AD/ADR/ADS
Series

- Planetary Gearboxes
- High Precision
- High Speed

High Precision
Planetary Gearboxes

출력단 테이퍼 롤러 베어링 적용
(AD/ADR/ADS 047~110 : 앵귤러 볼베어링 적용)

Gearbox Performance

Model No.		Stage	Ratio[1]	AD047	AD064	AD090	AD110	AD140	AD200	AD255
Nominal Output Torque T_{2N}	Nm	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	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
			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
			61	19	50	140	300	550	1,100	1,800
			91	14	40	100	230	450	900	1,500
Emergency Stop Torque T_{2NOT}[4]	Nm	1,2	4~100	3 times of Nominal Output Torque						
Nominal Input Speed n_{1N}	rpm	1,2	4~100	5,000	5,000	4,000	4,000	3,000	3,000	2,000
Max. Input Speed n_{1B}	rpm	1,2	4~100	10,000	10,000	8,000	8,000	6,000	6,000	4,000
Micro Backlash P0[6]	arcmin	1	4~10	-	★	≤ 1	≤ 1	≤ 1	≤ 1	≤ 1
		2	20~100	★	★	★	≤ 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}[2]	Nm	1,2	4~100	42.5	125	235	430	1,300	3,064	5,900
Max. Axial Load F_{2aB}[2]	N	1,2	4~100	990	1,050	2,850	2,990	10,590	16,660	29,430
Service Life	hr	1,2	4~100	30,000[5]						
Efficiency η	%	1	4~10	≧ 97%						
		2	20~100	≧ 94%						
Weight	kg	1	4~10	0.7	1.2	3	5.6	11.9	31.6	56.1
		2	20~100	1	1.6	3.7	7.3	15.9	36.9	70.4
			16~91	1	1.4	3.5	6.5	15.5	34.2	67.2
Operating Temp[3]	℃	1,2	4~100	-10℃~+90℃						
Lubrication		1,2	4~100	Synthetic lubrication oils (NYOGEL 792D)						
Degree of Gearbox Protection		1,2	4~100	IP65 (Option IP67)						
Mounting Position		1,2	4~100	all directions						
Noise Level(n_1=3000rpm,No Load)	dB(A)	1,2	4~100	≤ 56	≤ 58	≤ 60	≤ 63	≤ 65	≤ 67	≤ 70

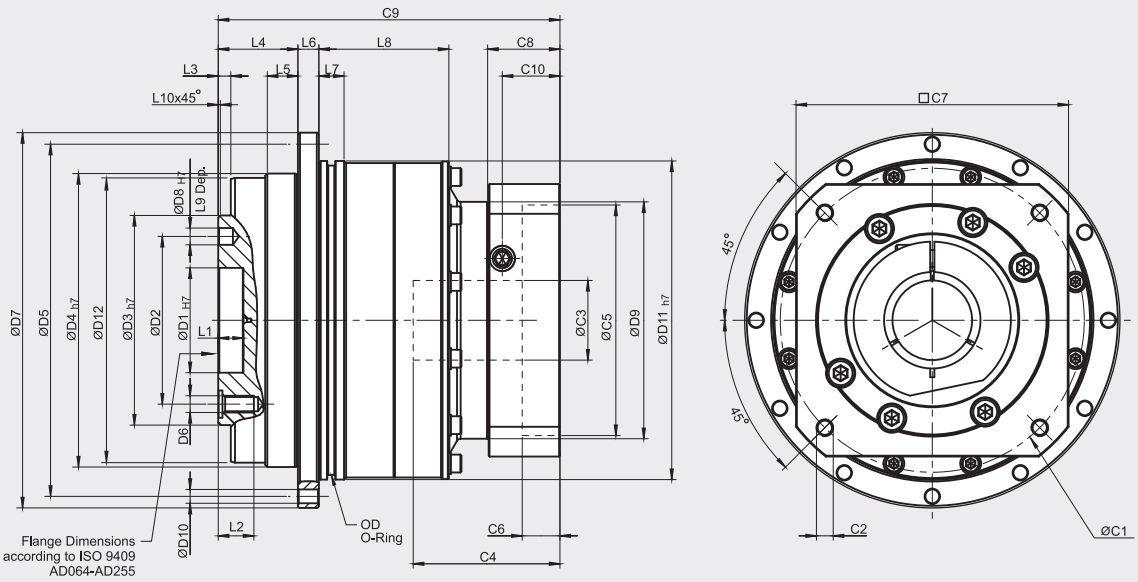
Gearbox Inertia

Model No.		Stage	Ratio[1]	AD047	AD064	AD090	AD110	AD140	AD200	AD255
Mass Moments of Inertia J_1	Kg · cm^2	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
		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
			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
			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

1. Ratio(i=N_{in}/N_{out})
2. 기준 : 출력속도 100rpm이하
3. 감속기 작동온도 : -10~90도, 감속기 주변온도 0~40도
4. 최대가속토크 T_{2B} = 60% of T_{2NOT}
5. Service life 15,000hrs (S1:연속운전조건)
6. AD047 1,2단 AD064 1,2단 AD090 2단 P0급 제작안됨

★ 고객의 요청 시 최대한 정밀하게 제작해 드립니다. 단, 납기와 가격에는 변동이 있습니다.

