The Available Solution

ISO9001
PTC NAGOYA PLANT

ISO14001
PTC NAGOYA PLANT

CYCLO® DRIVE

Gearmotors & Speed Reducers

6000

Series

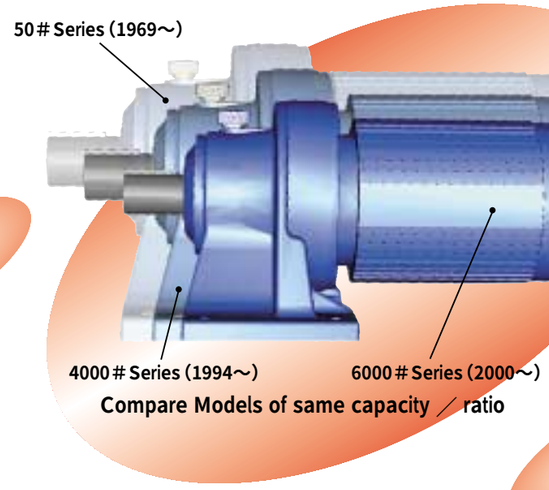
Sumitomo Heavy Industries, ltd.

WHAT DO YOU THINK OF THIS?
THESE ARE THE ADVANTAGES OF THE NEWEST CYCLO, 6000 SERIES:

LIGHTER WEIGHT MORE COMPACT

Compared to previous models of the same power and ratio, the new Cyclo 6000 Series has :

- Higher rated load capacity
- Decreased weight-up to 40% lighter



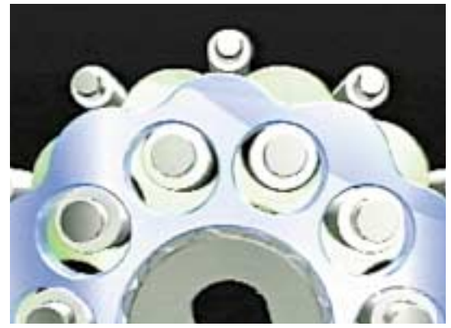
Compare Models of same capacity ／ ratio

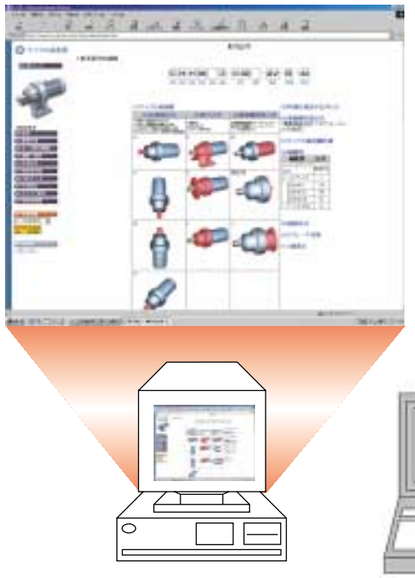
QUIETER OPERATION

Redesigned teeth reduce noise, provide smoother operation.

GREATER VERSATILITY

More frame sizes, gear ratios and motor capacities.
New 0.25kW, 0.55kW, 1.1kW and 3.0kW selections.
A full line of motor capabilities suitable for applications all over the world.
See the available combinations shown on the next page.





"IT" SUPPORT

Our technical support includes many information technology innovations.
Drawings and other technical data, as well as fast responses to questions, can be obtained at our Web site :

http://www.shi.co.jp/ptc/

AVAILABLE COMBINATION

Combinations with 4P motor Ratio6～119

Ratio		6	8	11	13	15	17	21	25	29	35	43	51	59	71	87	119
O/p Speed r/min	50Hz	242	181	132	112	96.7	85.3	69.0	58.0	50.0	41.4	33.7	28.4	24.6	20.4	16.7	12.2
	60Hz	292	219	159	135	117	103	83.3	70.0	60.3	50.0	40.7	34.3	29.7	24.6	20.1	14.7
MOTOR (kW×P)	0.1×4	●	●	●	●	●	●	●	●	●	●	●	●	●	●	●	●
	0.2×4	●	●	●	●	●	●	●	●	●	●	●	●	●	●	●	●
	0.25×4	●	●	●	●	●	●	●	●	●	●	●	●	●	●	●	●
	0.4×4	●	●	●	●	●	●	●	●	●	●	●	●	●	●	●	
	0.55×4	●	●	●	●	●	●	●	●	●	●	●	●	●	●	●	
	0.75×4	●	●	●	●	●	●	●	●	●	●	●	●	●	●	●	
	1.1×4	●	●	●	●	●	●	●	●	●	●	●	●	●	●	●	
	1.5×4	●	●	●	●	●	●	●	●	●	●	●	●	●	●	●	
	2.2×4	●	●	●	●	●	●	●	●	●	●	●	●	●	●	●	
	3.0×4	●	●	●	●	●	●	●	●	●	●	●	●	●	●	●	
	3.7×4	●	●	●	●	●	●	●	●	●	●	●	●	●	●	●	
	5.5×4	●	●	●	●	●	●	●	●	●	●	●	●	●	●	●	
	7.5×4	●	●	●	●	●	●	●	●	●	●	●	●	●	●	●	
	11×4	●	●	●	●	●	●	●	●	●	●	●	●	●	●	●	
	15×4	●	●	●	●	●	●	●	●	●	●	●	●	●	●	●	
	18.5×4	●	●	●	●	●	●	●	●	●	●	●	●	●	●	●	
	22×4	●	●	●	●	●	●	●	●	●	●	●	●	●			
	30×4	●	●	●	●	●	●	●	●	●	●	●	●	●			
	37×4			●	●	●	●	●	●	●	●	●		●			
	45×4			●	●	●	●	●	●	●		●					
	55×4			●		●		●		●		●					
	75×4			●		●		●		●							

Combinations with 6P motor Ratio11～87

Ratio		11	15	21	29	43	59	87
O/p Speed r/min	50Hz	89.1	65.3	46.7	33.8	22.8	16.6	11.3
	60Hz	106	77.7	55.5	40.2	27.1	19.7	13.4
MOTOR (kW×P)	15×6						●	●
	18.5×6						●	●
	22×6					●	●	●
	30×6			●	●	●	●	●
	37×6		●	●	●	●	●	●
	45×6		●	●	●	●	●	●
	55×6	●	●	●	●	●	●	
	75×6	●	●	●	●	●	●	
	90×6	●	●	●	●	●		
	110×6	●	●	●	●	●		
	132×6	●	●	●	●			

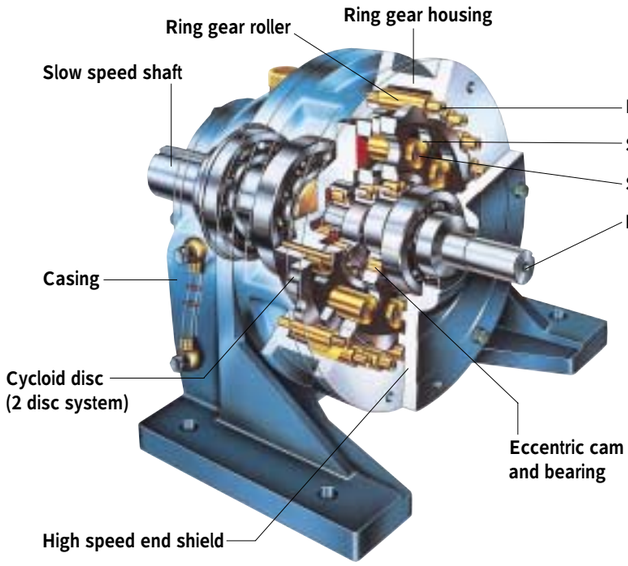
Added combinations are marked by ● color.

