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Sumitomo Drive Technologies

CYCLO® 6000 Series

Gearmotor & Speed Reducer

Sumitomo Drive Technologies

CYCLO®
6000 Series
Gearmotor & Speed Reducer

Sumitomo Heavy Industries, Ltd.

No.C2001E-7

Table of Contents

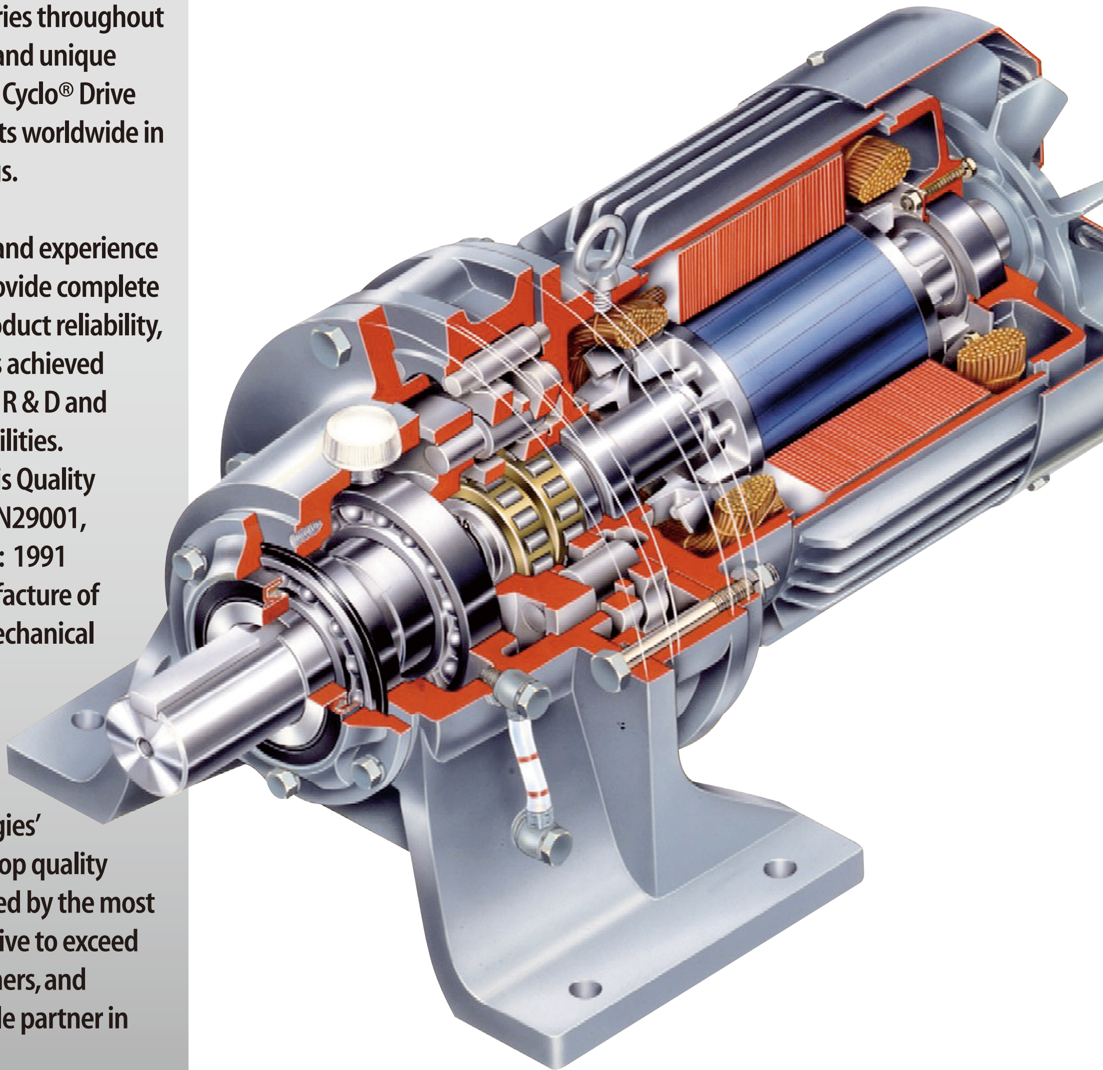
Over 12 Million in the Making

Sumitomo Drive Technologies is a world-class leader in power transmission and control devices. Our top lined product, the Cyclo® Drive is actively serving industries throughout the world through its popular and unique epitrochoidal mechanism. The Cyclo® Drive has served over ten million units worldwide in a wide range of model offerings.

