

# AD-series

## Overview



- Special design for continuous (S1) or cyclic (S5) duty operation
- Stainless steel housing, aluminum black anodized motor adapter flange
- Stainless steel output shaft, flange ISO 9409
- Helical gear technology
- Nominal Torques:
  - $T_{2N}$  : 14 Nm – 2000 Nm
- Ratios
  - 1-stage : 4 / 5 / 7 / 10
  - 2-stage : 20 / 25 / 35 / 40 / 50 / 70 / 100 / 16 / 21 / 31 / 61 / 91
- Low Backlash
  - 1-stage :  $\leq 1$  arcmin /  $\leq 3$  arcmin /  $\leq 5$  arcmin
  - 2-stage :  $\leq 3$  arcmin /  $\leq 5$  arcmin /  $\leq 7$  arcmin
- High Efficiency
  - 1-stage :  $\geq 97\%$
  - 2-stage :  $\geq 94\%$
- Easy mount
- Low noise
- Compact structure
- Sizes available: AD047 / AD064 / AD090 / AD110 / AD140 / AD200 / AD255

# Specifications

Model No.	Stage	Ratio <sup>1</sup>	AD047	AD064	AD090	AD110	AD140	AD200	AD255	
	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	
Nominal Output Torque $T_{2N}$	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 $T_{2NOT}^3$	Nm	1,2	4~100	3 times of nominal output torque $T_{2N}$				
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	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 $F_{2kB}^2$	Nm	1,2	4~100	42.5	125	235	430	1,300	3,064	5,900
Max. axial load $F_{2b}^2$	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 *						
Efficiency	%	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
			20~100	1.0	1.6	3.7	7.3	15.9	36.9	70.4
		2	16~91	1.0	1.4	3.5	6.5	15.5	34.2	67.2
Operating Temperature	°C	1,2	4~100	-10°C ~+ 90°C						
Lubrication		1,2	4~100	synthetic gear grease (NYOGEL 792D)						

Degree of Gearbox Protection		1,2	4-100	IP65						
Mounting Position		1,2	4-100	all directions						
Noise Level ( $n_i=3000\text{rpm}$ , No Load)	dB(A)	1,2	4-100	$\leq 56$	$\leq 58$	$\leq 60$	$\leq 63$	$\leq 65$	$\leq 67$	$\leq 70$

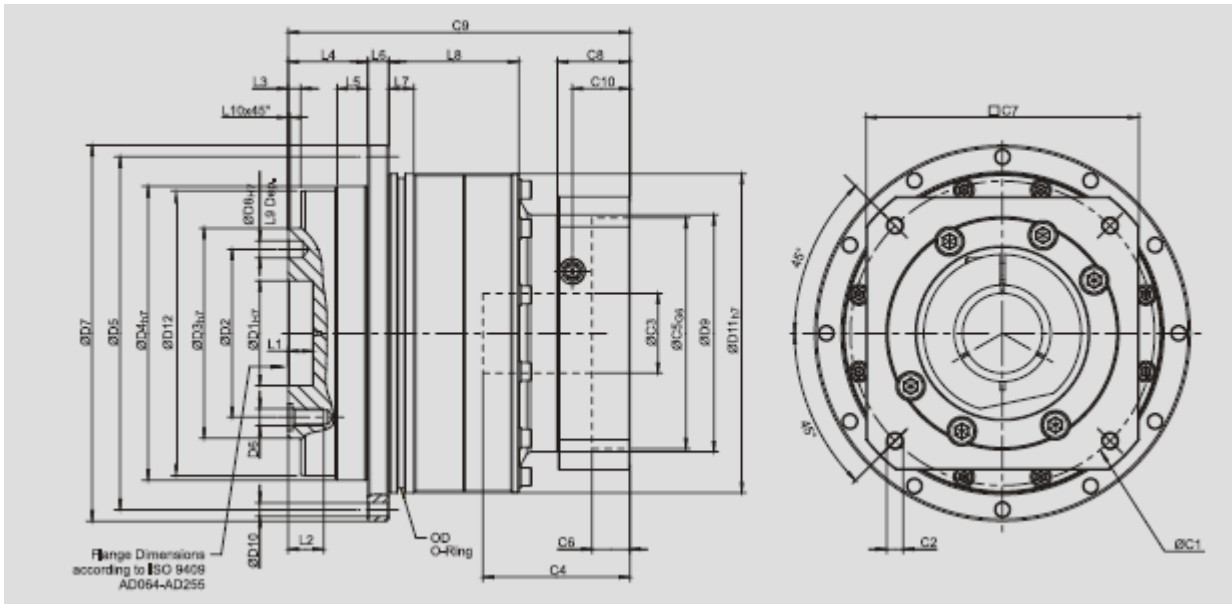
1. Ratio (  $i=N_{in} / N_{out}$  )
  2. Applied to the output flange @ 100 rpm
  3. Maximum Acceleration Torque  $T_{2B} = 60\%$  van  $T_{2NOT}$
- \* S1 service life 15,000 hrs.