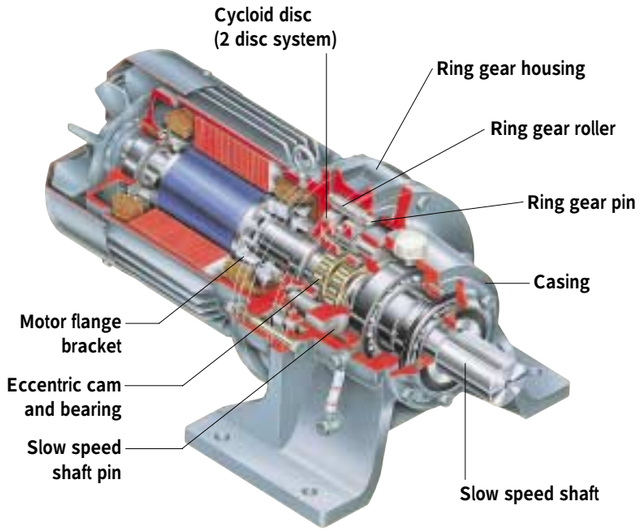
Combinations with 4P motor Ratio104～7569

Ratio		104	121	143	165	195	231	273	319	377	473	559	649	731	841	1003	1247	1479	1849	2065	2537	3045	3481	4437	5133	6177	7569
O/p Speed r/min	50Hz	13.9	12.0	10.1	8.79	7.44	6.28	5.31	4.55	3.85	3,07	2.59	2.23	1.98	1.72	1.45	1.16	0.980	0.784	0.702	0.572	0.476	0.417	0.327	0.282	0.235	0.192
	60Hz	16.8	14.5	12.2	10.6	8.97	7.58	6.41	5.49	4.64	3.70	3.13	2.70	2.39	2.08	1.74	1.40	1.18	0.946	0.847	0.690	0.575	0.503	0.394	0.341	0.283	0.231
MOTOR (kW×P)	0.1×4	●	●	●	●	●	●	●	●	●	●	●	●	●	●	●	●	●	●	●	●	●	●	●	●	●	●
	0.2×4	●	●	●	●	●	●	●	●	●	●	●	●	●	●	●	●	●	●	●	●	●	●	●	●	●	●
	0.25×4	●	●	●	●	●	●	●	●	●	●	●	●	●	●	●	●	●	●	●	●	●					
	0.4×4	●	●	●	●	●	●	●	●	●	●	●	●	●	●	●	●	●	●	●	●	●	●	●	●	●	●
	0.55×4	●	●	●	●	●	●	●	●	●	●	●	●	●	●	●	●	●	●								
	0.75×4	●	●	●	●	●	●	●	●	●	●	●	●	●	●	●	●	●	●	●	●	●	●	●	●	●	●
	1.1×4	●	●	●	●	●	●	●	●	●	●	●	●	●	●	●	●	●	●	●							
	1.5×4	●	●	●	●	●	●	●	●	●	●	●	●	●	●	●	●	●	●	●	●	●	●	●	●	●	●
	2.2×4	●	●	●	●	●	●	●	●	●	●	●	●	●	●	●	●	●	●	●	●	●	●	●	●	●	●
	3.0×4	●	●	●	●	●	●	●	●	●	●	●	●	●	●	●	●	●	●	●							
	3.7×4	●	●	●	●	●	●	●	●	●	●	●	●	●	●	●	●	●	●	●	●	●	●	●	●	●	●
	5.5×4	●	●	●	●	●	●	●	●	●	●	●	●	●	●	●	●	●	●	●	●	●	●	●	●	●	●
	7.5×4	●	●	●	●	●	●	●	●	●	●	●	●	●	●	●	●	●	●	●							
	11×4	●	●	●	●	●	●	●	●	●	●	●	●	●	●	●	●	●									
	15×4	●	●		●	●	●	●	●	●	●	●	●	●	●	●											
	18.5×4		●		●	●	●	●	●	●	●	●	●	●	●												
	22×4		●		●	●	●	●	●	●	●	●	●														
	30×4		●		●	●	●	●	●	●	●																
	37×4		●		●	●	●		●	●																	
	45×4		●		●	●			●																		
Output Torque N・m		24～7350	24～31300	24～7630	24～43700		24～46000		24～68200				45～68200	24～68200		45～68200	24～68200	150～68200	24～68200	45～68200		150～68200				525～68200	

Added combinations are marked by ● color.

A UNIQUE CONCEPT IN GEAR-MOTORS AND SPEED REDUCERS





The Name CYCLO

derived from Kyklos the Greek word for circle, refers to the CYCLO disc, whose outer profile resembles a cycloidal curve.

Worldwide Product Support

Fast, competent technical advice and assistance with design, application selection, installation, and after sales service is available from production and distribution centers in over 30 countries throughout the world.

Many Possibilities

of mechanical and electrical power transmission and control are available in the complete CYCLO product range. CYCLO means the available solution. Get in touch with us, we will be happy to provide whatever information you need.

70 Years of Product Development

The unique CYCLO operating principle was invented by the German engineer Lorenz Braren in 1931. His ingenious design has continued its progressive development up to the present day.

More than 7,000,000 Units Sold

Sumitomo Heavy Industries,Ltd. Power Transmission & Controls Group, a world leader in power transmission control, has produced more than 7,000,000 CYCLO DRIVES, CYCLO DRIVE Gearmotors, and Speed Reducers. They are used daily in industries throughout the world, replacing the more conventional helical, worm, and spur gear units.

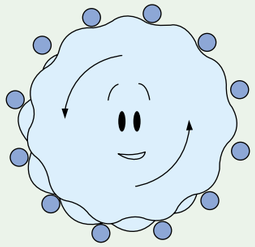
Power Transmission Experience

In addition to a wide range of application knowledge, we can offer 70 years of advanced power transmission drive experience.