With the technical know-how and experience cultivated over 80 years, we provide complete satisfaction with unrivalled product reliability, durability and economy. This is achieved through our continual product R & D and state-of-the-art production facilities. Sumitomo Drive Technologies is Quality System Certified to ISO 9001, EN29001, BS5750 Part 1: 1987, JIS Z9901: 1991 standard for design and manufacture of mechanical speed reducers, mechanical variators, electric motors and gearmotors in over 30 facilities located around the world.

The Sumitomo Drive Technologies' brand guarantees innovative, top quality products and services developed by the most advanced technologies. We strive to exceed the expectations of our customers, and continue to be your dependable partner in business.

High Shock Load, High Reliability Cycloidal Speed Reducers and Gearmotors



Exceptional Performance, Unmatched Reliability

The Sumitomo Cyclo® Drive is unsurpassed by any other inline drive available in the market today. Cyclo®'s unique cycloid design has advantages superior to speed reducers using common involute tooth gears.
Compared to gear teeth with limited contact points of involute gears, the Cyclo® has two to three times more of its reduction components in contact at all times. Cyclo® speed reducers and gearmotors are designed to withstand shock loads exceeding ratings of 500%, provide exceptional performance, reliability, and long life in the most severe applications.

CYCLO® 6000 Series

Features & Benefits

Outstanding Reliability - 2 Year Warranty

Cyclo® Drive speed reducers and gearmotors provide customers with a typical operating life of 20 years. We back this assurance with a two year warranty on all Cyclo® products.

Durable, Robust Construction

On top of the unique mechanism and design, Cyclo® housings are made of cast iron with the exception of our three smallest size models. All rotating elements are made from Chromium Molybdenum bearing steel, which have been hardened and ground .

Smooth Operation and Low Noise

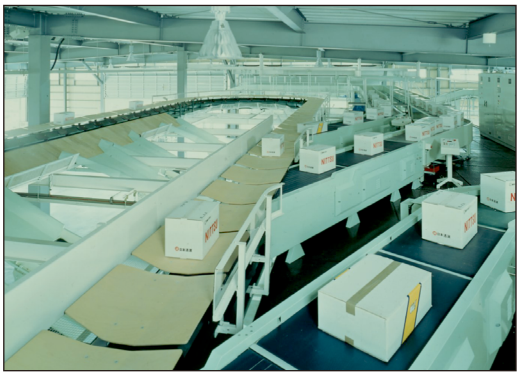
In comparison to the sliding tooth contact of the conventional gearing, the rolling contact of the Cyclo® system provides a reduced noise level.

Selection and Variety

Reduction Ratios from 1/2.5 to 1/119 are available for the single stage; for triple stages we offer ratios up to 658503:1 .

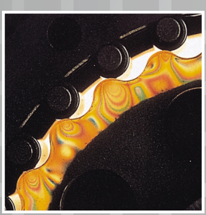
Applications

Applications Include: Conveyors, Automotive Plants, Recycling Machines, Wastewater Treatment, Steel Mills, Construction Equipment, Paper Mills, Food Machinery, Poultry Plants, Sawmills and Wood Mills, Processing Plants, etc.



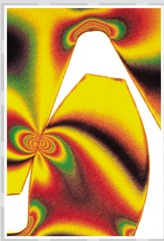
Clockwise from Top-Left: Chemical and Food Industry (agitator, mixer), Logistics and Handling Machines (sorting machines, conveyors), Iron and Steel Manufacturing (conveyors) and Water Treatment Machines (agitators).

Superior Design, Powerful Performance



CYCLO® SPEED REDUCER

All torque transmitting parts roll, not grind. The gear tooth profile of the Cyclo® reducer enables the sharing of the load by a number of teeth, thus not susceptible to tooth breakage.



CONVENTIONAL HELICAL REDUCER

Involute gears allow for small tooth engagement rate.
Torque transmitting parts grind, wear, and can break off with the sliding contact.