# Inertia

Model No.	Stage	Ratio <sup>1</sup>	AD047	AD064	AD090	AD110	AD140	AD200	AD255
Mass Moment of inertia J <sub>1</sub>	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
		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
	2	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

# Sizes

## AD series 1-stage, ratio $i=4\sim 10$



	AD047	AD064	AD090	AD110	AD140	AD200	AD255
D1 <sub>H7</sub>	12	20	31.5	40	50	80	100
D2	20	31.5	50	63	80	125	140
D3 <sub>H7</sub>	28	40	63	80	100	160	180
D4 <sub>H7</sub>	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 <sub>H7</sub>	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 <sub>H7</sub>	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 <sup>3</sup>	46	70	100	130	165	215	235
C2 <sup>3</sup>	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 <sup>3</sup>	≤11	*≤14 / ≤16	≤19 / ≤24	≤32	≤38	≤48	≤55
C4 <sup>3</sup>	30	34	40	50	60	85	116
C5 <sup>3</sup> <sub>G6</sub>	30	50	80	110	130	180	200
C6 <sup>3</sup>	3.5	8	4	5	6	6	6
C7 <sup>3</sup>	48	60	90	115	142	190	220
C8 <sup>3</sup>	19.5	19	17	19.5	22.5	29	63
C9 <sup>3</sup>	70	82.5	99.5	121.5	151	199.5	256.5
C10 <sup>3</sup>	13.25	13.5	10.75	13	15	20.75	53.5

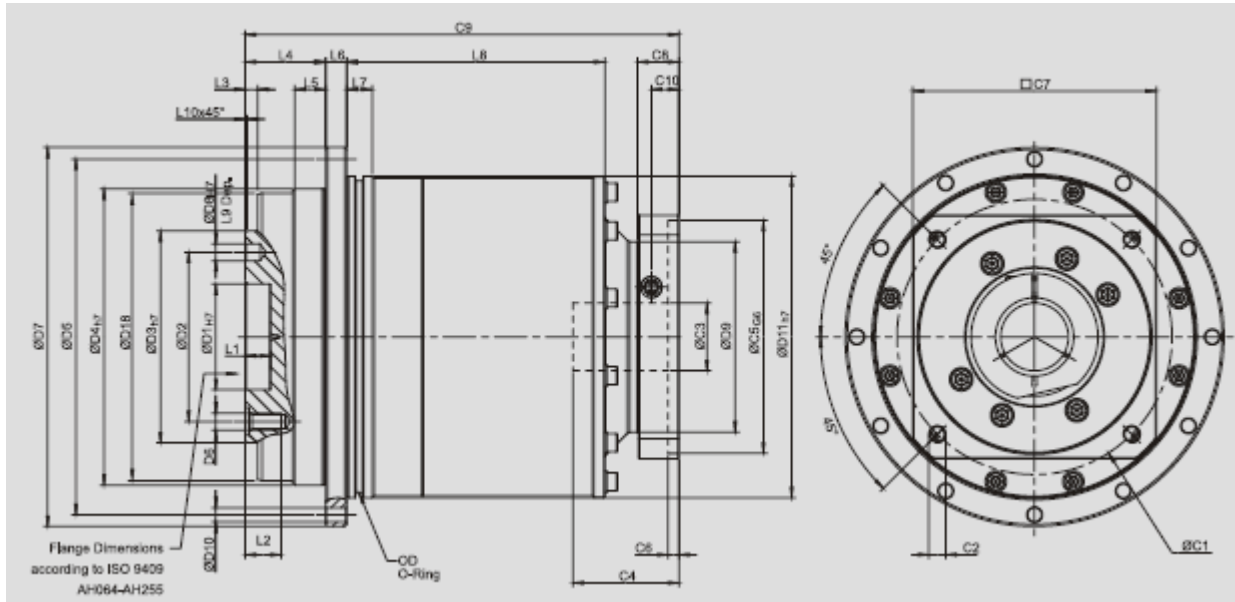
OD            56 X 2            66 X 2            90 X 3            110 X 3            145 X 3            200 X 5            238 X 5