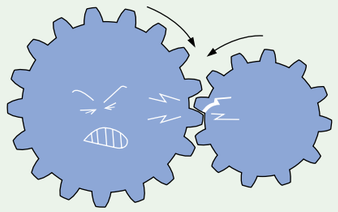
Quality System Certification

Sumitomo Heavy Industries, Ltd. Nagoya Plant, Power Transmission & Controls Group has achieved the Quality System Certification according to **ISO 9001, EN29001, BS5750 Part 1:1987, JIS Z9901:1991** Standard for design and manufacture of mechanical speed reducers, mechanical speed variators, electric motors, and gearmotors.

FEATURES AND BENEFITS



CYCLO SPEED REDUCER
Many teeth share the shock of overload.



CONVENTIONAL HELICAL GEAR.
1 or 2 teeth absorb the entire shock of overload.

Overload Capacity - 500%

Because the CYCLO's external gear has an epitrochoidal tooth profile, which provides a high contact ratio, the teeth can't be sheared off. It has the strength to withstand overload shocks that break the teeth of ordinary reducers.

Outstanding Reliability-2 Year Warranty

CYCLO speed reducers are known for outstanding reliability and extended operating lifetime. With proper care, 20 years of problem-free operation is not unusual. This reliabilty is not only due to high material specifications, component quality controls and careful assembly procedures, but also due to the complete absence of sliding friction. Correctly sized and selected CYCLO gearmotors and speed reducers are covered by a two-year warranty.

Robust Construction

CYCLO housings are made of gray cast iron, except for the two smallest sizes, which are aluminium. All the power transmitting components are made from 52100 bearing grade steel that is hardened and ground.

Ideal for Dynamic Applications

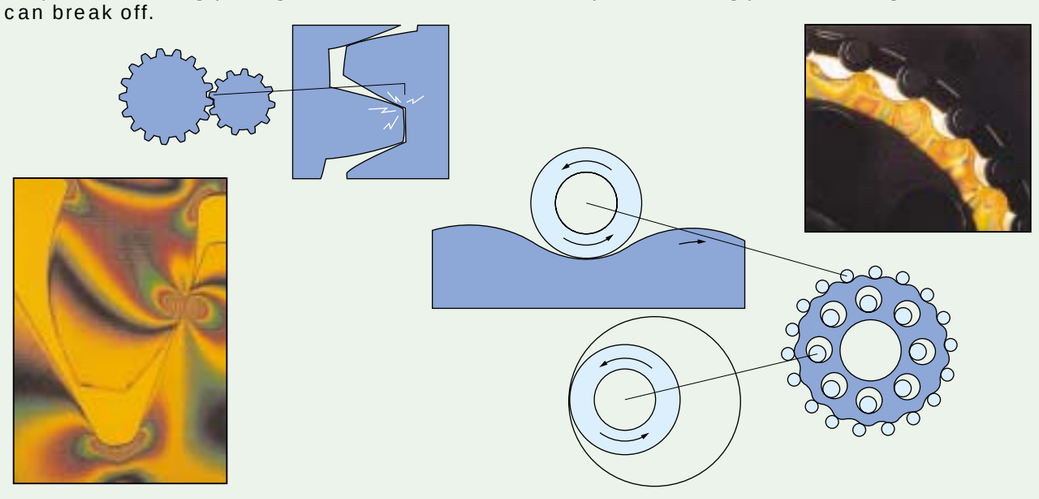
Since inertia is very low, the CYCLO speed reducer is ideally suited for frequent start-stop-reversing duties in combination with an adjustable frequency inverter.

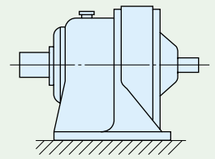
Low Noise

When compared with the sliding tooth contact of conventional gearing, the rolling contact of the CYCLO system reduces noise levels.

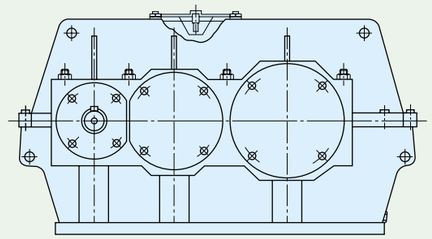
CONVENTIONAL HELICAL REDUCER
Torque transmitting parts grind,wear,and can break off.

CYCLO SPEED REDUCER
All torque transmitting parts roll,don't grind.





CYCLO SPEED REDUCER



CONVENTIONAL HELICAL GEAR

Compact Size

Single stage reduction ratios are available from 6:1 to 119:1, double stage up to 7,569:1 and triple stage up to almost 1,000,000:1. Fewer stages provide a much smaller footprint and envelope.

Overall Economy

Competitive initial cost, high reliability, long life and minimal maintenance give CYCLO speed reducers superior overall economy when compared to conventional gearboxes.

Motor Integral to the CYCLO

Standard gearmotors have directly fitted three-phase motors that meet JIS. Brakemotors are available upon request. Consult the factory when a two-speed motor is required.

Very Compact Size

A compact precision design motor has been developed for integral coupling with the CYCLO DRIVE.

Extruded Aluminium Alloy Motor Frame

50% stronger than die cast aluminium.

Low Inertia

The compact motor design keeps inertia low and makes this motor an ideal match for the low inertia CYCLO speed reducer.

Excellent Heat Dissipation

Outstanding heat dissipation makes the CYCLO gearmotor ideal for adjustable frequency inverter applications.

BASIC INFORMATION & RECOMMENDATION

Drive Ratings

Standard CYCLO speed reducers are designed and built for long, maintenance-free, 10-hour daily service under conditions of uniform load. When your application involves more severe conditions, catalog ratings must be divided by the proper service factor, or the actual load must be multiplied by this factor.

Shaft Rotation

For single and triple reduction units, the slow speed shaft turns in the direction opposite to that of the high speed shaft. For double reduction units, the slow speed and high speed shafts turn in the same direction. The slow and high speed shafts are coaxial for all reductions.

Shaft Connections

A pulley, sprocket or pinion should be mounted as close to the shaft bearing as possible and ideally, in order to avoid undue bearing load and shaft deflection, not with the point of radial load beyond the midpoint of the protruding shaft. Never over tighten belts or chains. Careful and accurate installation is essential for efficient and trouble-free operation. Before installing, the shafts should be checked to make sure that they are parallel and level. Accuracy of alignment after mounting can be checked with a string or straight edge held against the faces of the sprocket or pulley hubs.

Couplings should be properly aligned the limits specified by the manufacturer and checked carefully prior to initial startup. In order for it to give the required fit, the coupling bore diameter and tolerance should be appropriate to the gearbox shaft diameter and tolerance.