Product Line-up

6W Commercial

Industrial

In-Line

Offset-Parallel

Right-Angle

CYCLO®

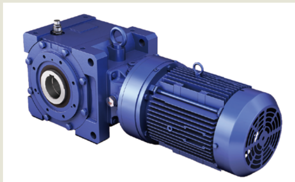
**Unmatched Reliability,
Exceptional Performance Cycloidal Drives**

6000 Series

Unique Cycloidal gear teeth and mechanism is unsurpassed by any other inline drive. Simple and compact design.
Power: 0.1kW~132kW Ratio: 1/2.5~1/658503

HBB Series

Integrated parallel shaft mount design, single stage, helical gearbox for durability.
Power: 0.1kW~30kW Ratio: 1/11~1/4365



BBB Series

Incorporates the strength and flexibility of the Cyclo® Drive with adaptability of a shaft-mounted design in a right angle spiral bevel gearbox for exceptional reliability.
Power: 0.1kW~55kW Ratio: 1/11~1/10658

ASTERO®

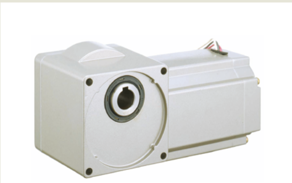
Practical and Convenient

ASTERO®

Modular system of motors and gearheads. Maximum flexibility and interchangability.
Power: 6W~90W Ratio: 1/3~1/2000

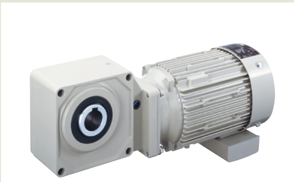
HYPONIC DRIVE®

Quiet, Compact & Maintenance Free



HYPONIC

Highly efficient, grease lubricated, compact design hypoid gearing.
Power: 15W~90W Ratio:1/5~1/240



HYPONIC

Patented all-steel hypoid gear technology is extremely high-performance and more efficient than worm gearing.
Power: 40W~11kW Ratio: 1/5~1/1440

Motion Control Drives (MCD)

High Precision, Very Low Backlash

F Series CYCLO®
Rolling contact of cycloid discs, optimum load distribution, and low vibration yields highest efficiencies.

Torque: 142N•m~4415N•m Ratio: 1/29~1/171
Backlash: No Backlash Lost Motion: 0.5~1.0arc min

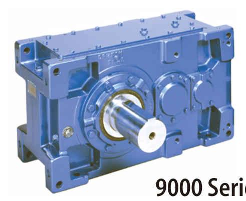
IB Series P1 Type
Precision planetary gearheads for Servomotor applications in the most compact design.

Torque: 10.0N•m~101N•m Ratio: 1/3.7~1/81
Backlash: 3min, 15min

Engineering 552kN•m

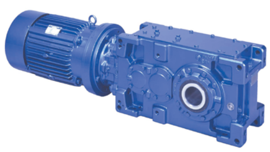
PARAMAX®

High Quality & Maximum Efficiency, Computer-Aided Design



9000 Series

The offset-parallel 9000 Series allow direct motor mounting and has universal housing for unique mounting positions.
Power: 2.6~552kN•m Ratio: 1/6.3~1/500



9000 Series

The new 9000 Series design combines helical gears and bevel gears in a right-angle gearbox for compact drive assembly.
Power: 2.6~552kN•m Ratio: 1/6.3~1/450

LB Series CYCLO®
The reputation of the Cyclo® Drive's strength to the Servomotor gives us a direct coupling gearhead possibility for a maintenance free operation.

Torque: 30N•m~630Nm Ratio: 1/11~1/29
Backlash: 6min

Sumitomo Drives

Speed Variators

BEIER Variator
BEIER CYCLO® Variator

Constant power torque converters with extremely accurate speed/ratio holding and repeatability to control speeds on industrial machinery.
Capacity: 0.2kW~150kW

Inverters
SF-520, HF-520, HF-430a

Multiple functions, easy to use highly efficient Inverter.
Output Power: 0.1kW~55kW

Shaft-Mounted Speed Reducer

HSM

Maximum loading and the highest efficiency torque output in the most compact design.
Power: 0.2kW~224kW

Worm Gears

HEDCON®

Unique double contact theory, high efficiency, and high strength work reduction mechanism.
Power: 0.8~82kN•m
Ratio: 1/5~1/100

Planetary Gears

COMPOWER®

Unique load sharing mechanism, high precision carburized ground gears.
Power: 0.46~736kN•m
Ratio: 1/5~1/1400

