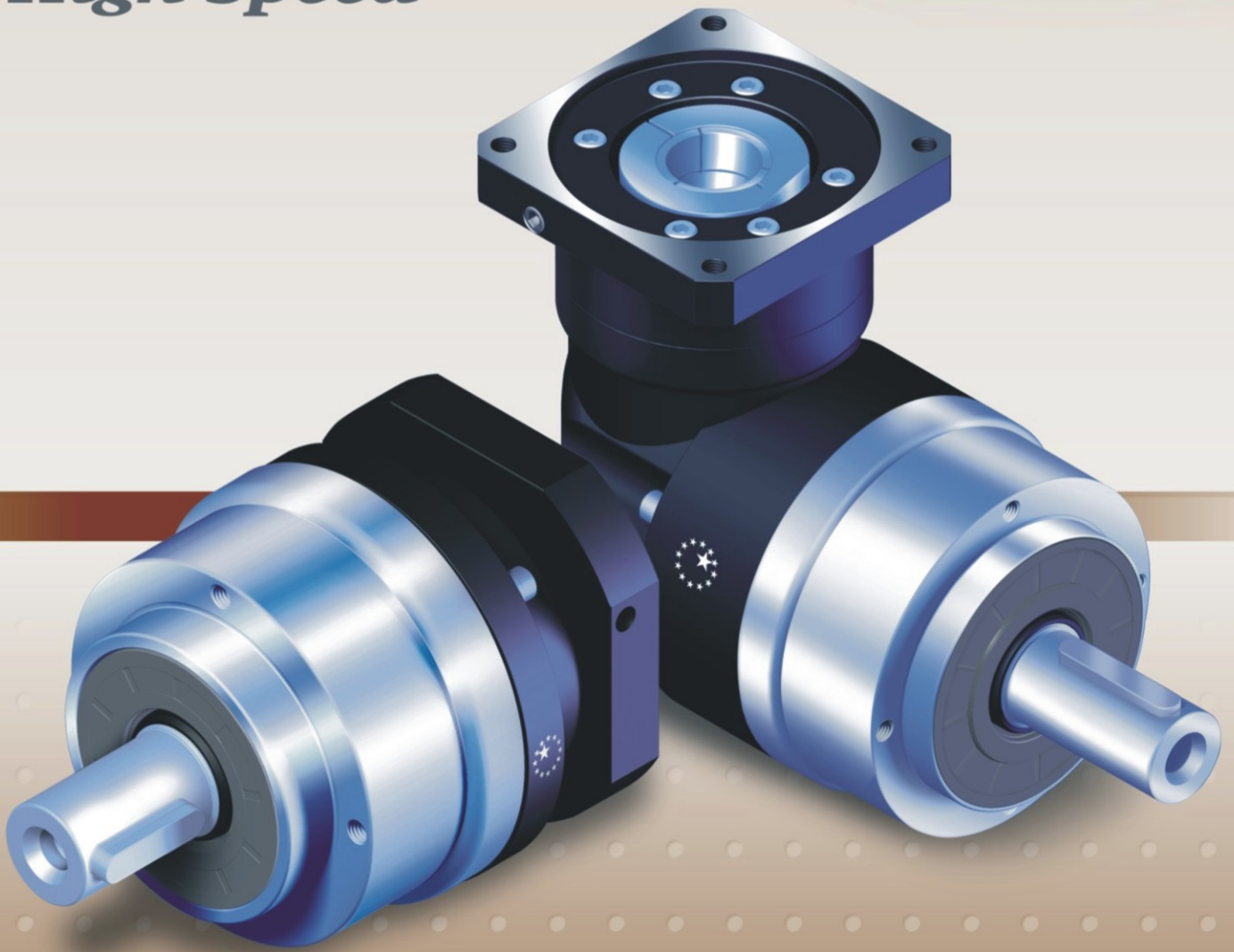




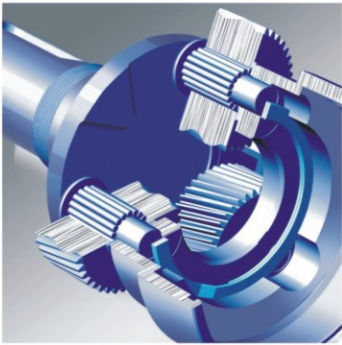
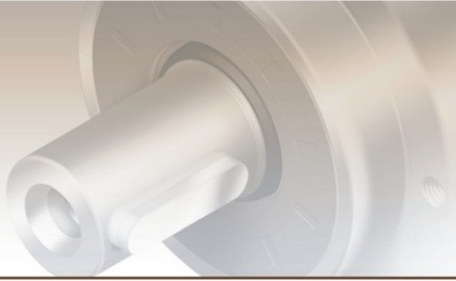
**APEX DYNAMICS, INC.**

# **AE / AER Series**

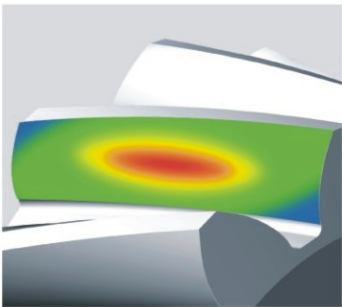
*Planetary Gearboxes  
High Precision  
High Speed*



