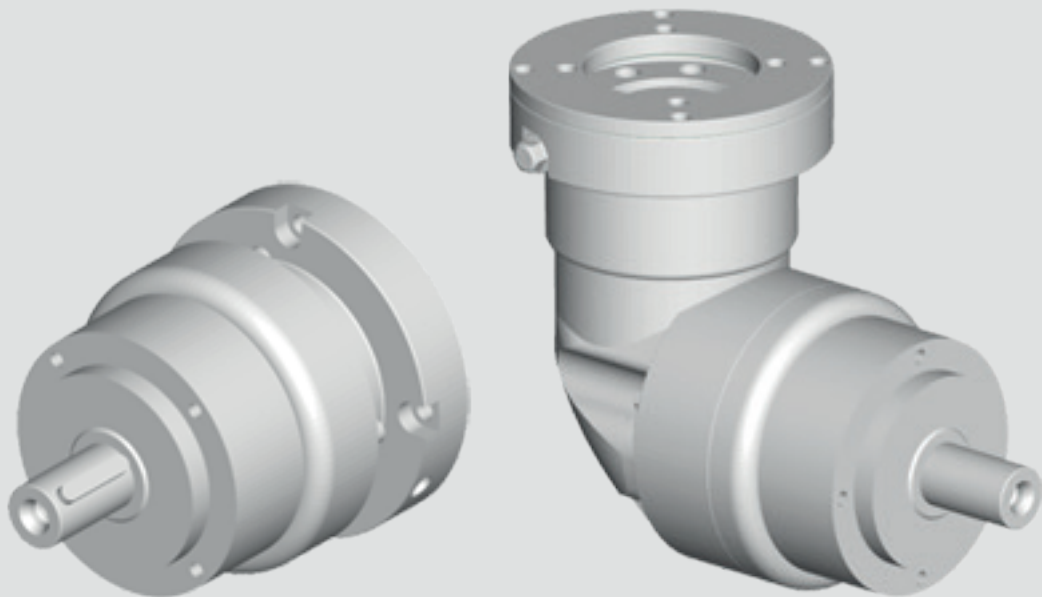




APEX DYNAMICS

**HIGH PRECISION
PLANETARY GEARBOX**

AES / AERS Series



Full Stainless Steel

Gearbox Series - AES / AERS

► Features:

- Stainless Steel round housing
- Standard with Food Grade lubrication
- Helical gears
- High efficiency
- Easy mounting
- Low noise
- Compact construction



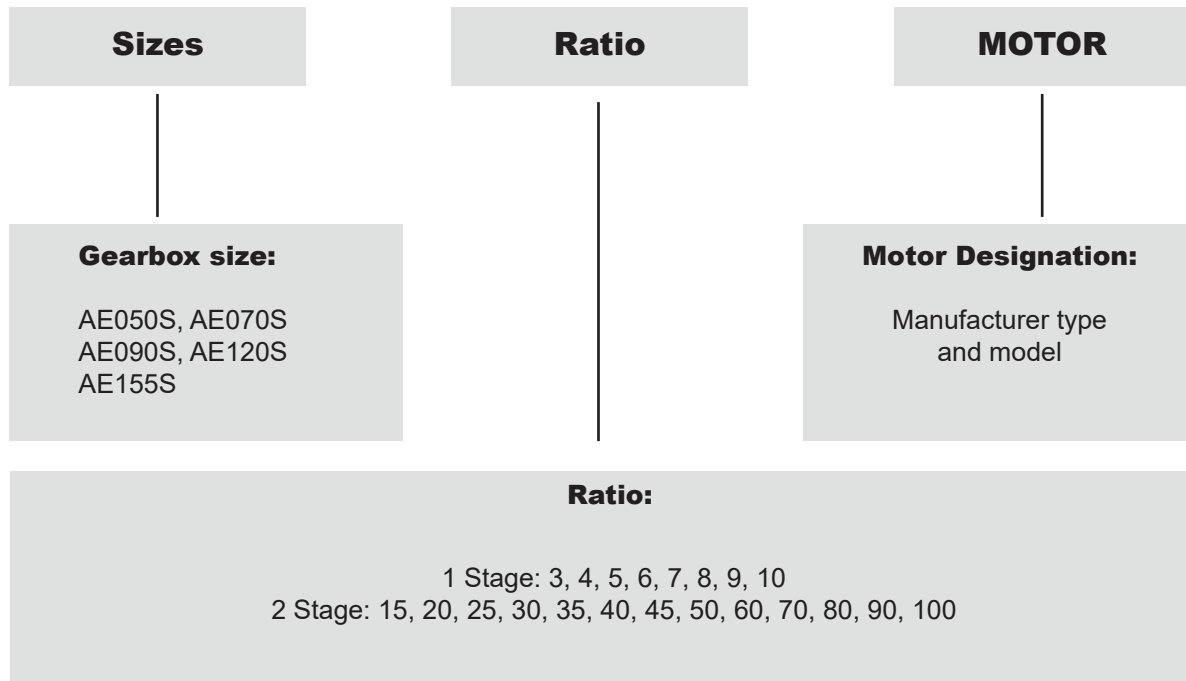
About Apex Dynamics

The world is constantly changing. Also in the technical field, developments can hardly be kept up to date. In the world of automation and robotization, for example, yesterday's innovations are already commonplace today. As a result, many companies are caught between a shortage of personnel with deep substantive knowledge and a need for automation or technical innovation. How do we get the market moving forward?

