



**APEX TAIWAN NORTH
ANDTEK AUTOMATION CO.,LTD**
TEL +886-02-82262655
13F-5, No.2, Jian 8th Rd., Jhonghe Dist., New
Taipei City 235, TAIWAN
sales@andtek.com.tw
www.apexdyna.com



**APEX TAIWAN CENTRAL
ANDTEK AUTOMATION CO.,LTD**
TEL +886-04-23594286
9F-6, No.925, Sec.4, Taiwan Blvd., Xitun Dist.
Taichung City 407 TAIWAN
sales@andtek.com.tw
www.apexdyna.com



**APEX TAIWAN SOUTH
MEN JENN ELECTRIC CO., LTD.**
TEL +886-06-2337332 ~ 6
No.774, Zhonghua Rd., Yongkang Dist., Tainan
City 710, TAIWAN
menjenn@ms24.hinet.net
www.apexdyna.com



APEX DYNAMICS INC. SHANGHAI
TEL +86-21-69220577
No.128 ZHUYING Road QINGPU Industry Area,
Shanghai, CHINA
sales@apexdyna.cn
www.apexdyna.com



APEX DYNAMICS SHENZHEN, LTD.
TEL +86-755-84516325
No. 1102A of D area , CFG mansion ,Bao Yuan
Road , Bao' an District , Shenzhen ,CHINA.
sales@szapexdyna.com
www.szapexdyna.com



APEX DYNAMICS BEIJING, LTD.
TEL +86-10-69570691
NO.1,YaoPingRoad,SongZhuang Town, Tongzhou
istrict, Beijing, CHINA.
bjapexdyna@163.com
www.bjapex.cn



CHONGQING APEX DYNAMICS CO., LTD.
TEL +86-23-67686860
406, Building 5, No.68, Jinyu Avenue, Beibu New
Area, Chongqing, CHINA
sales@cqapexdyna.com
www.apexdyna.com



APEX (XIAMEN) DYNAMICS TECHNOLOGY CO., LTD.
TEL +86-0592-720-5279
Unit B-3,1F.,No.129,Jingquan Road, Jimei District,
Xiamen, Fujian, CHINA
sales@xmapexdyna.com
www.xmapexdyna.com



APEX DYNAMICS USA, INC.
TEL +1-631-2449040
885 Marconi Avenue Ronkonkoma, NY 11779
U.S.A.
sales@apexdynamicsusa.com
www.apexdynamicsusa.com



APEX DYNAMICS KOREA
TEL +82-31-492-509995
1246-32, Seongsuk-dong, Ilsandong-gu, Goyang-city,
Gyeonggi-Do, KOREA (R.O.K) 410-570
sales@apexdynakorea.co.kr
www.apexdynakorea.co.kr



APEX DYNAMICS JAPAN
TEL +81-092-4511202
1-13-3, Sannou, Hakata-ku, Fukuoka-shi 812-0015,
JAPAN
sales@apexdyna.jp
www.apexdyna.jp



APEX DYNAMICS SINGAPORE PTE LTD
TEL +65-62-626228
3 South Buona Vista Road, #05-15 & #06-15.
SINGAPORE 118136
sales@apexdyna.com.sg
www.apexdyna.com.sg



APEX DYNAMICS (THAILAND) CO., LTD.
TEL +66-2-3266233
73 Soi Ladkrabang 30, Kadkrabang Rd.,Bangkok
10520, THAILAND
sales@apexdyna.co.th
www.apexdyna.co.th



APEX DYNAMICS BV
TEL +31-492-509995
Churchillaan 101 5705 BK Helmond, NETHERLANDS
sales@apexdyna.nl
www.apexdyna.nl
www.apexdyna.be



**APEX DYNAMICS
POLSKA SP. Z O.O.**
TEL +48-12-6304728
Krakowska 50, 32-083 Balice, POLAND
sales@apexdyna.pl
www.apexdyna.pl



APEX DYNAMICS SPAIN, S.L.
TEL +34-93-6562990
Poligono Industrial Moli dels Frares, Calle C n°
12,08620 - Sant Vicenç dels Horts, Barcelona, SPAIN
apexdyna@apexdyna.es
www.apexdyna.es



APEX DYNAMICS IRAN.
TEL +98-21-66593517
APT#6, 3rd Flr, No.5, 3rd Kowsar St., Sattarkhan
Ave., Tehran, IRAN
alahyari@farasysco.com
www.apexdyna.ir



APEKS REDUKTOR VE DISLI SAN. TIC. LTD. STI.
TEL +90-232-4589960
10042 Sok.No:10 AOSB Çiğli-İzmir, TURKEY
sales@apexdyna.com.tr
www.apexdyna.com.tr



APEX DYNAMICS AUSTRALIA PTY LTD.
TEL +613-95-852739
36 Taunton Drive, Cheltenham, Victoria 3192
AUSTRALIA.
sales@apexdyna.com.au
www.apexdyna.com.au



APEX DYNAMICS (I) JV
TEL +91-80-55345541
GAT NO. 279, KHED SHIVAPUR BAUG, TALUKA
HAVELI PUNE - 412205 INDIA.
sales@apexdyna.co.in
www.apexdyna.co.in



APEX DYNAMICS FRANCE SAS
TEL +33-160-135097
11 - Burospace F - 91570 -
Bièvres, FRANCE
info@apexdyna.fr
www.apexdyna.fr



APEX DYNAMICS SWEDEN AB
TEL +46-75-242444
Fredrikbergsgatan 2 SE-573 92 Tranås, SWEDEN
sales@apexdyna.se
www.apexdyna.se



PT.APEX DYNAMICS INDONESIA
TEL +62 21 2928 3681
Rukan Aralia Blok HY43 no.11, Harapan Indah II,
Bekasi - Jawa Barat, INDONESIA 17214
sales@apexdyna.co.id
www.apexdyna.co.id



APEX DYNAMICS GERMANY GMBH
TEL +49-7181-9329955
Spanninger Str. 9, 73650 Winterbach, GERMANY
Langer@apexdynamics.de
www.apexdynamics.de



APEX DYNAMICS CZECH S.R.O.
TEL +420-577-663877
tř. Tomáše Bati 1851 765 02 Otrokovice ČESKÁ
REPUBLIKA
info@apexdynaczech.cz
www.apexdynaczech.cz



APEX DYNAMICS ROSSIA
TEL +7-495-2255452
+7-495-6462422
г.Москва, ул. Южнопортовая, дом 7, строение
"С", 3-й этаж
info@apexdynarussia.ru
www.apexdynarussia.ru



APEX DYNAMICS UK LIMITED
TEL +44-1827-253340
2 Centurion Way, Centurion Park, Tamworth
Staffs, B77 5PN, UK
sales@apexdynamicsuk.com
www.apexdynamicsuk.com



APEX DYNAMICS SWITZERLAND AG
TEL +41-55-4517020 Talstrasse 24, CH-8852
Altendorf, SWITZERLAND
info@apexdyna.ch
www.apexdyna.ch



APEX DYNAMICS MOTION SDN BHD
TEL +60 7237 1055
No.1, Jalan Perniagaan Setia 3, Taman
Perniagaan Setia, 81100 Johor Bahru, Johor,
MALAYSIA (Setia Business Park 2 @ Iskandar
Malaysia)
sales@apexdyna.com.sg
www.apexdyna.com.sg



APEX DYNAMICS BRAZIL
TEL +55-47-30298700
Rua Senador Petrônio Portela, 47 - Bloco 5, Zona
Industrial Norte - CEP 89218-575 - Joinville (SC)
lucan@neoyama.com.br
adriano.duarte@neoyama.com.br
www.neoyama.com.br



APEX DYNAMICS ITALY
TEL +39 02.36634521
VIA E. DE AMICIS, 2 - 20091 BRESSO (MI)
info@apexdynamics.it
www.apexdynamics.it



APEX DYNAMICS, INC.

No.10. Keyuan 3rd RD.Situn District, Taichung City 40763, Taiwan (R.O.C)
Tel:886-4-24650219 | Fax:886-4-24650118
sales@apexdyna.com | http://www.apexdyna.com

APEX-2017-05-AD/ADR/ADS SERIES-4.0E-TWN

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APEX DYNAMICS, INC.