(1단 감속, 감속비(Ratio) i=4~10)

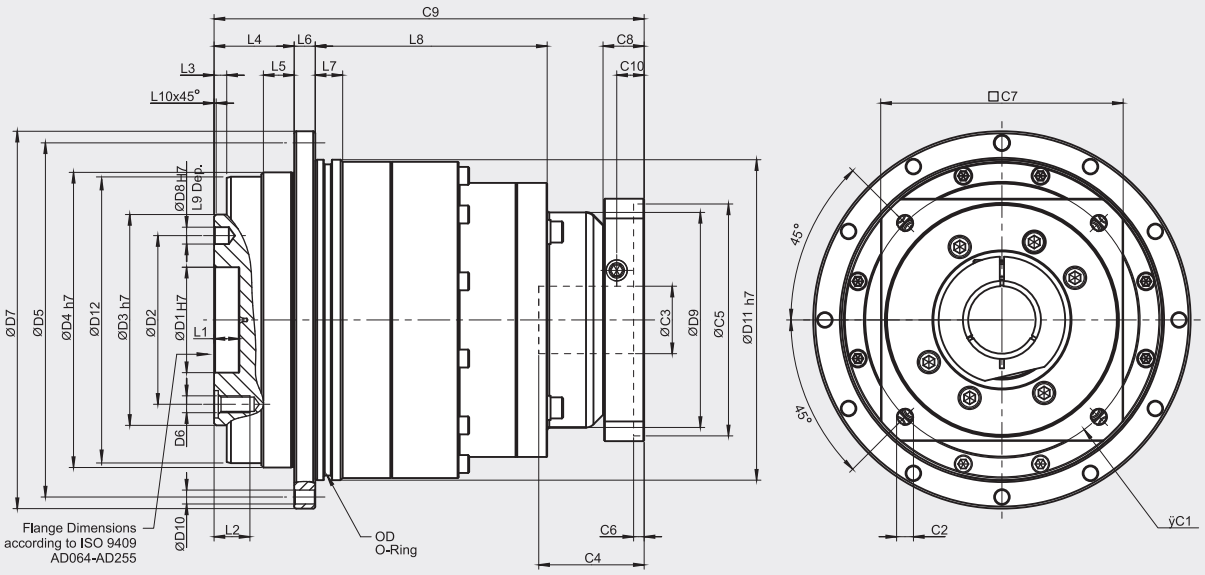


[unit:mm]

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[4]	46	70	100	130	165	215	235
C2[4]	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[4]	≤ 11 / ≤ 12[1]	≤ 14 / ≤ 16[2]	≤ 19 / ≤ 24[3]	≤ 32	≤ 38	≤ 48	≤ 55
C4[4]	30	34	40	50	60	85	116
C5[4]	30	50	80	110	130	180	200
C6[4]	3.5	8	4	5	6	6	6
C7[4]	48	60	90	115	142	190	220
C8[4]	19.5	19	17	19.5	22.5	29	63
C9[4]	70	82.5	99.5	121.5	151	199.5	256.5
C10[4]	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. AD047감속비 1/5와 1/10에 한정해 C3=12mm을 optional로 제공
2. AD064감속비 1/5와 1/10에 한정해 C3=16mm을 optional로 제공
3. AD090에서 C3=24mm을 optional로 제공, 단 연속운전조건(S1 condition)에서는 사용상 주의를 요망
4. C1~C10은 적용모터에 따라 다릅니다. 당사 홈페이지 www.apexdynakorea.co.kr로 접속하신후 Design Tool을 이용하여 치수를 확인할 수 있습니다.

(2단 감속, 감속비(Ratio) i=20~100)

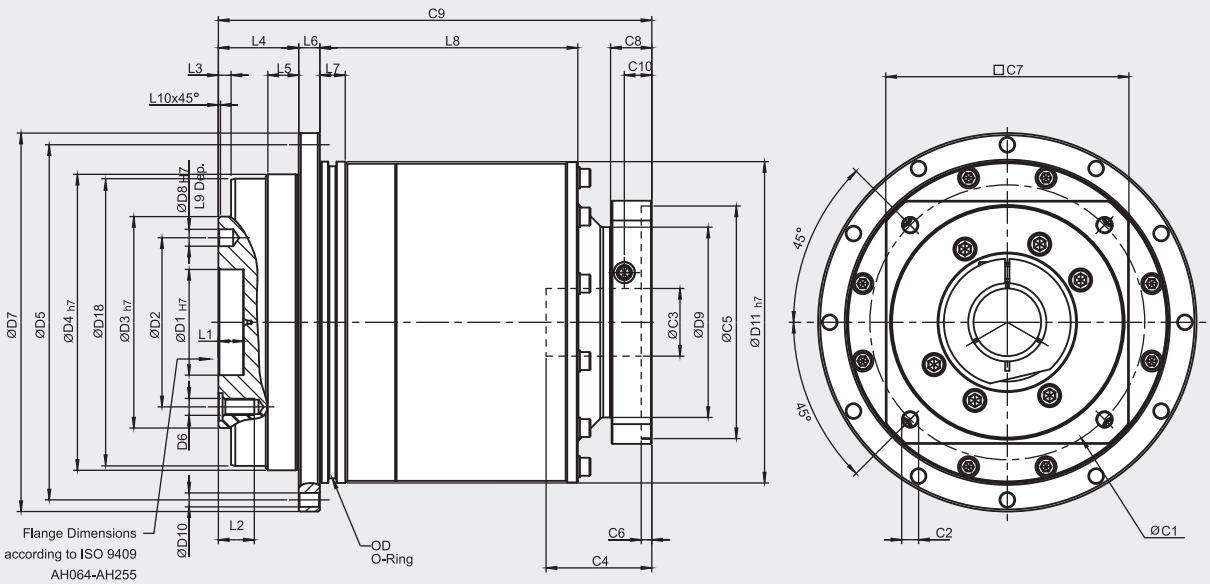


[unit:mm]

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[5]	46	46	70	100	130	165	200
C2[5]	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[5]	≤ 11 / ≤ 12[1]	≤ 11 / ≤ 12[2]	≤ 14 / ≤ 15.875 / ≤ 16[3]	≤ 19 / ≤ 24[4]	≤ 32	≤ 38	≤ 48
C4[5]	30	30	34	40	50	60	85
C5[5]	30	30	50	80	110	130	180
C6[5]	3.5	3.5	8	4	5	6	6
C7[5]	48	48	60	90	115	142	190
C8[5]	19.5	19.5	19	17	19.5	22.5	29
C9[5]	97.5	108	134	160	204	248	311.5
C10[5]	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

1. AD047 C3=12mm을 optional로 제공
2. AD064 C3=12mm을 optional로 제공
3. AD090 C3=15.875 & C3=16을 optional로 제공
4. AD110 C3=24mm을 optional로 제공, 단 연속운전조건(S1 condition) 에서는 사용상 주의를 요망
5. C1~C10은 적용모터에 따라 다릅니다. 당사 홈페이지 www.apexdynakorea.co.kr로 접속하신후 Design Tool을 이용하여 치수를 확인할 수 있습니다