Product Line-up

Product Range of CYCLO® DRIVE

COMMON

CYCLO® Frame Size

Table A-1 CYCLO Frame Size

6000SK Series
Frame Size
6070SK
6075SK
6080SK
6085SK
6090SK
6095SK
6100SK
6105SK
6110SK
6115SK

6000 Series							
Single Reduction		Double Reduction					
Frame Size		Frame Size	(Output side + Input side)	Frame Size	(Output side + Input side)	Frame Size	(Output side + Input side)
6060	6140	6060DA	(6060+6060)	6140DC	(6140+6105)	6190DA	(6190+6125)
6065	6145	6065DA	(6065+6060)	6145DA	(6145+6075)	6190DB	(6190+6135)
6070	614H	6070DA	(6070+6065)	6145DB	(6145+6095)	6195DA	(6195+6125)
6075	6160	6075DA	(6075+6065)	6145DC	(6145+6105)	6195DB	(6195+6135)
6080	6165	6090DA	(6090+6075)	6160DA	(6160+6095)	6205DA	(6205+6125)
6085	616H	6095DA	(6095+6075)	6160DB	(6160+6105)	6205DB	(6205+6135)
6090	6170	6100DA	(6100+6075)	6160DC	(6160+6125)	6215DA	(6215+6135)
6095	6175	6105DA	(6105+6075)	6165DA	(6165+6095)	6215DB	(6215+6165)
6100	6180	6120DA	(6120+6075)	6165DB	(6165+6105)	6225DA	(6225+6135)
6105	6185	6120DB	(6120+6095)	6165DC	(6165+6125)	6225DB	(6225+6175)
610H	6190	6125DA	(6125+6075)	6170DA	(6170+6095)	6235DA	(6235+6165)
6110	6195	6125DB	(6125+6095)	6170DB	(6170+6105)	6235DB	(6235+6185)
6115	6205	6130DA	(6130+6075)	6170DC	(6170+6125)	6245DA	(6245+6165)
6120	6215	6130DB	(6130+6095)	6175DA	(6175+6095)	6245DB	(6245+6185)
6125	6225	6130DC	(6130+6105)	6175DB	(6175+6105)	6255DA	(6255+6175)
612H	6235	6135DA	(6135+6075)	6175DC	(6175+6125)	6255DB	(6255+6195)
6130	6245	6135DB	(6135+6095)	6180DA	(6180+6105)	6265DA	(6265+6195)
6135	6255	6135DC	(6135+6105)	6180DB	(6180+6135)	6275DA	(6275+6195)
	6265	6140DA	(6140+6075)	6185DA	(6185+6105)		
	6275	6140DB	(6140+6095)	6185DB	(6185+6135)		

Reduction Ratio

Table A-2 6000 Series

Single Reduction								
6	8	11	13	15	17	21	25	29
35	43	51	59	71	87	119		

Double Reduction indicated in catalog (Upper row: reduction ratio, lower row: output side reduction ratio x input side reduction ratio)										
104	121	143	165	195	231	273	319	377	473	559
(13 × 8)	(11 × 11)	(13 × 11)	(15 × 11)	(15 × 13)	(21 × 11)	(21 × 13)	(29 × 11)	(29 × 13)	(43 × 11)	(43 × 13)
649	731	841	1003	1247	1479	1849	2065	2537	3045	3481
(59 × 11)	(43 × 17)	(29 × 29)	(59 × 17)	(43 × 29)	(87 × 17)	(43 × 43)	(59 × 35)	(59 × 43)	(87 × 35)	(59 × 59)
4437	5133[Note: 1]	6177	7569							
(87 × 51)	(87 × 59)	(87 × 71)	(87 × 87)							

Note: 1. Frame size 6205# ~ 6265# are (59 × 87).

Other Reduction Ratios (Under certain conditions, the following reduction ratios may also be available, please consult us.)