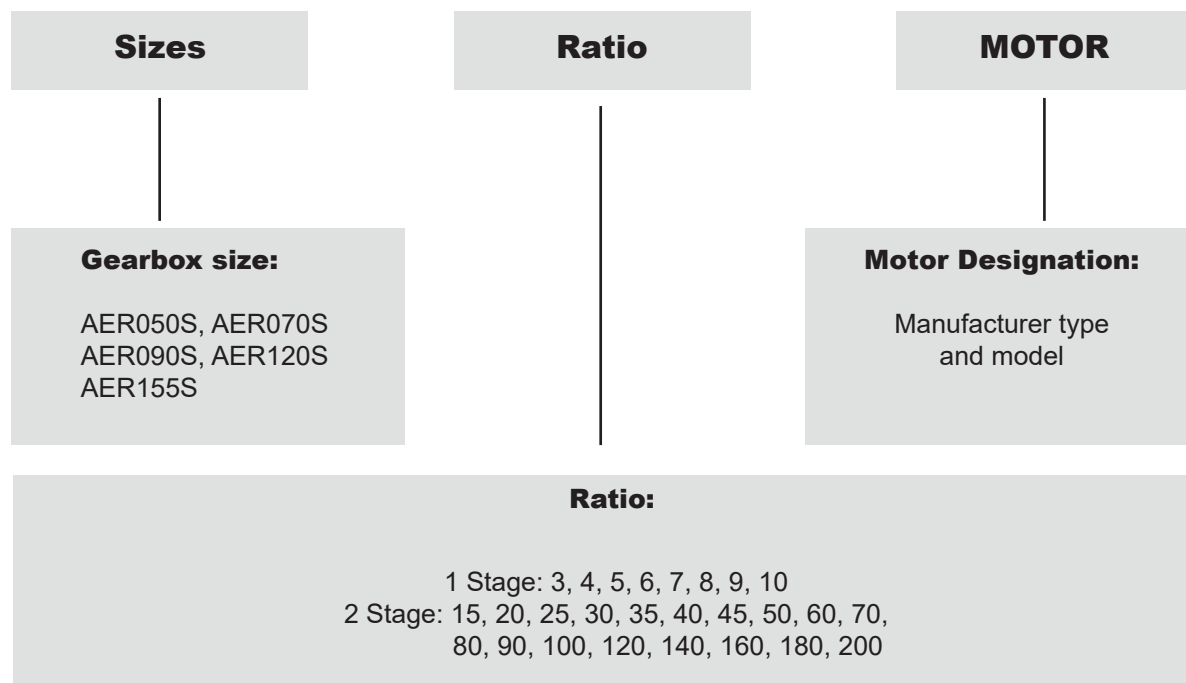
Apex Dynamics supplies the essential parts for the mechanical drive of machines and robots. But that does not stop with gearboxes, racks and pinions. Apex Dynamics provides its customers and the market, where necessary, with the knowledge and expertise that will help you move forward. In addition, we take our responsibility when it comes to training new young specialists. With our innovative products, in-depth knowledge and years of experience, we do not only help the industry but also you further on a commercial and product-technical level.

We create opportunities for our customers, the technical industry and the world around us to move forward. Together we work on advanced solutions for the challenges of tomorrow. Apex Dynamics stands for a forward movement.

Ordering Code - AES / AERS Gearbox



Ordering example: AE090S-010-FG / KOLLMORGEN AKMH41C-CN



Ordering example: AER090S-010-FG / KOLLMORGEN AKMH41C-CN

Specifications / AES Series

Model No.	Stage	Ratio ^A	AE050S	AE070S	AE090S	AE120S	AE155S	
Nominal Output T _{2N}	1	3	20	55	130	208	342	
		4	19	50	140	290	542	
		5	22	60	160	330	650	
		6	20	55	150	310	600	
		7	19	50	140	300	550	
		8	17	45	120	260	500	
		9	14	40	100	230	450	
		10	14	40	100	230	450	
		2	15	20	55	130	208	342
			20	19	50	140	290	542
	25		22	60	160	330	650	
	30		20	55	150	310	600	
	35		19	50	140	300	550	
	40		17	45	120	260	500	
	45		14	40	100	230	450	
	50		22	60	160	330	650	
	60		20	55	150	310	600	
	70		19	50	140	300	550	
	80	17	45	120	260	500		
	90	14	40	100	230	450		
100	14	40	100	230	450			
Max. Torque T _{2B}	Nm	1,2	3~100	60% of Emergency Torque T _{2NOT}				
Emergency Torque T _{2NOT}	Nm	1,2	3~100	3 times of Nominal Torque T _{2N}				
No Load Torque ^B	Nm	1	3~10	0,33	0,44	0,77	1,98	2,53
		2	15~100	0,17	0,17	0,28	0,55	1,43
Nominal Input Speed N _{1N}	rpm	1,2	3~100	5.000	5.000	4.000	4.000	3.000
Max. Input Speed N _{1B}	rpm	1,2	3~100	10.000	10.000	8.000	8.000	6.000
Backlash	arcmin	1	3~10	≤ 8	≤ 8	≤ 8	≤ 8	≤ 8
		2	15~100	≤ 12	≤ 12	≤ 12	≤ 12	≤ 12
Torsional Rigidity	Nm/arcmin	1,2	3~100	3	8	14	25	50
Max. Radial Load F _{2a1B} ^C	N	1,2	3~100	702	1.377	2.985	6.100	
Max. Axial Load F _{2a2B} ^C	N	1,2	3~100	390	765	1.625	3.350	
Service life ^D	hr	1,2	3~100	20.000				
Efficiency	%	1	3~10	≥ 97%				
		2	15~100	≥ 93%				
Weight	kg	1	3~10	0,6	1,4	3,3	6,9	13
		2	15~100	0,9	1,6	4,7	8,7	17
Operating Temperature	°C	1,2	3~100	-10 °C ~ 90 °C				
Lubrication				Food Grade				
Degree of Gearbox Protection		1,2	3~100	IP67				
Mounting Position		1,2	3~100	all directions				
Noise (n1=3000rpm,i=10, no load) ^E	dB (A)	1,2	3~100	≤ 56	≤ 58	≤ 60	≤ 63	≤ 65

