Important safety information

Be sure to read this section before starting use.

When designing or selecting

CAUTION

1 Selection

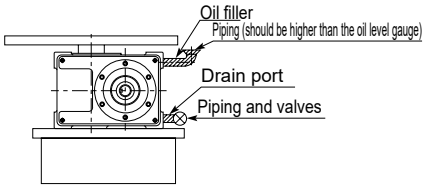
1) The load torque should be smaller than the dynamic rated output torque of index drive.
2) When you operate the input shaft at 200 rpm or faster, consult CKD as the installation adjustment procedure for high speed operation is required. (Special specifications)
3) Allowable max. diameter of the table
   The max. diameter of the table should be less than the allowable max. table diameter calculated when selecting index drive.
   Contact CKD if it exceeds this.
4) When you operate index drive intermittently using clutch/brake, check the motion time of the clutch/brake.
   The motion time of the clutch/brake varies depending on the characteristics of the clutch/brake itself and the rotation speed and moment of inertia of the shaft/pulley to be operated.
5) When you install a detection switch, check the response time of the detection switch.
   If the input shaft speed is fast, the detection switch may not be able to detect.
6) Index drive should be used in the ambient temperature of 0 to 40 degrees C. (no condensation)
   Also, mount a cover in dusty places or those exposed to water or oil drops, etc.
7) Note that optionally mountable parts have specifications, characteristic values, and durability set by their manufacturers; in some cases, depending on the usage environment, speed, or frequency, they may not be available for use or may have shortened service lives. Refer to each manufacturer's catalog for details.

Service life suggested by the manufacturers of optional components.

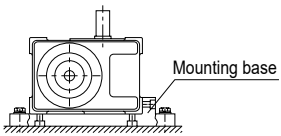
Options	Approximate service life	Manufacturer
Motor with brake or with C/B	2,000,000 operating cycles	Oriental Motors

2 Design of mounting and installation

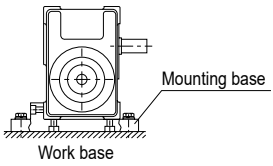
1) When you design the mounting and installation of index drive, take into consideration that inspection, disassembly and assembly should be able to be easily conducted and the oil level gauge should be accessible.



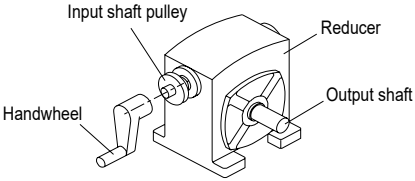
2) When you install index drive in an automated machine, replacing oil may become impossible. In this case, we recommend you should provide piping for draining and refilling oil before installation so that you can replace it easily.



3) Index drive receives a large load. As in the right diagram, it should be securely fastened not only vertically but also horizontally to the base.

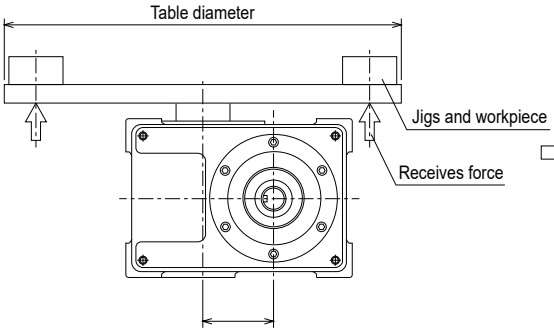


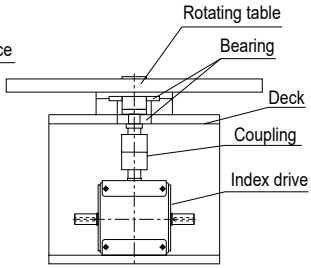
4) If the unit is stopped for emergency, be sure to turn the unit slowly by hand so that the output is in a dwell interval and then restart the system.
In case this procedure is needed, provide a manual handwheel in the driving system so that the input shaft can be turned manually.



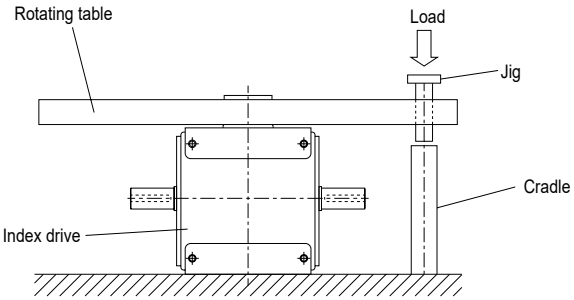
3 Designing the output shaft section

1) Allowable thrust force of the output shaft
Use the units within allowable thrust force. When the thrust force on the output shaft exceeds the allowable thrust force while the load torque is within the rated dynamic output torque of index drive, the rotating tables should be supported individually with thrust bearings or rollers.