Reduction Ratio	88	90	102	120	126	136	150	168	169	174	187	200	210	221	225	232	255	258	275
	(11 × 8)	(15 × 6)	(17 × 6)	(15 × 8)	(21 × 6)	(17 × 8)	(25 × 6)	(21 × 8)	(13 × 13)	(29 × 6)	(17 × 11)	(25 × 8)	(35 × 6)	(17 × 13)	(15 × 15)	(29 × 8)	(17 × 15)	(43 × 6)	(25 × 11)
Output speed 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	6.25	5.69	5.62	5.27
r/min 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	7.54	6.86	6.87	6.36
Reduction Ratio	280	289	306	315	325	344	354	357	375	385	408	425	426	435	441	455	472	493	522
	(35 × 8)	(17 × 17)	(51 × 6)	(21 × 15)	(25 × 13)	(43 × 8)	(59 × 6)	(21 × 17)	(25 × 15)	(35 × 11)	(51 × 8)	(25 × 17)	(71 × 6)	(29 × 15)	(21 × 21)	(35 × 13)	(59 × 8)	(29 × 17)	(87 × 6)
Output speed 50Hz	5.18	5.02	4.74	4.60	4.46	4.22	4.10	4.06	3.87	3.77	3.55	3.41	3.40	3.33	3.29	3.19	3.07	2.94	2.78
r/min 60Hz	6.25	6.06	5.72	5.56	5.38	5.09	4.94	4.90	4.67	4.55	4.29	4.12	4.11	4.02	3.97	3.85	3.71	3.55	3.35
Reduction Ratio	525	561	568	595	609	625	645	663	696	725	735	765	767	781	867	875	885	903	923
	(35 × 15)	(51 × 11)	(71 × 8)	(35 × 17)	(29 × 21)	(25 × 25)	(43 × 15)	(51 × 13)	(87 × 8)	(29 × 25)	(35 × 21)	(51 × 15)	(59 × 13)	(71 × 11)	(51 × 17)	(35 × 25)	(59 × 15)	(43 × 21)	(71 × 13)
Output speed 50Hz	2.76	2.58	2.55	2.44	2.38	2.32	2.25	2.19	2.08	2.00	1.97	1.90	1.89	1.86	1.67	1.66	1.64	1.61	1.57
r/min 60Hz	3.33	3.12	3.08	2.94	2.87	2.80	2.71	2.64	2.51	2.41	2.38	2.29	2.28	2.24	2.02	2.00	1.98	1.94	1.90
Reduction Ratio	957	1015	1065	1071	1075	1131	1207	1225	1239	1275	1305	1475	1491	1505	1711	1775	1785	1827	2059
	(87 × 11)	(35 × 29)	(71 × 15)	(51 × 21)	(43 × 25)	(87 × 13)	(71 × 17)	(35 × 35)	(59 × 21)	(51 × 25)	(87 × 15)	(59 × 25)	(71 × 21)	(43 × 35)	(59 × 29)	(71 × 25)	(51 × 35)	(87 × 21)	(71 × 29)
Output speed 50Hz	1.52	1.43	1.36	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	0.70
r/min 60Hz	1.83	1.72	1.64	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	0.85
Reduction Ratio	2175	2193	2485	2523	2601	3009	3053	3621	3741	4189	5041								
	(87 × 25)	(51 × 43)	(71 × 35)	(87 × 29)	(51 × 51)	(59 × 51)	(71 × 43)	(71 × 51)	(87 × 43)	(71 × 59)	(71 × 71)								
Output speed 50Hz	0.67	0.66	0.58	0.57	0.56	0.48	0.47	0.40	0.39	0.45	0.29								
r/min 60Hz	0.80	0.80	0.70	0.69	0.67	0.58	0.57	0.48	0.47	0.42	0.35								

Calculation of output speed is based on the following input speed.
50Hz: 1450r/min
60Hz: 1750r/min

Table A-3 6000SK Series (Actual Reduction Ratio)

Frame Size	Nominal Reduction Ratio						
	2.5	3	4	5	6	8	10
6070SK, 6075SK	2.514	2.911	3.985	5.109	5.915	8.097	9.848
6080SK, 6085SK	2.475	2.931	3.878	5.114	6.164	7.660	9.474
6090SK, 6095SK	2.492	2.878	4.100	5.017	5.623	8.169	9.996
6100SK, 6105SK	2.492	2.878	4.100	5.017	5.623	8.169	9.996
6110SK, 6115SK	2.483	3.063	3.859	4.707	5.980	7.738	10.07

*Note that reduction ratio differs for each frame size for 6000SK Series.