A. Ratio (i=n_{in} / n_{out})

B. Measured at ratio 10 of 100, 20°C environmental temperature and 3000 rpm input speed

C. Applied to the output shaft center at 100 rpm

D. For continuous operation, the service life time is less than 10.000 hrs

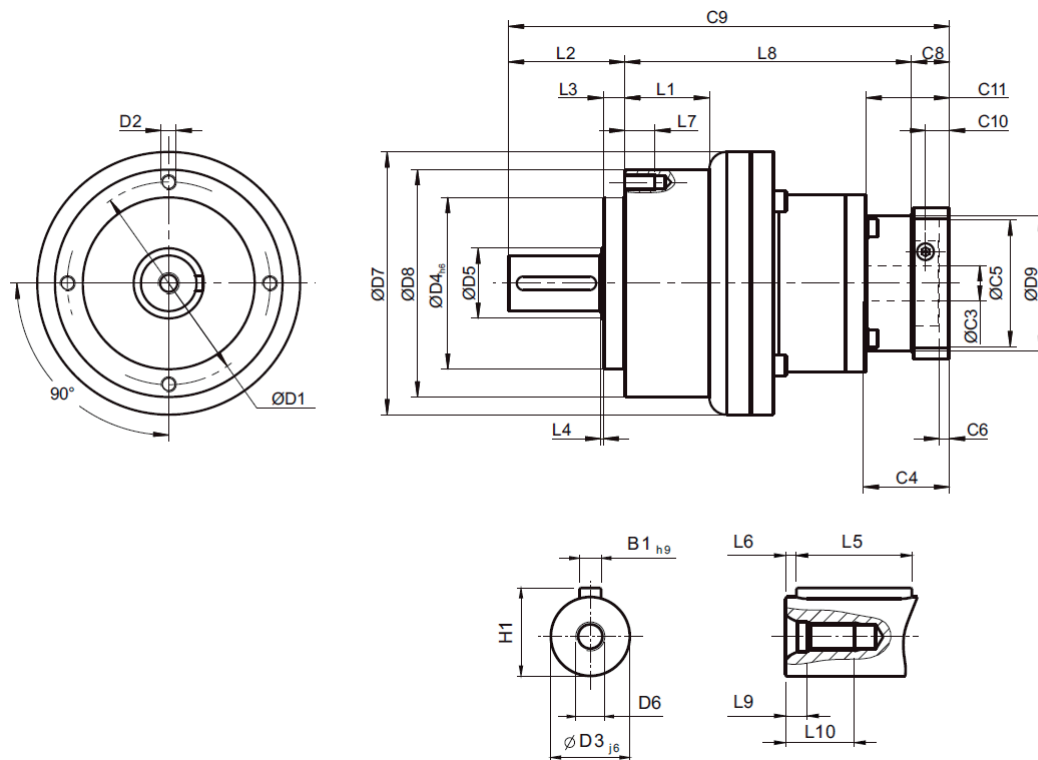
E. These values are measured by gearbox with ratio 10:1 (1-stage) or 100:1 (2-stage) at 3.000 rpm no loading
By less smaller than 10, the noise value would be 3~5 dB higher.

Gearbox Inertia AES Serie

Model No.	Stage	Ratio ^A	AE050S	AE070S	AE090S	AE120S	AE155S	
Mass Moments of Inertia J ₁	1	3	0,03	0,16	0,61	3,25	9,21	
		4	0,03	0,14	0,48	2,74	7,54	
		5	0,03	0,13	0,47	2,71	7,42	
		6	0,03	0,13	0,45	2,65	7,25	
		7	0,03	0,13	0,45	2,62	7,14	
		8	0,03	0,13	0,44	2,58	7,07	
		9	0,03	0,13	0,44	2,57	7,04	
		10	0,03	0,13	0,44	2,57	7,03	
		2	15	0,03	0,03	0,13	0,47	2,71
			20	0,03	0,03	0,13	0,47	2,71
	25		0,03	0,03	0,13	0,47	2,71	
	30		0,03	0,03	0,13	0,47	2,71	
	35		0,03	0,03	0,13	0,47	2,71	
	40		0,03	0,03	0,13	0,47	2,71	
	45		0,03	0,03	0,13	0,47	2,71	
	50		0,03	0,03	0,13	0,44	2,57	
	60		0,03	0,03	0,13	0,44	2,57	
	70		0,03	0,03	0,13	0,44	2,57	
	80	0,03	0,03	0,13	0,44	2,57		
	90	0,03	0,03	0,13	0,44	2,57		
100	0,03	0,03	0,13	0,44	2,57			