3. C1~C10 are motor specific dimensions.

\* AD064M1 ratio 5,10 offers C3 =16 option.

\* AD090M1 offers C3 =24 option.

**AD series 2-stage, ratio i= 20~100**



	AD047	AD064	AD090	AD110	AD140	AD200	AD255
D1 <sub>H7</sub>	12	20	31.5	40	50	80	100
D2	20	31.5	50	63	80	125	140
D3 <sub>H7</sub>	28	40	63	80	100	160	180
D4 <sub>H7</sub>	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 <sub>H7</sub>	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 <sub>H7</sub>	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 <sup>4</sup>	46	46	70	100	130	165	200
C2 <sup>4</sup>	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 <sup>4</sup>	≤11	*≤11 / ≤12	* 14 / ≤15.875 / ≤16	19 / ≤24	≤32	≤38	≤48

C4 <sup>4</sup>	30	30	34	40	50	60	85
C5 <sup>4</sup> <sub>G6</sub>	30	30	50	80	110	130	180
C6 <sup>4</sup>	3.5	3.5	8	4	5	6	6
C7 <sup>4</sup>	48	48	60	90	115	142	190
C8 <sup>4</sup>	19.5	19.5	19	17	19.5	22.5	29
C9 <sup>4</sup>	97.5	108	134	160	204	248	311.5
C10 <sup>4</sup>	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.