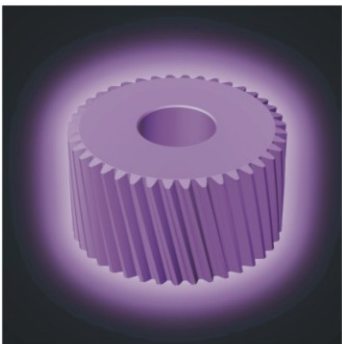
**Stainless**



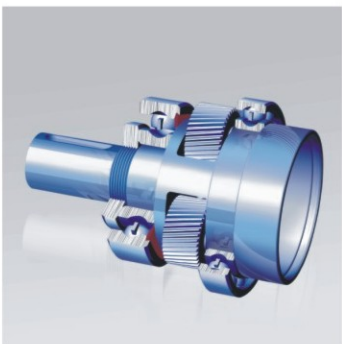
Equipped with **solid uncaged needle roller bearings**, provides maximum contact points to increase stiffness and transmit high output torque.



A high setting gear performance is achieved by using our **HeliTopo technology**. This **eases off the tooth profile** and **crowns the lead of each tooth**. This optimizes the gear mesh alignment and overlap to achieve maximum tooth surface contact.



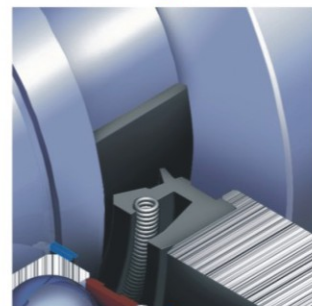
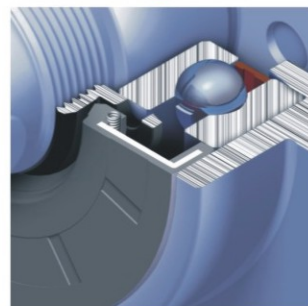
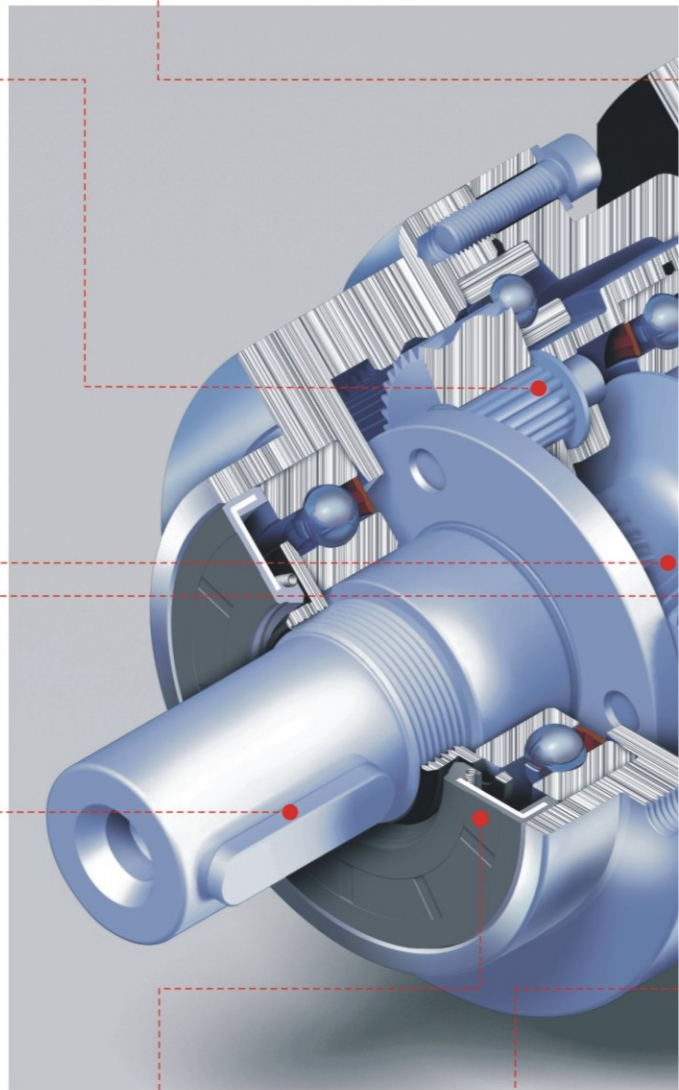
Our **in-house plasma nitriding** heat treatment process maintains the tooth surface hardness at **840Hv** for superior wear-resistance and a core hardness at **30 HRC** for toughness.



**One piece planet carrier with extended bearing design** provides maximum radial load capacity and increases system reliability and stiffness.



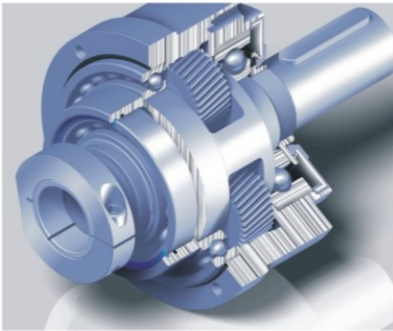
**True helical gear design**  
Precision helical gearing increases tooth to tooth contact ratio by over 33% vs spur gearing. The helix angle produces smooth and quiet operation with decreased backlash ( less than 8 arc-minutes and  $\leq 56\text{dB}$  ).