Product Range of CYCLO® DRIVE

Available Combination

Table A-4 6000SK Series

Nominal Reduction Ratio		2.5	3	4	5	6	8	10
Output Speed	50Hz	580	483	363	290	242	181	145
[r/min]	60Hz	700	583	438	350	292	219	175
0.4 × 4P	kW	●	●	●	●	●	●	●
0.55 × 4P	kW	●	●	●	●	●	●	●
0.75 × 4P	kW	●	●	●	●	●	●	●
1.1 × 4P	kW	●	●	●	●	●	●	●
1.5 × 4P	kW	●	●	●	●	●	●	●
2.2 × 4P	kW	●	●	●	●	●	●	●
3.0 × 4P	kW	●	●	●	●	●	●	●
3.7 × 4P	kW	●	●	●	●	●	●	●
5.5 × 4P	kW	●	●	●	●	●	●	

Table A-5 6000 Series Single Reduction

Reduction Ratio		6	8	11	13	15	17	21	25	29	35	43	51	59	71	87	119
Output Speed	50Hz	242	181	132	112	96.7	85.3	69	58	50	41.4	33.7	28.4	24.6	20.4	16.7	12.2
[r/min]	60Hz	292	219	159	135	117	103	83.3	70	60.3	50	40.7	34.3	29.7	24.6	20.1	14.7
0.1 × 4P	kW	●	●	●	●	●	●	●	●	●	●	●	●	●	●	●	●
0.2 × 4P	kW	●	●	●	●	●	●	●	●	●	●	●	●	●	●	●	●
0.25 × 4P	kW	●	●	●	●	●	●	●	●	●	●	●	●	●	●	●	●
0.4 × 4P	kW	●	●	●	●	●	●	●	●	●	●	●	●	●	●	●	
0.55 × 4P	kW	●	●	●	●	●	●	●	●	●	●	●	●	●	●	●	
0.75 × 4P	kW	●	●	●	●	●	●	●	●	●	●	●	●	●	●	●	
1.1 × 4P	kW	●	●	●	●	●	●	●	●	●	●	●	●	●	●	●	
1.5 × 4P	kW	●	●	●	●	●	●	●	●	●	●	●	●	●	●	●	
2.2 × 4P	kW	●	●	●	●	●	●	●	●	●	●	●	●	●	●	●	
3.0 × 4P	kW	●	●	●	●	●	●	●	●	●	●	●	●	●	●	●	
3.7 × 4P	kW	●	●	●	●	●	●	●	●	●	●	●	●	●	●	●	
5.5 × 4P	kW	●	●	●	●	●	●	●	●	●	●	●	●	●	●	●	
7.5 × 4P	kW	●	●	●	●	●	●	●	●	●	●	●	●	●	●	●	
11 × 4P	kW	●	●	●	●	●	●	●	●	●	●	●	●	●	●	●	
15 × 4P	kW	●	●	●	●	●	●	●	●	●	●	●	●	●	●	●	
18.5 × 4P	kW	●	●	●	●	●	●	●	●	●	●	●	●	●	●		
22 × 4P	kW	●	●	●	●	●	●	●	●	●	●	●	●	●			
30 × 4P	kW	●	●	●	●	●	●	●	●	●	●	●	●	●			
37 × 4P	kW			●	●	●	●	●	●	●	●	●		●			
45 × 4P	kW			●	●	●	●	●	●	●		●					
55 × 4P	kW			●		●		●		●		●					
75 × 4P	kW			●		●		●		●							

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

Note:
1. Calculation of output speed is based on the following input speed.
   - 4P Motor
     50Hz: 1450 r/min
     60Hz: 1750 r/min
   - 6P Motor
     50Hz: 980 r/min
     60Hz: 1165 r/min
2. Combination in the table is based on service factor 1.0. Refer to Gearmotor Selection Table for combinations with other service factors.
3. Reduction ratios in 6000SK Series table are nominal ratios. Output speeds are based on these ratios. Refer to "Reduction Ratio" tables in the previous page for actual reduction ratio.
4. The rated current of 6P motor is different from the one of 4P motor even if the power is same.