(2단 감속, 감속비(Ratio) i=16,21,31,61,91)



[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[5]	46	46	70	100	130	165	215
C2[5]	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[5]	≤ 11 / ≤ 12[1]	≤ 11 / ≤ 12[2]	≤ 14 / ≤ 15.875 / ≤ 16[3]	≤ 19 / ≤ 24[4]	≤ 32	≤ 38	≤ 48
C4[5]	30	30	34	40	50	60	85
C5[5]	30	30	50	80	110	130	180
C6[5]	3.5	3.5	8	4	5	6	6
C7[5]	48	48	60	90	115	142	190
C8[5]	19.5	19.5	19	17	19.5	22.5	29
C9[5]	100	106	130.5	149	205	247.5	323
C10[5]	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

1. AD047 C3=12mm을 optional로 제공
2. AD064 C3=12mm을 optional로 제공
3. AD090 C3=15.875 & C3=16을 optional 로 제공
4. AD110 C3=24mm을 optional로 제공, 단 연속운전조건(S1 condition) 에서는 사용상 주의를 요망
5. C1~C10은 적용모터에 따라 다릅니다. 당사 홈페이지 www.apexdynakorea.co.kr로 접속하신후 Design Tool을 이용하여 치수를 확인할 수 있습니다

Gearbox Performance

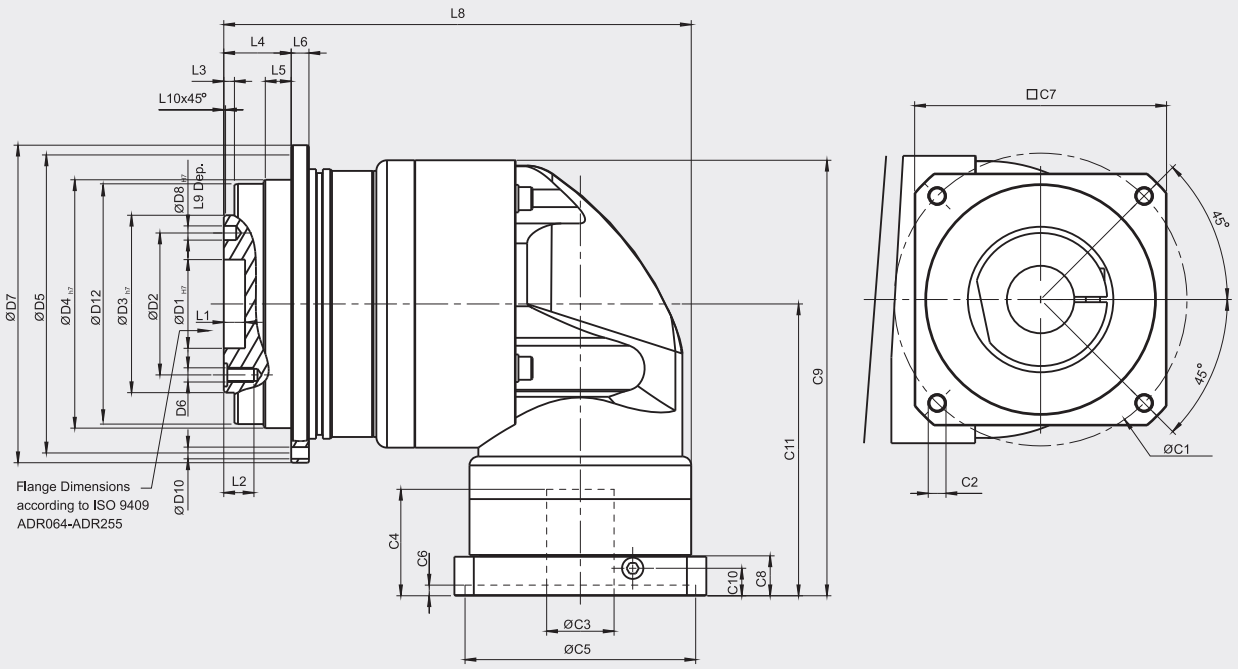
Model No.		Stage	Ratio[1]	ADR047	ADR064	ADR090	ADR110	ADR140	ADR200	ADR255
Nominal Output Torque T_{2N}	Nm	1	4	19	48	130	270	560	1,100	1,700
			5	22	60	160	330	650	1,200	2,000
			7	19	50	140	300	550	1,100	1,800
			10	14	40	100	230	450	900	1,500
			14	-	42	140	300	550	1,100	1,800
			20	-	40	100	230	450	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_{2NOT}[4]	Nm	1,2	4~200	3 times of Nominal Output Torque						
Nominal Input Speed n_{1N}	rpm	1,2	4~200	5,000	5,000	4,000	4,000	3,000	3,000	2,000
Max. Input Speed n_{1B}	rpm	1,2	4~200	10,000	10,000	8,000	8,000	6,000	6,000	4,000
Micro Backlash P0[6]	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}[2]	Nm	1,2	4~200	42.5	125	235	430	1,300	3,064	5,900
Max. Axial Load F_{2aB}[2]	N	1,2	4~200	990	1,050	2,850	2,990	10,590	16,660	29,430
Service Life	hr	1,2	4~200	30,000[5]						
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[3]	℃	1,2	4~200	-10℃~+90℃						
Lubrication		1,2	4~200	Synthetic lubrication oils (NYOGEL 792D)						
Degree of Gearbox Protection		1,2	4~200	IP65 (Option IP67)						
Mounting Position		1,2	4~200	all directions						
Noise Level(n_1=3000 rpm,No Load)	dB(A)	1,2	4~200	≤ 61	≤ 63	≤ 65	≤ 68	≤ 70	≤ 72	≤ 74

Gearbox Inertia

Model No.		Stage	Ratio[1]	ADR047	ADR064	ADR090	ADR110	ADR140	ADR200	ADR255
Mass Moments of Inertia J_1	Kg · cm^2	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

