

CY DRIVE

PRECISION REDUCER GEAR BOX / HIGH RELIABILITY

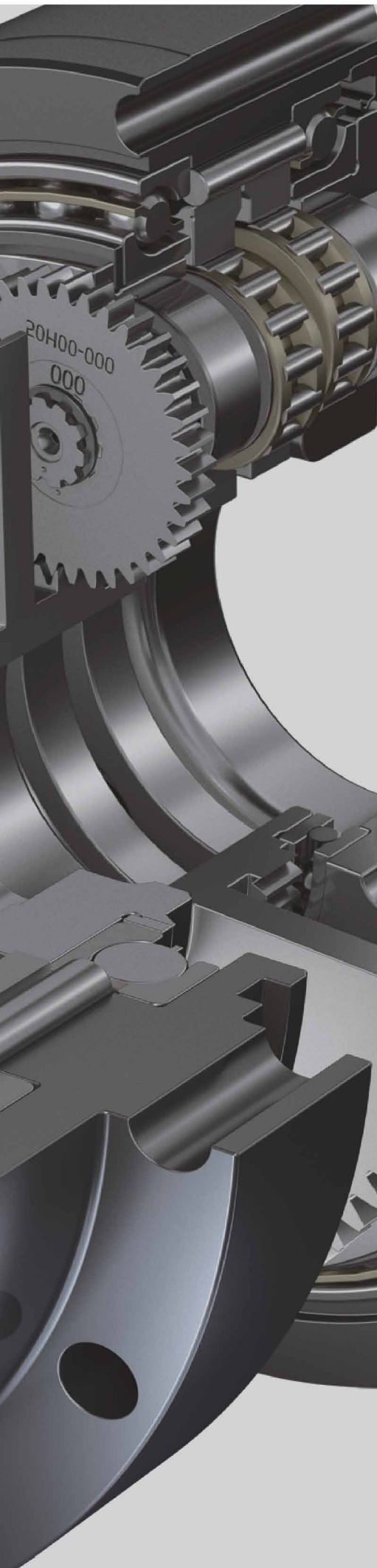




W O O R I M M A C H I N E R Y

40S00-000

40S00-000



CYDRIVE

Specialized for high-precision control

A reducer specialized for precision control operating within several arc/min, for applications, such as industrial robots, medical devices, automation equipment, and defense field.

Manufactured by reliable maker

Woorim Machinery has been in the reducer business for 40 years and is the KOSDAQ-listed manufacturer. We have been supplying products domestically and to advanced markets such as USA and Japan.

Custom-tailored

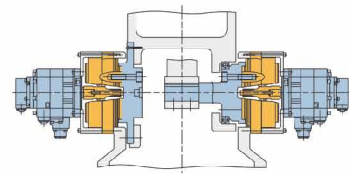
We deliver engineering services optimized for our customers' design and production needs. From the design stage, we supply the products that meet customer's needs in the shortest time.

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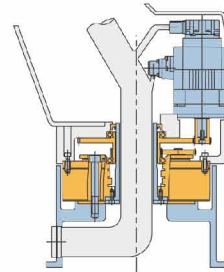
CY-E Series

(Standard Type)



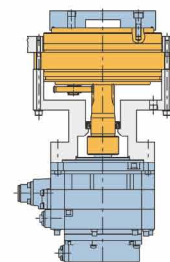
CY-C Series

(Hollow Shaft Type)



CY-U Series

(Compact Type)