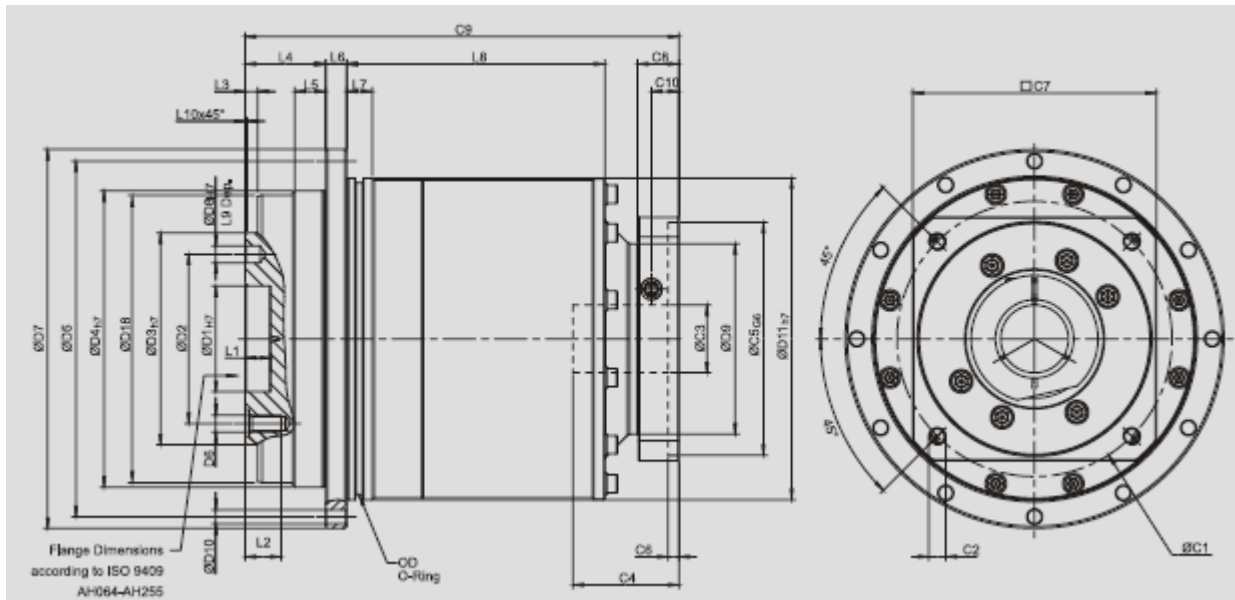
\* AD064M1 ratio 20~50 offers C3 =12 option.

\* AD090M1 ratio 20~50 offers C3 =16 option.

\* AD090M2 ratio 20~50 offers C3 =15,875 option.

\* AD110M1 offers C3 =24 option.

### AD serie s2-stage, ratio i= 16~91



	AD047	AD064	AD090	AD110	AD140	AD200	AD255
D1 <sub>H7</sub>	12	20	31.5	40	50	80	100
D2	20	31.5	50	63	80	125	140
D3 <sub>H7</sub>	28	40	63	80	100	160	180
D4 <sub>H7</sub>	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 <sub>H7</sub>	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 <sub>H7</sub>	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 <sup>5</sup>	46	46	70	100	130	165	215
C2 <sup>5</sup>	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 <sup>5</sup>	≤11	*≤11 / ≤12	* ≤14 / ≤15.875 / ≤16	≤ 19 / ≤ 24	≤32	≤38	≤48
C4 <sup>5</sup>	30	30	34	40	50	60	85
C5 <sup>5</sup> <sub>G6</sub>	30	30	50	80	110	130	180
C6 <sup>5</sup>	3.5	3.5	8	4	5	6	6
C7 <sup>5</sup>	48	48	60	90	115	142	190
C8 <sup>5</sup>	19.5	19.5	19	17	19.5	22.5	29
C9 <sup>5</sup>	100	106	130.5	149	205	247.5	323
C10 <sup>5</sup>	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

5. C1~C10 are motor specific dimensions.

\* AD064M1 ratio 20~50 offers C3 =12 option.

\* AD090M1 ratio 20~50 offers C3 =16 option.

\* AD090M2 ratio 20~50 offers C3 =15,875 option.

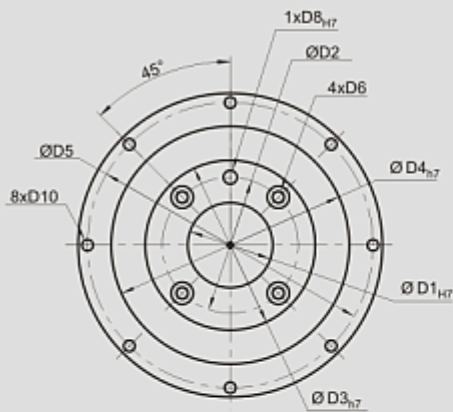
\* AD110M1 offers C3 =24 option.