HIGH PRECISION HIGH SPEED PLANETARY GEARBOX

AD / ADR / ADS Series



Stainless





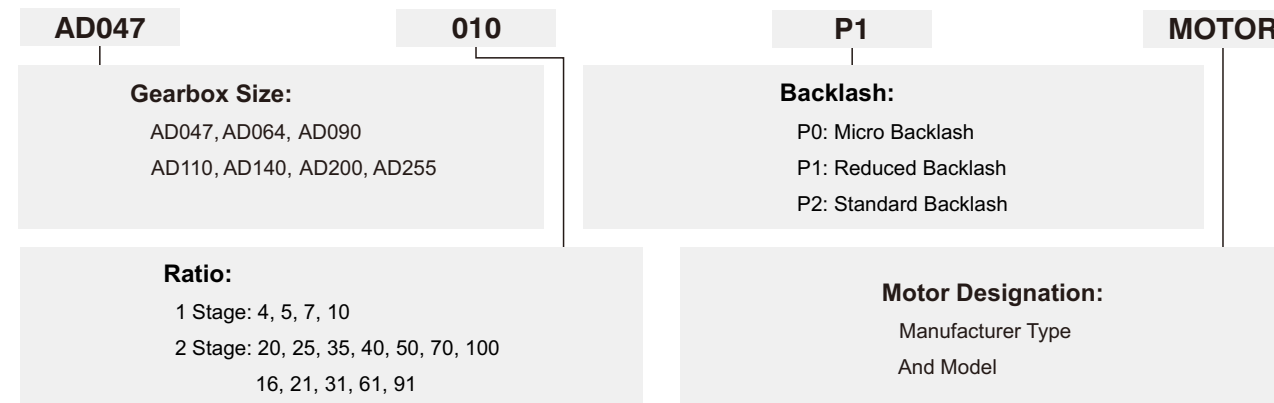
Apex Dynamics, Inc. is the world's most productive manufacturer of servomotor drive planetary gearboxes for precision automation machinery. From our 800,000+ square foot ISO 9001:2008 manufacturing facility, based in Taichung, Taiwan, we manufacture to stock using the newest precision machine tools and quality test and inspection equipment. Complete focus on quality and precision allows us to produce our high quality gearheads at precision levels down to less than 1 arc minute (1/60 th of a degree), with consistency and high reliability.

Based on more than twenty years of accumulated manufacturing and marketing experience, plus the highest level of technical production capabilities, Apex Dynamics, Inc. designs and builds technically advanced, high speed, low backlash servo application planetary gearboxes. Our Break through patented technology (over 6 patents), provides the customer with the optimum high precision helical reducer at a reasonable price. We are continuously improving processes, finding proper and effective methods to provide customers new solutions for difficult applications, and developing new products.

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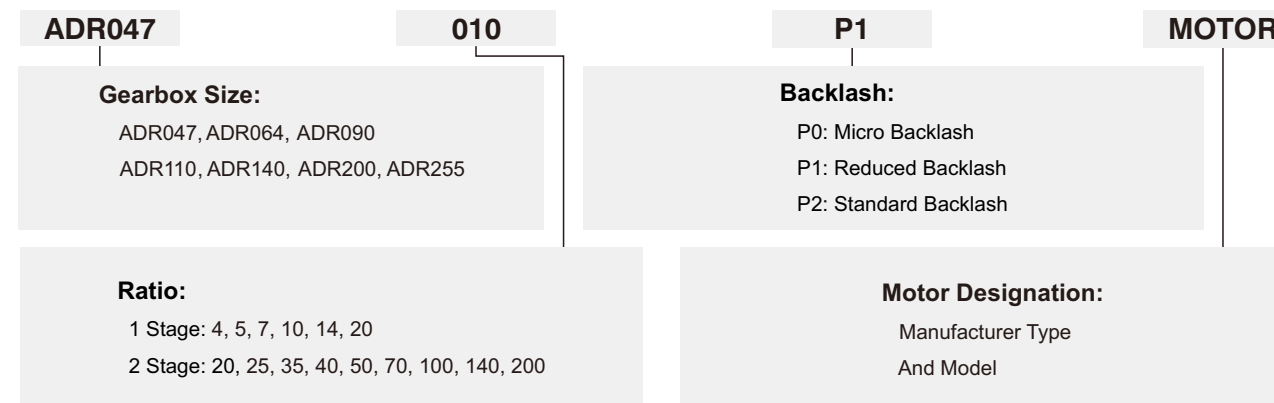


AD Series Ordering Code



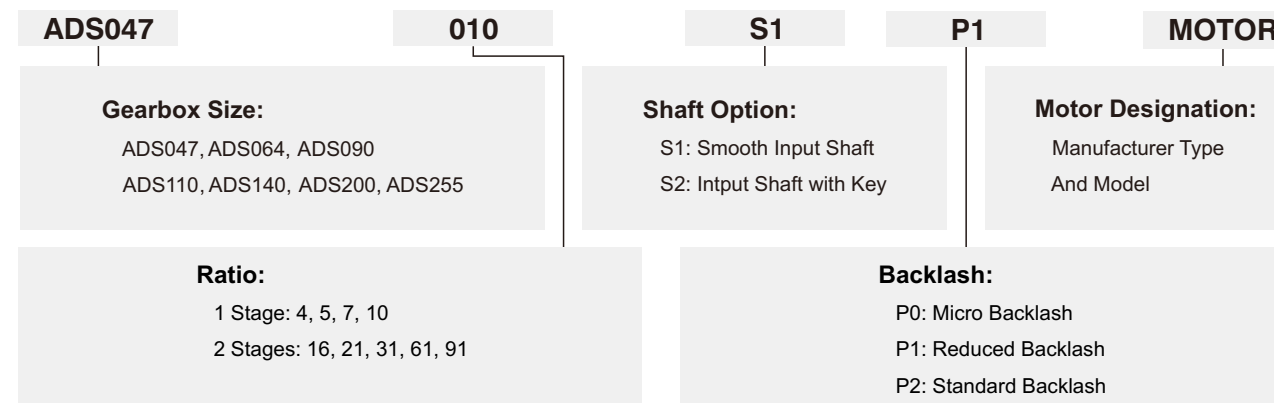
Ordering Example: AD047-010-P1 / SIEMENS 1FT6 041-4AF71

ADR Series Ordering Code



Ordering Example: ADR047-010-P1 / SIEMENS 1FT5 034-OAK71

ADS Series Ordering Code



Ordering Example: ADS047-010-S1-P1 / SIEMENS 1FT5 034-OAK71

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Specifications / AD Series

Dimensions (1-stage, Ratio i=4~10) / AD Series

Gearbox Performance

Model No.	Stage	Ratio ^A	AD047	AD064	AD090	AD110	AD140	AD200	AD255		
Nominal Output Torque T _{2N}	1	4	19	48	130	270	560	1,100	1,700		
		5	22	60	160	330	650	1,200	2,000		
		7	19	50	140	300	550	1,100	1,800		
		10	14	40	100	230	450	900	1,500		
	Nm	2	20	19	48	130	270	560	1,100	1,700	
			25	22	60	160	330	650	1,200	2,000	
			35	19	50	140	300	550	1,100	1,800	
			40	19	48	130	270	560	1,100	1,700	
			50	22	60	160	330	650	1,200	2,000	
			70	19	50	140	300	550	1,100	1,800	
		Nm	2	100	14	40	100	230	450	900	1,500
				16	19	48	130	270	560	1,100	1,700
				21	22	60	160	330	650	1,200	2,000
				31	19	50	140	300	550	1,100	1,800
Nm	2	61	19	50	140	300	550	1,100	1,800		
		91	14	40	100	230	450	900	1,500		
Emergency Stop Torque T _{2NOT} ^B	Nm	1,2	3 times of Nominal Output Torque								
Nominal Input Speed n _{IN}	rpm	1,2	4~100	5,000	5,000	4,000	4,000	3,000	3,000	2,000	
Max. Input Speed n _{IB}	rpm	1,2	4~100	10,000	10,000	8,000	8,000	6,000	6,000	4,000	
Micro Backlash P0	arcmin	1	4~10	-	-	≤1	≤1	≤1	≤1	≤1	
		2	20~100	-	-	≤3	≤3	≤3	≤3	≤3	
Reduced Backlash P1	arcmin	1	4~10	≤3	≤3	≤3	≤3	≤3	≤3	≤3	
		2	20~100	≤5	≤5	≤5	≤5	≤5	≤5	≤5	
Standard Backlash P2	arcmin	1	4~10	≤5	≤5	≤5	≤5	≤5	≤5	≤5	
		2	20~100	≤7	≤7	≤7	≤7	≤7	≤7	≤7	
Torsional Rigidity	Nm/arcmin	1,2	4~100	7	13	31	82	151	440	1,006	
Max. Bending moment M _{2KB} ^C	Nm	1,2	4~100	42.5	125	235	430	1,300	3,064	5,900	
Max. Axial Load F _{2aB} ^C	N	1,2	4~100	990	1,050	2,850	2,990	10,590	16,660	29,430	
Service Life ^D	hr	1,2	4~100	30,000							
Efficiency η	%	1	4~10	≥97%							
		2	20~100	≥94%							
Weight	kg	1	4~10	0.7	1.2	3.0	5.6	11.9	31.6	56.1	
		2	20~100	1.0	1.6	3.7	7.3	15.9	36.9	70.4	
kg		16~91	1.0	1.4	3.5	6.5	15.5	34.2	67.2		
Operating Temp	°C	1,2	4~100	-10°C~90°C							
Lubrication				Synthetic lubrication oils							
IP Level		1,2	4~100	IP65							
Mounting Position		1,2	4~100	all directions							
Noise (n _i =3000rpm, i=10, No load) ^E	dB(A)	1,2	4~100	≤56	≤58	≤60	≤63	≤65	≤67	≤70	