1. Ratio($i=N_{in}/N_{out}$)
2. 기준 : 출력속도 100rpm이하
3. 감속기 작동온도 : -10~90도, 감속기 주변온도 0~40도
4. 최대가속토크 T_{2B} = 60% of T_{2NOT}
5. Service life 15,000hrs (S1:연속운전조건)
6. ADR047 1,2단 ADR064 1,2단 P0급 제작안됨

(1단 감속, 감속비(Ratio) i=4~20)

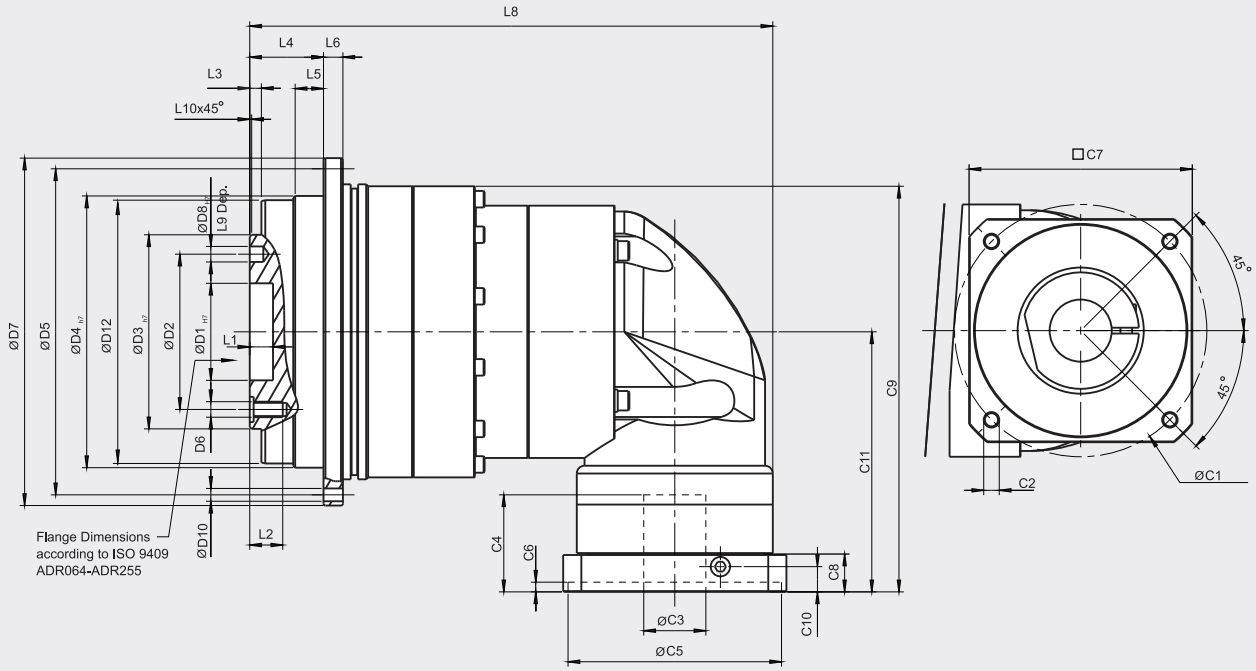


[unit:mm]

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 [4]	46	70	100	130	165	215	235
C2 [4]	M4 X 0.7P	M5 X 0.8P	M6 X1P	M8 X 1.25P	M10 X 1.5P	M12 X 1.75P	M12 X 1.75P
C3 [4]	≤ 11 / ≤ 12 [1]	≤ 14 / ≤ 16 [2]	≤ 19 / ≤ 24 [3]	≤ 32	≤ 38	≤ 48	≤ 55
C4 [4]	30	34	40	50	60	85	116
C5 [4]	30	50	80	110	130	180	200
C6 [4]	3.5	8	4	5	6	6	6
C7 [4]	48	60	90	115	142	190	220
C8 [4]	19.5	16	17	19.5	22.5	29	63
C9 [4]	104.25	116.5	159.5	199	245.5	316	398.5
C10 [4]	13.25	13.5	10.75	13	15	20.75	53.5
C11 [4]	74	81.5	107.5	134	164.5	213.5	268.5

1, ADR047 C3=12mm을 optional로 제공 2, ADR064 C3=16mm을 optional로 제공
3, ADR090 C3=24mm을 optional로 제공, 단 연속운전조건(S1 condition) 에서는 사용상 주의를 요망
4, C1~C10은 적용모터에 따라 다릅니다. 당사 홈페이지 www.apexdynakorea.co.kr로 접속하신후 Design Tool을 이용하여 치수를 확인할 수 있습니다

(2단 감속, 감속비(Ratio) i=25~200)



[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 [5]	46	46	70	100	130	165	200
C2 [5]	M4 X 0.7P	M4 X 0.7P	M4 X 0.7P	M6 X 1P	M8 X 1.25P	M10 X 1.5P	M12 X 1.75P
C3 [5]	≤ 11 / ≤ 12[1]	≤ 11 / ≤ 12[2]	≤ 14 / ≤ 15.875 / ≤ 16[3]	≤ 19 / ≤ 24[4]	≤ 32	≤ 38	≤ 48
C4 [5]	30	30	34	40	50	60	85
C5 [5]	30	30	50	80	110	130	180
C6 [5]	3.5	3.5	8	4	5	6	6
C7 [5]	48	48	60	90	115	142	190
C8 [5]	19.5	19.5	19	17	19.5	22.5	29
C9 [5]	103.25	108.25	128.25	166.5	209	269.5	340
C10 [5]	13.25	13.25	13.5	10.75	13	15	20.75
C11 [5]	74	74	81.5	107.5	134	164.5	213.5

1. ADR047 C3=12mm을 optional로 제공
2. ADR064 C3=12mm을 optional로 제공
3. ADR090 C3=15.875 & C3=16을 optional 로 제공
4. ADR110 C3=24mm을 optional로 제공, 단 연속운전조건(S1 condition) 에서는 사용상 주의를 요망
5. C1~C10은 적용모터에 따라 다릅니다. 당사 홈페이지 www.apexdynakorea.co.kr로 접속하신후 Design Tool을 이용하여 치수를 확인할 수 있습니다