# AE / AER Series

## Characteristic Highlights

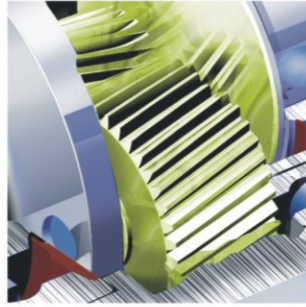


**Patented planet carrier design** puts the sun gear bearing directly into the planet carrier. It minimizes gear misalignment to gain higher accuracy.

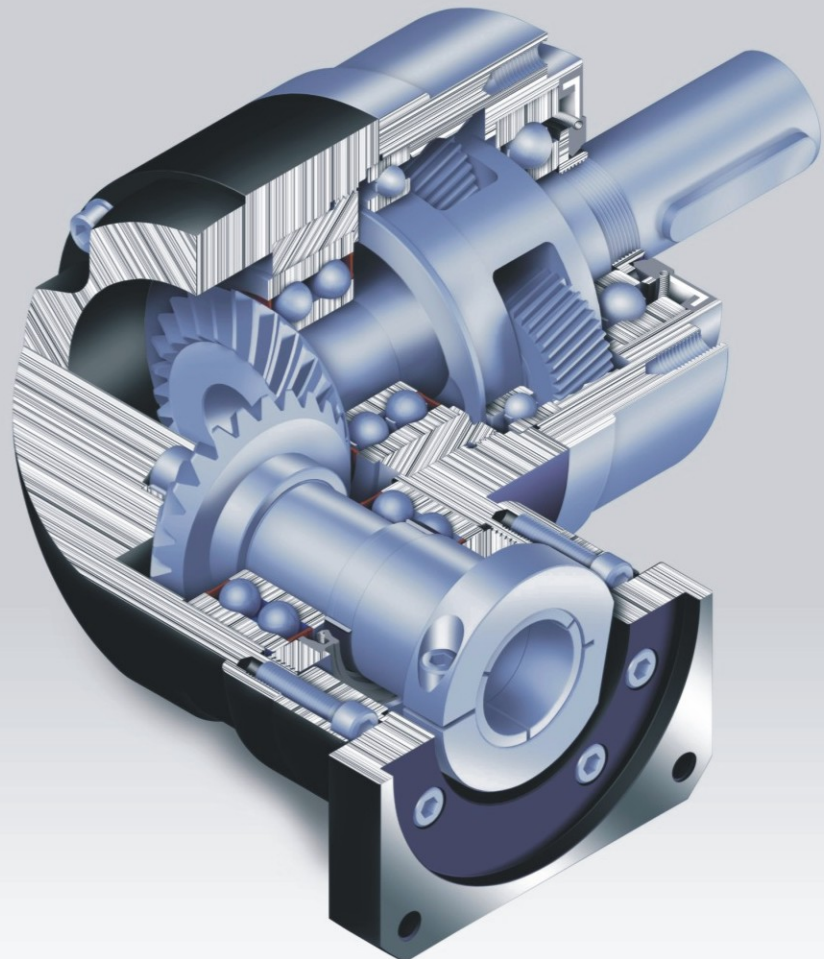


**Triple split collet with dynamic balanced set collar clamping system** provides backlash free power transmission and eliminates slippage. 100% concentricity allows for smooth rotation and higher input speed capability.

Lubrication by **synthetic Nyogel 792D grease** for smooth operation over the whole service life, regardless of mounting orientation. Sealed to **IP65** standard for protection and maintenance-free performance.



## AER Series



**Patented sealing system** featuring a TiCN coated shaft surface that eliminates leakage and increases service life to over 20,000 hours. The high tech coating, with a surface quality of  $0.2 \mu\text{m}$  and hardness of 3700 Hv. Interfaces with our proprietary seal, decreasing wear and running temperature.

**AER version** with  $90^\circ$  input via helical bevel gear. Featuring an extremely short, light yet rigid housing and full compatibility with standard motor adapters.