Quiet

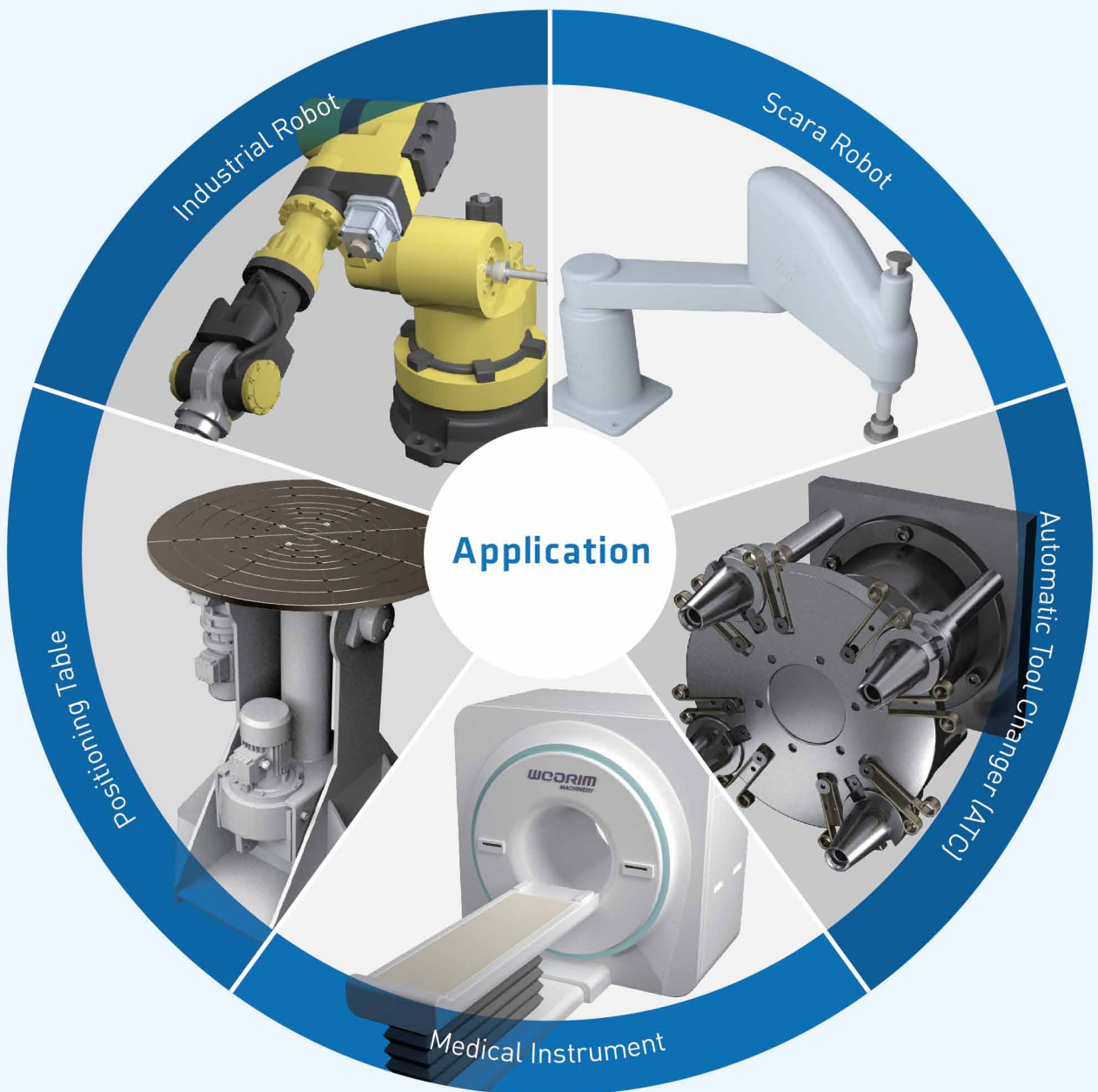
Low Inertia
Wide Rotation Range

Precise

Zero Backlash
High Torsional Stiffness

Strong

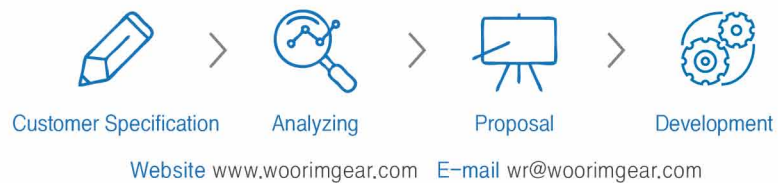
Compact Profile
Shock Loads to 400%



Customized Products

Customer needs are our top priority.

We make products optimized for your needs. For inquiries related to product ordering, customized product design, etc., please contact us at the following site or email us and we will response within 24 hours. The first design specification of CYdrive is the voice of our customers.



I/O Total Package

We provide the finest reducer solutions

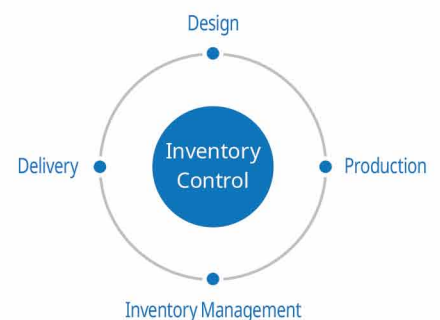
- Woorim Machinery is based on total package supply including input gear as well as reducer.
- The input gear is a part that is attached to a motor and plays an important role in noise control of reducer.
- We do our best to make affordable, quiet, and easy-to-handle products.



The Shortest Delivery Time

With us, there is no need to wait.

After design confirmation and production of the initial product, we will be fully prepared for the delivery schedule without disruption by managing inventory cycle according to customer needs.

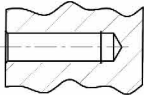
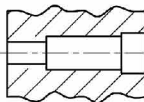
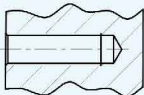
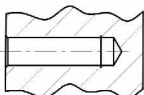


Product Selection Guide

Reducer Type Selection -> Rated Output Torque Selection
-> Reduction Ratio -> Tightening Method

