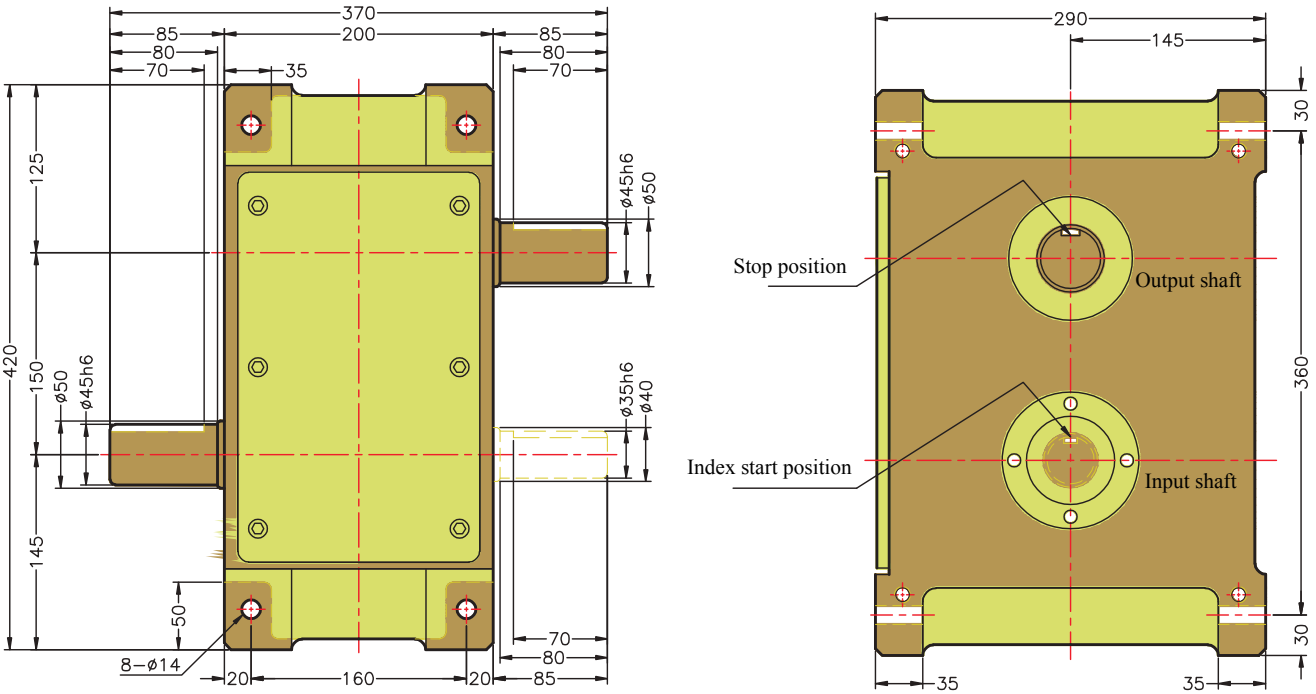


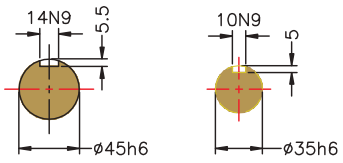
Output / Input shaft

Technical Parameter

Item	Symbol	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	5.03×10^3
Input shaft allowable axial stress	P4	kgf	520
Allowable thrust load on input shaft	P5	kgf	630
Allowable torque	P6	kgf-m/rad	65
Input shaft rotary rigid	K2	sec	5.03×10^3
1DWELL segmentation accuracy		sec	±60
2DWELL segmentation accuracy		sec	±120
Repeat positioning accuracy		sec	60
Weight		kg	65