A. Ratio ($i = n_{in} / n_{out}$)

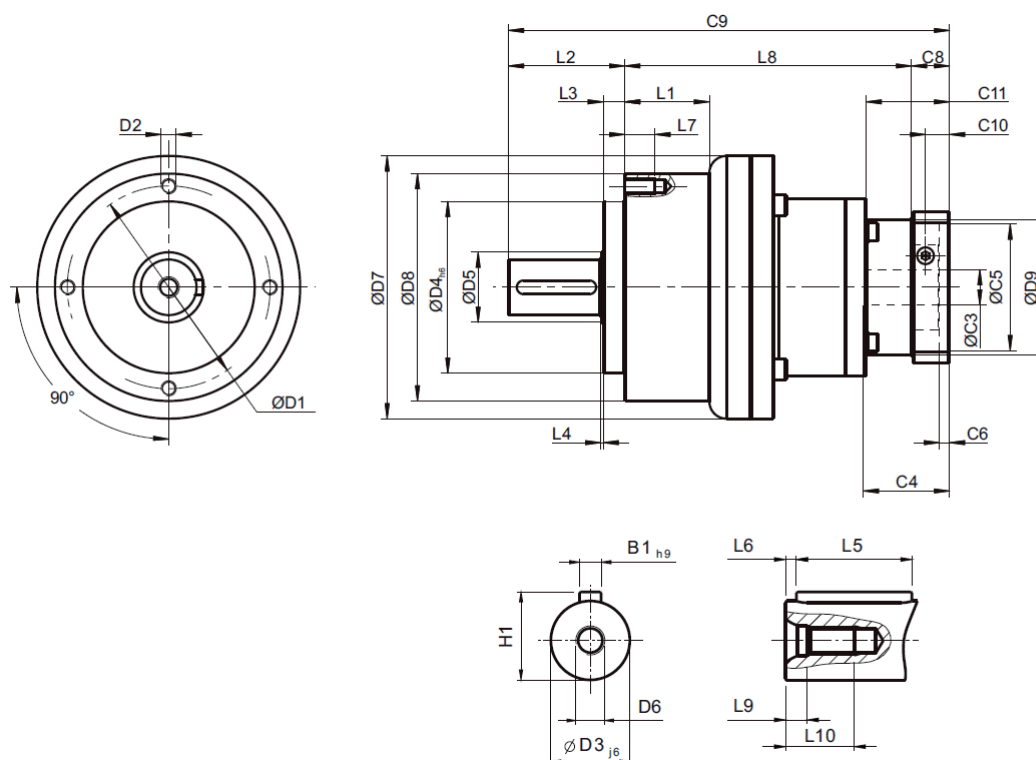
Dimensions (1 stage, Ratio $i=3\sim 10$) AES Series



Dimensions	AE050S	AE070S	AE090S	AE120S	AE155S
D1	44	62	80	108	140
D2	M4 x 0,7P	M5 x 0,8P	M6 x 1P	M8 x 1,25P	M10 x 1,5P
D3 _{j6}	12	16	22	32	40
D4 _{h6}	35	52	68	90	120
D5	22	22	30	40	75
D6	M4 x 0,7P	M5 x 0,8P	M8 x 1,25P	M12 x 1,75P	M16 x 2P
D7	53	70	104	130	162
D8	50	70	90	120	155
D9	45,5	53,4	77	102	125
L1	--	--	33,5	38	50
L2	24,5	36	46	70	97
L3	4	6,5	8,5	17,5	15
L4	1	1	1	1,5	2
L5	14	25	32	40	63
L6	2	2	3	5	5
L7	8	10	12	16	20
L8	46	59	80,5	97	119,5
L9	4,5	4,8	7,2	10	112
L10	10	12,5	19	28	36
C3 ¹	$\leq 11 / \leq 12^2$	$\leq 14 / \leq 16^2$	$\leq 19 / \leq 24^2$	≤ 32	≤ 38
B1 _{h9}	4	5	6	10	12
H1	14	18	24,5	35	43

1. C1-C11 are motor specific dimensions (metric std shown) Refer to www.apexdyna.nl and Design Tool
2. AE050S ratio 5:1 and 10:1 offers C3 ≤ 12 mm option; AE070S ratio 5:1 and 10:1 offers C3 ≤ 16 mm option; AE090S ratio 5:1 and 10:1 offers C3 ≤ 24 mm option

Dimensions (2 stage, Ratio i=15~100) AES Series



Dimensions	AE050S	AE070S	AE090S	AE120S	AE155S
D1	44	62	80	108	140
D2	M4 x 0,7P	M5 x 0,8P	M6 x 1P	M8 x 1,25P	M10 x 1,5P
D3 _{j6}	12	16	22	32	40
D4 _{h6}	35	52	68	90	120
D5	22	22	30	40	75
D6	M4 x 0,7P	M5 x 0,8P	M8 x 1,25P	M12 x 1,75P	M16 x 2P
D7	53	70	104	130	162
D8	50	70	90	120	155
D9	45,5	53,4	77	102	102
L1	--	--	33,5	38	50
L2	24,5	36	46	70	97
L3	4	6,5	8,5	17,5	15
L4	1	1	1	1,5	3
L5	14	25	32	40	63
L6	2	2	3	5	5
L7	8	10	12	16	20
L8	73	86,5	110,5	138,5	176
L9	4,5	4,8	7,2	10	12
L10	10	12,5	19	28	36
C3 ¹	≤ 11 / ≤ 12 ²	≤ 11 / ≤ 12 ²	≤ 14 / ≤ 15,875 / ≤ 16 ²	≤ 19 / ≤ 24 ²	≤ 32
B1 _{h9}	4	5	6	10	12
H2	14	18	24,5	35	43