# AE Series

## Specifications

### Gearbox Performance

| Model No.                      | Stage     | Ratio | AE050                            | AE070                               | AE090  | AE120 | AE155 | AE205 | AE235  |        |
|--------------------------------|-----------|-------|----------------------------------|-------------------------------------|--------|-------|-------|-------|--------|--------|
| Nominal output torque $T_{2N}$ | 1         | 3     | 20                               | 55                                  | 130    | 208   | 342   | 588   | 1,140  |        |
|                                |           | 4     | 19                               | 50                                  | 140    | 290   | 542   | 1,050 | 1,700  |        |
|                                |           | 5     | 22                               | 60                                  | 160    | 330   | 650   | 1,200 | 2,000  |        |
|                                |           | 6     | 20                               | 55                                  | 150    | 310   | 600   | 1,100 | 1,900  |        |
|                                |           | 7     | 19                               | 50                                  | 140    | 300   | 550   | 1,100 | 1,800  |        |
|                                |           | 8     | 17                               | 45                                  | 120    | 260   | 500   | 1,000 | 1,600  |        |
|                                |           | 9     | 14                               | 40                                  | 100    | 230   | 450   | 900   | 1,500  |        |
|                                |           | 10    | 14                               | 40                                  | 100    | 230   | 450   | 900   | 1,500  |        |
|                                |           | 2     | 15                               | 20                                  | 55     | 130   | 208   | 342   | 588    | 1,140  |
|                                |           |       | 20                               | 19                                  | 50     | 140   | 290   | 542   | 1,050  | 1,700  |
|                                | 25        |       | 22                               | 60                                  | 160    | 330   | 650   | 1,200 | 2,000  |        |
|                                | 30        |       | 20                               | 55                                  | 150    | 310   | 600   | 1,100 | 1,900  |        |
|                                | 35        |       | 19                               | 50                                  | 140    | 300   | 550   | 1,100 | 1,800  |        |
|                                | 40        |       | 17                               | 45                                  | 120    | 260   | 500   | 1,000 | 1,600  |        |
|                                | 45        |       | 14                               | 40                                  | 100    | 230   | 450   | 900   | 1,500  |        |
|                                | 50        |       | 22                               | 60                                  | 160    | 330   | 650   | 1,200 | 2,000  |        |
|                                | 60        |       | 20                               | 55                                  | 150    | 310   | 600   | 1,100 | 1,900  |        |
|                                | 70        |       | 19                               | 50                                  | 140    | 300   | 550   | 1,100 | 1,800  |        |
|                                | 80        | 17    | 45                               | 120                                 | 260    | 500   | 1,000 | 1,600 |        |        |
|                                | 90        | 14    | 40                               | 100                                 | 230    | 450   | 900   | 1,500 |        |        |
| 100                            | 14        | 40    | 100                              | 230                                 | 450    | 900   | 1,500 |       |        |        |
| Max. output torque $T_{2B}$    | Nm        | 1,2   | 3 times of nominal output torque |                                     |        |       |       |       |        |        |
| Nominal input speed $n_{1N}$   | rpm       | 1,2   | 3~100                            | 5,000                               | 5,000  | 4,000 | 4,000 | 3,000 | 3,000  | 2,000  |
| Max. input speed $n_{1B}$      | rpm       | 1,2   | 3~100                            | 10,000                              | 10,000 | 8,000 | 8,000 | 6,000 | 6,000  | 4,000  |
| Backlash                       | arcmin    | 1     | 3~10                             | ≤8                                  | ≤8     | ≤8    | ≤8    | ≤8    | ≤8     | ≤8     |
|                                |           | 2     | 15~100                           | ≤12                                 | ≤12    | ≤12   | ≤12   | ≤12   | ≤12    | ≤12    |
| Torsional rigidity             | Nm/arcmin | 1,2   | 3~100                            | 3                                   | 7      | 14    | 25    | 50    | 145    | 225    |
| Max. radial load $F_{2B}^2$    | N         | 1,2   | 3~100                            | 702                                 | 1,377  | 2,985 | 6,100 | 8,460 | 13,050 | 8,700  |
| Max. axial load $F_{2a1B}^2$   | N         | 1,2   | 3~100                            | 350                                 | 630    | 1,300 | 2,400 | 4,000 | 6,200  | 4,800  |
| Max. axial load $F_{2a2B}^2$   | N         | 1,2   | 3~100                            | 390                                 | 765    | 1,625 | 3,350 | 4,700 | 7,250  | 18,000 |
| Service life                   | hr        | 1,2   | 3~100                            | 20,000*                             |        |       |       |       |        |        |
| Efficiency $\eta$              | %         | 1     | 3~10                             | ≥97%                                |        |       |       |       |        |        |
|                                |           | 2     | 15~100                           | ≥94%                                |        |       |       |       |        |        |
| Weight                         | kg        | 1     | 3~10                             | 0.6                                 | 1.4    | 3.3   | 6.9   | 13    | 31     | 53     |
|                                |           | 2     | 15~100                           | 0.9                                 | 1.6    | 4.7   | 8.7   | 17    | 35     | 66     |
| Operating temp                 | °C        | 1,2   | 3~100                            | -10°C~+90°C                         |        |       |       |       |        |        |
| Lubrication                    |           | 1,2   | 3~100                            | synthetic gear grease (NYOGEL 792D) |        |       |       |       |        |        |
| Degree of gearbox protection   |           | 1,2   | 3~100                            | IP65                                |        |       |       |       |        |        |
| Mounting position              |           | 1,2   | 3~100                            | all directions                      |        |       |       |       |        |        |
| Noise level ( $n_1=3000$ rpm)  | dB        | 1,2   | 3~100                            | ≤56                                 | ≤58    | ≤60   | ≤63   | ≤65   | ≤67    | ≤70    |