Gearbox Inertia

Model No.	Stage	Ratio ^A	AD047	AD064	AD090	AD110	AD140	AD200	AD255		
Moments of Inertia J _i	1	4	0.03	0.14	0.51	2.87	7.54	25.03	58.31		
		5	0.03	0.13	0.47	2.71	7.42	23.29	53.27		
		7	0.03	0.13	0.45	2.62	7.14	22.48	50.97		
		10	0.03	0.13	0.44	2.57	7.03	22.51	50.56		
	kg · cm ²	2	20	0.03	0.03	0.13	0.47	2.71	7.42	23.29	
			25	0.03	0.03	0.13	0.47	2.71	7.42	23.29	
			35	0.03	0.03	0.13	0.47	2.71	7.42	23.29	
			40	0.03	0.03	0.13	0.44	2.57	7.03	22.51	
			50	0.03	0.03	0.13	0.44	2.57	7.03	22.51	
			70	0.03	0.03	0.13	0.44	2.57	7.03	22.51	
		kg · cm ²	2	100	0.03	0.03	0.13	0.44	2.57	7.03	22.51
				16	0.03	0.03	0.13	0.47	2.71	7.42	23.29
				21	0.03	0.03	0.13	0.47	2.71	7.42	23.29
				31	0.03	0.03	0.13	0.44	2.57	7.03	22.51
kg · cm ²	2	61	0.03	0.03	0.13	0.44	2.57	7.03	22.51		
		91	0.03	0.03	0.13	0.44	2.57	7.03	22.51		

A. Ratio (i=N_n/N_{out})

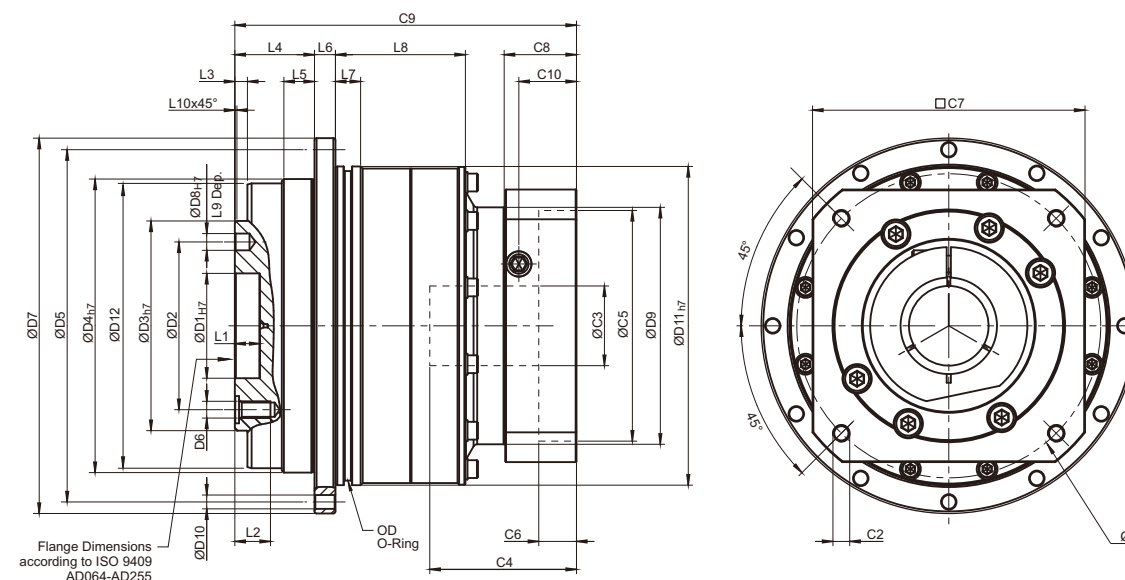
B. Max. acceleration torque T_{2B} = 60% of T_{2NOT}

C. Applied to the output shaft center at 100 rpm

D. For continuous operation, the service life time is less than 15,000hrs

E. These values are measured by gearbox with ratio = 10 (1-stage) or ratio = 100 (2-stage) at 3,000 rpm without load.

By smaller ratio and/or higher speed(RPM), the noise level would be higher



[unit: mm]

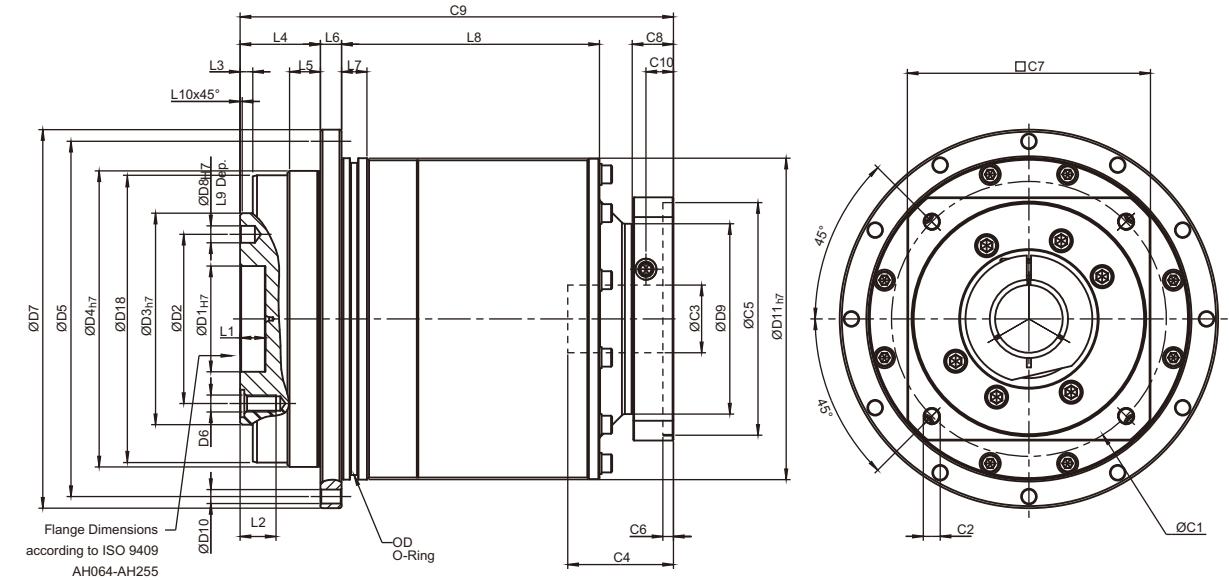
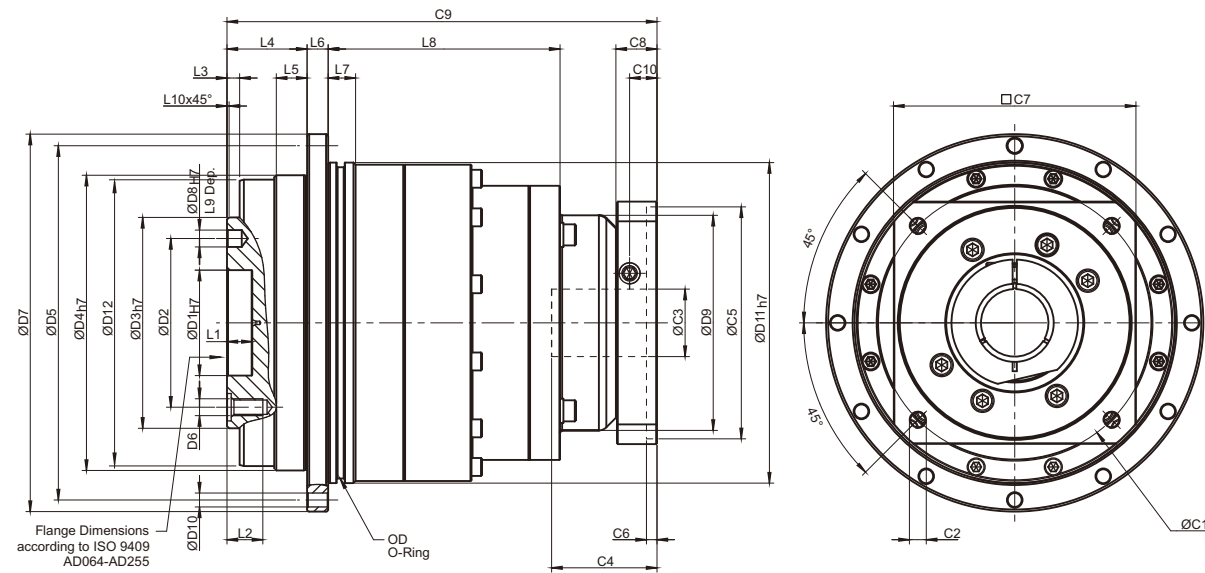
Dimension	AD047	AD064	AD090	AD110	AD140	AD200	AD255
D1 H7	12	20	31.5	40	50	80	100
D2	20	31.5	50	63	80	125	140
D3 h7	28	40	63	80	100	160	180
D4 h7	47	64	90	110	140	200	255
D5	67	79	109	135	168	233	280
D6	4 x M3 x 0.5P	7 x M5 x 0.8P	7 x M6 x 1P	11 x M6 x 1P	11 x M8 x 1.25P	11 x M10 x 1.5P	12 x M16 x 2P
D7	72	86	118	145	179	247	300
D8 H7	3	5	6	6	8	10	12
D9	45.5	55	77	90	113	138	175
D10	8 x 3.4	8 x 4.5	8 x 5.5	8 x 5.5	12 x 6.6	12 x 9	16 x 13.5
D11 h7	60	70	95	120	152	212	255
D12	46.2	63.2	89.2	109.2	139.2	199.2	254.2
L1	4	8	12	12	12	16	20
L2	6.5	8	13.5	13.5	17	22.5	30.5
L3	3	3	6	6	6	8	12
L4	19.5	19.5	30	29	38	50	66
L5	7	7	10	10	14.6	15	20
L6	4	4	7	8	10	12	18
L7	5	7.7	8	10	12	15	20
L8	18.5	28.5	27	37	62	69.5	82
L9	4	6	7	7	7	10	10
L10	0.5	0.5	1	1	1	1	1
C1 ¹	46	70	100	130	165	215	235
C2 ¹	M4 x 0.7P	M5 x 0.8P	M6 x 1P	M8 x 1.25P	M10 x 1.5P	M12 x 1.75P	M12 x 1.75P
C3 ¹	≤11 / ≤12 ²	≤14 / ≤16 ²	≤19 / ≤24	≤32	≤38	≤48	≤55
C4 ¹	30	34	40	50	60	85	116
C5 ¹	30	50	80	110	130	180	200
C6 ¹	3.5	8	4	5	6	6	6
C7 ¹	48	60	90	115	142	190	220
C8 ¹	19.5	19	17	19.5	22.5	29	63
C9 ¹	70	82.5	99.5	121.5	151	199.5	256.5
C10 ¹	13.25	13.5	10.75	13	15	20.75	53.5
OD	56 x 2	66 x 2	90 x 3	110 x 3	145 x 3	200 x 5	238 x 5