1. C1~C11 are motor specific dimensions (metric std shown) Refer to www.apexdyna.nl and Design Tool
2. AE050S ratio 5:1 and 10:1 offers C3 ≤ 12mm option; AE070S ratio 5:1 and 10:1 offers C3 ≤ 12mm option; AE090S ratio 5:1 and 10:1 offers C3 ≤ 15,875mm en ≤ 16mm optie; AE120S offers C3 ≤ 24mm option

Specifications AERS Series

Model No.		Stage	Ratio ^A	AER050S	AER070S	AER090S	AER120S	AER155S	
Nominal Output T_{2N}	Nm	1	3	9	36	90	195	342	
			4	12	48	120	260	520	
			5	15	60	150	325	650	
			6	18	55	150	310	600	
			7	19	50	140	300	550	
			8	17	45	120	260	500	
			9	14	40	100	230	450	
			10	14	60	150	325	450	
			14	-	42	140	300	550	
			20	-	40	100	230	450	
		2	15	14	-	-	-	-	-
			20	14	-	-	-	-	-
			25	15	60	150	325	650	
			30	20	55	150	31	600	
			35	19	50	140	300	550	
			40	17	45	120	260	500	
			45	14	40	100	230	450	
			50	14	60	100	230	650	
			60	20	55	150	310	600	
			70	19	50	140	300	550	
80	17	45	120	260	500				
90	14	40	100	230	450				
100	14	40	100	230	450				
120	-	-	150	310	605				
140	-	-	140	300	550				
160	-	-	120	260	550				
180	-	-	100	230	450				
200	-	-	100	230	450				
Max. Torque T_{2B}	Nm	1,2	3~200	60% of Emergency Torque T_{2NOT}					
Emergency Torque T_{2NOT}	Nm	1,2	3~200	3 times of Nominal Torque T_{2N}					
No Load Torque ^B	Nm	1	3~20	0,33	0,44	0,77	1,98	2,53	
		2	25~200	0,17	0,17	0,28	0,55	1,43	
Nominal input speed N_{1N}	rpm	1,2	3~200	5.000	5.000	4.000	4.000	3.000	
Max. input speed N_{1B}	rpm	1,2	3~200	10.000	10.000	8.000	8.000	6.000	
Backlash	arcmin	1	3~20	≤ 10	≤ 10	≤ 10	≤ 10	≤ 10	
		2	25~200	≤ 14	≤ 14	≤ 14	≤ 14	≤ 14	
Torsial Rigidity	Nm/arcmin	1,2	3~200	3	7	14	25	50	
Max. Radial load F_{2a1B} ^C	N	1,2	3~200	702	1.377	2.985	6.100	8.460	
Max. Axial Load F_{2a2B} ^C	N	1,2	3~200	390	765	1.625	3.350	4.700	
Service life ^D	hr	1,2	3~200	20.000					
Efficiency	%	1	3~20	≥ 95%					
		2	25~200	≥ 92%					
Weight	kg	1	3~20	1,0	2,1	5,8	11,2	22,4	
		2	25~200	1,3	2,0	4,6	11,1	21,8	
Operating Temperature	°C	1,2	3~200	-10 °C ~ 90 °C					
Lubrication				Food Grade					
Degree of Gearbox Protection		1,2	3~200	IP67					
Munting Position		1,2	3~200	all directions					
Noise ($n_1=3000\text{rpm}, i=10, \text{No load}$) ^E	dB (A)	1,2	3~200	≤ 61	≤ 63	≤ 65	≤ 68	≤ 70	