Order Code

1 Reducer Type E	2 Rated Output 20	3 Reduction Ratio 121	4 Tightening Method (See the image) B
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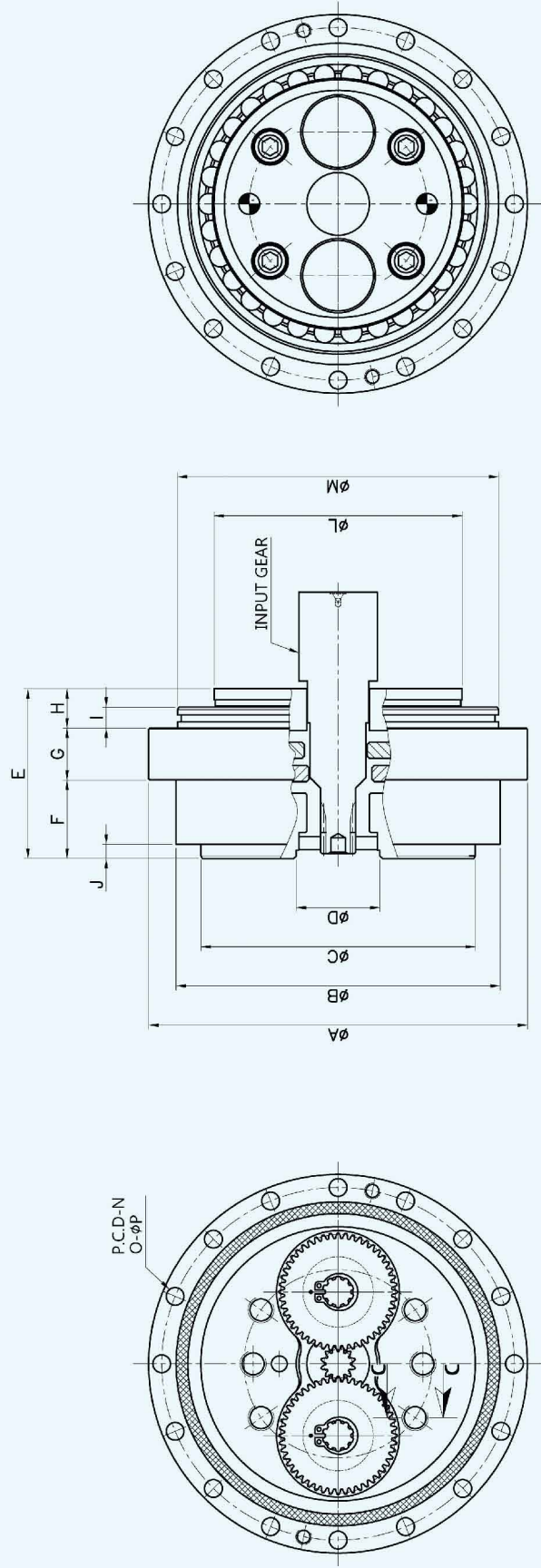
Name	Rated Torque(kgf.m)	GearRatio (R)	Output
E Solid Shaft	06	31, 43, 53.5, 59, 79, 103	B : Bolt Clamping 
	20	57, 81, 105, 121, 141, 161	
	40	57, 81, 105, 121, 153	
	80	57, 81, 101, 121, 153	
	110	81, 111, 161, 175.28	P : Bolt / Pin Clamping 
	160	81, 101, 129, 145, 171	
	320	81, 101, 118.5, 129, 141, 171, 185	
	450	81, 101, 118.5, 129, 1547.8, 171, 192.4	
C Hollow Shaft	10	27	B : Bolt Clamping 
	27	36.57	
	50	32.54	
	100	36.75	T : Through-Bolt Clamping 
	200	34.86	
	320	35.61	
	500	37.34	
U Compact	25	41, 81, 107.66, 126, 137, 164.07	B : Bolt Clamping 
	42	41, 81, 105, 126, 141, 164.07	
	60	41, 81, 102.17, 121, 145.61, 161	
	80	41, 81, 101, 129, 141, 171	
	100	41, 81, 102.17, 121, 141, 161	
	125	41, 81, 102.17, 121, 145.61, 161	
	160	41, 81, 102.81, 125.21, 156, 201	
	380	75, 93, 117, 139, 162, 185	
	500	81, 105, 123, 144, 159, 192.75	
	700	105, 118, 142.44, 159, 183, 203.52	

CY-E series

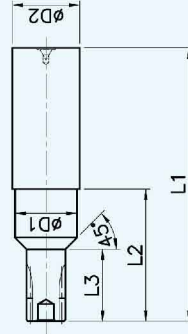


Dimension

TYPE	E06	E20	E40	E80	E110	E160	E320	E450	E550
ØA	122	145	190	222	244	280	325	370	395
ØBh7	103	124	160	190	208	240	284	328	351
ØCh7	86	105	135	160	182	204	245	275	317
ØDh7	26	32	50	62	80	110	130	154	175
E	53	65	76	84	92.5	104	125	140	159
F	24	30	31	48	67	68.5	79.5	84	95.5
G	12	20	24	15	19	25	30	38	45
H	17	15	21	21	6.5	10.5	15.5	18	48.5
I	8	8	13	12	-	-	-	-	7
J	4	5.5	7	11	14	8	8	8	7.5
ØL	78	91.5	123	139	154	178	214	248	275
ØMh7	103	123	160	190	-	-	-	-	325
N	113	135	175	206	226	260	304	348	374
O	8	16	16	16	12	12	16	24	30
P	5.8	6.8	9	9	11	13	13	13	13
Rated output torque	6[58]	17[167]	42[412]	80[784]	110[1,078]	160[1,568]	320[3,136]	450[4,410]	550[5,390]
Starting and stopping allowable torque	12[117]	42[412]	105[1,029]	200[1,960]	275[2,695]	400[3,920]	800[7,840]	1,125[11,025]	1,375[13,475]
Momentary peak torque	30[294]	85[833]	210[2,058]	400[3,920]	550[5,390]	800[7,840]	1,600[15,680]	2,250[22,050]	2,750[36,950]
Allowable moment	20[196]	90[882]	170[1,666]	220[2,156]	300[2,940]	400[3,920]	720[7,056]	900[8,820]	-
Torsional rigidity	2[20]	5[49]	11[108]	20[196]	30[294]	40[392]	100[980]	120[1,176]	160[1568]
Backlash	< 1.5	< 1	< 1	< 1	< 1	< 1	< 1	< 1	< 1
Speed ratio	31~103	57~161	57~153	57~153	81~175.28	81~171	81~185	81~192.4	123~192.4
Max. output speed	100	75	70	70	50	45	35	25	20
Weight	2.5	4.7	9.3	13.1	17.4	26.4	44.3	66.4	71
Lubricant fill volume	42~48	87~100	195~224	345~439	432~495	630~694	1040~1193	1596~1831	-