2) Designing the rotating table jigs
(1) In order to reduce the load applying to index drive, make the diameter of the rotation table, the pitch circle of the jig and the weight, as compact as possible.
(2) The rotating table should be aligned not only with the bolts but with 2 positioning pins so that the alignment can be accurately reproduced after disassembly. (Flange)
(3) When vertical load applies because of pressing, stamping, or caulking, never let the load apply directly to the rotating table or index drive. Be sure to provide a cradle or an alternative unit.



Cradle example

Important safety information

Be sure to read this section before starting use.

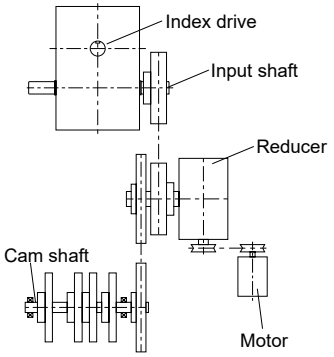
When designing or selecting

⚠ CAUTION

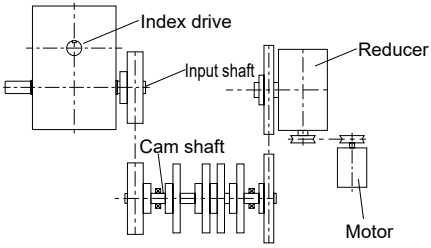
4 Designing the input shaft section

1) Minimize backlash in the driving system from the motor to index drive, and give the driving system high rigidity.
In general, the input shaft of index drive should be rotated at a constant speed. Backlash or uneven rotation of the driving system may cause vibration while the table is rotating, shorten the service life of the unit, and damage the components.

2) Avoid inserting an input shaft in series between the motor and the input shaft of index drive.

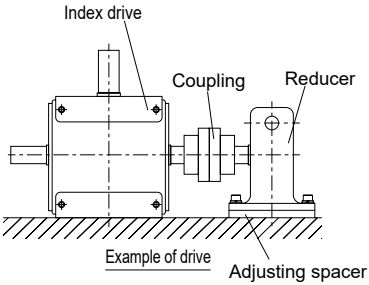


Good driving system example



Sample arrangement which induces shocks

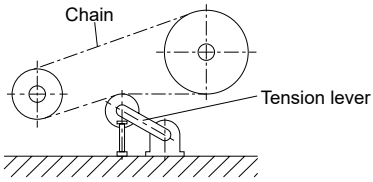
3) When you connect the input shaft of index drive directly to the output shaft of a reducer with a coupling, be sure to use a coupling which would not have backlash and which has a center adjusting mechanism.
(We also provide index drive with an integrated reducer if the space allows.)



Example of drive

4) When stopping and starting frequency is 5 times per minute or less, a brake motor can handle this.
When the frequency exceeds this, insert a clutch/brake or use a motor with clutch/brake.

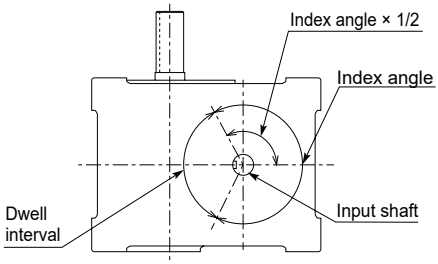
5) When you use a timing belt or a chain, be sure to install a tensioner.
Without a tensioner, the slack may cause shock or vibration.



Tension lever example

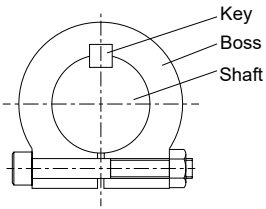
6) When you use the input shaft for another attachment to synchronize, pay attention to the relationship between the keyway of the input shaft and the output shaft stop range.
(Refer to "Timing chart and keyway location" for the description of motion.)

When the keyway of the input shaft is within the index angle, the output shaft rotates; when it is in the dwell interval, the output shaft stops. (for single-dwell Index series)



5 Designing the coupling of shafts

1) When you use a key to secure the shaft with a coupling, gear, sprocket, pulley, cam, or boss, shock or vibration occurs if the key is loose. We recommend the following key materials below in the table. You also should think of ensuring the fastening with split clamping or friction coupling in addition to the key.