### Gearbox Inertia

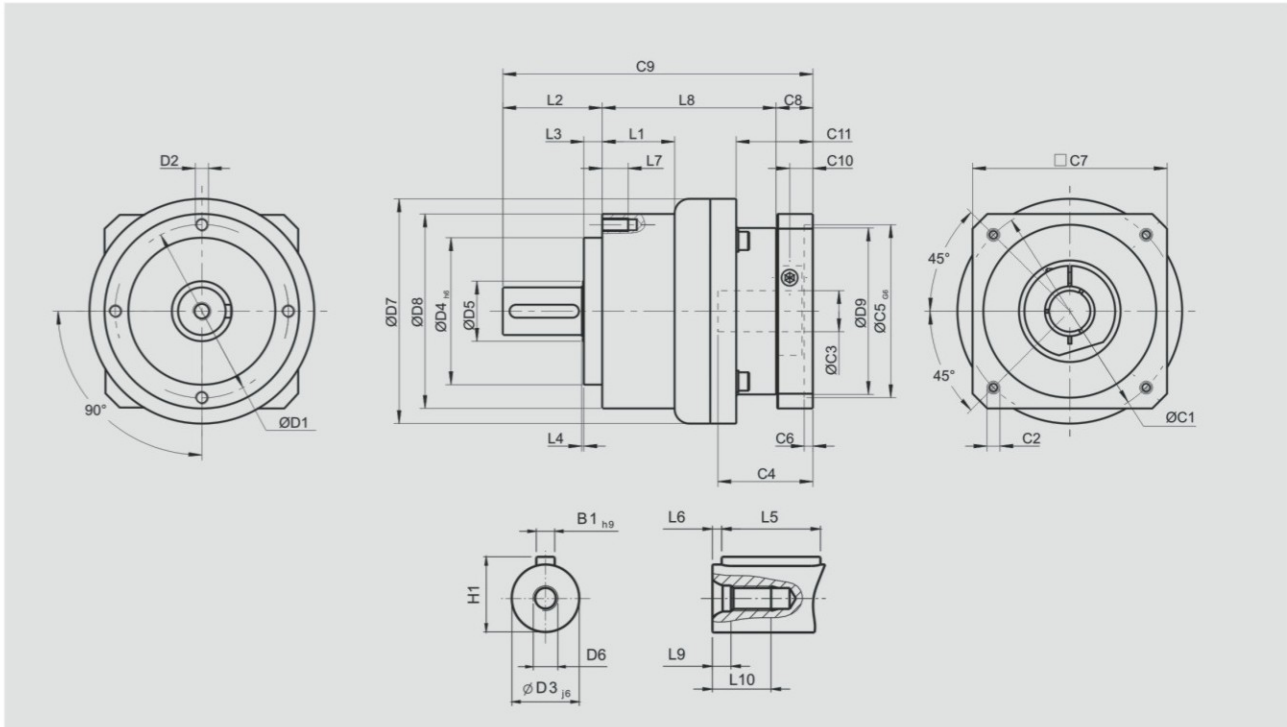
| Model No.                     | Stage | Ratio | AE050 | AE070 | AE090 | AE120 | AE155 | AE205 | AE235 |       |
|-------------------------------|-------|-------|-------|-------|-------|-------|-------|-------|-------|-------|
| Mass moments of inertia $J_1$ | 1     | 3     | 0.03  | 0.16  | 0.61  | 3.25  | 9.21  | 28.98 | 69.61 |       |
|                               |       | 4     | 0.03  | 0.14  | 0.48  | 2.74  | 7.54  | 23.67 | 54.37 |       |
|                               |       | 5     | 0.03  | 0.13  | 0.47  | 2.71  | 7.42  | 23.29 | 53.27 |       |
|                               |       | 6     | 0.03  | 0.13  | 0.45  | 2.65  | 7.25  | 22.75 | 51.72 |       |
|                               |       | 7     | 0.03  | 0.13  | 0.45  | 2.62  | 7.14  | 22.48 | 50.97 |       |
|                               |       | 8     | 0.03  | 0.13  | 0.44  | 2.58  | 7.07  | 22.59 | 50.84 |       |
|                               |       | 9     | 0.03  | 0.13  | 0.44  | 2.57  | 7.04  | 22.53 | 50.63 |       |
|                               |       | 10    | 0.03  | 0.13  | 0.44  | 2.57  | 7.03  | 22.51 | 50.56 |       |
|                               |       | 2     | 15    | 0.03  | 0.03  | 0.13  | 0.47  | 2.71  | 7.42  | 23.29 |
|                               |       |       | 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 |       |
|                               | 30    |       | 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  | 0.47  | 2.71  | 7.42  | 23.29 |       |
|                               | 45    |       | 0.03  | 0.03  | 0.13  | 0.47  | 2.71  | 7.42  | 23.29 |       |
|                               | 50    |       | 0.03  | 0.03  | 0.13  | 0.44  | 2.57  | 7.03  | 22.51 |       |
|                               | 60    |       | 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 |       |
|                               | 80    | 0.03  | 0.03  | 0.13  | 0.44  | 2.57  | 7.03  | 22.51 |       |       |
|                               | 90    | 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 |       |       |       |

1. Ratio ( $i=N_{in}/N_{out}$ )

\* S1 service life 10,000 hrs

2. Applied to the output shaft center @ 100 rpm

# Dimensions (1-stage, Ratio i=3~10)



[unit: mm]