A. Ratio ($i=n_{1N} / n_{out}$)

B. Measured at ratio 10 of 100, 20°C environmental temperature and 3000 rpm input speed

C. Applied to the output shaft center at 100 rpm

D. For continuous operation, the service life time is less than 10.000 hrs

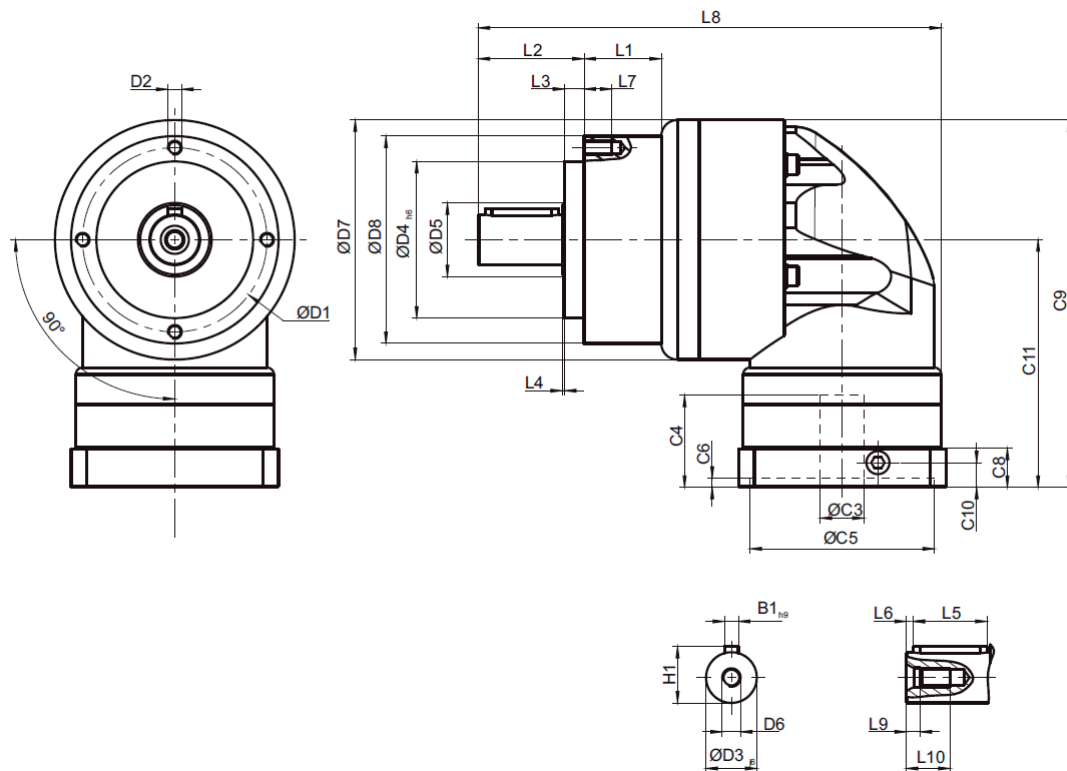
E. These values are measured by gearbox with ratio 10:1 (1-stage) or 100:1 (2-stage) at 3.000 rpm no loading
By less smaller than 10, the noise value would be 3~5 dB higher.

Gearbox Inertia AERS Series

Model No.	Stage	Ratio ^A	AE050S	AE070S	AE090S	AE120S	AER155S
Mass Moments of Inertia J ₁	1	3	0,09	0,35	2,25	6,84	23,4
		4	0,09	0,35	2,25	6,84	23,4
		5	0,09	0,35	2,25	6,84	23,4
		6	0,09	0,35	2,25	6,84	23,4
		7	0,09	0,35	2,25	6,84	23,4
		8	0,09	0,35	2,25	6,84	23,4
		9	0,09	0,35	2,25	6,84	23,4
		10	0,09	0,35	2,25	6,84	23,4
		14	-	0,07	1,87	6,25	21,8
		20	-	0,07	1,87	6,25	21,8
	2	15	0,09	-	-	-	-
		20	0,09	-	-	-	-
		25	0,09	0,09	0,35	2,25	6,84
		30	0,09	0,09	0,35	2,25	6,84
		35	0,09	0,09	0,35	2,25	6,84
		40	0,09	0,09	0,35	2,25	6,84
		45	0,09	0,09	0,35	2,25	6,84
		50	0,09	0,09	0,35	2,25	6,84
		60	0,09	0,09	0,35	2,25	6,84
		70	0,09	0,09	0,35	2,25	6,84
80	0,09	0,09	0,35	2,25	6,84		
90	0,09	0,09	0,35	2,25	6,84		
100	0,09	0,09	0,35	2,25	6,84		
120			0,31	1,87	6,25		
140	-	-	0,31	1,87	6,25		
160	-	-	0,31	1,87	6,25		
180	-	-	0,31	1,87	6,25		
200	-	-	0,31	1,87	6,25		

A. Ratio ($i = n_{in} / n_{out}$)

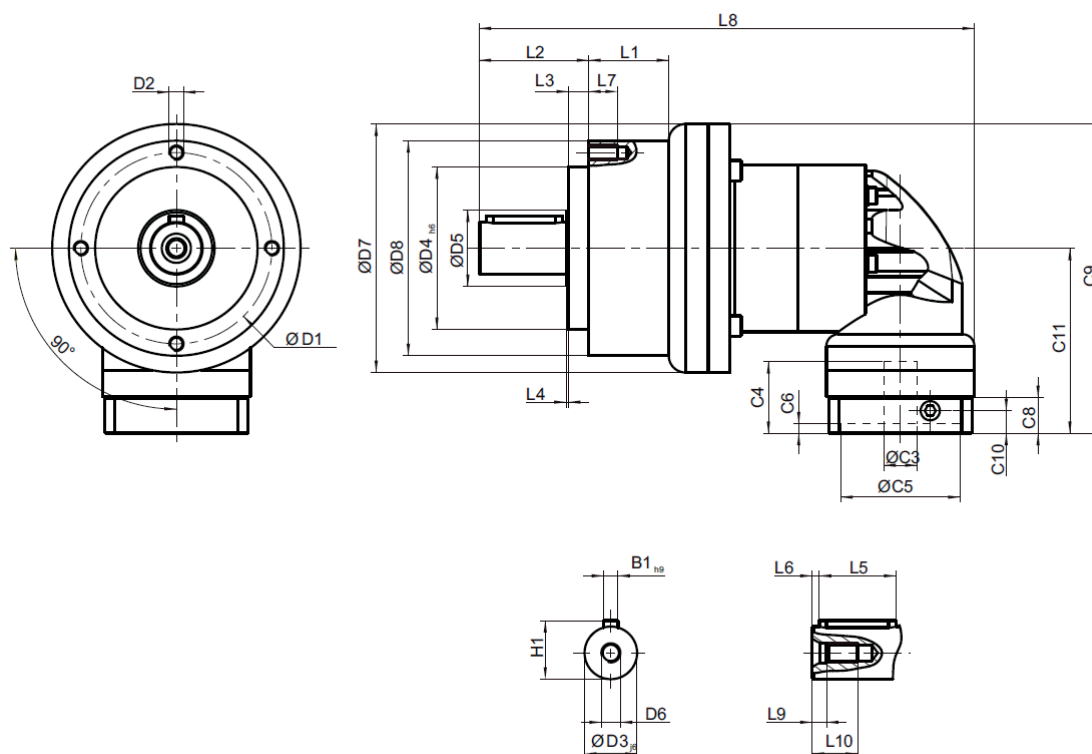
Dimensions (1 stage, Ratio $i=3\sim 10$) AERS Series