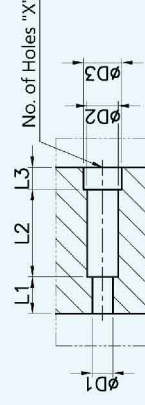
I INPUT GEAR TYPE



INPUT GEAR "Standard A"

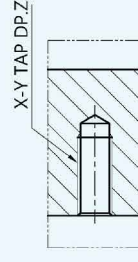
MODEL	L1	L2	L3	L4	D1	D2	D3
E6	90	54	22	18	28		
E20	95	46	25	21.5	23.5		
E40	100	53	29	26.5	29.5		
E80	100	-	29	-	36		
E110	120	70	34	38	40		
E160	120	-	35	-	42		
E320	140	-	35	-	46		
E450	155	-	38	-	56		

I OUTPUT TYPE



SECTION C-C
"P" TYPE

MODEL	X	L1	L2	L3	D1	D2	D3	P.C.D.
E20	2	11	46	8	8	10	12	65
E40	2	23	40	11	8	10	12	85
E80	3	15	56	9	10	13	15	104
E160	3	30	59	15	13	16	23	136
E320	3	25	82	18	16	20	26	163
E450	3	35	105	-	20	24	-	184



SECTION C-C
"B" TYPE

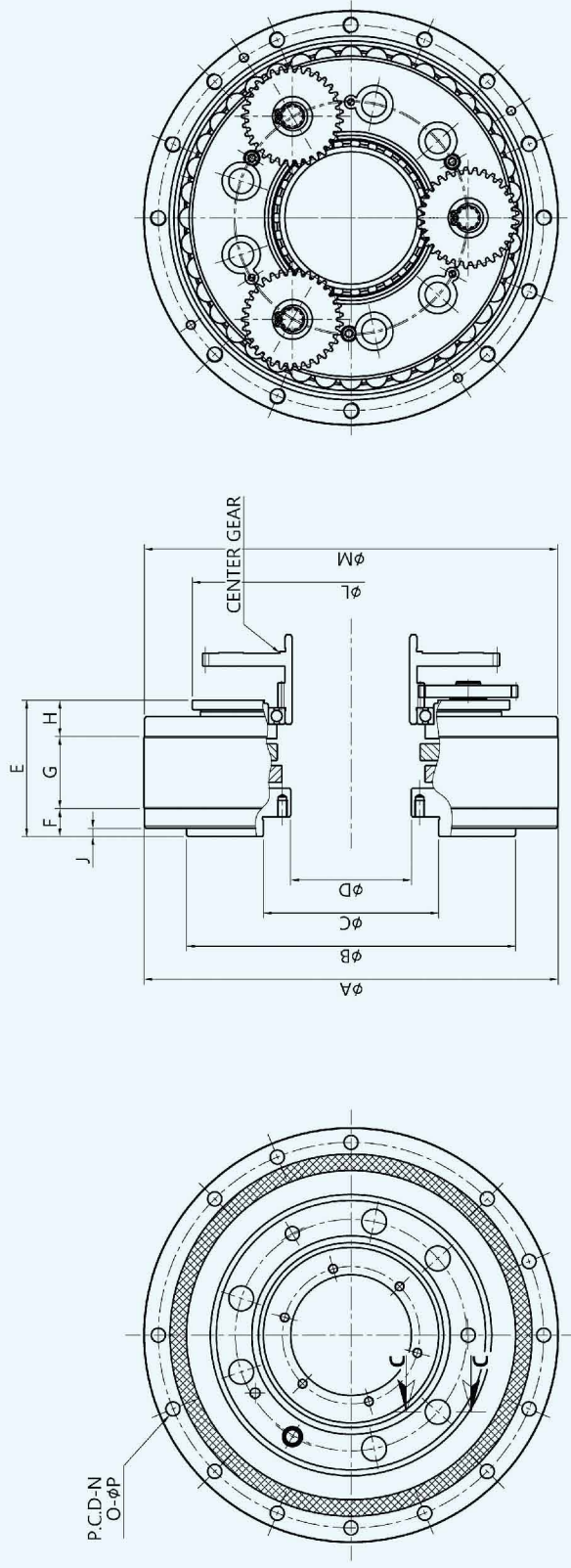
MODEL	X	Y	Z	P.C.D.
E6	2	M8	12	54
E20	2	M10	15	65
E40	2	M14	18	85
E80	6	M10	15	110
E110	3	M12	18	138
E160	6	M16	25	145
E320	6	M16	29	172
E450	21	M12	18	250

CY-C series



Dimension

TYPE	C10	C27	C50	C100	C200	C320	C500
ØA	147	182	222.5	250.5	347	438	475
ØBh7	110	140	176	199	260	340	390
ØCh7	46	66	93	106	138	200	195
ØDh7	34	47	66	73	100	140	150
E	59	67.5	79	82.5	120.5	126	162.5
F	4	5	5	17	17	37	57
G	35.5	42.5	51	43.6	75	64	73.5
H	19.5	20	23	21.9	25.5	25	32
J	4	5	5	5	7	5.5	7.5
ØL	106	138	171.25	202	248	340	378
ØMh7	146	181	222	250	346	440	520
Rated output torque	10[98]	27[265]	50[490]	100[950]	200[1,961]	320[3,136]	500[4,900]
Starting and stopping allowable torque	25[245]	67.5[662]	125[1,225]	250[2,450]	500[4,900]	800[7,840]	1,250[12,250]
Momentary peak torque	50[490]	135[1,323]	250[2,450]	500[4,900]	1,000[9,800]	1,600[15,680]	2,500[24,500]
Allowable moment	70[686]	100[980]	180[1,764]	250[2,450]	900[8,820]	2,100[20,580]	3,500[34,300]
Torsional rigidity	4.8[47]	15[147]	26[255]	52[510]	100[980]	200[1,960]	350[3,430]
Backlash	< 1	< 1	< 1	< 1	< 1	< 1	< 1
Speed ratio	27	36.57	32.54	36.75	34.86	35.61	37.34
Max. output speed	80	60	50	40	30	25	20
Weight	4.6	8.5	14.6	19.5	55.6	79.5	154
Lubricant fill volume	147~167	266~305	498~571	756~857	1831~2076	3536~4047	5934~6900