Product Range of CYCLO® DRIVE

Table A-6 6000 Series Double Reduction

Reduction Ratio		104	121	143	165	195	231	273	319	377	473	559	649	731	841	1003	1247	1479	1849	2065
Output Speed	50Hz	13.9	12	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	0.98	0.784	0.702
[r/min]	60Hz	16.8	14.5	12.2	10.6	8.97	7.58	6.41	5.49	4.64	3.7	3.13	2.7	2.39	2.08	1.74	1.4	1.18	0.946	0.847
0.1 × 4P	kW	●	●	●	●	●	●	●	●	●	●	●	●	●	●	●	●	●	●	●
0.2 × 4P	kW	●	●	●	●	●	●	●	●	●	●	●	●	●	●	●	●	●	●	●
0.25 × 4P	kW	●	●	●	●	●	●	●	●	●	●	●	●	●	●	●	●	●	●	●
0.4 × 4P	kW	●	●	●	●	●	●	●	●	●	●	●	●	●	●	●	●	●	●	●
0.55 × 4P	kW	●	●	●	●	●	●	●	●	●	●	●	●	●	●	●	●	●	●	
0.75 × 4P	kW	●	●	●	●	●	●	●	●	●	●	●	●	●	●	●	●	●	●	●
1.1 × 4P	kW	●	●	●	●	●	●	●	●	●	●	●	●	●	●	●	●	●	●	●
1.5 × 4P	kW	●	●	●	●	●	●	●	●	●	●	●	●	●	●	●	●	●	●	●
2.2 × 4P	kW	●	●	●	●	●	●	●	●	●	●	●	●	●	●	●	●	●	●	●
3 × 4P	kW	●	●	●	●	●	●	●	●	●	●	●	●	●	●	●	●	●	●	●
3.7 × 4P	kW	●	●	●	●	●	●	●	●	●	●	●	●	●	●	●	●	●	●	●
5.5 × 4P	kW	●	●	●	●	●	●	●	●	●	●	●	●	●	●	●	●	●	●	●
7.5 × 4P	kW	●	●	●	●	●	●	●	●	●	●	●	●	●	●	●	●	●	●	●
11 × 4P	kW	●	●	●	●	●	●	●	●	●	●	●	●	●	●	●	●	●		
15 × 4P	kW	●	●		●	●	●	●	●	●	●	●	●	●	●	●				
18.5 × 4P	kW		●		●	●	●	●	●	●	●	●	●	●	●					
22 × 4P	kW		●		●	●	●	●	●	●	●	●	●							
30 × 4P	kW		●		●	●	●	●	●	●	●									
37 × 4P	kW		●		●	●	●		●	●										
45 × 4P	kW		●		●	●			●											

Reduction Ratio		2537	3045	3481	4437	5133	6177	7569
Output Speed	50Hz	0.572	0.476	0.417	0.327	0.282	0.235	0.192
[r/min]	60Hz	0.69	0.575	0.503	0.394	0.341	0.283	0.231
0.1 × 4P	kW	●	●	●	●	●	●	●
0.2 × 4P	kW	●	●	●	●	●	●	●
0.25 × 4P	kW	●	●					
0.4 × 4P	kW	●	●	●	●	●	●	●
0.75 × 4P	kW	●	●	●	●	●	●	●
1.5 × 4P	kW	●	●	●	●	●	●	●
2.2 × 4P	kW	●	●	●	●	●	●	●
3.7 × 4P	kW	●	●	●	●	●	●	●
5.5 × 4P	kW	●	●	●	●	●	●	●

Note: 1. Calculation of output speed is based on the following input speed.
- 4P Motor
  50Hz: 1450 r/min
  60Hz: 1750 r/min
- 6P Motor
  50Hz: 980 r/min
  60Hz: 1165 r/min

2. Combination in the table is based on service factor 1.0. Refer to Gearmotor Selection Table for combinations with other service factors.
3. Reduction ratios in 6000SK Series table are nominal ratios. Output speeds are based on these ratios. Refer to "Reduction Ratio" tables in the previous page for actual reduction ratio.
4. The rated current of 6P motor is different from the one of 4P motor even if the power is same.

Product Range of Motor

Table A-7 3-Phase Induction Motors ◎: Standard & Available Option ○: Manufactured Models

Specification	Indoor Type		Outdoor Type		Corrosion Proof Class 2		Thermal Class				Inverter Motors (Constant Torque)			
							F		H		Indoor Type		Outdoor Type	
Capacity [kW] / P	4	6	4	6	4	6	4	6	4	6	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: 4P: 3.7kW and below 220 - 240V 50Hz 220V 60Hz 380 - 420V 50Hz 5.5kW and above 380 - 420V 50Hz 440 - 480V 60Hz 6P: 200V 50/60Hz 220V 60Hz 400V 50/60Hz 440V 60Hz Provided that the base frequency for driving an inverter is 60Hz.													