| Dimension                     | AE050     | AE070       | AE090      | AE120       | AE155      | AE205       | AE235       |
|-------------------------------|-----------|-------------|------------|-------------|------------|-------------|-------------|
| D1                            | 44        | 62          | 80         | 108         | 140        | 184         | 210         |
| D2                            | M4 x 0.7P | M5 x 0.8P   | M6 x 1P    | M8 x 1.25P  | M10 x 1.5P | M12 x 1.75P | M16 x 2P    |
| D3 <sub>j6</sub>              | 12        | 16          | 22         | 32          | 40         | 55          | 75          |
| D4 <sub>h6</sub>              | 35        | 52          | 68         | 90          | 120        | 160         | 180         |
| D5                            | 22        | 22          | 30         | 40          | 75         | 95          | 115         |
| D6                            | M4 x 0.7P | M5 x 0.8P   | M8 x 1.25P | M12 x 1.75P | M16 x 2P   | M20 x 2.5P  | M20 x 2.5P  |
| D7                            | 53        | 70          | 104        | 130         | 162        | 205         | 260         |
| D8                            | 50        | 70          | 90         | 120         | 155        | 205         | 235         |
| D9                            | 45.5      | 53.4        | 77         | 102         | 125        | 160         | 205         |
| L1                            | --        | --          | 33.5       | 38          | 50         | --          | 70          |
| L2                            | 24.5      | 36          | 46         | 70          | 97         | 100         | 126         |
| L3                            | 4         | 6.5         | 8.5        | 17.5        | 15         | 15          | 18          |
| L4                            | 1         | 1           | 1          | 1.5         | 3          | 3           | 3           |
| L5                            | 14        | 25          | 32         | 40          | 63         | 70          | 90          |
| L6                            | 2         | 2           | 3          | 5           | 5          | 6           | 7           |
| L7                            | 8         | 10          | 12         | 16          | 20         | 22          | 28          |
| L8                            | 47        | 62          | 80.5       | 97          | 119.5      | 159         | 175.5       |
| L9                            | 3.2       | 4           | 6          | 9.5         | 12         | 15          | 15          |
| L10                           | 10        | 12.5        | 19         | 28          | 36         | 42          | 42          |
| 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>               | 91        | 117         | 143.5      | 186.5       | 239        | 288         | 364.5       |
| C10 <sup>3</sup>              | 13.25     | 13.5        | 10.75      | 13          | 15         | 20.75       | 53.5        |
| C11 <sup>3</sup>              | 19.5      | 37          | 35.5       | 46          | 53.5       | 79.5        | 106.5       |
| B1 <sub>h9</sub>              | 4         | 5           | 6          | 10          | 12         | 16          | 20          |
| H1                            | 14        | 18          | 24.5       | 35          | 43         | 59          | 79.5        |

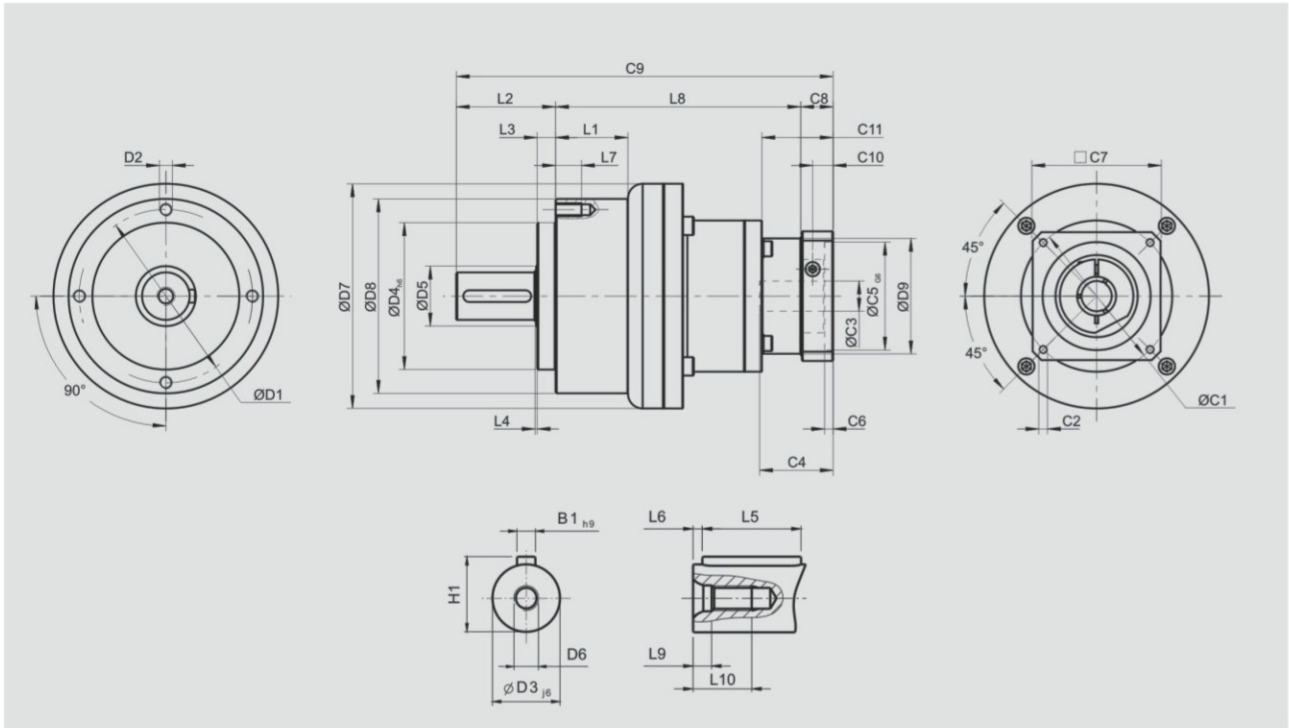
3. C1~C11 are motor specific dimensions (metric std shown). Refer to [apexdyna.com](http://apexdyna.com) and design tool to view your specific motor mounting system.  
\* AE070 ratio 5,10 offers C3 ≤16 option.