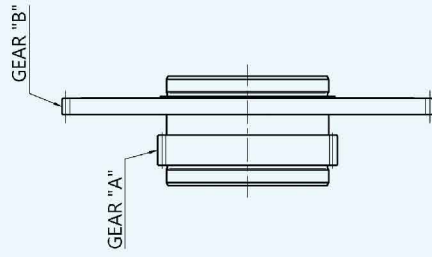
I CENTER GEAR TYPE

□ GEAR "A" SPEC.

MODEL	MODULE	No. of Teeth	MODIFICATION COEF.
C10	1	48	-0.04
C27	1	57	+0.2
C50	1.25	61	0
C100	1.75	48	+0.3
C200	2.5	43	0
C320	2	78	0
C500	2	83	0

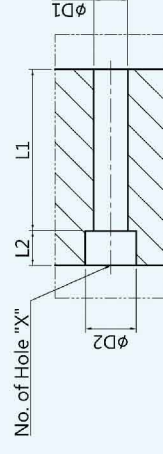
□ GEAR "B" SPEC.

MODEL	MODULE	No. of Teeth	MODIFICATION COEF.	BACK LASH
C10	2	57	0	0.035~0.090
C27	1.25	78	0	0.040~0.110
C50	2	78	0	0.050~0.130
C100	1.75	112	0	0.060~0.140
C200	2	110	0	
C320	2	125	0	0.075~0.180
C500	2	150	0	



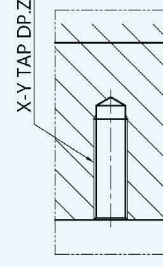
CENTER GEAR "Standard"

I OUTPUT TYPE



SECTION C-C "T" TYPE

MODEL	X	L1	L2	D1	D2	P.C.D
C10	4	45.5	13.5	11	17	76
C27	4	55	12.5	13	20	98
C50	6	66	13	13	19	131
C100	6	67.5	15	15	23	140
C200	6	101.5	19	18	26	194
C320	9	112	14	20	32	252



SECTION C-C "B" TYPE

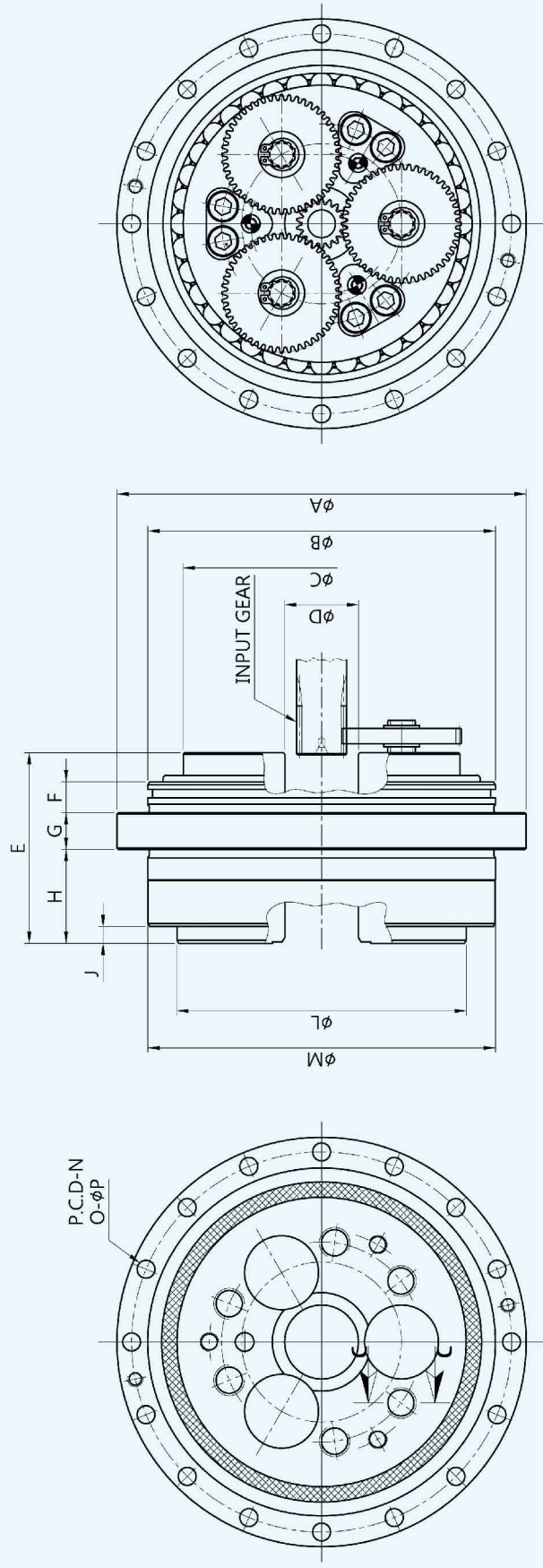
MODEL	X	Y	Z	P.C.D
C10	6	M8	13	82
C27	8	M8	15	116
C50	9	M10	18	133
C100	9	M12	20	160
C200	9	M16	25	194
C320	15	M16	29	294
C500	18	M16	28	320