PU150



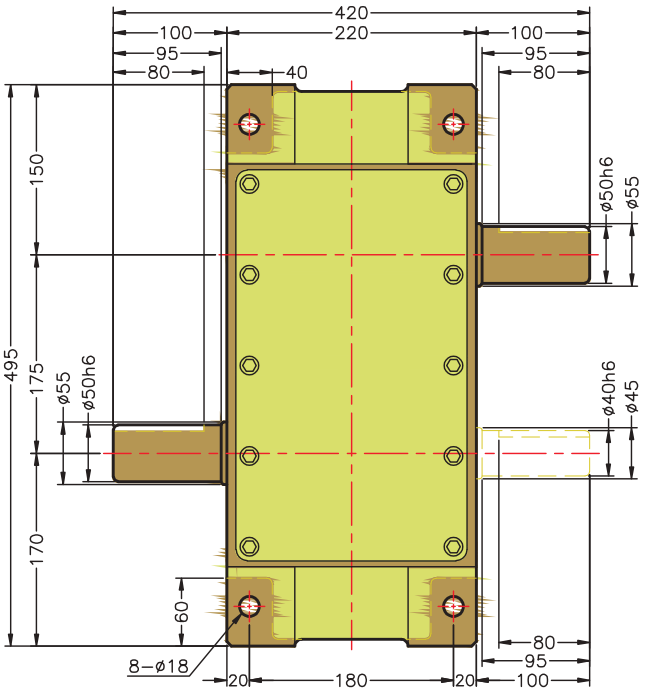


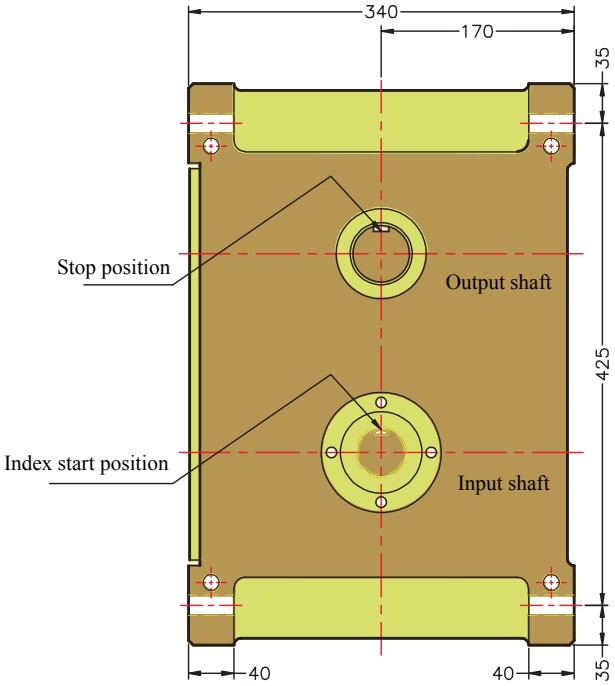
Output / Input shaft　　Input shaft

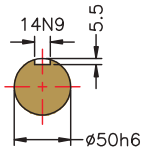
Technical Parameter

Item	Symbol	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	$1.8x10^4$
Input shaft allowable axial stress	P4	kgf	750
Allowable thrust load on input shaft	P5	kgf	880
Allowable torque	P6	kgf-m/rad	135
Input shaft rotary rigid	K2	sec	$1.8x10^4$
1DWELL segmentation accuracy		sec	±60
2DWELL segmentation accuracy		sec	±120
Repeat positioning accuracy		sec	60
Weight		kg	87