Control of Shaft Load

When power is transmitted through spur gear, belts, pulleys, or chains, radial forces are applied to the shafts. The radial capacities are calculated from load centering and compared to the allowable radial load.

Installation

Be sure to install and operate CYCLO drives in compliance with applicable local and national safety codes. Appropriate guards for rotating shafts should always be used.

Mounting Considerations

Horizontal and vertical oil-lubricated units should be mounted in exact planes whenever possible. When they are mounted on inclined surfaces, minor modifications are necessary since inclined mounting could lower the oil level. However, overfilling the unit with oil may cause leakage through the air vent, foaming, churning and consequently overheating. Please contact the factory.

Lubrication Information

The smaller CYCLO units up to size 6125 and some multiple reduction units are grease lubricated. All other units are oil lubricated as standard.

Grease Lubricated

All grease lubricated units are filled with grease at our factory and arrive ready for use.

a)Lifetime Grease Lubrication

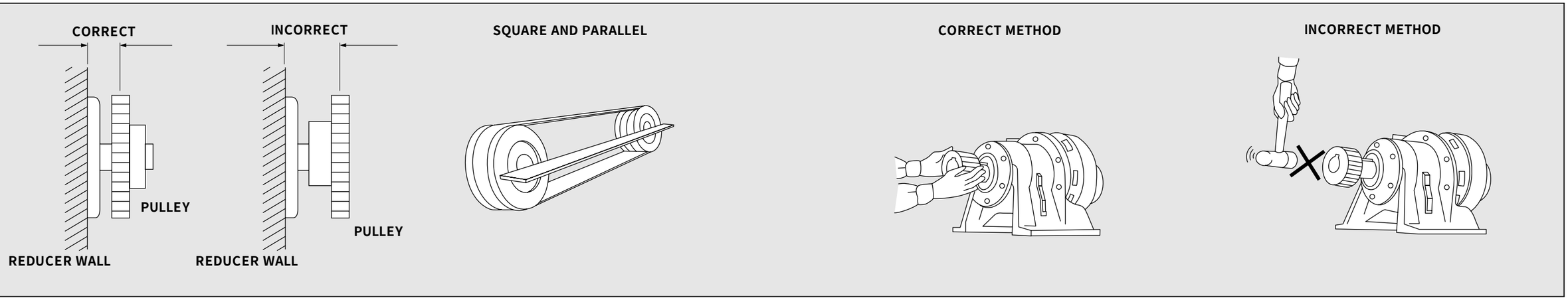
CYCLO units up to size 6125 are grease lubricated for life and suitable for any mounting position.
These sizes are filled with SHELL ALVANIA RA grease at our factory and are maintenance-free for 20,000 operating hours or 4 to 5 years.

b)Other Grease Lubrication

Grease lubricated units larger than size 6125 are usually filled with SHELL ALVANIA R2 grease at our factory. These units are quipped with grease nipples and vent plugs to allow for periodic regreasing.

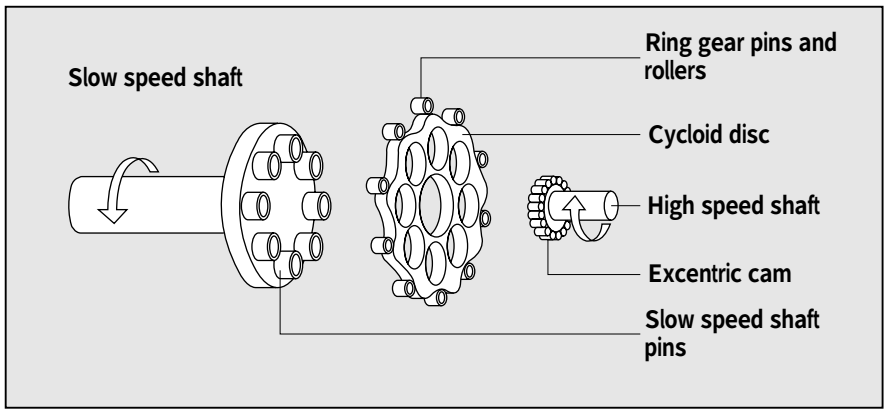
Oil Lubricated Units

Oil lubricated units must be filled to the correct level with oil before operating. Choose an appropriate oil viscosity that suits the installation ambient temperature. For recommended oil types and viscosity grades, please refer to our current Operating and maintenance manual.



HOW IT WORKS

The unique CYCLO speed reducing system is based on an ingeniously simple principle that offers many benefits to the designer and user of power transmission drives. Basically, the speed reducer has only three major moving parts:



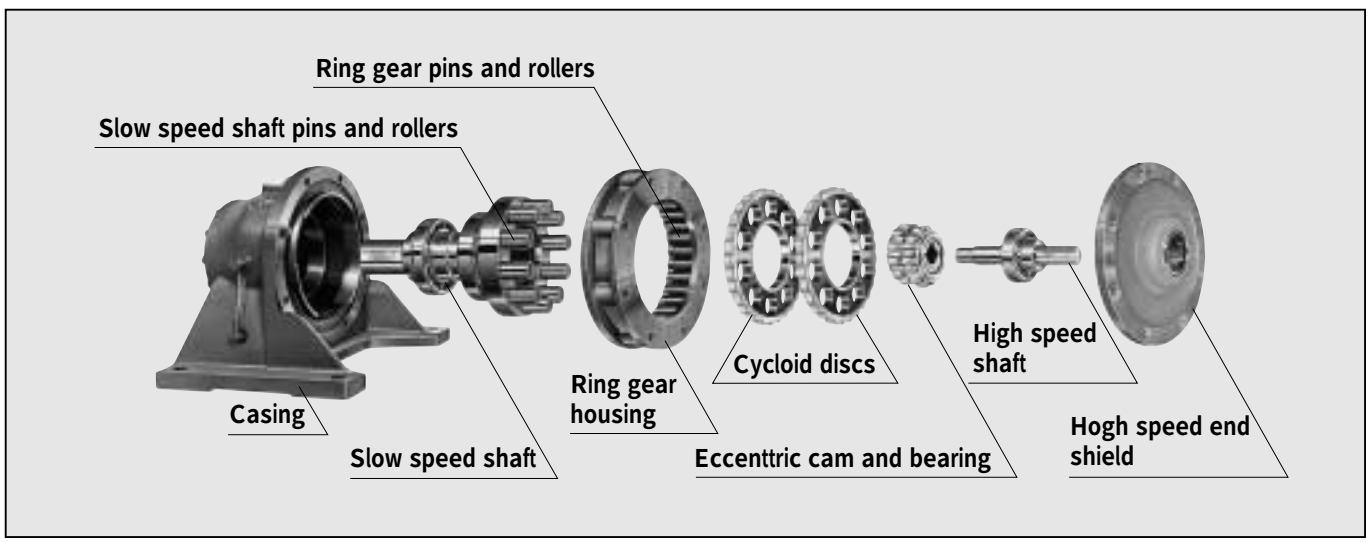
*** High speed input shaft with integrally mounted eccentric cam and roller bearing assembly**
*** Cycloid discs**
*** Slow speed shaft assembly**

As the eccentric cam rotates, it rolls the cycloid discs around the internal circumference of the stationary ring gear.