# AE Series

## Dimensions (2-stage, Ratio $i=15\sim100$ )



[unit: mm]

| Dimension                     | AE050     | AE070       | AE090                 | AE120       | AE155      | AE205       | AE235       |
|-------------------------------|-----------|-------------|-----------------------|-------------|------------|-------------|-------------|
| D1                            | 44        | 62          | 80                    | 108         | 140        | 184         | 210         |
| D2                            | M4 x 0.7P | M5 x 0.8P   | M6 x 1P               | M8 x 1.25P  | M10 x 1.5P | M12 x 1.75P | M16 x 2P    |
| D3 <sub>j6</sub>              | 12        | 16          | 22                    | 32          | 40         | 55          | 75          |
| D4 <sub>h6</sub>              | 35        | 52          | 68                    | 90          | 120        | 160         | 180         |
| D5                            | 22        | 22          | 30                    | 40          | 75         | 95          | 115         |
| D6                            | M4 x 0.7P | M5 x 0.8P   | M8 x 1.25P            | M12 x 1.75P | M16 x 2P   | M20 x 2.5P  | M20 x 2.5P  |
| D7                            | 53        | 70          | 104                   | 130         | 162        | 205         | 260         |
| D8                            | 50        | 70          | 90                    | 120         | 155        | 205         | 235         |
| D9                            | 45.5      | 45.5        | 53.4                  | 77          | 102        | 125         | 160         |
| L1                            | --        | --          | 33.5                  | 38          | 50         | --          | 70          |
| L2                            | 24.5      | 36          | 46                    | 70          | 97         | 100         | 126         |
| L3                            | 4         | 6.5         | 8.5                   | 17.5        | 15         | 15          | 18          |
| L4                            | 1         | 1           | 1                     | 1.5         | 3          | 3           | 3           |
| L5                            | 14        | 25          | 32                    | 40          | 63         | 70          | 90          |
| L6                            | 2         | 2           | 3                     | 5           | 5          | 6           | 7           |
| L7                            | 8         | 10          | 12                    | 16          | 20         | 22          | 28          |
| L8                            | 74        | 87.5        | 113.5                 | 138.5       | 176        | 214.5       | 260         |
| L9                            | 3.2       | 4           | 6                     | 9.5         | 12         | 15          | 15          |
| L10                           | 10        | 12.5        | 19                    | 28          | 36         | 42          | 42          |
| C1 <sup>4</sup>               | 46        | 46          | 70                    | 100         | 130        | 165         | 215         |
| 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>               | 118       | 143         | 178.5                 | 225.5       | 292.5      | 337         | 415         |
| C10 <sup>4</sup>              | 13.25     | 13.25       | 13.5                  | 10.75       | 13         | 15          | 20.75       |
| C11 <sup>4</sup>              | 19.5      | 19.5        | 37                    | 35.5        | 46         | 53.5        | 79.5        |
| B1 <sub>h9</sub>              | 4         | 5           | 6                     | 10          | 12         | 16          | 20          |
| H1                            | 14        | 18          | 24.5                  | 35          | 43         | 59          | 79.5        |

4. C1~C11 are motor specific dimensions (metric std shown). Refer to [apexdyna.com](http://apexdyna.com) and design tool to view your specific motor mounting system.  
 \* AE070 ratio 15~50 offers C3 ≤ 12 option. \* AE090 ratio 15~50 offers C3 ≤ 15.875 / ≤ 16 option.