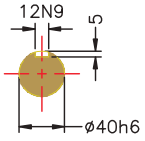
PU175







Output / Input shaft

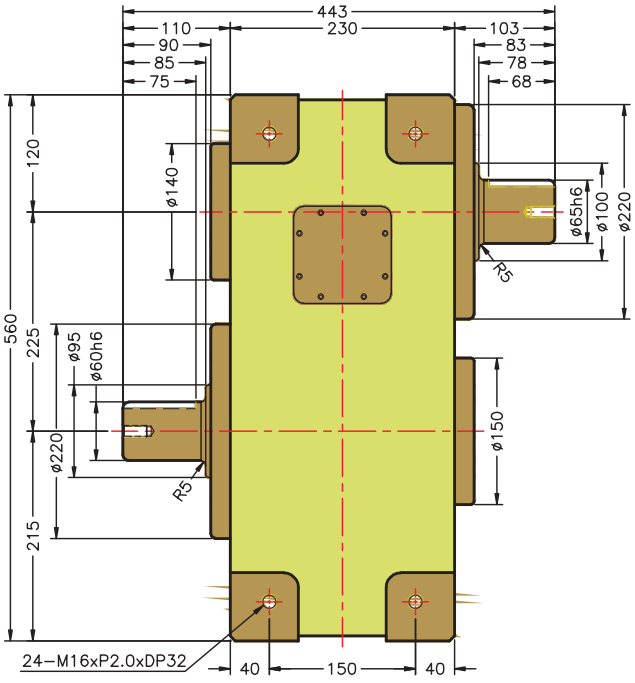


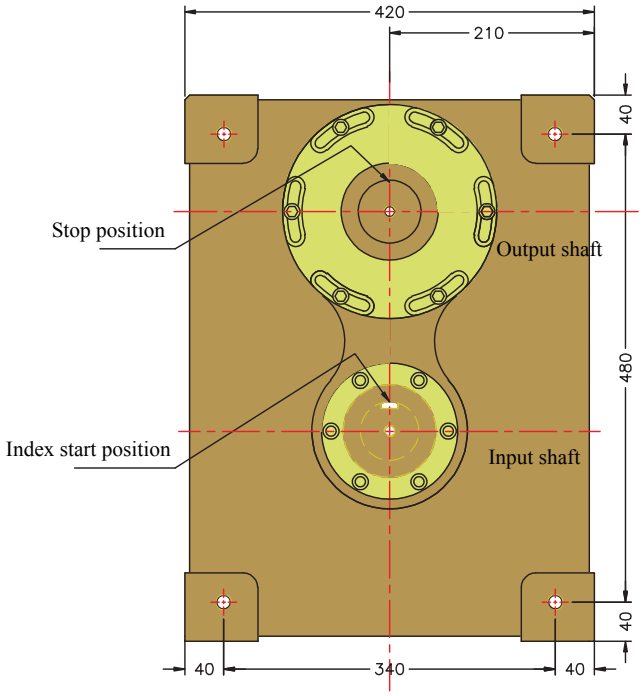
Input shaft

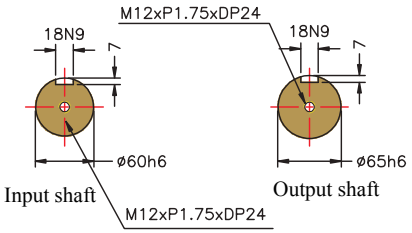
Technical Parameter

Item	Symbol	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	1.68×10^4
Input shaft allowable axial stress	P4	kgf	920
Allowable thrust load on input shaft	P5	kgf	1000
Allowable torque	P6	kgf-m/rad	185
Input shaft rotary rigid	K2	sec	1.68×10^4
1DWELL segmentation accuracy		sec	±60
2DWELL segmentation accuracy		sec	±120
Repeat positioning accuracy		sec	60
Weight		kg	127