1. C1~C10 are motor specific dimensions (metric std shown). Refer to www.apexdyna.com and Design Tool to view your specific motor mounting system.

2. AD047 ratio 5, 10 offers C3 ≤ 12 option; AD064 ratio 5, 10 offers C3 ≤ 16 option.

Dimensions (2-stage, Ratio i=20~100) / AD Series

Dimensions (2-stage, Ratio i=16~91) / AD Series



[unit: mm]

Dimension	AD047	AD064	AD090	AD110	AD140	AD200	AD255
D1 _{H7}	12	20	31.5	40	50	80	100
D2	20	31.5	50	63	80	125	140
D3 _{H7}	28	40	63	80	100	160	180
D4 _{H7}	47	64	90	110	140	200	255
D5	67	79	109	135	168	233	280
D6	4 x M3 x 0.5P	7 x M5 x 0.8P	7 x M6 x 1P	11 x M6 x 1P	11 x M8 x 1.25P	11 x M10 x 1.5P	12 x M16 x 2P
D7	72	86	118	145	179	247	300
D8 _{H7}	3	5	6	6	8	10	12
D9	45.5	45.5	53.4	77	102	125	160
D10	8 x 3.4	8 x 4.5	8 x 5.5	8 x 5.5	12 x 6.6	12 x 9	16 x 13.5
D11 _{H7}	60	70	95	120	152	212	255
D12	46.2	63.2	89.2	109.2	139.2	199.2	254.2
L1	4	8	12	12	12	16	20
L2	6.5	8	13.5	13.5	17	22.5	30.5
L3	3	3	6	6	6	8	12
L4	19.5	19.5	30	29	38	50	66
L5	7	7	10	10	14.6	15	20
L6	4	4	7	8	10	12	18
L7	5	7.7	8	10	12	15	20
L8	54.5	65	60	87.5	110	132.5	148
L9	4	6	7	7	7	10	10
L10	0.5	0.5	1	1	1	1	1
C1 ³	46	46	70	100	130	165	215
C2 ³	M4 x 0.7P	M4 x 0.7P	M5 x 0.8P	M6 x 1P	M8 x 1.25P	M10 x 1.5P	M12 x 1.75P
C3 ³	≤11 / ≤12	≤11 / ≤12	≤14 / ≤15.875 / ≤16	≤19 / ≤24	≤32	≤38	≤48
C4 ³	30	30	34	40	50	60	85
C5 ³	30	30	50	80	110	130	180
C6 ³	3.5	3.5	8	4	5	6	6
C7 ³	48	48	60	90	115	142	190
C8 ³	19.5	19.5	19	17	19.5	22.5	29
C9 ³	97.5	108	134	160	204	248	311.5
C10 ³	13.25	13.25	13.5	10.75	13	15	20.75
OD	56 x 2	66 x 2	90 x 3	110 x 3	145 x 3	200 x 5	238 x 5

3. C1~C10 are motor specific dimensions (metric std shown). Refer to www.apexdyna.com and Design Tool to view your specific motor mounting system.

[unit: mm]

Dimension	AD047	AD064	AD090	AD110	AD140	AD200	AD255
D1 _{H7}	12	20	31.5	40	50	80	100
D2	20	31.5	50	63	80	125	140
D3 _{H7}	28	40	63	80	100	160	180
D4 _{H7}	47	64	90	110	140	200	255
D5	67	79	109	135	168	233	280
D6	4 x M3 x 0.5P	7 x M5 x 0.8P	7 x M6 x 1P	11 x M6 x 1P	11 x M8 x 1.25P	11 x M10 x 1.5P	12 x M16 x 2P
D7	72	86	118	145	179	247	300
D8 _{H7}	3	5	6	6	8	10	12
D9	45.5	45.5	55	77	90	113	138
D10	8 x 3.4	8 x 4.5	8 x 5.5	8 x 5.5	12 x 6.6	12 x 9	16 x 13.5
D11 _{H7}	60	70	95	120	152	212	255
D18	46.2	63.2	89.2	109.2	139.2	199.2	254.2
L1	4	8	12	12	12	16	20
L2	6.5	8	13.5	13.5	17	22.5	30.5
L3	3	3	6	6	6	8	12
L4	19.5	19.5	30	29	38	50	66
L5	7	7	10	10	14.6	15	20
L6	4	4	7	8	10	12	18
L7	5	7.7	8	10	12	15	20
L8	52.5	28.5	32	37	122	79.5	82
L9	4	6	7	7	7	10	10
L10	0.5	0.5	1	1	1	1	1
C1 ⁴	46	46	70	100	130	165	215
C2 ⁴	M4 x 0.7P	M4 x 0.7P	M5 x 0.8P	M6 x 1P	M8 x 1.25P	M10 x 1.5P	M12 x 1.75P
C3 ⁴	≤11 / ≤12	≤11 / ≤12	≤14 / ≤15.875 / ≤16	≤19 / ≤24	≤32	≤38	≤48
C4 ⁴	30	30	34	40	50	60	85
C5 ⁴	30	30	50	80	110	130	180
C6 ⁴	3.5	3.5	8	4	5	6	6
C7 ⁴	48	48	60	90	115	142	190
C8 ⁴	19.5	19.5	19	17	19.5	22.5	29
C9 ⁴	100	106	130.5	149	205	247.5	323
C10 ⁴	13.25	13.25	13.5	10.75	13	15	20.75
OD	56 x 2	66 x 2	90 x 3	110 x 3	145 x 3	200 x 5	238 x 5

4. C1~C10 are motor specific dimensions (metric std shown). Refer to www.apexdyna.com and Design Tool to view your specific motor mounting system.

Specifications / ADR Series

Dimensions (1-stage, Ratio i=4~20) / ADR Series

Gearbox Performance

Model No.	Stage	Ratio ^A	ADR047	ADR064	ADR090	ADR110	ADR140	ADR200	ADR255	
Nominal Output Torque T _{2N}	1	4	19	48	130	270	560	1,100	1,700	
		5	22	60	160	330	650	1,200	2,000	
		7	19	50	140	300	550	1,100	1,800	
		10	14	60	160	325	650	1,200	2,000	
		14	-	42	140	300	550	1,100	1,800	
		20	-	40	100	230	450	900	1,500	
	2	20	19	-	-	-	-	-	-	-
		25	22	60	160	330	650	1,200	2,000	
		35	19	50	140	300	550	1,100	1,800	
		40	19	48	130	270	560	1,100	1,700	
		50	22	60	160	330	650	1,200	2,000	
		70	19	50	140	300	550	1,100	1,800	
		100	14	40	100	230	450	900	1,500	
		140	-	-	140	300	550	1,100	1,800	
200	-	-	100	230	450	900	1,500			
Emergency Stop Torque T _{2NOTB}	Nm	1,2	4~200	3 times of Nominal Output Torque						
Nominal Input Speed n _{IN}	rpm	1,2	4~200	5,000	5,000	4,000	4,000	3,000	3,000	2,000
Max. Input Speed n _{IB}	rpm	1,2	4~200	10,000	10,000	8,000	8,000	6,000	6,000	4,000
Micro Backlash P0	arcmin	1	4~20	-	-	≤2	≤2	≤2	≤2	≤2
		2	25~200	-	-	≤4	≤4	≤4	≤4	≤4
Reduced Backlash P1	arcmin	1	4~20	≤4	≤4	≤4	≤4	≤4	≤4	≤4
		2	25~200	≤7	≤7	≤7	≤7	≤7	≤7	≤7
Standard Backlash P2	arcmin	1	4~20	≤6	≤6	≤6	≤6	≤6	≤6	≤6
		2	25~200	≤9	≤9	≤9	≤9	≤9	≤9	≤9
Torsional Rigidity	Nm/arcmin	1,2	4~200	7	13	31	82	151	440	1,006
Max. Bending moment M _{2KB} ^C	Nm	1,2	4~200	42.5	125	235	430	1,300	3,064	5,900
Max. Axial Load F _{2AB} ^C	N	1,2	4~200	990	1,050	2,850	2,990	10,590	16,660	29,430
Service Life ^D	hr	1,2	4~200	30,000*						
Efficiency η	%	1	4~20	≥95%						
		2	25~200	≥92%						
Weight	kg	1	4~20	1.1	2.1	5.9	10.5	21.9	50.9	85.4
		2	25~200	1.4	1.9	4.5	9.8	20.1	45.4	85.9
Operating Temp	°C	1,2	4~200	-10°C~90°C						
Lubrication				Synthetic lubrication oils						
IP Level		1,2	4~200	IP65						
Mounting Position		1,2	4~200	all directions						
Noise	dB(A)	1,2	4~200	≤61	≤63	≤65	≤68	≤70	≤72	≤74