Table A-8 3-Phase Induction Motors with Built-in Brakes ◎: Standard Thermal Class ○: Manufactured Models

Specification	Indoor Type		Outdoor Type		Corrosion Proof Class 2		Thermal Class				Inverter Motors (Constant Torque)			
							F		H		Indoor Type		Outdoor Type	
Capacity [kW] / P	4	6	4	6	4	6	4	6	4	6	4	6	4	6
0.1	○		○		○	○	◎		○		○		○	
0.2	○		○		○	○	◎		○		○		○	
0.25	○		○		○	○	◎		○					
0.4	○	○	○	○	○	○	◎	◎	○	○	○		○	
0.55	○		○		○	○	◎		○					
0.75	○	○	○	○	○	○	◎	◎	○	○	○		○	
1.1	○		○		○	○	◎		○					
1.5	○	○	○	○	○	○	◎	◎	○	○	○		○	
2.2	○	○	○	○	○	○	◎	◎	○	○	○		○	
3	○		○		○	○	◎		○					
3.7	○	○	○	○	○	○	◎	◎	○	○	○		○	
5.5	○	○	○	○	○	○	◎	◎	○	○	○	○	○	○
7.5	○	○	○	○	○	○	◎	◎	○	○	○	○	○	○
11	○	○	○	○	○	○	◎	◎	○	○	○	○	○	○
15	○	○	○	○	○	○	◎	◎	○	○	○	○	○	○
18.5	○	○	○	○	○	○	◎	◎	○	○	○	○	○	○
22	○	○	○	○	○	○	◎	◎	○	○	○	○	○	○
30	○	○	○	○	○	○	◎	◎	○	○	○	○	○	○
37	○	○	○	○	○	○	◎	◎	○	○	○		○	
Remarks	Continuous Rating Applicable Voltage: 4P: 3.7kW and below 220 - 240V 50Hz 220V 60Hz 380 - 420V 50Hz 5.5kW and above 380 - 420V 50Hz 400V 60Hz Brake Thermal Class: F 6P: 200V 50/60Hz 220V 60Hz 400V 50/60Hz 440V 60Hz Provided that the base frequency for driving an inverter is 60Hz.													

Note: 1. Motors with capacities and specifications other than as listed in Tables A-7 ~ A-10 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 F52 ~ 56 of Technical Information.
2. Indicate outdoor type when placing 6P motor outdoor. Structure differs for indoor and outdoor type although protection type is IP54 or IP55.
3. For inverter drive use, consult us with ambient temperature, input speed, mounting method, load characteristics, and other operation conditions. Startup properties, lubrication, thermal rating, and such must be reviewed for selection of proper CYCLO DRIVE frame size for combination.
4. For standard electric motor use with inverter, consult us if input voltage is high (400V or more), carrier frequency is high (typical in IGBT), or wiring distance is large. Review of withstand voltage of the motor may be necessary.

Product Range of Motor

Table A-9 Increased Safety (eG3) 3-Phase Induction Motor

◎: Standard Thermal Class ○: Manufactured Models

Specification	Indoor Type (IP44)		Outdoor Type (IP44)		Corrosion Proof Class 2		Thermal Class			
							B		F	
Capacity [kW] / P	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 A-10 Flame-Proof (d2G4) 3-Phase Motor

◎: Standard Thermal Class ○: Manufactured Models

Specification	Indoor Type (IP44)		Outdoor Type (IP44)		Corrosion Proof Class 1, 2		Thermal Class				Inverter Motors (Constant Torque)	
							B		F		Indoor Type	Outdoor Type
Capacity [kW] / P	4	6	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	○	○	○	○	○	○	◎	○	○	○	○	○
22	○	○	○	○	○	○	◎	◎	○	○	○	○
30	○	○	○	○	○	○	◎	◎	○	○	○	○
37	○	○	○	○	○	○		◎	◎	○	○	○
Remarks	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. Authorized combination in Japan for motor and inverter is 1:1 when explosion protection motor is driven with inverter.
   Always operate with the specific indicated inverter. Always locate inverter unit in the area without explosive gas; it does not have explosion protection structure.
2. Consult us when the unit is exposed to the elements or to frequent water splashing.

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