PU225



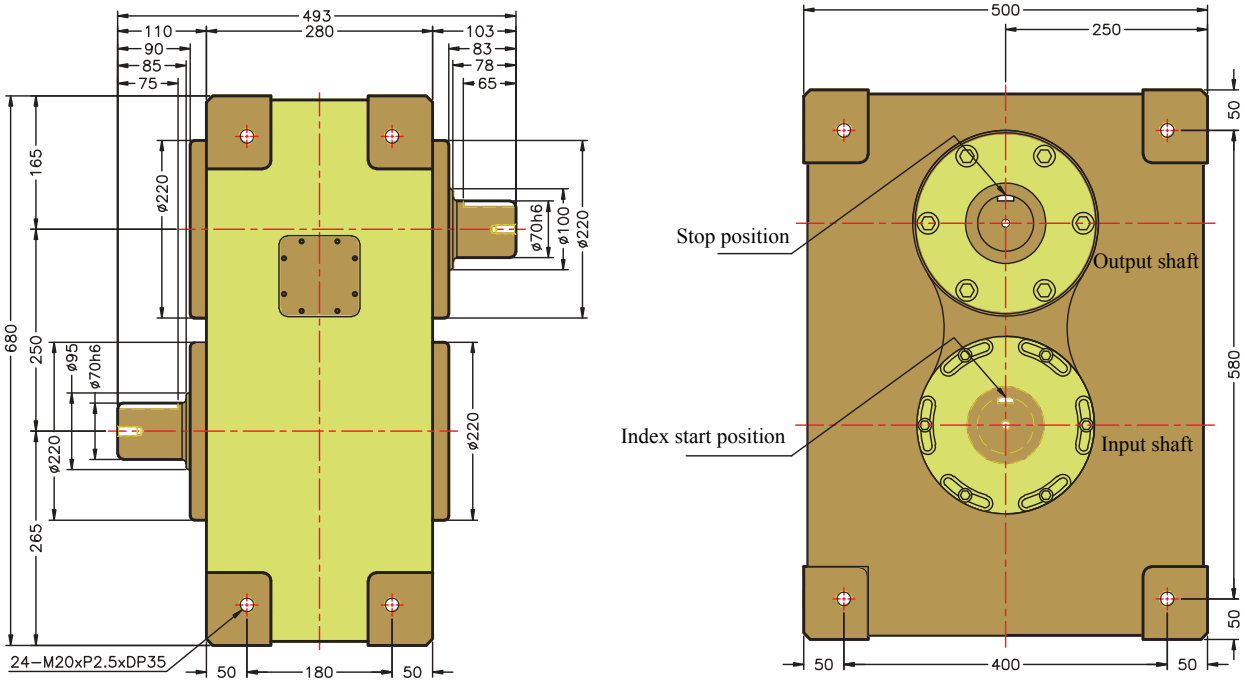


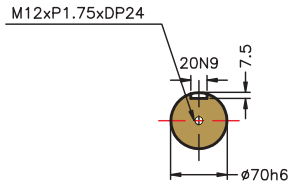


Technical Parameter

Item	Symbol	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	1470
Allowable torque	P6	kgf-m/rad	410
Input shaft rotary rigid	K2	sec	4.31×10^4
1DWELL segmentation accuracy		sec	±60
2DWELL segmentation accuracy		sec	±120
Repeat positioning accuracy		sec	60
Weight		kg	220

PU250



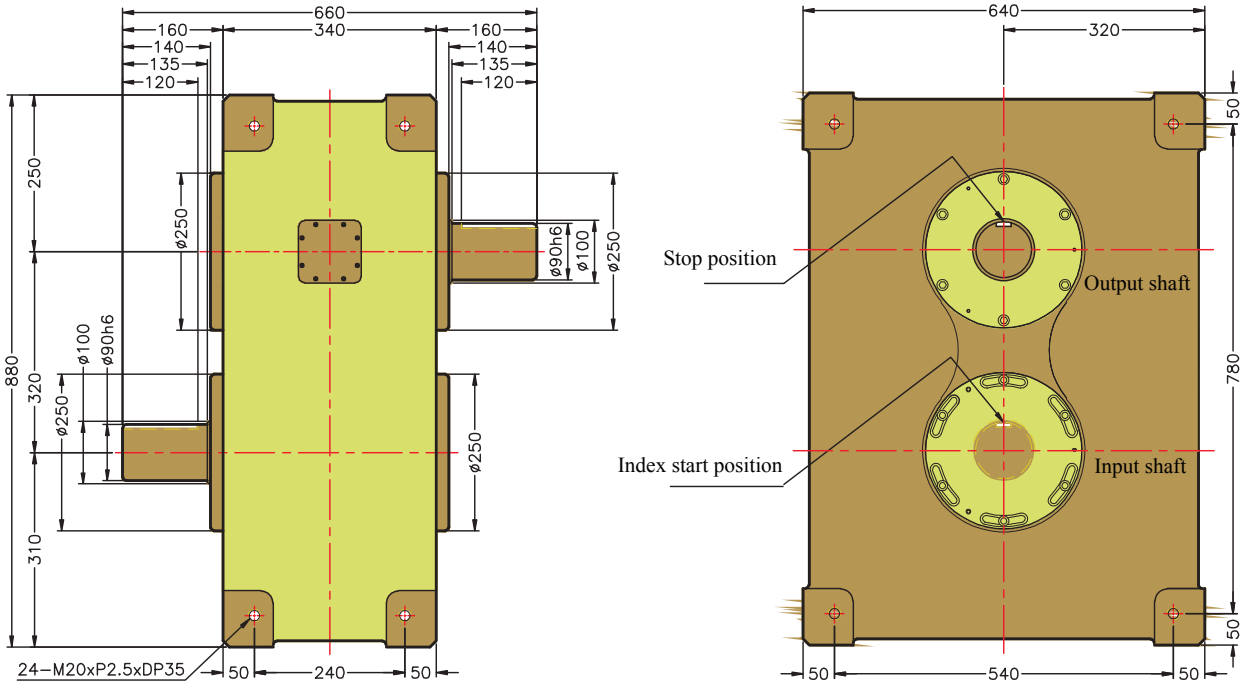


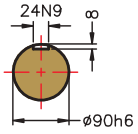
Output / Input shaft

Technical Parameter

Item	Symbol	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/rad	500
Input shaft rotary rigid	K2	sec	5.37×10^4
1DWELL segmentation accuracy		sec	±60
2DWELL segmentation accuracy		sec	±120
Repeat positioning accuracy		sec	60
Weight		kg	388