Dimensions	AER050S	AER070S	AER090S	AER120S	AER155S
D1	44	62	80	108	140
D2	M4 x 0,7P	M5 x 0,8P	M6 x 1P	M8 x 1,25P	M10 x 1,5P
D3 _{j6}	12	16	22	32	40
D4 _{h6}	35	52	68	90	120
D5	22	22	30	40	75
D6	M4 x 0,7P	M5 x 0,8P	M8 x 1,25P	M12 x 1,75P	M16 x 2P
D7	53	70	104	130	162
D8	50	70	90	120	155
L1	--	--	33,5	38	50
L2	24,5	36	46	70	97
L3	4	6,5	8,5	17,5	15
L4	1	1	1	1,5	3
L5	14	25	32	40	63
L6	2	2	3	5	5
L7	8	10	12	16	20
L8	115,5	148,5	201	252	324,5
L9	4,5	4,8	7,2	10	12
L10	10	12,5	19	28	36
C3 ¹	$\leq 11 / \leq 12^2$	$\leq 14 / \leq 16^2$	$\leq 19 / \leq 24^2$	≤ 32	≤ 38
B1 _{h9}	4	5	6	10	12
H1	14	18	24,5	35	43

1. C1~C11 are motor specific dimensions (metric std shown) Refer to www.apexdyna.nl and Design Tool
2. AER050S ratio 5:1 and 10:1 offers C3 ≤ 12 mm option; AER070S ratio 5:1 and 10:1 offers C3 ≤ 16 mm option; AER090S ratio 5:1 and 10:1 offers C3 ≤ 24 mm option

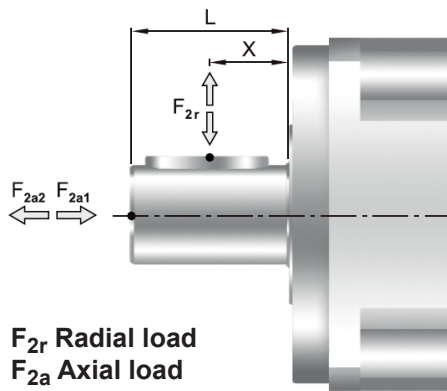
Dimensions (2 stage, Ratio i=15~100) AERS Series



Dimensions	AER050S	AER070S	AER090S	AER120S	AER155S
D1	44	62	80	108	210
D2	M4 x 0,7P	M5 x 0,8P	M6 x 1P	M8 x 1,25P	M10 x 1,5P
D3 _{j6}	12	16	22	32	40
D4 _{h6}	35	52	68	90	120
D5	22	22	30	40	75
D6	M4 x 0,7P	M5 x 0,8P	M8 x 1,25P	M12 x 1,75P	M16 x 2P
D7	53	70	104	130	162
D8	50	70	90	120	155
L1	--	--	33,5	38	50
L2	24,5	36	46	70	97
L3	4	6,5	8,5	17,5	15
L4	1	1	1	1,5	3
L5	14	25	32	40	63
L6	2	2	3	5	5
L7	8	10	12	16	20
L8	142,5	167,5	210	283	358
L9	4,5	4,8	7,2	10	12
L10	10	12,5	19	28	36
C3 ¹	≤ 11 / ≤ 12 ²	≤ 11 / ≤ 12 ²	≤ 14 / ≤ 15,875 / ≤ 16 ²	≤ 19 / ≤ 24 ²	≤ 32
B1 _{h9}	4	5	6	10	12
H2	14	18	24,5	35	43

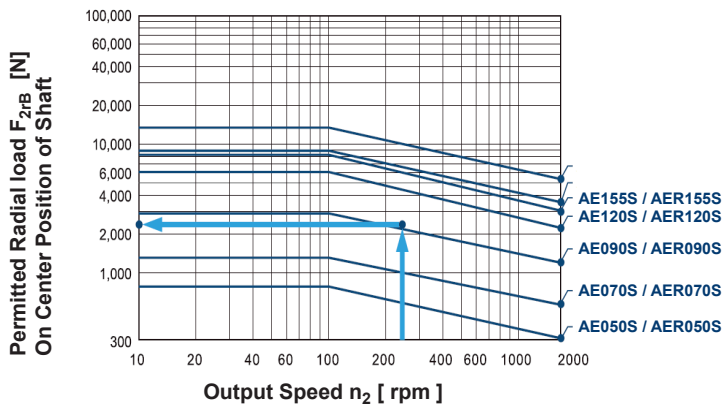
1. C1~C11 are motor specific dimensions (metric std shown) Refer to www.apexdyna.nl and Design Tool
2. AER050S ratio 5:1 and 10:1 offers C3 ≤ 12mm option; AER070S ratio 5:1 and 10:1 offers C3 ≤ 12mm option; AER090S ratio 5:1 and 10:1 offers C3 ≤ 15,875mm en ≤ 16mm optie; AER120S offers C3 ≤ 24mm option

Permitted Radial and Axial load



The permitted radial and axial load on output 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.