CY-U series

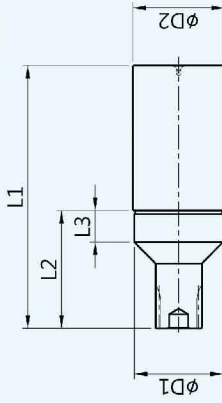


Dimension

TYPE	U25	U42	U60	U80	U100	U125	U160	U380	U500	U700
ØA	133	159	183	189	208	221	238	295	325	395
ØBh7	113	136	160	160	179	186	202	252	284	350
ØCh7	90	110	129	131	146	152	166	208.35	230	275
ØDh7	24	30	35	35	42	40	42	42	49	70
E	62	65.5	69.5	74	80	80	104	131	137.5	170
F	10	14.5	15.5	19	18.2	15.5	20.6	23.5	20	20
G	12	20	25	20	30	25	37	47	53	58
H	30.5	27.5	26	33	31	32.9	43.5	52.15	53	72
I	5.7	5.7	7	7	9	8.9	11.5	16.15	16	25
K	10	10	10	10	10	10	10	14	15	26
ØLh7	94	118	140	140	160	160	179	222	253	315
ØMh7	113	136	160	160	179	186	202	252	284	353
N	123.5	148	172	175	194	204	220	276	305	374
O	16	16	20	16	18	16	16	24	28	32
P	5.8	6.8	6.8	9	9	11	11	13	13	13
Rated output torque	25[245]	42[412]	61.2[600]	80[784]	102[1,000]	125[1,225]	160[1,600]	380[3,724]	500[4,900]	700[7,000]
Starting and stopping allowable torque	62[612]	105[1,029]	153[1,500]	200[1,960]	255[2,500]	312[3,062]	408[4,000]	950[9,310]	1,250[12,250]	1,786[17,500]
Momentary peak torque	125[1,225]	210[2,058]	306[3,000]	400[3,920]	510[5,000]	625[6,125]	816[8,000]	1,900[18,620]	2,500[24,500]	3,571[35,000]
Allowable moment	80[784]	169[1,660]	204[2,000]	219[2,150]	276[2,700]	350[3,430]	408[4,000]	719[7,050]	1,122[11,000]	1,531[15,000]
Torsional rigidity	54.1[530]	85.7[840]	116.3[1,140]	121.4[1,190]	142.9[1,400]	163.3[1,600]	209.2[2,050]	530.6[5,200]	699[6,850]	918.4[9,000]
Backlash	< 1	< 1	< 1	< 1	< 1	< 1	< 1	< 1	< 1	< 1
Speed ratio	41~164	41~164	41~161	41~171	41~161	41~161	41~201	75~185	81~193	105~ 203
Max. output speed	70	60	50	50	50	50	50	50	50	50
Weight	3.8	6.3	8.9	9.3	13.0	13.9	22.1	44	57.2	102
Lubricant fill volume	239	358	503	577	770	843	984	4073	2569	4327



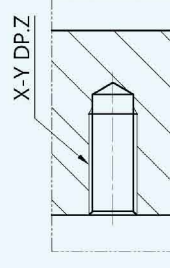
INPUT GEAR TYPE



INPUT GEAR "Standard A"

MODEL	L1	L2	L3	D1	D2
U25	129	60	14	40.4	41
U42	138.5	64.5	15.5	50.4	50.4
U60	139	65	15.5	50.4	50.4
U80	148.9	68.4	15.5	55.4	55.4
U100	185.1	70.1	15.5	60.4	60.4
U125	185.1	70.1	15.5	60.4	60.4
U160	190	75	15.5	65.4	65.4
U380	193	78	15.5	65.4	65.4
U500	192.5	77.5	16.5	65.4	65.4
U700	192.5	77.5	15.5	65.4	65.4

OUTPUT TYPE



SECTION C-C

MODEL	X	Y	Z	P.C.D.
U25	6	M10	14.5	10
U42	9	M10	14	10
U60	14	M8	13	76
U80	6	M8	15	84
U100	15	M10	17.5	108
U125	6	M10	18	118
U160	15	M12	19	124
U380	12	M12	19	170
U500	21	M12	19	200
U700	26	M16	25	285

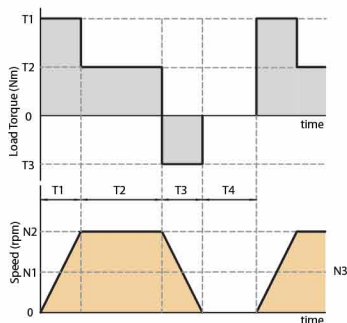
Order Form

Please fill in the bottom details for ordering.