(Split)

Model			Recommended standards	
Roller gear cam	Compact	(RG□S)	Standard	(JIS B 1301-1996)
	Standard	(RG□S)	Type 1 key	(JIS B 1301-1959)
	Table type	(RG□T)	Type 1 key	(JIS B 1301-1959)
	Wide angle	(RG□L)	Standard	(JIS B 1301-1996)
	Basic	(RGIB)	Standard	(JIS B 1301-1996)
Parallel cam		(PC□S)	Standard	(JIS B 1301-1996)

2) When you connect shafts, align the centers of the shafts.
If not aligned, the shaft may get broken.

Important safety information

Be sure to read this section before starting use.

Installation & adjustment

⚠ CAUTION

1 Be sure to make index drive start and stop within a dwell interval.
(Refer to "Input shaft keyway position and index angle.")
Avoid emergency stopping, starting, or inching at an indexing section. Load which far exceeds the normal operational load would apply to index drive resulting in malfunction or deterioration of accuracy. If the unit is stopped for emergency, be sure to turn the unit slowly by hand so that the output is in a dwell interval and then restart the system. (Generally, index drive is driven to a worm reducer. Turn the input shaft of the reducer when you turn by hand.) When the rotation detection switch is installed on the input shaft, adjust the detection cam so that the input shaft stops within a dwell interval.

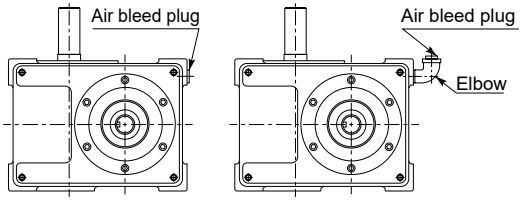
2 When you install a pulley, sprocket, or table to the input/output shaft, do not apply impact with a hammer. When impacted, index drive may be damaged or the accuracy may deteriorate.

3 Check for any loose connection or play in the input and output shaft connection.
If the connection is loose or play exists, the table does not turn smoothly resulting in shocks.

4 Install the unit in the position specified in the specifications.

5 Rotate the input shaft at speed specified in the specifications.

6 Index drive (excluding compact types) are shipped with lubricating oil filled.
Make sure the oil level comes around the center of the oil level gauge. Before operation, replace the plug with the 1 with breather holes included in the shipment.
If not replaced, oil leak may occur.
When the internal pressure increases due to work speed or environment, oil may come out from the plug with breather holes. In this case, provide additional piping with an elbow so that oil does not spill over.



During use & maintenance

⚠ CAUTION

1 Inspect for any loosened bolts and screws.

2 If any abnormal noise comes out, immediately stop the machine. The index drive may be damaged internally. Contact your dealer of CKD.

3 Procedure of water-proofing and rust-proofing
The input and output shafts and installation faces are not treated against rusting. Depending on the storage condition or atmosphere, rusting may occur. Apply anti-rust oil or grease or anti-rust paint on the machined surfaces.

4 Replacing lubricating oil
Lubricating oil should be replaced after the initial 500 hours. After this, replace it at every 2,000 hour interval. Check the oil level every week. Refill as necessary. Be sure to use specified lubricating oil.

Type / Manufacturer	Lubricating oil		Grease
	Input shaft rotational speed less than 200 rpm	Input shaft rotational speed 200 rpm or more	
ENEOS (CKD standard products)	Bonnoc TS220	Gear Grand GL-5 80W-90	
Kyodo Yushi Co., Ltd. (CKD standard products)			Citrax EP No.2
ENEOS			Epnoc Grease AP2
Idemitsu Kosan CO., Ltd.	Daphne Super Gear oil 220	Apollo oil Wide Gear LW 80W-90	Daphne Eponex EP No.2
Showa Shell Sekiyu K.K.	Shell Omala Oil 220	Shell Gelco Power Gear 80W-90	Shell Alvania EP Grease R02
Exxon Mobil	Mobil Gear 600XP 220	Mobil Lube HD 80W-90	Mobilux EP2
Cosmo Oil Lubricants Co., Ltd.	Cosmo Gear SE220	Cosmo Gear GL-5 80W-90	Cosmo Grease Dynamax EP No.2

5 Service life of repair parts such as oil seals depends on the operational conditions, and it may not be satisfied in some cases.
Regularly check any abnormal noise or oil leak in addition to checking the oil level.