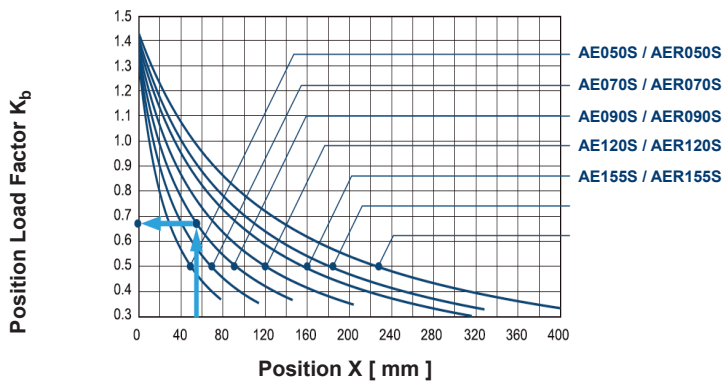
F_{2r} Radial load
 F_{2a} Axial load



If radial load F_{2r} 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.



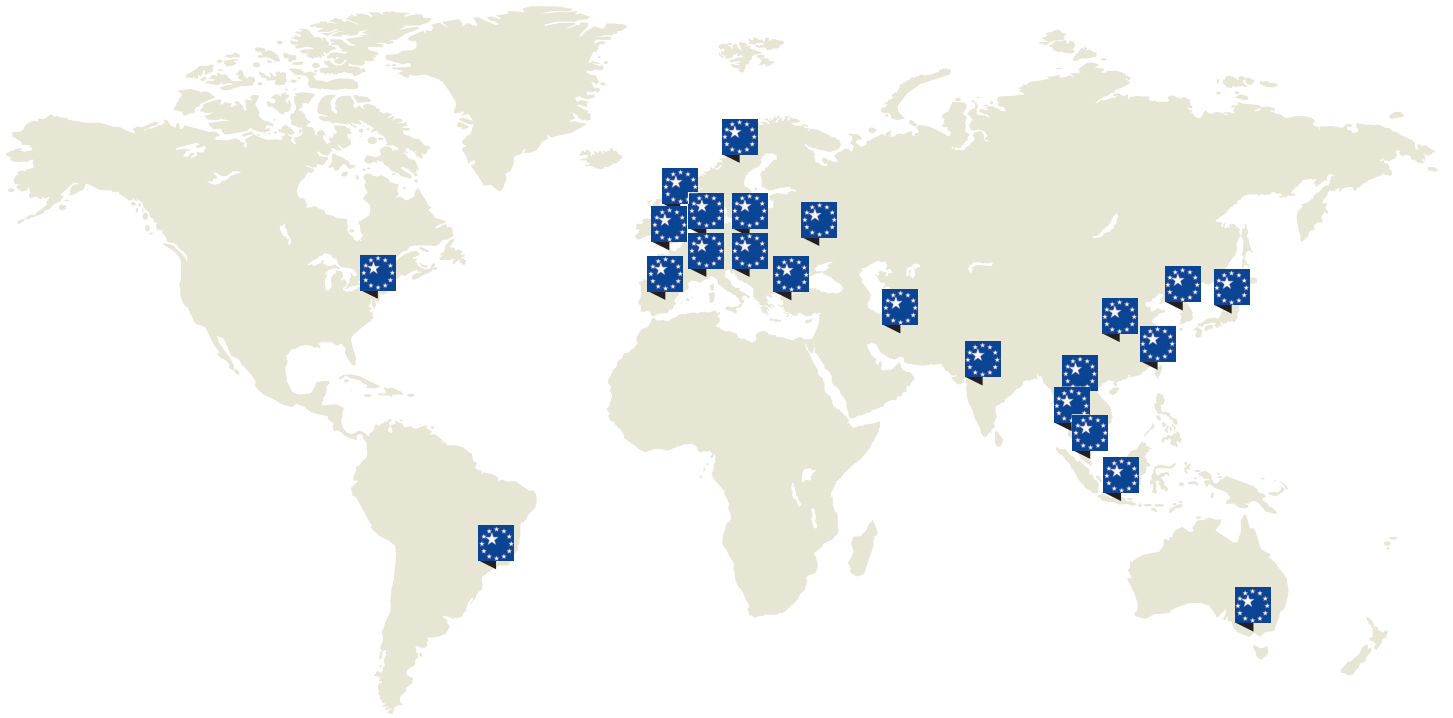
If radial force F_{2r} not exert on the center of the output shaft:
 $X < 1/2 \times L$ or $X > 1/2 \times L$.

The permitted radial and axial load can be calculated by the position load factor K_b on the left diagram.

* S1 Service live 10.000 hrs

Materials AES - AERS Series

Materials AES - AERS	
Component	Material
Housing	SUS416
Right-Angle Housing (AERS)	SUS304
Motor Adapter plate (round)	SUS304
Input House (PK cover)	SUS304
Output Shaft	SUS416
Bolts	SUS304
Key	SUS304
Standard Lubrication	Food Grade NSF-H1



APEX is with 29 offices present in 25 countries worldwide!

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