General Information

Company		
Tel		
E-mail		
Place of Use	Ambient Temperature	℃
Applicable Equipment		
Application		
Reducer Specification		
Model	Gear ratio	

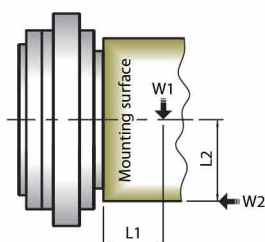
Load Condition



	Starting(Max)	Normal	Stopping(Max)	Dwell Time
Load Torque(Nm)	T1	T2	T3	
Revolutions per minute (rpm)	N1	N2	N3	
Time (s)	t1	t2	t3	t4

Operating Time	(Cycle/Day)	(Day/Year)	(Year)
----------------	-------------	------------	--------

External Load



W1	N
W2	N
L1	mm
L2	mm

Mounting Method

☐ Vertical

☐ Horizontal

Installation Schematic

Driving Part Specification

☐ Servo Motor

☐ Miscellaneous()

Capacity kw

Rated Torque Nm

Input Speed rpm

Output Shaft Specification ☐ Key Type ☐ Spline Type

Φ mm L mm

Miscellaneous

Glossary

Allowable Torque

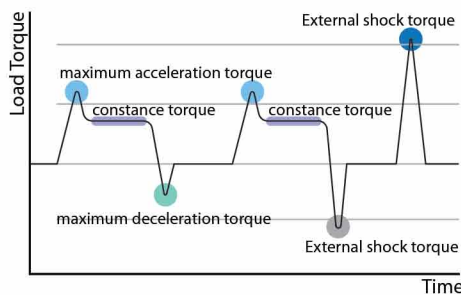
Starting and stopping allowable torque

Allowable torque refers to when the motor starts and stops, at which time the load inertia moment causes a large fluctuating load in accordance with the acceleration and deceleration conditions of the motor than the normal load operation.

Momentary peak torque

It means the limit value of the load on the reducer output section caused by emergency stop or external impact.

* The momentary overtorque should not exceed momentary peak torque.



Backlash, Lost motion, Torsional rigidity

Backlash

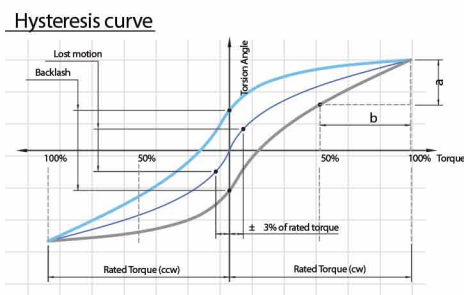
The error of the twist angle of the output shaft during forward rotation and reverse rotation is called backlash. As shown in the hysteresis curve, the CYdrive defines a backlash as a twist angle error after applying a constant torque in both directions and removing the torque.

Lost motion

The rotation accuracy or the lost motion is defined as the twist angle error of the midpoint of the measured hysteresis curve by applying $\pm 3\%$ of the rated torque to the output shaft in both directions.

Torsional rigidity

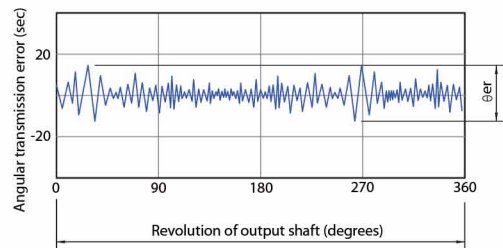
Torsional rigidity is the slope of the hysteresis curve measured at 50% and 100% load torque of the rated output torque. Lost motion and torsional rigidity are proportional to the stiffness of the reducer, and CYdrive has high rigidity.



Angular Transmission Error

The angular transmission error (θ_{er}) is defined as the difference between the theoretical output rotation angle and the actual output rotation angle (θ_{out}) when an arbitrary rotation angle (θ_{in}) is applied.

$$\theta_{er} = \frac{\theta_{in}}{R} - \theta_{out}(R:\text{Gear ratio})$$



No-load Running Torque

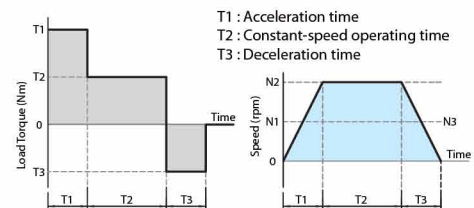
No-load running torque is the torque required to rotate the input shaft at the desired speed with the output shaft in no-load condition.

Load Characteristics and Life

Rated life

When a reducer is operated in rated torque and rated output speed (15 rpm), it is called the rated life of the reducer.

* The rated life of CYdrive is defined as B10 life = 6,000hr.



Equivalent output torque (ISO6336-6)

$$T_m = \sqrt[10/3]{\frac{t_1 \cdot N_1 \cdot T_1^3 + t_2 \cdot N_2 \cdot T_2^3 + \dots + t_n \cdot N_n \cdot T_n^3}{t_1 \cdot N_1 + t_2 \cdot N_2 + \dots + t_n \cdot N_n}}$$

Equivalent output speed (ISO6336-6)

$$N_m = \sqrt[10/3]{\frac{t_1 \cdot N_1 + t_2 \cdot N_2 + \dots + t_n \cdot N_n \cdot T_n}{t_1 + t_2 + \dots + t_n}}$$

Required life (B10)

$$L_h = 6000 \times \frac{N_o}{N_m} \times \left(\frac{T_o}{T_m} \right)^{10/3}$$

N_o Rated output speed
 T_o Rated output torque

Installation Information

Tightening Torque and Tightening Force of Bolts

When mounting the reducer to the reducer output shaft, apply tightening torque as below using hexagonal wrench bolts.

Hexagon Wrench Bolt Nominal x Pitch (mm)	Tightening Torque (Nm)	Tightening Force (F)(N)	Bolt Spec
M5 X 0.8	7.2 ~ 9.5	9,217	Hexagon wrench bolt KS B 1003
M6 X 1.0	14.82 ~ 16.38	13,078	
M8 X 1.25	35.34 ~ 39.06	23,792	
M10 X 1.75	70.07 ~ 76.93	37,687	
M12 X 1.75	122.63 ~ 135.37	54,765	Strength grade ISO 898-1 12.9
M14 X 2.0	194.8 ~ 215.2	75,024	
M16 X 2.0	303.1 ~ 334.9	101,818	
M18 X 2.0	418 ~ 462	132,697	

* The values shown in the table are based on steel or cast iron.