Gearbox Performance

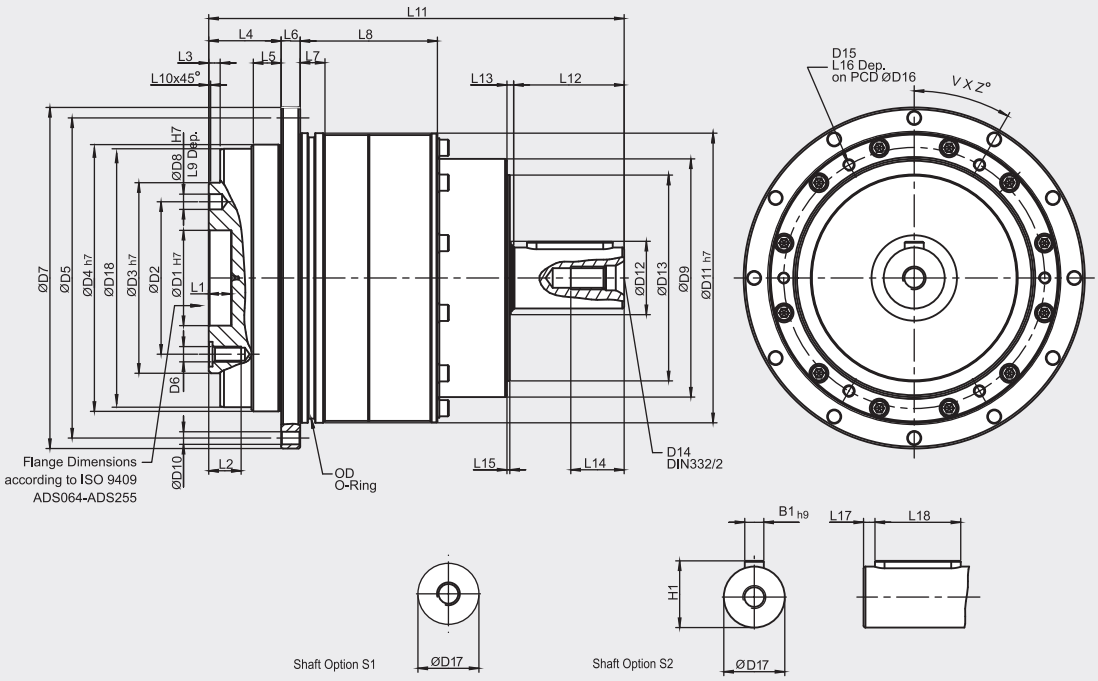
Model No.		Stage	Ratio[1]	ADS047	ADS064	ADS090	ADS110	ADS140	ADS200	ADS255
Nominal Output Torque T_{2N}	Nm	1	4	19	48	130	270	560	1,100	1,700
			5	22	60	160	330	650	1,200	2,000
			7	19	50	140	300	550	1,100	1,800
			10	14	40	100	230	450	900	1,500
		2	16	19	48	130	270	560	1,100	1,700
			21	22	60	160	330	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}[4]	Nm	1,2	4~91	3 times of Nominal Output Torque						
Nominal Input Speed n_{1N}	rpm	1,2	4~91	5,000	5,000	4,000	4,000	3,000	3,000	2,000
Max. Input Speed n_{1B}	rpm	1,2	4~91	10,000	10,000	8,000	7,500	4,500	4,500	3,800
Micro Backlash P0[6]	arcmin	1	4~10	-	-	≤ 1	≤ 1	≤ 1	≤ 1	≤ 1
		2	16~91	-	-	-	≤ 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}[2]	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}[2]	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	hr	1,2	4~91	30,000[5]						
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	63.8
		2	16~91	1.1	1.6	4	7.3	16.6	36.4	74.7
Operating Temp[3]	℃	1,2	4~91	-10℃~+90℃						
Lubrication		1,2	4~9	Synthetic lubrication oils (NYOGEL 792D)						
Degree of Gearbox Protection		1,2	4~91	IP65 (Option IP67)						
Mounting Position		1,2	4~91	all directions						
Noise Level(n_1=3000 rpm,No Load)	dB(A)	1,2	4~91	≤ 56	≤ 58	≤ 60	≤ 63	≤ 65	≤ 67	≤ 70

Gearbox Inertia

Model No.		Stage	Ratio[1]	ADS047	ADS064	ADS090	ADS110	ADS140	ADS200	ADS255
Mass Moments of Inertia J_1	Kg · cm^2	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

1. Ratio($i=N_{in}/N_{out}$)
2. 기준 : 출력속도 100rpm이하
3. 감속기 작동온도 : -10~90도, 감속기 주변온도 0~40도
4. 최대가속토크 T_{2B} = 60% of T_{2NOT}
5. Service life 15,000hrs (S1:연속운전조건)
6. ADS047 1,2단 ADS064 1,2단 ADS090 2단 P0급 제작안됨

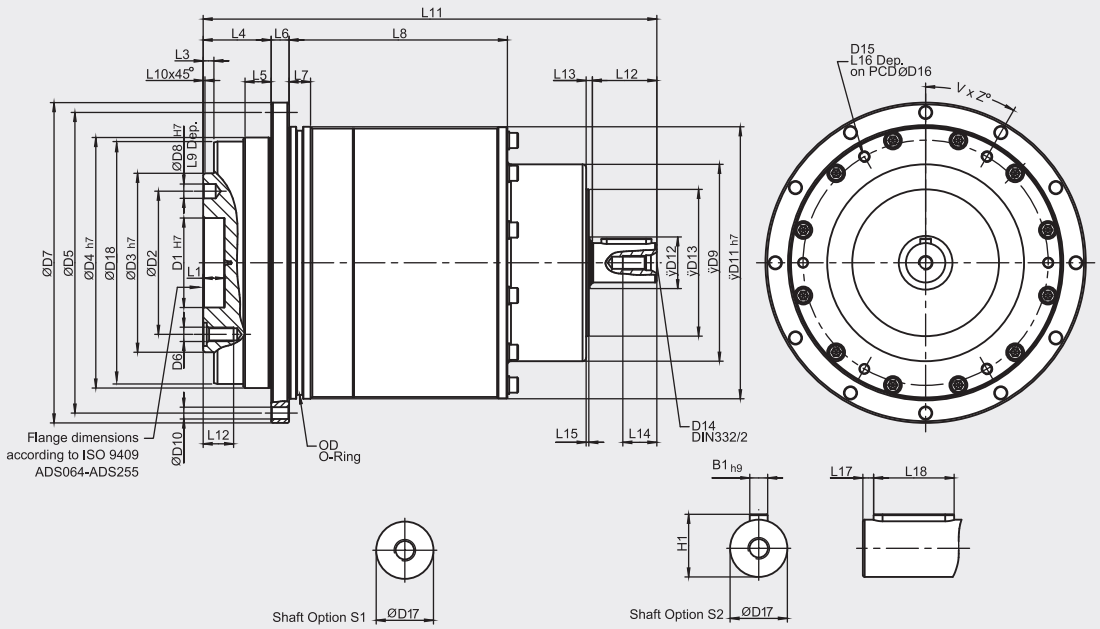
(1단 감속, 감속비(Ratio) i=4~10)