The resulting action is similar to that of a wheel rolling around the inside of a ring. As the wheel (cycloid disc) travels in a clockwise path around the ring (ring gear housing), the wheel itself turns slowly on its own axis in a counter-clockwise direction. In the CYCLO system the cycloidal profile around the outer edge of the disc engages progressively with the rollers of the fixed ring gear housing to produce a reverse rotation at reduced speed. For each complete revolution of the high speed shaft, the cycloid disc turns one cycloidal tooth pitch in the opposite direction. In general, there is one less cycloidal tooth around the disc than there are pins in the fixed ring gear housing, which results in reduction ratios equal to the number of cycloidal teeth on the disc. (Note: For some ratios, there are two less teeth per cycloid disc than there are pins in the ring gear housing.)

The reduced rotation of the cycloid discs is transmitted to the slow speed shaft by means of drive pins and rollers that engage with holes located around the middle of each disc.

Typically, a two disc system is used with a double eccentric cam which increases the torque capacity and offers an exceptionally smooth, vibration-free drive.



BASIC MOTOR SPECIFICATIONS

Table 1. 3-Phase Induction Motors.

◎ : Standard Insulation
○ : Manufactured Models

Specification / Capacity (kW)	P	Indoor Type (JP44)		Outdoor Type (JPW44)		Corrosion Proof Class 2		Insulation Class							Two Speed Motors (Constant Torque)	Inverter Motors (Constant Torque)			
								E	B		F		H			Indoor Type		Outdoor Type	
		4	6	4	6	4	6	4	4	6	4	6	4	6	4/8	4	6	4	6
0.1		○		○		○		◎	○		○		○			○		○	
0.2		○		○		○		◎	○		○		○			○		○	
0.25		○		○		○		◎	○		○		○						
0.4		○	○	○	○	○	○	◎	○	○	○	○	○	○	○	○		○	
0.55		○		○		○			◎		○		○						
0.75		○	○	○	○	○	○		◎	○	○	○	○	○	○	○	○	○	○
1.1		○		○		○			◎		○		○						
1.5		○	○	○	○	○	○		◎	○	○	○	○	○	○	○	○	○	○
2.2		○	○	○	○	○	○		◎	○	○	○	○	○	○	○	○	○	○
3.0		○		○		○			◎		○		○						
3.7		○	○	○	○	○	○		◎	○	○	○	○	○	○	○	○	○	○
5.5		○	○	○	○	○	○		◎	○	○	○	○	○	○	○	○	○	○
7.5		○	○	○	○	○	○		◎	○	○	○	○	○	○	○	○	○	○
11		○	○	○	○	○	○		◎	○	○	○	○	○	○	○	○	○	○
15		○	○	○	○	○	○		◎	◎	○	○	○	○	○	○	○	○	○
18.5		○	○	○	○	○	○		◎		○	◎	○	○	○	○	○	○	○
22		○	○	○	○	○	○		◎		○	◎	○	○	○	○	○	○	○
30		○	○	○	○	○	○				◎	◎	○	○	○	○	○	○	○
37		○	○	○	○	○	○				◎	◎	○	○		○	○	○	○
45		○	○	○	○	○	○				◎	◎	○	○		○	○	○	○
55		○	○	○	○	○	○				◎	◎	○	○		○	○	○	○
Remarks		Continuous Rating & Applicable Voltage : 200V 50/60Hz • 220V 60Hz(400V 50/60Hz • 440V 60Hz) Applicable Voltage. Provided that the base frequency for driving an inverter is 60Hz.																	

Table 2. 3-Phase Induction Motors with Built-in Brakes.

◎ : Standard Insulation
○ : Manufactured Models

Specification / Capacity (kW)	P	Indoor Type (JP44)		Outdoor Type (JPW44)		Corrosion Proof Class 2		Insulation Class							Two Speed Motors (Constant Torque)	Inverter Motors (Constant Torque)			
								E	B		F		H			Indoor Type		Outdoor Type	
		4	6	4	6	4	6	4	4	6	4	6	4	6	4/8	4	6	4	6
0.1		○		○		○		◎	○		○		○			○		○	
0.2		○		○		○		◎	○		○		○			○		○	
0.25		○		○		○		◎	○		○		○						
0.4		○	○	○	○	○	○	◎	○	○	○	○	○	○	○	○		○	
0.55		○		○		○			◎		○		○						
0.75		○	○	○	○	○	○		◎	○	○	○	○	○	○	○	○	○	○
1.1		○		○		○			◎		○		○						
1.5		○	○	○	○	○	○		◎	○	○	○	○	○	○	○	○	○	○
2.2		○	○	○	○	○	○		◎	○	○	○	○	○	○	○	○	○	○
3.0		○		○		○			◎		○		○						
3.7		○	○	○	○	○	○		◎	○	○	○	○	○	○	○	○	○	○
5.5		○	○	○	○	○	○		◎	○	○	○	○	○	○	○	○	○	○
7.5		○	○	○	○	○	○		◎	○	○	○	○	○	○	○	○	○	○
11		○	○	○	○	○	○		◎	○	○	○	○	○	○	○	○	○	○
15		○	○	○	○	○	○		◎	◎	○	○	○	○	○	○	○	○	○
18.5		○	○	○	○	○	○		◎		○	◎	○	○	○	○	○	○	○
22		○	○	○	○	○	○		◎		○	◎	○	○	○	○	○	○	○
30		○	○	○	○	○	○				◎	◎	○	○	○	○	○	○	○
37		○	○	○	○	○	○				◎	◎	○	○					
Remarks		Continuous Rating & Applicable Voltage : 200V 50/60Hz • 220V 60Hz(400V 50/60Hz • 440V 60Hz) Brake Insulation : B type Provided that the base frequency for driving an inverter is 60Hz.																	

Notes : 1. Motors with output kW specifications other than as listed in Tables 1～4 are also manufactured .Consult factory.
Examples : Special voltage, dust-proof, humidity proof, tropical treatment high temperature, ship use, dual shaft (round & square shaft), CSA Standard , NEMA Standard, etc. For other corresponding Standards, refer to Comparison of Sumitomo Standards with International Standards on Page E50～53 of Technical Information.