Gearbox Inertia

Model No.	Stage	Ratio ^A	ADR047	ADR064	ADR090	ADR110	ADR140	ADR200	ADR255
Moments of Inertia J _i	1	4~10	0.09	0.35	2.25	6.84	23.4	68.9	135.4
		14	-	0.07	1.87	6.25	21.8	65.6	119.8
		20	-	0.07	1.87	6.25	21.8	65.6	119.8
	2	20	0.09	-	-	-	-	-	-
		25~100	0.09	0.09	0.35	2.25	6.84	23.4	68.9
		140~200	-	-	0.31	1.87	6.25	21.8	65.6

A. Ratio (i=N_n/N_{out})

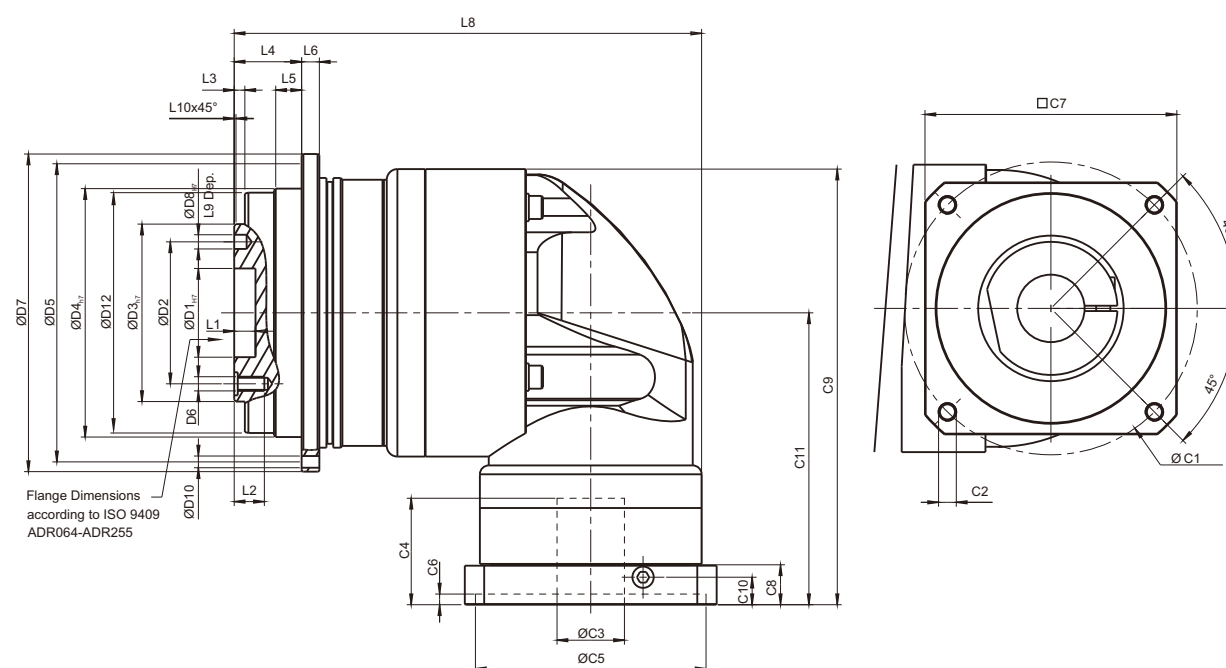
B. Max. acceleration torque T_{2B} = 60% of T_{2NOT}

C. Applied to the output shaft center at 100 rpm

D. For continuous operation, the service life time is less than 15,000hrs

E. These values are measured by gearbox with ratio = 10 (1-stage) or ratio = 100 (2-stage) at 3,000 rpm without load.

By smaller ratio and/or higher speed(RPM), the noise level would be higher



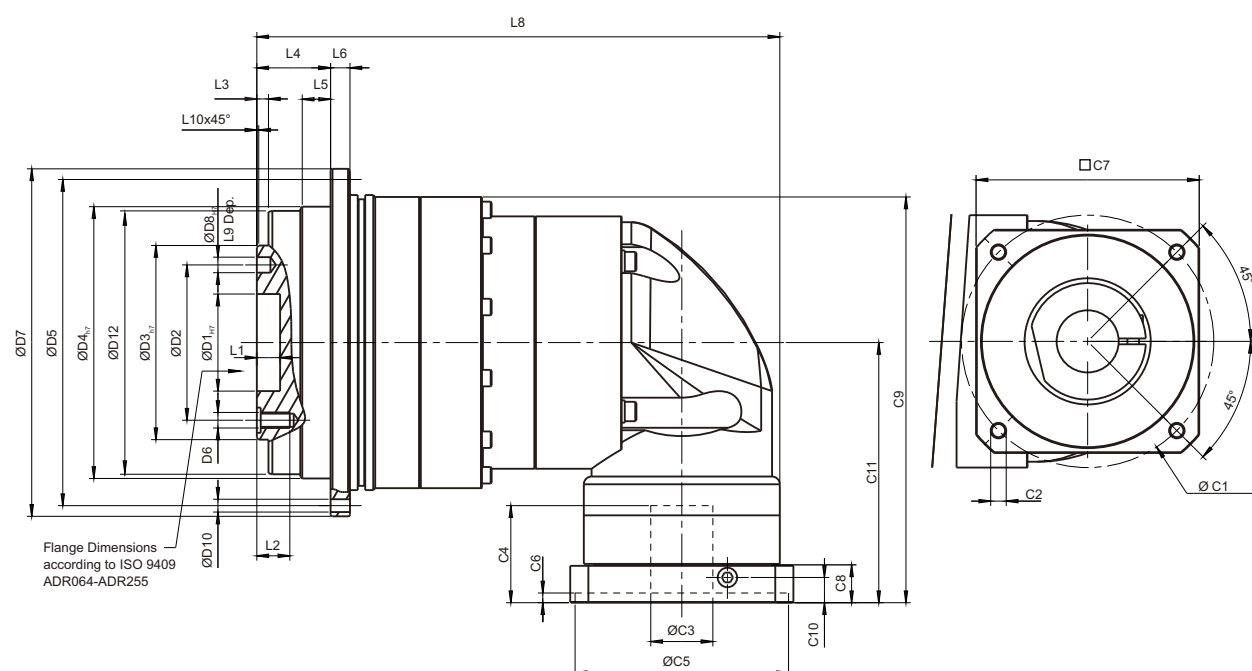
[unit: mm]

Dimension	ADR047	ADR064	ADR090	ADR110	ADR140	ADR200	ADR255
D1 ^{h7}	12	20	31.5	40	50	80	100
D2	20	31.5	50	63	80	125	140
D3 ^{h7}	28	40	63	80	100	160	180
D4 ^{h7}	47	64	90	110	140	200	255
D5	67	79	109	135	168	233	280
D6	4 x M3 x 0.5P	7 x M5 x 0.8P	7 x M6 x 1P	11 x M6 x 1P	11 x M8 x 1.25P	11 x M10 x 1.5P	12 x M16 x 2P
D7	72	86	118	145	179	247	300
D8 ^{h7}	3	5	6	6	8	10	12
D10	8 x 3.4	8 x 4.5	8 x 5.5	8 x 5.5	12 x 6.6	12 x 9	16 x 13.5
D12	46.2	63.2	89.2	109.2	139.2	199.2	254.2
L1	4	8	12	12	12	16	20
L2	6.5	8	13.5	13.5	17	22.5	30.5
L3	3	3	6	6	6	8	12
L4	19.5	19.5	30	29	38	50	66
L5	7	7	10	10	14.6	15	20
L6	4	4	7	8	10	12	18
L8	107.5	126	172.5	201	263.5	334.5	392
L9	4	6	7	7	7	10	10
L10	0.5	0.5	1	1	1	1	1
C1 ¹	46	70	100	130	165	215	235
C2 ¹	M4 x 0.7P	M5 x 0.8P	M6 x 1P	M8 x 1.25P	M10 x 1.5P	M12 x 1.75P	M12 x 1.75P
C3 ¹	≤11 / ≤12	≤14 / ≤16	≤19 / ≤24	≤32	≤38	≤48	≤55
C4 ¹	30	34	40	50	60	85	116
C5 ¹	30	50	80	110	130	180	200
C6 ¹	3.5	8	4	5	6	6	6
C7 ¹	48	60	90	115	142	190	220
C8 ¹	19.5	19	17	19.5	22.5	29	63
C9 ¹	104.25	116.5	159.5	199	245.5	316	398.5
C10 ¹	13.25	13.5	10.75	13	15	20.75	53.5
C11 ¹	74	81.5	107.5	134	164.5	213.5	268.5

1. C1~C10 are motor specific dimensions (metric std shown). Refer to www.apexdyna.com and Design Tool to view your specific motor mounting system.