[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

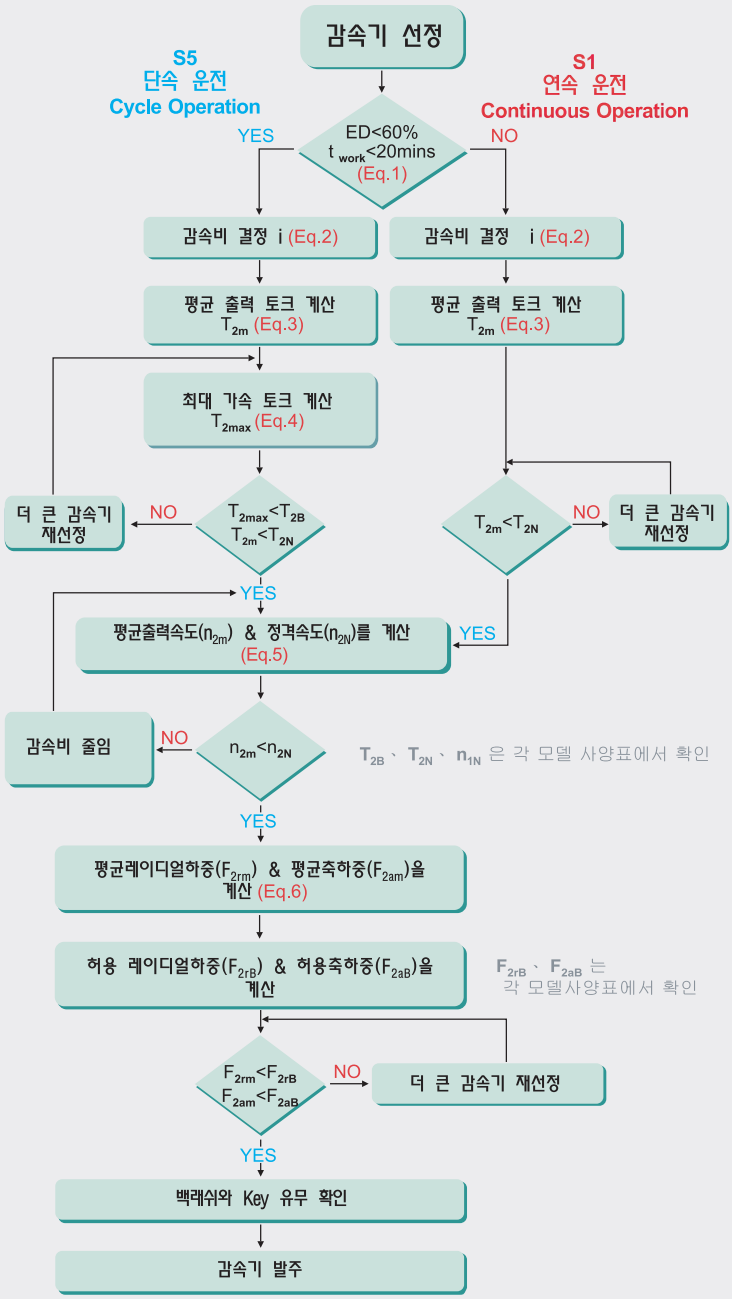
(2단 감속, 감속비(Ratio) i=16~91)



[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

Selection of the Optimum Gearbox



T2B 、 T2N 、 n1N 은 각 모델 사양표에서 확인

F2rB 、 F2aB 는
각 모델사양표에서 확인

Recommended (for S5 Cycle Operation)

The general design is given for

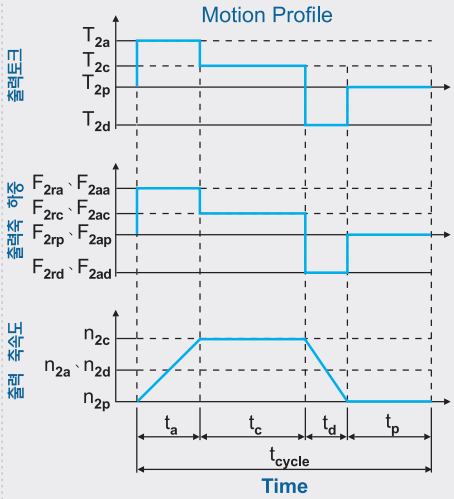
$\frac{J_L}{i^2} \leq 4 \times J_m$

The optimal design is given for

$\frac{J_L}{i^2} \cong J_m$

J_L Load Inertia

J_m Motor Inertia



S1 : 연속운전의 기준

- 전체 Cycle중 작동시간이 60%이상일때
- 작동시간이 20분을 초과할때
- 하루 작동시간이 20시간을 초과할때

1. $ED = \frac{t_a + t_c + t_d}{t_{cycle}} \times 100\%$, $t_{work} = t_a + t_c + t_d$

   Index : a. Acceleration, c. Constant,
   d. Deceleration, p. Pause (Eq.1)

2. $i \cong \frac{n_m}{n_{work}}$

   n_m Output Speed of the Motor

   n_{work} Working Speed (Eq.2)