PU320





Output / Input shaft

Technical Parameter

Item	Symbol	Unit	Value
Allowable thrust load on output shaft	P1	kgf	1750
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	5.82×10^4
Input shaft allowable axial stress	P4	kgf	1690
Allowable thrust load on input shaft	P5	kgf	2670
Allowable torque	P6	kgf−m/rad	580
Input shaft rotary rigid	K2	sec	5.82×10^4
1DWELL segmentation accuracy		sec	±60
2DWELL segmentation accuracy		sec	±120
Repeat positioning accuracy		sec	60
Weight		kg	750

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: _____ RMP

4. Disc (diameter): _____ mm; Thickness: _____ mm; Material: _____ mm;

5·Weight of each group fixture: _____ kg

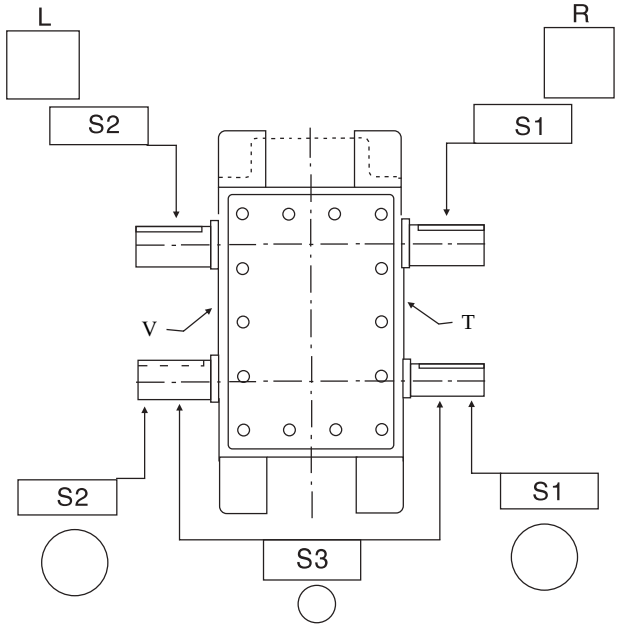
6··Weight of each group workpiece: _____ kg

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)

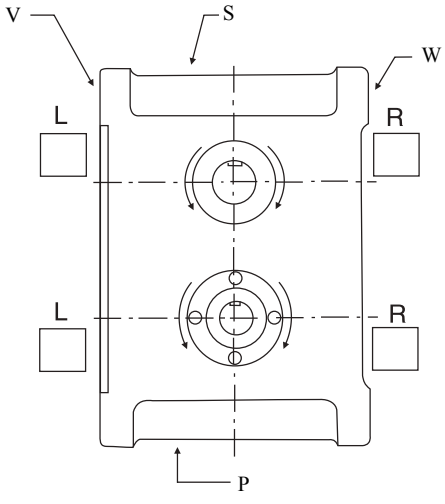
Indexer mounting surface: **P** _____ **S** _____ **T** _____ **U** _____ **V** _____ **W** _____