## Dimensions Output Flange( ISO 9409 )

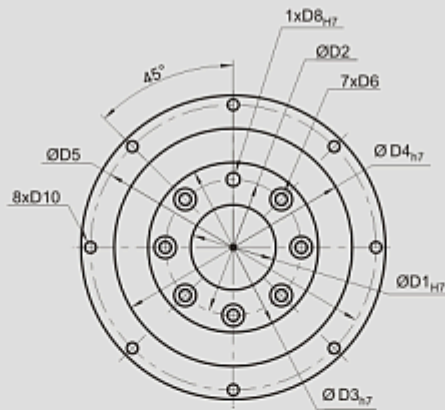
### ADS



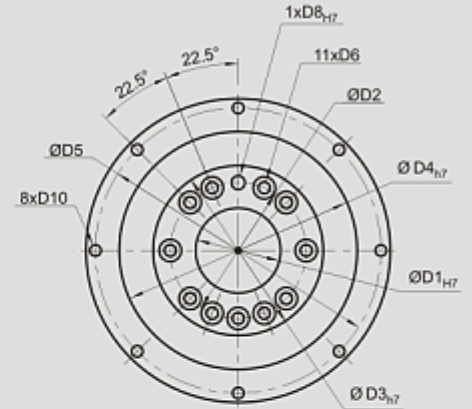
**AD 047  
ADR 047  
ADS 047**



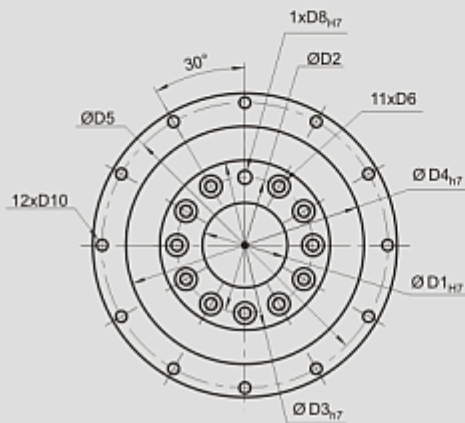
**AD 064 / AD 090  
ADR 064 / ADR 090  
ADS 064 / ADS 090**



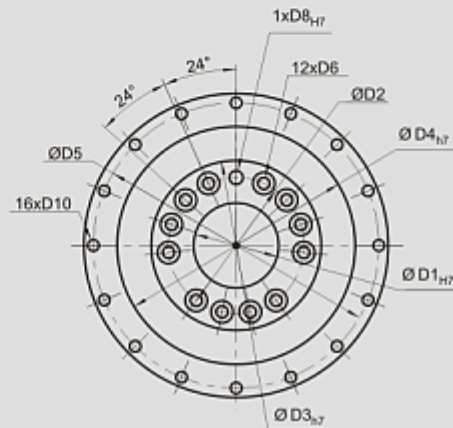
**AD 110  
ADR 110  
ADS 110**



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



**AD 255  
ADR 255  
ADS 255**



	<b>AD047</b>	<b>AD064</b>	<b>AD090</b>	<b>AD110</b>	<b>AD140</b>	<b>AD200</b>	<b>AD255</b>
<b>Dimension</b>	<b>ADR047</b>	<b>ADR064</b>	<b>ADR090</b>	<b>ADR110</b>	<b>ADR140</b>	<b>ADR200</b>	<b>ADR255</b>
	<b>ADS047</b>	<b>ADS064</b>	<b>ADS090</b>	<b>ADS110</b>	<b>ADS140</b>	<b>ADS200</b>	<b>ADS255</b>
<b>D1<sub>H7</sub></b>	12	20	31.5	40	50	80	100
<b>D2</b>	20	31.5	50	63	80	125	140
<b>D3<sub>H7</sub></b>	28	40	63	80	100	160	180
<b>D4<sub>H7</sub></b>	47	64	90	110	140	200	255
<b>D5</b>	67	79	109	135	168	233	280
<b>D6</b>	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
<b>D8<sub>H7</sub></b>	3	5	6	6	8	10	12
<b>D10</b>	3.4	4.5	5.5	5.5	6.6	9	13.5