2. Standard protection type : Indoor Type JP44, JP54, Outdoor Type JPW44, JPW54.
3. Using an inverter drive, start-up lubrication properties and thermal rating must be reviewed for selection of the proper Cyclo reducer from size combination. Advise us of ambient temperature, input r/min, mounting method, load characteristics and other conditions of use.
4. When the standard electric motor is driven by an inverter, the dielectric withstand voltage of the electric motor may have to be taken into account if the inverter has a high carrier frequency (typical in IGBT) with high input voltage (400V or more), or if it has a long wiring distance. Consult factory in such a case.

Table 3. Safety Increased Explosion-proof(eG3)3-Phase Induction Motor

◎ : Standard Insulation
○ : Manufactured Models

Specification / Capacity (kW) / P	Indoor Type (JP44)		Outdoor Type (JPW44)		Corrosion Proof Class 2		Insulation Class B		Insulation Class F	
	4	6	4	6	4	6	4	6	4	6
0.1	○		○		○		◎		○	
0.2	○		○		○		◎		○	
0.4	○		○		○		◎		○	
0.75	○		○		○		◎		○	
1.5	○		○		○		◎		○	
2.2	○		○		○		◎		○	
3.7	○		○		○		◎		○	
5.5	○		○		○		◎		○	
7.5	○	○	○	○	○	○	◎	○	○	
11	○	○	○	○	○	○	◎	○	○	
15	○	○	○	○	○	○	◎	◎		
18.5	○	○	○	○	○	○	◎			◎
22	○	○	○	○	○	○	◎			◎
30	○	○	○	○	○	○	◎		○	◎
37	○	○	○	○	○	○			◎	◎
45	○	○	○	○	○	○			◎	◎
55	○	○	○	○	○	○			◎	◎
Remarks	Continuous Rating. Applicable Voltage : 200V、220V、350V、380V、400V、440V、50/60Hz									

Table 4. Pressure-tight Explosion-proof(d_2G4)3-Phase Motor

◎ : Standard Insulation
○ : Manufactured Models

Specification / Capacity (kW) / P	Indoor Type (JP44)		Outdoor Type (JPW44)		Corrosion Proof Class 2		Insulation Class B		Insulation Class F	Inverter Motors (Constant Torque) Indoor Type	Inverter Motors (Constant Torque) Outdoor Type
	4	6	4	6	4	6	4	4	6	4	4
0.1	○		○		○		◎				
0.2	○		○		○		◎			○	○
0.4	○		○		○		◎			○	○
0.75	○		○		○		◎			○	○
1.5	○		○		○		◎			○	○
2.2	○		○		○		◎			○	○
3.7	○		○		○		◎			○	○
5.5	○		○		○		◎			○	○
7.5	○	○	○	○	○	○	◎			○	○
11	○	○	○	○	○	○	◎	○		○	○
15	○	○	○	○	○	○	◎	◎		○	○
22	○	○	○	○	○	○	◎	◎		○	○
30	○	○	○	○	○	○	◎	◎		○	○
37	○	○	○	○	○	○		◎	◎	○	○
Ramarks	Continuous Rating. Applicable Voltage : 200V、220V、350V、380V、400V、440V、50/60Hz (For inverter drive) 200V 60Hz 220V 60Hz 400V 60Hz 440V 60Hz Applicable inverter : Applicable only to Sumitomo inverters. (Refer to Inverter catalogue.)										

⚠ Safety Precautions

1. When driving explosion protection motor by inverter, the combination authorized in Japan for motor and inverter is 1:1.
   Always operate with the specific inverter indicated. Also, inverter unit is not explosion protection structure, so always locate in the area with no explosive gas.
2. Protection of outdoor motor is JPW44. Inquire us when using in locations where it is directly exposed to the weather or where water splashes frequently.

NOMENCLATURE

C | CYCLO DRIVE

Input capacity symbol
(Motor capacity of gearmotors)
Refer Table 5, Page 15

Special specification symbol (S)

●Refer to Page 16 for mounting position examples.

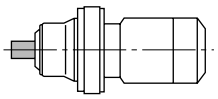
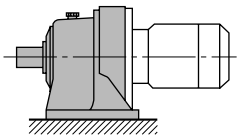
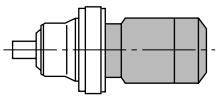
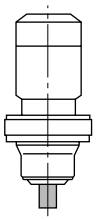
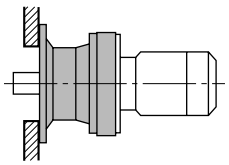
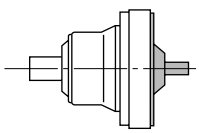
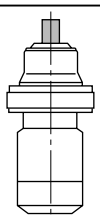
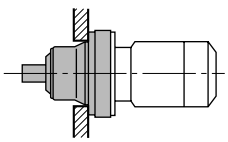
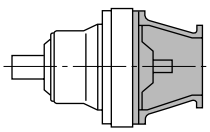
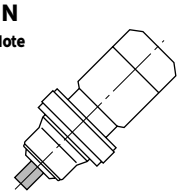
With or Without Brake
Refer Table 9, Page 15

C	H	H	M		3	—	6130		—		—		—	43

Reduction ratio.
Refer Table 10, Page 17

Suffix
Refer Table 8, Page 15

Slow Speed Shaft Direction	Mounting Style	Type of Input
H (Horizontal, slow speed shaft level)	H (Foot)	M (Gearmotors)
V (Vertical, slow speed shaft down)	V (V Flange)	No symbol (Reducers)
W (Vertical, slow speed shaft up)	F (Flange)	J,JM (With adaptor)
N (Maintenance-free Universal direction)		Refer Table 7, Page 15 for details.

H 	H 	M 
V 	V 	No symbol 
W 	F 	J 
N Note 		

Shaft Spec. / **Symbol**

Metric JIS	No symbol
Inch Size	Y
AGMA I	YA
AGMA II	YB
AGMA III	YC
Metric DIN	G

Cyclo Reducer Frame Size
Refer Table 6, Page 15

Note : N : Universal Mounting Maintenance-free is for Frame Size up to 6125 (Single stage), 6125DB (Double stage)

Table 5. Input Capacity Symbol(Motor capacity of gearmotors).

4P	Capacity symbol	01	02	03	05	08	1	1H	2	3	4	5
	kW(HP)	0.1(1/8)	0.2(1/4)	0.25(1/3)	0.4(1/2)	0.55(3/4)	0.75(1)	1.1(1.5)	1.5(2)	2.2(3)	3.0(4)	3.7(5)
	Capacity symbol	8	10	15	20	25	30	40	50	60	75	100
	kW(HP)	5.5(7.5)	7.5(10)	11(15)	15(20)	18.5(25)	22(30)	30(40)	37(50)	45(60)	55(75)	75(100)

6P	Capacity symbol	206	256	306	406	506	606	756	1006	1256	1506	1756
	kW(HP)	15(20)	18.5(25)	22(30)	30(40)	37(50)	45(60)	55(75)	75(100)	90(125)	110(150)	132(175)

Table 6 Cyclo Reducer Frame Size.