Dimensions (2-stage, Ratio i=25~200) / ADR Series

Specifications / ADS Series



[unit: mm]

Dimension	ADR047	ADR064	ADR090	ADR110	ADR140	ADR200	ADR255
D1 H7	12	20	31.5	40	50	80	100
D2	20	31.5	50	63	80	125	140
D3 h7	28	40	63	80	100	160	180
D4 h7	47	64	90	110	140	200	255
D5	67	79	109	135	168	233	280
D6	4 x M3 x 0.5P	7 x M5 x 0.8P	7 x M6 x 1P	11 x M6 x 1P	11 x M8 x 1.25P	11 x M10 x 1.5P	12 x M16 x 2P
D7	72	86	118	145	179	247	300
D8 H7	3	5	6	6	8	10	12
D10	8 x 3.4	8 x 4.5	8 x 5.5	8 x 5.5	12 x 6.6	12 x 9	16 x 13.5
D12	46.2	63.2	89.2	109.2	139.2	199.2	254.2
L1	4	8	12	12	12	16	20
L2	6.5	8	13.5	13.5	17	22.5	30.5
L3	3	3	6	6	6	8	12
L4	19.5	19.5	30	29	38	50	66
L5	7	7	10	10	14.6	15	20
L6	4	4	7	8	10	12	18
L8	122	132.5	163	217.5	269.5	333.5	403
L9	4	6	7	7	7	10	10
L10	0.5	0.5	1	1	1	1	1
C1 ²	46	46	70	100	130	165	215
C2 ²	M4 x 0.7P	M4 x 0.7P	M5 x 0.8P	M6 x 1P	M8 x 1.25P	M10 x 1.5P	M12 x 1.75P
C3 ²	≤11 / ≤12	≤11 / ≤12	≤14 / ≤15.875 / ≤16	≤19 / ≤24	≤32	≤38	≤48
C4 ²	30	30	34	40	50	60	85
C5 ²	30	30	50	80	110	130	180
C6 ²	3.5	3.5	8	4	5	6	6
C7 ²	48	48	60	90	115	142	190
C8 ²	19.5	19.5	19	17	19.5	22.5	29
C9 ²	103.25	108.25	128.25	166.5	209	269.5	340
C10 ²	13.25	13.25	13.5	10.75	13	15	20.75
C11 ²	74	74	81.5	107.5	134	164.5	213.5

2. C1-C10 are motor specific dimensions (metric std shown). Refer to www.apexdyna.com and Design Tool to view your specific motor mounting system.

Gearbox Performance

Model No.	Stage	Ratio ^A	ADS047	ADS064	ADS090	ADS110	ADS140	ADS200	ADS255	
Nominal Output Torque T _{2N}	1	4	19	48	130	270	560	1,100	1,700	
		5	22	60	160	330	650	1,200	2,000	
		7	19	50	140	300	550	1,100	1,800	
		10	14	40	100	230	450	900	1,500	
	2	16	19	48	130	270	560	1,100	1,700	
		21	22	60	160	330	650	1,200	2,000	
		31	19	50	140	300	550	1,100	1,800	
		61	19	50	140	300	550	1,100	1,800	
		91	14	40	100	230	450	900	1,500	
Emergency Stop Torque T _{2NOT} ^B	Nm	1,2	4~91	3 times of Nominal Output Torque						
Nominal Input Speed n _{IN}	rpm	1,2	4~91	5,000	5,000	4,000	4,000	3,000	3,000	2,000
Max. Input Speed n _{IB}	rpm	1,2	4~91	10,000	10,000	8,000	7,500	4,500	4,500	3,800
Micro Backlash P0	arcmin	1	4~10	-	-	≤1	≤1	≤1	≤1	≤1
		2	16~91	-	-	≤3	≤3	≤3	≤3	≤3
Reduced Backlash P1	arcmin	1	4~10	≤3	≤3	≤3	≤3	≤3	≤3	≤3
		2	16~91	≤5	≤5	≤5	≤5	≤5	≤5	≤5
Standard Backlash P2	arcmin	1	4~10	≤5	≤5	≤5	≤5	≤5	≤5	≤5
		2	16~91	≤7	≤7	≤7	≤7	≤7	≤7	≤7
Torsional Rigidity	Nm/arcmin	1,2	4~91	3	7	14	25	50	145	225
Max. Bending moment	Nm	1,2	4~91	42.5	125	235	430	1,300	3,064	5,900
Max. Axial Load	N	1,2	4~91	990	1,050	2,850	2,990	10,590	16,660	29,430
Input Max. Radial Load F _{1rB} ^C	N	1	4~10	165	395	1,300	1,525	2,800	4,500	12,500
		2	16~91	165	165	395	1,300	1,525	2,800	4,500
Input Max. Axial Load F _{1aB} ^C	N	1	4~10	580	1,000	1,100	980	2,700	4,700	8,000
		2	16~91	580	580	1,000	1,100	980	2,700	4,700
Service Life ^D	hr	1,2	4~91	30,000						
Efficiency η	%	1	4~10	≥97%						
		2	16~91	≥94%						
Weight	kg	1	4~10	0.8	1.4	3.4	6.7	13.5	35.0	63.8
		2	16~91	1.1	1.6	4.0	7.3	16.6	36.4	74.7
Operating Temp	°C	1,2	4~91	-10°C~90°C						
Lubrication				Synthetic lubrication oils						
IP Level		1,2	4~91	IP65						
Mounting Position		1,2	4~91	all directions						
Noise	dB(A)	1,2	4~91	≤56	≤58	≤60	≤63	≤65	≤67	≤70

Gearbox Inertia

Model No.	Stage	Ratio ^A	ADS047	ADS064	ADS090	ADS110	ADS140	ADS200	ADS255
Moments of Inertia J _i	1	4	0.06	0.21	0.87	3.65	10.27	43.05	102.68
		5	0.06	0.21	0.83	3.53	10.17	41.76	99.12
		7	0.06	0.21	0.82	3.47	9.99	41.15	97.41
		10	0.06	0.21	0.81	3.45	9.93	40.97	97.03
	2	16	0.06	0.06	0.21	0.83	3.53	10.17	41.76
		21	0.06	0.06	0.21	0.83	3.53	10.17	41.76
		31	0.06	0.06	0.21	0.83	3.53	10.17	41.76
		61	0.06	0.06	0.21	0.81	3.45	9.93	40.97
		91	0.06	0.06	0.21	0.81	3.45	9.93	40.97

A. Ratio (i=N_r/N_{out})

B. Max. acceleration torque T_{2a} = 60% of T_{2NOT}

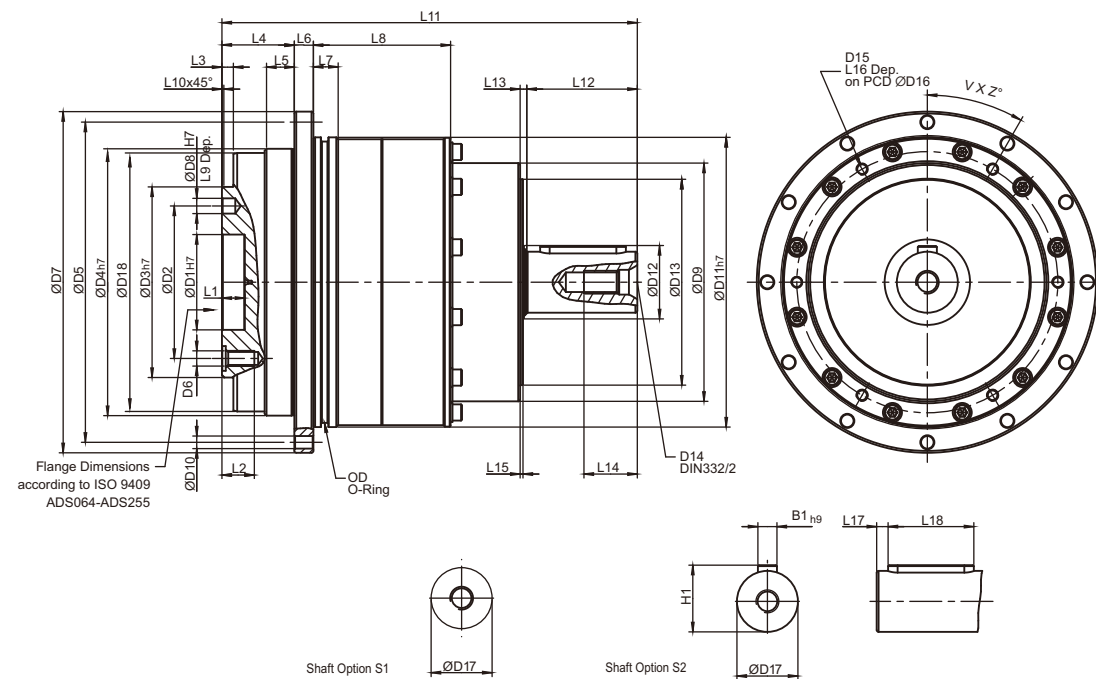
C. Applied to the output shaft center at 100 rpm