Please check the needs of output shaft direction.
Right side S1 , Left side S2



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: _____ RMP

4. Pitch of conveyor 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 _____ mm

8. Pitch circle diameter of the sprocket wheel: _____ mm Weight _____ kg Quantity _____ mm

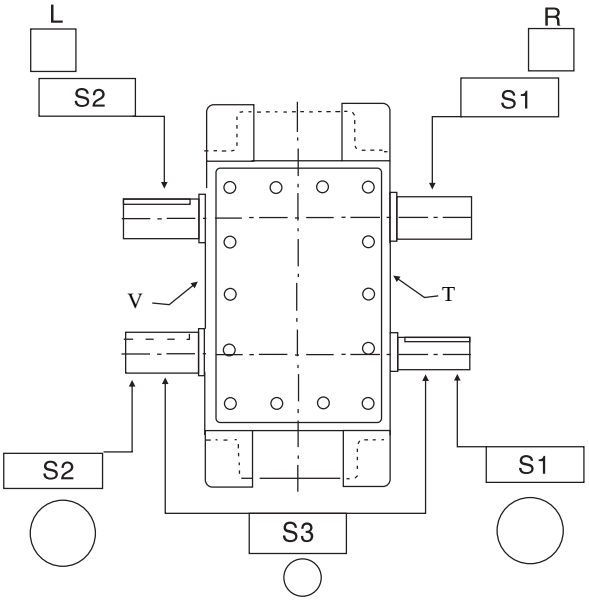
9. Weight of chain: _____ kg Quantity _____ mm

10. Weight of each fixture set: _____ kg Quantity _____ mm

11. Weight of each workpiece set: _____ kg Quantity _____ mm

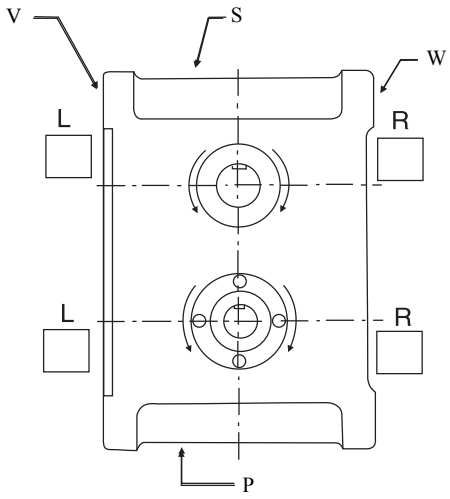
Indexer mounting surface: **P**_____ **S** _____ **T** _____ **U** _____ **V** _____ **W**_____

Please check the needs of output shaft direction.
Right side S1 , Left side S2



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

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: _____ RMP

4.Pitch circle diameter of driving wheel:_____ mm; weight: _____ kg

5.PPitch circle diameter of follower wheel:_____mm; weight: _____ kg

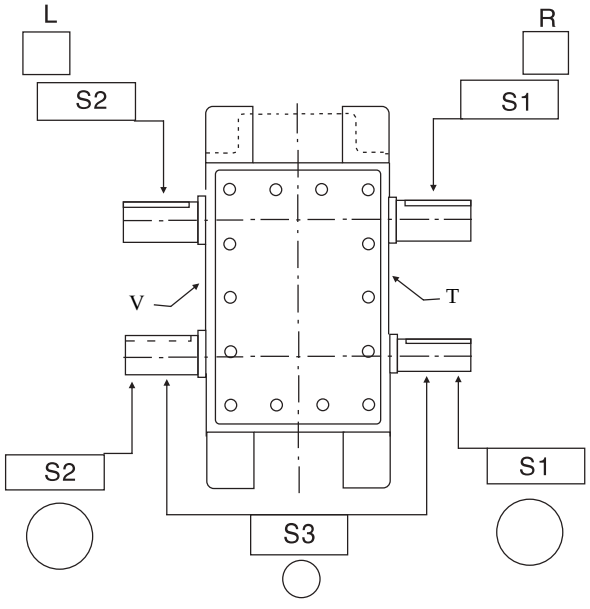
6.Weight of each group workpiece: _____kg

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)

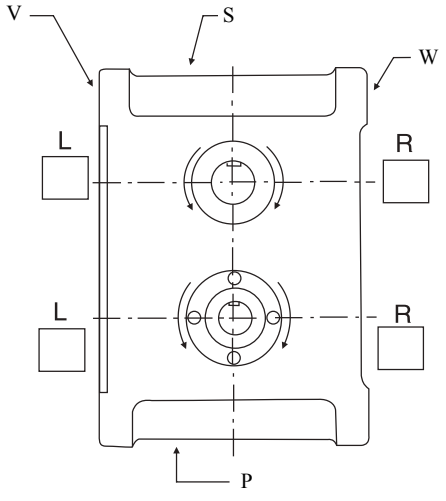
Indexer mounting surface: P_____ S _____ T _____ U _____ V _____ W_____

Please check the needs of output shaft direction.
Right side S1 , Left side S2



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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