Single Reduction
6060
6065
6070
6075
6080
6085
6090
6095
6100
6105
610H
6110
6115
6120
6125
612H
6130
6135
6140
6145
614H
6160
6165
616H
6170
6175
6180
6185
6190
6195
6205
6215
6225
6235

Single Reduction
6245
6255
6265
6275

Double Reduction	(Output side+Input side)
6060DA	6060+6060
6065DA	6065+6065
6070DA	6070+6065
6075DA	6075+6065
6090DA	6090+6075
6095DA	6095+6075
6100DA	6100+6075
6105DA	6105+6075
6120DA	6120+6075
6120DB	6120+6095
6125DA	6125+6075
6125DB	6125+6095
6130DA	6130+6075
6130DB	6130+6095
6130DC	6130+6105
6135DA	6135+6075
6135DB	6135+6095
6135DC	6135+6105
6140DA	6140+6075
6140DB	6140+6095
6140DC	6140+6105
6145DA	6145+6075
6145DB	6145+6095
6145DC	6145+6105
6160DA	6160+6095
6160DB	6160+6105
6160DC	6160+6125
6165DA	6165+6095
6165DB	6165+6105
6165DC	6165+6125
6170DA	6170+6095
6170DB	6170+6105
6170DC	6170+6125
6175DA	6175+6095

Double Reduction	(Output side+Input side)
6175DB	6175+6105
6175DC	6175+6125
6180DA	6180+6105
6180DB	6180+6135
6185DA	6185+6105
6185DB	6185+6135
6190DA	6190+6125
6190DB	6190+6135
6195DA	6195+6125
6195DB	6195+6135
6205DA	6205+6125
6205DB	6205+6135
6215DA	6215+6135
6215DB	6215+6165
6225DA	6225+6135
6225DB	6225+6175
6235DA	6235+6165
6235DB	6235+6185
6245DA	6245+6165
6245DB	6245+6185
6255DA	6255+6175
6255DB	6255+6195
6265DA	6265+6195
6275DA	6275+6195

H type is option.

Table 7. Type of Motor Connection

Type of Motor Connection	Without Motor	With Motor
Integral Motor		M
Free Shaft	–	
W/C-Face Adaptor	J	JM
W/Quill I/P Adaptor	X	XM
Beier	B	BM
With Clutch Brake		CM
With Fluid Coupling		RM

Table 8. Suffix Designation

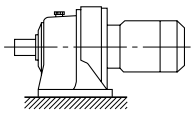
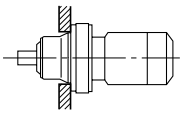
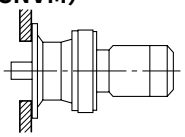
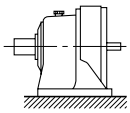
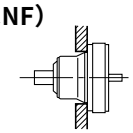
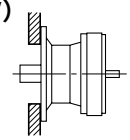
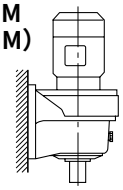
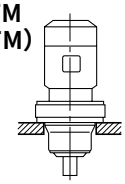
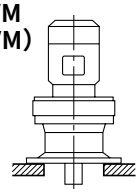
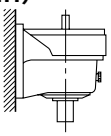
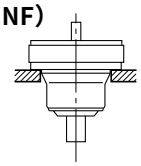
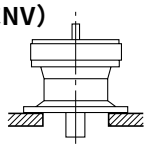
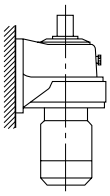
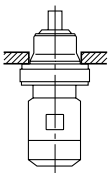
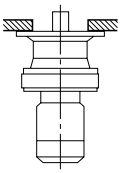
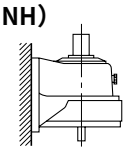
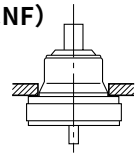
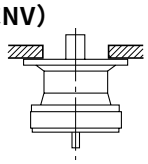
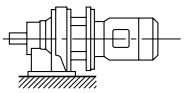
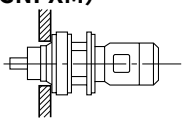
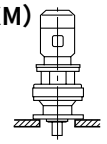
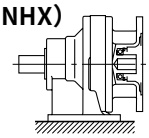
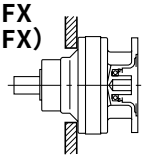
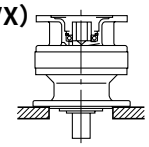
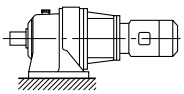
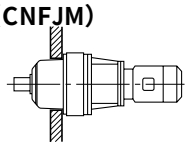
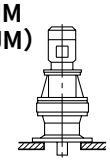
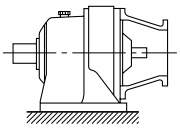
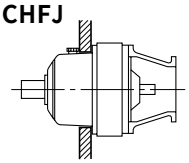
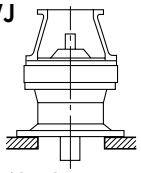
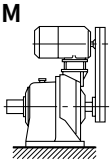
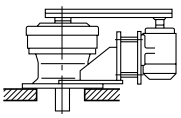
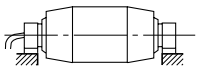
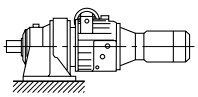
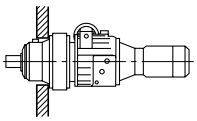
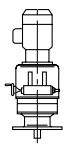
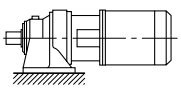
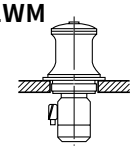
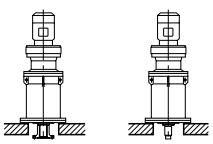
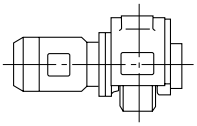
Reducer Specification	Symbol	Motor Specification	Symbol
Torque Limiter	TL	AF Motor	AV
Light Heavy Radial	R1	Servo Motor	SV
High Cap. Brg. Ductile Casing	R2	DC Motor	DV
Baseplate	BP	High Efficency Motor	ES
HH Type Ceiling	H1		
Modification Left Wall	H2		
Modification Right Wall	H3		
Low Backlash	LB		

Table 9. Brake(Integral Only)

Brake	Symbol
NO	
YES	B

MOUNTING POSITIONS

N : Universal Mounting Maintenance-free is for Frame Size up to 6125 (Single stage), 6125DB (Double stage)