D. For continuous operation, the service life time is less than 15,000hrs

E. These values are measured by gearbox with ratio = 10 (1-stage) or ratio = 100 (2-stage) at 3,000 rpm without load.

By smaller ratio and/or higher speed(RPM), the noise level would be higher

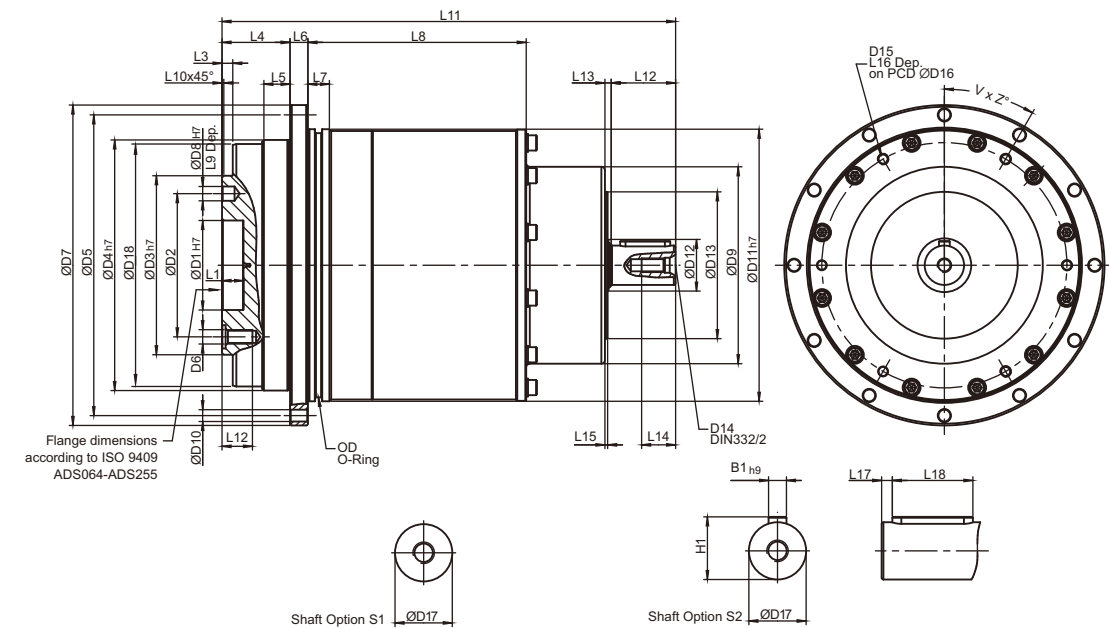
Dimensions (1-stage, Ratio i=4~10) / ADS Series



[unit: mm]

Dimension	ADS047	ADS064	ADS090	ADS110	ADS140	ADS200	ADS255
D1 _{H7}	12	20	31.5	40	50	80	100
D2	20	31.5	50	63	80	125	140
D3 _{H7}	28	40	63	80	100	160	180
D4 _{H7}	47	64	90	110	140	200	255
D5	67	79	109	135	168	233	280
D6	4 x M3 x 0.5P	7 x M5 x 0.8P	7 x M6 x 1P	11 x M6 x 1P	11 x M8 x 1.25P	11 x M10 x 1.5P	12 x M16 x 2P
D7	72	86	118	145	179	247	300
D8 _{H7}	3	5	6	6	8	10	12
D9	43	55	78	100	125	175	210
D10	8 x 3.4	8 x 4.5	8 x 5.5	8 x 5.5	12 x 6.6	12 x 9	16 x 13.5
D11 _{H7}	60	70	95	120	152	212	255
D12	31	22	22	30	40	75	95
D13	37	50	62	82	108	145	172
D14	M4 x 0.7P	M4 x 0.7P	M5 x 0.8P	M8 x 1.25P	M12 x 1.75P	M16 x 2P	M20 x 2.5P
D15	M3 x 0.5P	M3 x 0.5P	M4 x 0.7P	M5 x 0.8P	M6 x 1P	M8 x 1.25P	M8 x 1.25P
D16	51.5	61.5	84	107	137	193	235
D17 _{K6}	11	14	16	22	32	40	55
D18	46.2	63.2	89.2	109.2	139.2	199.2	254.2
L1	4	8	12	12	12	16	20
L2	6.5	8	13.5	13.5	17	22.5	30.5
L3	3	3	6	6	6	8	12
L4	19.5	19.5	30	29	38	50	66
L5	7	7	10	10	14.6	15	20
L6	4	4	7	8	10	12	18
L7	5	7.7	8	10	12	15	20
L8	32.5	43.5	47	62	72	89.5	112
L9	4	6	7	7	7	10	10
L10	0.5	0.5	1	1	1	1	1
L11	89.5	110.5	138.5	170	218	296	372.5
L12	18	22	28	36	58	82	115
L13	2.5	2.5	3.5	3.5	3.5	4.5	4.5
L14	10	10	12.5	19	28	36	42
L15	1.5	1.5	1.5	1.5	1.5	1.5	1.5
L16	5.5	5.5	7	9	11	14	14
L17	2	2	3	3	6	6	7
L18	14	18	22	28	45	70	90
B1 _{h9}	4	5	5	6	10	12	16
H1	12.5	16	18	24.5	35	43	59
OD	56 x 2	66 x 2	90 x 3	110 x 3	145 x 3	200 x 5	238 x 5
V	4	4	4	4	6	6	6
Z	45	45	45	45	30	30	30

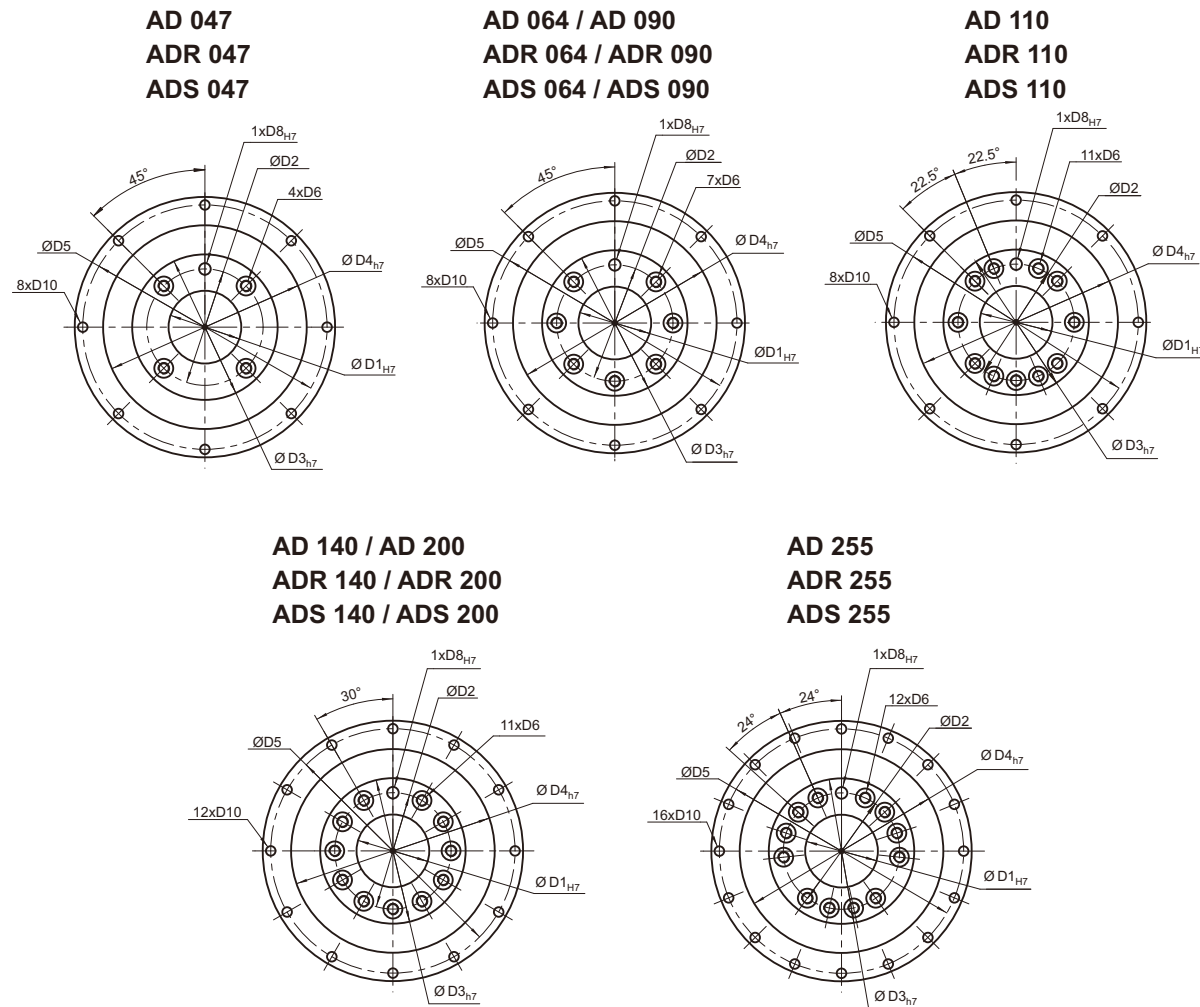
Dimensions (2-stage, Ratio i=16~91) / ADS Series