3. $T_{2m} = \sqrt[3]{\frac{n_{2a} \times t_a \times T_{2a}^{\ 3} + n_{2c} \times t_c \times T_{2c}^{\ 3} + n_{2d} \times t_d \times T_{2d}^{\ 3}}{n_{2a} \times t_a + n_{2c} \times t_c + n_{2d} \times t_d}}$ (Eq.3)

4. $T_{2max} = T_{mB} \times i \times k_s \times \eta$

   where K_s is

K_s	No. of Cycles / hr
1.0	0~1,000
1.1	1,000 ~ 1,500
1.3	1,500 ~ 2,000
1.6	2,000 ~ 3,000
1.8	3,000 ~ 5,000
2.0	5,000 ~ 9,000
2.05	9,000 ~ 10,000
not recommended	above 10,000

   T_{mB} Max. Output Torque of the Motor

   η Efficiency of the Gearbox (Eq.4)

5. $n_{2a} = n_{2d} = \frac{1}{2} \times n_{2c}$

   $n_{2m} = \frac{n_{2a} \times t_a + n_{2c} \times t_c + n_{2d} \times t_d}{t_a + t_c + t_d}$

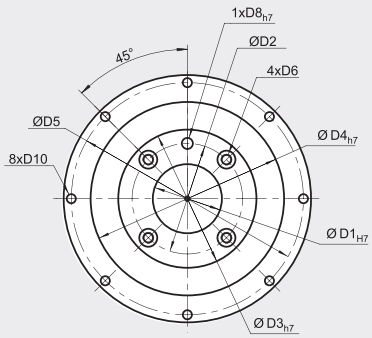
   $n_{2N} = \frac{n_{1N}}{i}$ (Eq.5)

6. $F_{2rm} = \sqrt[3]{\frac{n_{2a} \times t_a \times F_{2ra}^{\ 3} + n_{2c} \times t_c \times F_{2rc}^{\ 3} + n_{2d} \times t_d \times F_{2rd}^{\ 3}}{n_{2a} \times t_a + n_{2c} \times t_c + n_{2d} \times t_d}}$

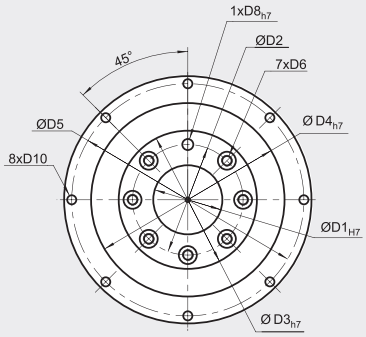
   $F_{2am} = \sqrt[3]{\frac{n_{2a} \times t_a \times F_{2aa}^{\ 3} + n_{2c} \times t_c \times F_{2ac}^{\ 3} + n_{2d} \times t_d \times F_{2ad}^{\ 3}}{n_{2a} \times t_a + n_{2c} \times t_c + n_{2d} \times t_d}}$ (Eq.6)

Output Dimensions

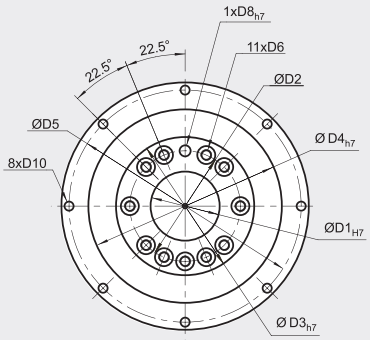
AD 047
ADR 047
ADS 047



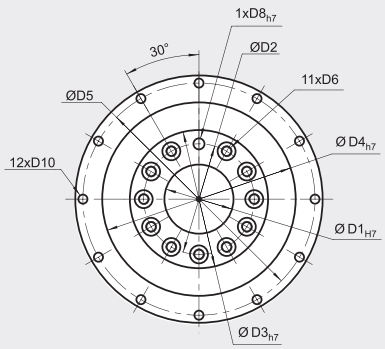
AD 064 / AD 090
ADR 064 / ADR 090
ADS 064 / ADS 090



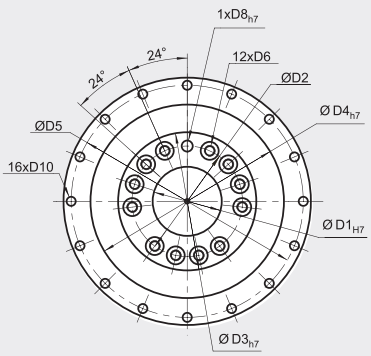
AD 110
ADR 110
ADS 110



AD 140 / AD 200
ADR 140 / ADR 200
ADS 140 / ADS 200



AD 255
ADR 255
ADS 255



[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

Ordering Code

AD Series

AD047 – 010 – P1 / MOTOR

Gearbox Size:
AD047, AD064, AD090
AD110, AD140, AD200, AD255

Backlash:
P0: Micro Backlash
P1: Reduced Backlash
P2: Standard Backlash

Ratio:
1 Stage: 4, 5, 7, 10
2 Stage: 20, 25, 35, 40, 50, 70, 100
16, 21, 31, 61, 91

Motor Designation:
Manufacturer Type
And Model

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

ADR Series

ADR047 – 010 – P1 / MOTOR

Gearbox Size:
ADR047, ADR064, ADR090
ADR110, ADR140, ADR200, ADR255

Backlash:
P0: Micro Backlash
P1: Reduced Backlash
P2: Standard Backlash

Ratio:
1 Stage: 4, 5, 7, 10, 14*, 20*
2 Stage: 20, 25, 35, 40, 50, 70, 100, 140**, 200**

Motor Designation:
Manufacturer Type
And Model

* ADR047에는적용안됨
** ADR047,ADR064에는 적용안됨

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

ADS Series

ADS047 – 010 – S1 – P1

Gearbox Size:
ADS047, ADS064, ADS090
ADS110, ADS140, ADS200, ADS255

Shaft Option:
S1: Smooth Input Shaft
S2: Intput Shaft with Key

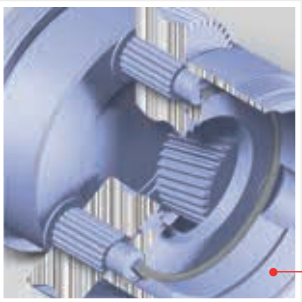
Ratio:
1 Stage: 4, 5, 7, 10
2 Stages: 16, 21, 31, 61, 91