Allowable Transmission Torque of Bolts and Pins

Allowable transmission torque of bolts

$$T_1 = F \times \mu \times \frac{D}{2000} \times n$$

T_1 Allowable transmission torque of bolts (Nm)
 F Bolt tightening force (N)
 μ Coefficient of friction (μ : 0.15 or 0.20)
 D Bolt P.C.D (mm)
 n Number of bolts

Allowable transmission torque when using pins together (bolts + pins)

$$T_2 = T_1 + \frac{\pi d^2}{4} \times \tau \times \frac{D^2}{2000} \times n_2$$

T_2 Allowable transmission torque of bolts and pins (Nm)
 d Pin diameter (mm)
 τ Allowable shear force of pin (N/mm²)
 D^2 Pin P.C.D (mm)
 n_2 Number of pins

Installation Precaution

- After installing the reducer, we recommend installing an air supply vent so that grease can be exchanged easily.
- Tighten the hexagon wrench bolt with spring washer uniformly with the specified tightening torque.
- If the mounting accuracy is low, it may cause vibration and noise.
- When using a liquid sealant, do not make it go into the reducer and apply it not to be leaked from the bolt holes for shaft mounting.

Quality assurance

Installation Precaution

Service environment

Use the reducer in a location with ambient temperature of -10 ~ 40°C and good ventilation. When used at high load and high speed, the speed reducer may overheat and exceed the allowable temperature. Operate the cooling system in such a way that the surface temperature of the reducer does not exceed 60°C. Please contact us if heavy load and operating environment are not compatible.

Lubricating oil

The lubricant has a standard exchange time of 20,000 hours. However, when using the reducer at a surface temperature of 40°C or more, check for lubricant deterioration and contamination to determine the replacement period of the lubricant.

If the ambient temperature is over 50°C, the main unit is operated at over 80°C temperature for an extended period or if other lubricant is mixed, the aging of the lubricant may be accelerated.

Please choose lubricant specifications after consulting with us.

Product handling

Be careful not to apply any physical impact to the product.

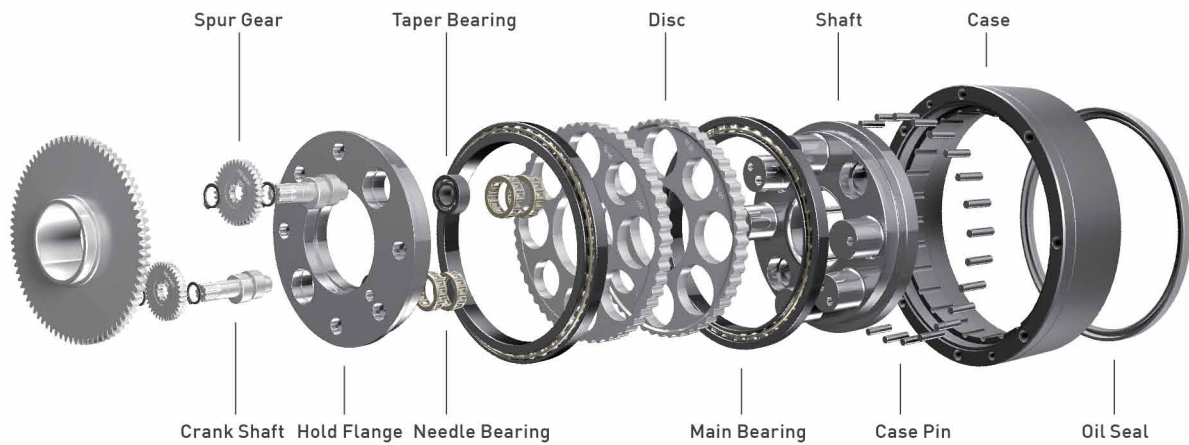
Do not disassemble or modify the product.

Be sure not to exceed the allowable torque.

Quality Assurance Provision

1. If we confirm that this product has been damaged due to defects arising from the product itself or the manufacturing process during the warranty period of this product, we will repair or replace the product at our own expense at our sole discretion.
2. Unless otherwise agreed in writing, the warranty will apply only to the replacement or repair of the defective product, and any other obligation (including damages or claims, including loss of opportunity due to loss of machine, assembly disassembly and installation cost) will not be compensated. In any event, the rights to the buyer's damages are limited to the maximum amount equal to the value of the defective product.
3. Even if it is within the guarantee period, the product cannot be repaired free of charge in the event of a defect or breakdown due to the reasons listed below.
 - 1) If this product is used outside of the range specified in the usage conditions or specifications specified by us
 - 2) Contamination, attachment of foreign matter, etc.
 - 3) If the product is used in an unsuitable environment (environment with high temperature, high humidity, large amount of dust, gas corrosion, volatilization, and risk of burning, and in the atmosphere of increased and decreased pressure, however, excluding the scope that we expressly acknowledge in the specifications.)
 - 4) If this product is disassembled, reassembled, repaired or modified by a third party other than our company
 - 5) If a defect is caused by equipment other than this product
 - 6) Due to natural disasters that cannot be deemed as our company's responsibility
 - 7) If the cause of the defect is due to use of other products, rather than our products

CYDRIVE



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