Gearmotors			Speed Reducers		
CHHM (CNHM) 	**CHFM (CNFM)** 	**CHVM (CNVM)** 	**CHH (CNH)** 	**CHF (CNF)** 	**CHV (CNV)** 
CVHM (CNHM) 	**CVFM (CNFM)** 	**CVVM (CNVM)** 	**CVH (CNH)** 	**CVF (CNF)** 	**CVV (CNV)** 
CWHM (CNHM) 	**CWFM (CNFM)** 	**CWVM (CNVM)** 	**CWH (CNH)** 	**CWF (CNF)** 	**CWV (CNV)** 
CHHXM (CNHXM)  Input side Hollow shaft	**CHFXM (CNFXM)**  Input side Hollow shaft	**CVVXM (CNVXM)**  Input side Hollow shaft	**CHHM (CNHX)**  Input side Hollow shaft	**CHFX (CNFX)**  Input side Hollow shaft	**CVVX (CNVX)**  Input side Hollow shaft
CHHJM (CNHJM)  With Adaptpr	**CHFJM (CNFJM)**  With Adaptpr	**CVVJM (CNVJM)**  With Adaptpr	**CHHJ**  With Adaptpr	**CHFJ**  With Adaptpr	**CVVJ**  With Adaptpr
CHHPM  Top Mount Type	**CVVPM**  Side Mount Type	**CPM**  Cyclo motor pully			
CHHBM  Beier Cyclo Variator	**CHFBM**  Beier Cyclo Variator	**CVVBM**  Beier Cyclo Variator			
CHHCM  Cyclo Pack with Clutch Brake	**C11WM**  Cyclo capstan	**C14VM** **C15VM**  Vertical special base mount			
C10CM  Cyclo wheel	**CPC** Center post type	**C17VM** **C18VM** Vertical special base mount			

Because we constantly strive to satisfy individual user requirements, we can provide a wide variety of other special models in addition to those shown above. Please contact us for additional information.

Table 10. Available Reduction Ratios.

Single Reduction									
6	8	11	13	15	17	21	25	29	35
43	51	59	71	87	119				
Double Reduction									
104 (13×8)	121 (11×11)	143 (13×11)	165 (15×11)	195 (15×13)	231 (21×11)	273 (21×13)	319 (29×11)	377 (29×13)	473 (43×11)
559 (43×13)	649 (59×11)	731 (43×17)	841 (29×29)	1003 (59×17)	1247 (43×29)	1479 (87×17)	1849 (43×43)	2065 (59×35)	2537 (59×43)
3045 (87×35)	3481 (59×59)	4437 (87×51)	Note 1 5133 (87×59)	6177 (87×71)	7569 (87×87)				

Note1 : Frame size 6205#～6265# are（59×87）.

Table 11. Other Reduction Ratios.

Under certain conditions, the following reduction ratios may also be available, please consult us. (The following output shaft r/min, is an example when coupled with a 4-pole motor)

Reduction Ratio		88 (11×8)	90 (15×6)	102 (17×6)	120 (15×8)	126 (21×6)	136 (17×8)	150 (25×6)	168 (21×8)	169 (13×13)	174 (29×6)	187 (17×11)	200 (25×8)	210 (35×6)	221 (17×13)	225 (15×15)
Output speed r/min	50Hz	16.5	16.1	14.2	12.1	11.5	10.7	9.67	8.63	8.58	8.33	7.75	7.25	6.90	6.56	6.44
	60Hz	19.9	19.4	17.2	14.6	13.9	12.9	11.7	10.4	10.4	10.1	9.36	8.75	8.33	7.92	7.78

Reduction Ratio		232 (29×8)	255 (17×15)	258 (43×6)	275 (25×11)	280 (35×8)	289 (17×17)	306 (51×6)	315 (21×15)	325 (25×13)	344 (43×8)	354 (59×6)	357 (21×17)	375 (25×15)	385 (35×11)	408 (51×8)
Output speed r/min	50Hz	6.25	5.69	5.62	5.27	5.18	5.02	4.74	4.60	4.46	4.22	4.10	4.06	3.87	3.77	3.55
	60Hz	7.54	6.86	6.87	6.36	6.25	6.06	5.72	5.56	5.38	5.09	4.94	4.90	4.67	4.55	4.29

Reduction Ratio		425 (25×17)	426 (71×6)	435 (29×15)	441 (21×21)	455 (35×13)	472 (59×8)	493 (29×17)	522 (87×6)	525 (35×15)	561 (51×11)	568 (71×8)	595 (35×17)	609 (29×21)	625 (25×25)	645 (43×15)
Output speed r/min	50Hz	3.41	3.40	3.33	3.29	3.19	3.07	2.94	2.78	2.76	2.58	2.55	2.44	2.38	2.32	2.25
	60Hz	4.12	4.11	4.02	3.97	3.85	3.71	3.55	3.35	3.33	3.12	3.08	2.94	2.87	2.80	2.71

Reduction Ratio		663 (51×13)	696 (87×8)	725 (29×25)	735 (35×21)	765 (51×15)	767 (59×13)	781 (71×11)	867 (51×17)	875 (35×25)	885 (59×15)	903 (43×21)	923 (71×13)	957 (87×11)	1015 (35×29)	1065 (71×15)
Output speed r/min	50Hz	2.19	2.08	2.00	1.97	1.90	1.89	1.86	1.67	1.66	1.64	1.61	1.57	1.52	1.43	1.36
	60Hz	2.64	2.51	2.41	2.38	2.29	2.28	2.24	2.02	2.00	1.98	1.94	1.90	1.83	1.72	1.64

Reduction Ratio		1071 (51×21)	1075 (43×25)	1131 (87×13)	1207 (71×17)	1225 (35×35)	1239 (59×21)	1275 (51×25)	1305 (87×15)	1475 (59×25)	1491 (71×21)	1505 (43×35)	1711 (59×29)	1775 (71×25)	1785 (51×35)	1827 (87×21)
Output speed r/min	50Hz	1.35	1.35	1.28	1.20	1.18	1.17	1.14	1.11	0.98	0.97	0.96	0.85	0.82	0.81	0.79
	60Hz	1.63	1.63	1.55	1.45	1.43	1.41	1.37	1.34	1.19	1.17	1.16	1.02	0.99	0.98	0.96

Reduction Ratio		2059 (71×29)	2175 (87×25)	2193 (51×43)	2485 (71×35)	2523 (87×29)	2601 (51×51)	3009 (59×51)	3053 (71×43)	3621 (71×51)	3741 (87×43)	4189 (71×59)	5041 (71×71)
Output speed r/min	50Hz	0.70	0.67	0.66	0.58	0.57	0.56	0.48	0.47	0.40	0.39	0.45	0.29
	60Hz	0.85	0.80	0.80	0.70	0.69	0.67	0.58	0.57	0.48	0.47	0.42	0.35

Input speed
50Hz：1450r/min
60Hz：1750r/min