Backlash:
P0: Micro Backlash
P1: Reduced Backlash
P2: Standard Backlash

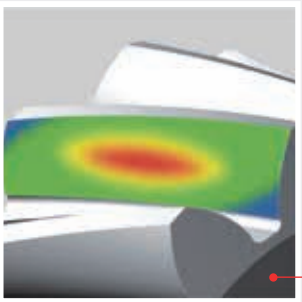
Ordering Example: ADS090-010-S1-P1

AD/ADR/ADS Series

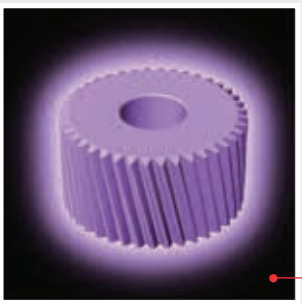
Characteristic Highlights



Solid uncaged needle roller bearings을 적용
일정한 공간에 최대한 많은수의 니들베어링을 적용
고강성, 고토크, 저소음의 장점을 가짐.



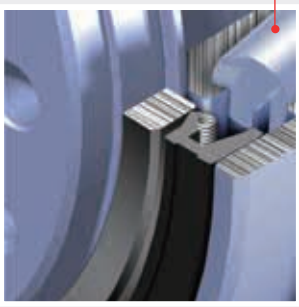
HeliTopo technology을 적용하여 높은 기어성능을 가짐.
기어 Crowning을 통해 기어 맞물림율과 오버랩을 최적화시킴.
이로인해 기어 표면 접촉율을 극대화시켜 토크용량 증대

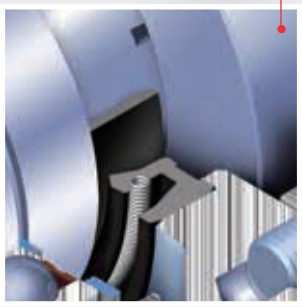


당사에 Plasma nitriding열처리 장비를 직접보유
기어 심부경도는 30 HRC로 유지하면서 기어표면 경도를
900Hv까지 높여 내마모성 및 내충격성을 동시에 증대시킴
또한 저온 열처리 방식이라 열처리후 변형이 극히 적음

One piece planet carrier with extended bearing design
레이디얼 하중 용량을 극대화 시키고 시스템의 정도와
강성을 극대화 시킴.

True Helical Gear Design
기어간 접촉율이 스퍼기어 대비 33%이
상 높아 토크용량을 높일수 있음.
이 헬릭스 앵글구조는 백래쉬를 낮추면
서도 정숙하고 조용한 운전가능
backlash (less than 1 arc-minutes and ≤ 56dB)

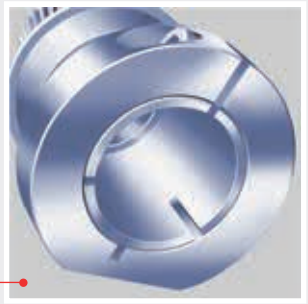




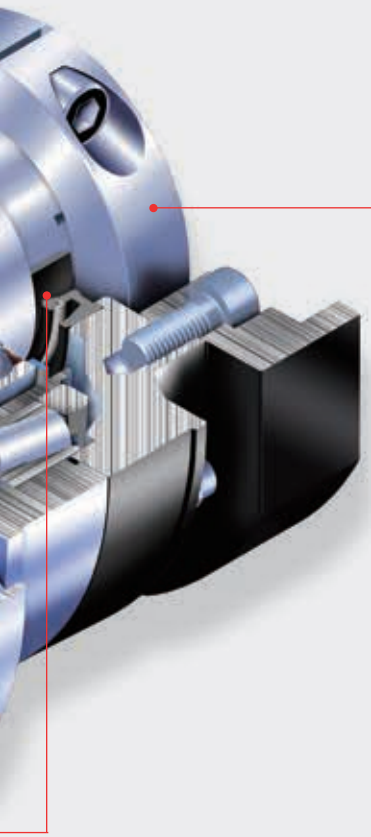
Patented sealing system
오일씰과 맞닿은 부분에 TiCN 코팅처리를 하여 마찰과 발열을 줄여 오일리크를
방지하고 수명을 극대화함.(경도 : 3700Hv, 조도 : R_a0.2㎛)

Patented planet carrier design
선기어 베어링을 플래닛 케리어안에 위치시킴으로써
기어의 오배열을 줄여 높은 정밀도를 얻음.

고성능 합성윤활유
Nyogel 792D(Smart Grease)을
사용하여 오일누유를 방지하고
유지보수가 필요없음

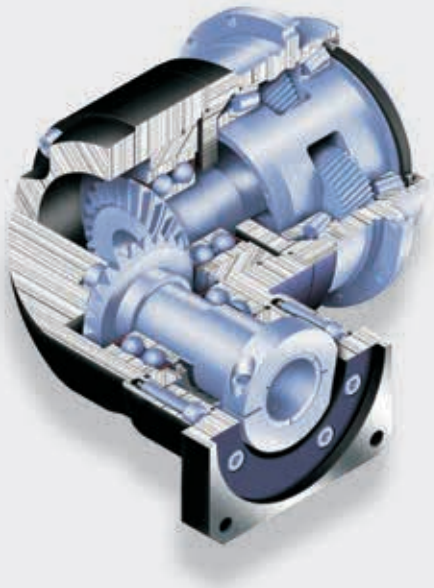


Triple split collet with dynamic balanced set collar clamping system 은 백래쉬 발생없는
동력을 전달하고 슬립현상을 완전히 제거함.
또한 100%의 동심도 확보로 높은 입력속도 에서도
정숙한 운전을 보장함.



ADR Series

ADR모델은 스파이럴 베벨기어를 적용한
Angle 구조로 길이를 짧게 하였고
어떤 모터에도 대응할 수 있는
고강성 하우징을 사용.



ADS Series

ADS모델은 입력부에 샤프트가 나와 있어
감속기와 모터를 병렬로 연결 할때나
모터와 감속기를 Key 방식으로 체결하고자
할때 적합한 구조입니다.