[unit: mm]

Dimension	ADS047	ADS064	ADS090	ADS110	ADS140	ADS200	ADS255
D1 _{H7}	12	20	31.5	40	50	80	100
D2	20	31.5	50	63	80	125	140
D3 _{H7}	28	40	63	80	100	160	180
D4 _{H7}	47	64	90	110	140	200	255
D5	67	79	109	135	168	233	280
D6	4 x M3 x 0.5P	7 x M5 x 0.8P	7 x M6 x 1P	11 x M6 x 1P	11 x M8 x 1.25P	11 x M10 x 1.5P	12 x M16 x 2P
D7	72	86	118	145	179	247	300
D8 _{H7}	3	5	6	6	8	10	12
D9	43	48	68	86	110	132	182
D10	8 x 3.4	8 x 4.5	8 x 5.5	8 x 5.5	12 x 6.6	12 x 9	16 x 13.5
D11 _{H7}	60	70	95	120	152	212	255
D12	22	22	22	22	30	40	75
D13	37	37	50	62	82	108	145
D14	M4 x 0.7P	M4 x 0.7P	M4 x 0.7P	M5 x 0.8P	M8 x 1.25P	M12 x 1.75P	M16 x 2P
D15	M3 x 0.5P	M3 x 0.5P	M4 x 0.7P	M5 x 0.8P	M6 x 1P	M8 x 1.25P	M10 x 1.5P
D16	51.5	61.5	84	107	137	193	235
D17 _{K6}	11	11	14	16	22	32	40
D18	46.2	63.2	89.2	109.2	139.2	199.2	254.2
L1	4	8	12	12	12	16	20
L2	6.5	8	13.5	13.5	17	22.5	30.5
L3	3	3	6	6	6	8	12
L4	19.5	19.5	30	29	38	50	66
L5	7	7	10	10	14.6	15	20
L6	4	4	7	8	10	12	18
L7	5	7.7	8	10	12	15	20
L8	62.5	63.5	67	82	122	79.5	177
L9	4	6	7	7	7	10	10
L10	0.5	0.5	1	1	1	1	1
L11	119.5	125.5	158.5	188	253.5	314.5	419.5
L12	18	18	22	28	36	58	82
L13	2.5	2.5	2.5	3.5	3.5	3.5	4.5
L14	10	10	10	12.5	19	28	36
L15	1.5	1.5	1.5	1.5	1.5	1.5	1.5
L16	5.5	5.5	7	9	11	14	18
L17	2	2	2	3	3	6	6
L18	14	14	18	22	28	45	70
B1 _{h9}	4	4	5	5	6	10	12
H1	12.5	12.5	16	18	24.5	35	43
OD	56 x 2	66 x 2	90 x 3	110 x 3	145 x 3	200 x 5	238 x 5
V	4	4	4	4	6	6	6
Z	45	45	45	45	30	30	30

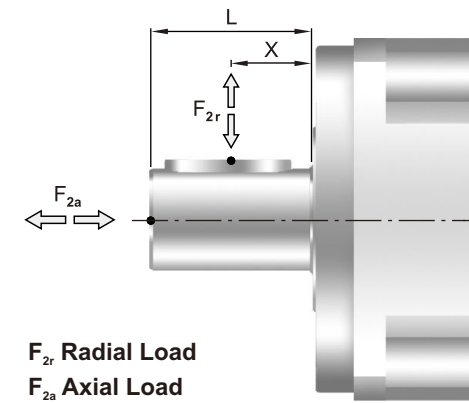
Output Dimensions



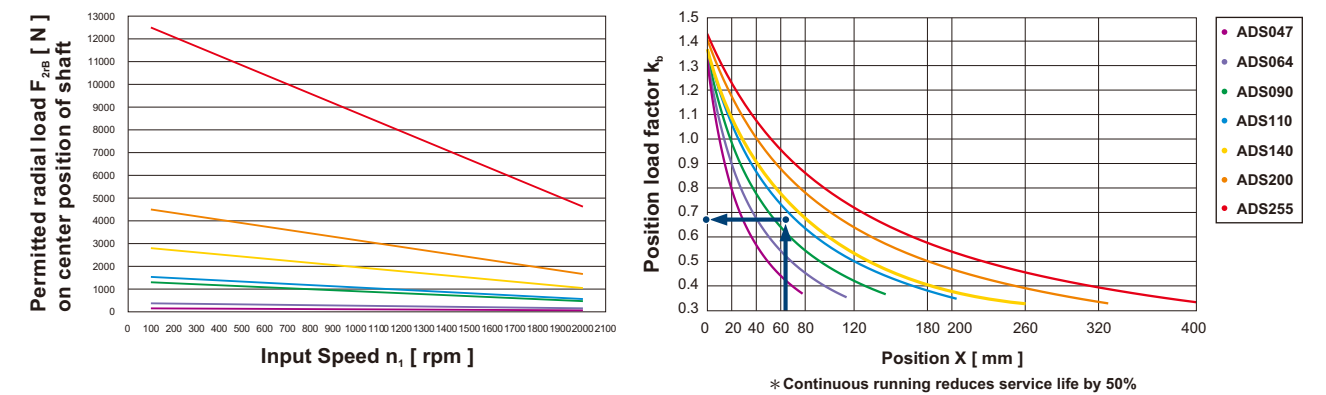
[unit: mm]

Dimension	AD047	AD064	AD090	AD110	AD140	AD200	AD255
	ADR047	ADR064	ADR090	ADR110	ADR140	ADR200	ADR255
	ADS047	ADS064	ADS090	ADS110	ADS140	ADS200	ADS255
D1 _{H7}	12	20	31.5	40	50	80	100
D2	20	31.5	50	63	80	125	140
D3 _{H7}	28	40	63	80	100	160	180
D4 _{H7}	47	64	90	110	140	200	255
D5	67	79	109	135	168	233	280
D6	M3 x 0.5P	M5 x 0.8P	M6 x 1P	M6 x 1P	M8 x 1.25P	M10 x 1.5P	M16 x 2P
D8 _{H7}	3	5	6	6	8	10	12
D10	3.4	4.5	5.5	5.5	6.6	9	13.5

Permitted Radial and Axial Loads

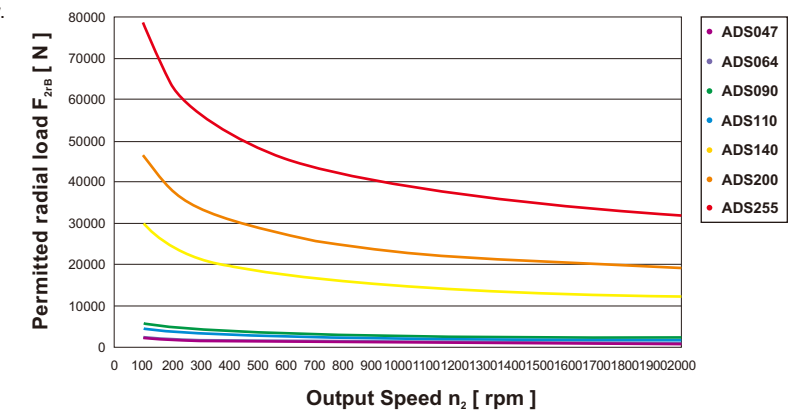
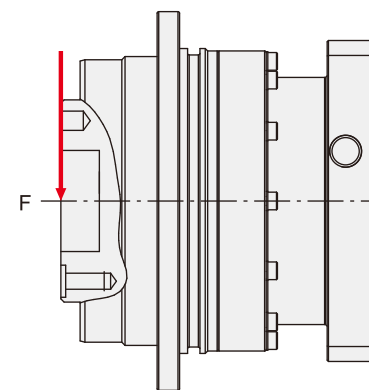


The permitted radial and axial loads on input shaft of the gearbox depend on the design of the gearbox supporting bearings. APEX use the extension straddle oversized ball bearing design. It can take heavy load from both axes.



If radial force F_{2r} is exert on the center of the output shaft $X=1/2 \times L$. Under various operating condition the lifetime is over 20,000 hours. The permitted radial load is given on left diagram.

The result from assumption of load location as below.



If radial force F_{2r} is not exert on the center of the output shaft $X < 1/2 \times L$ or $X > 1/2 \times L$. The permitted radial and axial loads can be calculated by the position load factor K_b on the left diagram.