# AER Series

## Specifications

### Gearbox Performance

| Model No.                      | Stage     | Ratio | AER050 | AER070                              | AER090 | AER120 | AER155 | AER205 | AER235 |        |   |
|--------------------------------|-----------|-------|--------|-------------------------------------|--------|--------|--------|--------|--------|--------|---|
| Nominal output torque $T_{2N}$ | 1         | 3     | 9      | 36                                  | 90     | 195    | 342    | 588    | 1,140  |        |   |
|                                |           | 4     | 12     | 48                                  | 120    | 260    | 520    | 1,040  | 1,680  |        |   |
|                                |           | 5     | 15     | 60                                  | 150    | 325    | 650    | 1,200  | 2,000  |        |   |
|                                |           | 6     | 18     | 55                                  | 150    | 310    | 600    | 1,100  | 1,900  |        |   |
|                                |           | 7     | 19     | 50                                  | 140    | 300    | 550    | 1,100  | 1,800  |        |   |
|                                |           | 8     | 17     | 45                                  | 120    | 260    | 500    | 1,000  | 1,600  |        |   |
|                                |           | 9     | 14     | 40                                  | 100    | 230    | 450    | 900    | 1,500  |        |   |
|                                |           | 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     | 15     | 14                                  | -      | -      | -      | -      | -      | -      | - |
|                                |           |       | 20     | 14                                  | -      | -      | -      | -      | -      | -      | - |
|                                |           |       | 25     | 15                                  | 60     | 150    | 325    | 650    | 1,200  | 2,000  |   |
|                                |           |       | 30     | 20                                  | 55     | 150    | 310    | 600    | 1,100  | 1,900  |   |
|                                | 35        |       | 19     | 50                                  | 140    | 300    | 550    | 1,100  | 1,800  |        |   |
|                                | 40        |       | 17     | 45                                  | 120    | 260    | 500    | 1,000  | 1,600  |        |   |
|                                | 45        |       | 14     | 40                                  | 100    | 230    | 450    | 900    | 1,500  |        |   |
|                                | 50        |       | 14     | 60                                  | 100    | 230    | 650    | 1,200  | 2,000  |        |   |
|                                | 60        |       | 20     | 55                                  | 150    | 310    | 600    | 1,100  | 1,900  |        |   |
|                                | 70        |       | 19     | 50                                  | 140    | 300    | 550    | 1,100  | 1,800  |        |   |
|                                | 80        |       | 17     | 45                                  | 120    | 260    | 500    | 1,000  | 1,600  |        |   |
|                                | 90        |       | 14     | 40                                  | 100    | 230    | 450    | 900    | 1,500  |        |   |
|                                | 100       |       | 14     | 40                                  | 100    | 230    | 450    | 900    | 1,500  |        |   |
|                                | 120       |       | -      | -                                   | 150    | 310    | 600    | 1,100  | 1,900  |        |   |
|                                | 140       | -     | -      | 140                                 | 300    | 550    | 1,100  | 1,800  |        |        |   |
|                                | 160       | -     | -      | 120                                 | 260    | 550    | 1,000  | 1,600  |        |        |   |
|                                | 180       | -     | -      | 100                                 | 230    | 450    | 900    | 1,500  |        |        |   |
|                                | 200       | -     | -      | 100                                 | 230    | 450    | 900    | 1,500  |        |        |   |
| Max. output torque $T_{2B}$    | Nm        | 1,2   | 3~200  | 3 times of nominal output torque    |        |        |        |        |        |        |   |
| Nominal Input Speed $n_{1N}$   | rpm       | 1,2   | 3~200  | 5,000                               | 5,000  | 4,000  | 4,000  | 3,000  | 3,000  | 2,000  |   |
| Max. Input Speed $n_{1B}$      | rpm       | 1,2   | 3~200  | 10,000                              | 10,000 | 8,000  | 8,000  | 6,000  | 6,000  | 4,000  |   |
| Backlash                       | arcmin    | 1     | 3~20   | ≤10                                 | ≤10    | ≤10    | ≤10    | ≤10    | ≤10    | ≤10    |   |
|                                |           | 2     | 25~200 | ≤14                                 | ≤14    | ≤14    | ≤14    | ≤14    | ≤14    | ≤14    |   |
| Torsional Rigidity             | Nm/arcmin | 1,2   | 3~200  | 3                                   | 7      | 14     | 25     | 50     | 145    | 225    |   |
| Max. radial load $F_{2rB}^2$   | N         | 1,2   | 3~200  | 702                                 | 1,377  | 2,985  | 6,100  | 8,460  | 13,050 | 8,700  |   |
| Max. axial load $F_{2a1B}^2$   | N         | 1,2   | 3~200  | 350                                 | 630    | 1,300  | 2,400  | 4,000  | 6,200  | 4,800  |   |
| Max. axial load $F_{2a2B}^2$   | N         | 1,2   | 3~200  | 390                                 | 765    | 1,625  | 3,350  | 4,700  | 7,250  | 18,000 |   |
| Service life                   | hr        | 1,2   | 3~200  | 20,000*                             |        |        |        |        |        |        |   |
| Efficiency $\eta$              | %         | 1     | 3~20   | ≥95%                                |        |        |        |        |        |        |   |
|                                |           | 2     | 25~200 | ≥92%                                |        |        |        |        |        |        |   |
| Weight                         | kg        | 1     | 3~20   | 1.0                                 | 2.1    | 5.8    | 11.2   | 22.4   | 46.8   | 78.0   |   |
|                                |           | 2     | 25~200 | 1.3                                 | 2.0    | 4.6    | 11.1   | 21.8   | 43.7   | 81.9   |   |
| Operating temp                 | °C        | 1,2   | 3~200  | -10°C~+90°C                         |        |        |        |        |        |        |   |
| Lubrication                    |           | 1,2   | 3~200  | synthetic gear grease (NYOGEL 792D) |        |        |        |        |        |        |   |
| Degree of gearbox protection   |           | 1,2   | 3~200  | IP65                                |        |        |        |        |        |        |   |
| Mounting position              |           | 1,2   | 3~200  | all directions                      |        |        |        |        |        |        |   |
| Noise level ( $n_1=3000$ rpm)  | dB        | 1,2   | 3~200  | ≤61                                 | ≤63    | ≤65    | ≤68    | ≤70    | ≤72    | ≤74    |   |

### Gearbox Inertia

| Model No.                     | Stage | Ratio   | AER050 | AER070 | AER090 | AER120 | AER155 | AER205 | AER235 |
|-------------------------------|-------|---------|--------|--------|--------|--------|--------|--------|--------|
| Mass Moments of Inertia $J_1$ | 1     | 3~10    | 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     | 15      | 0.09   | -      | -      | -      | -      | -      | -      |
|                               |       | 20      | 0.09   | -      | -      | -      | -      | -      | -      |
|                               |       | 25~100  | 0.09   | 0.09   | 0.35   | 2.25   | 6.84   | 23.4   | 68.9   |
|                               |       | 120~200 | -      | -      | 0.31   | 1.87   | 6.25   | 21.8   | 65.6   |
|                               |       |         |        |        |        |        |        |        |        |

1. Ratio ( $i=N_{in}/N_{out}$ )

\* S1 service life 10,000 hrs

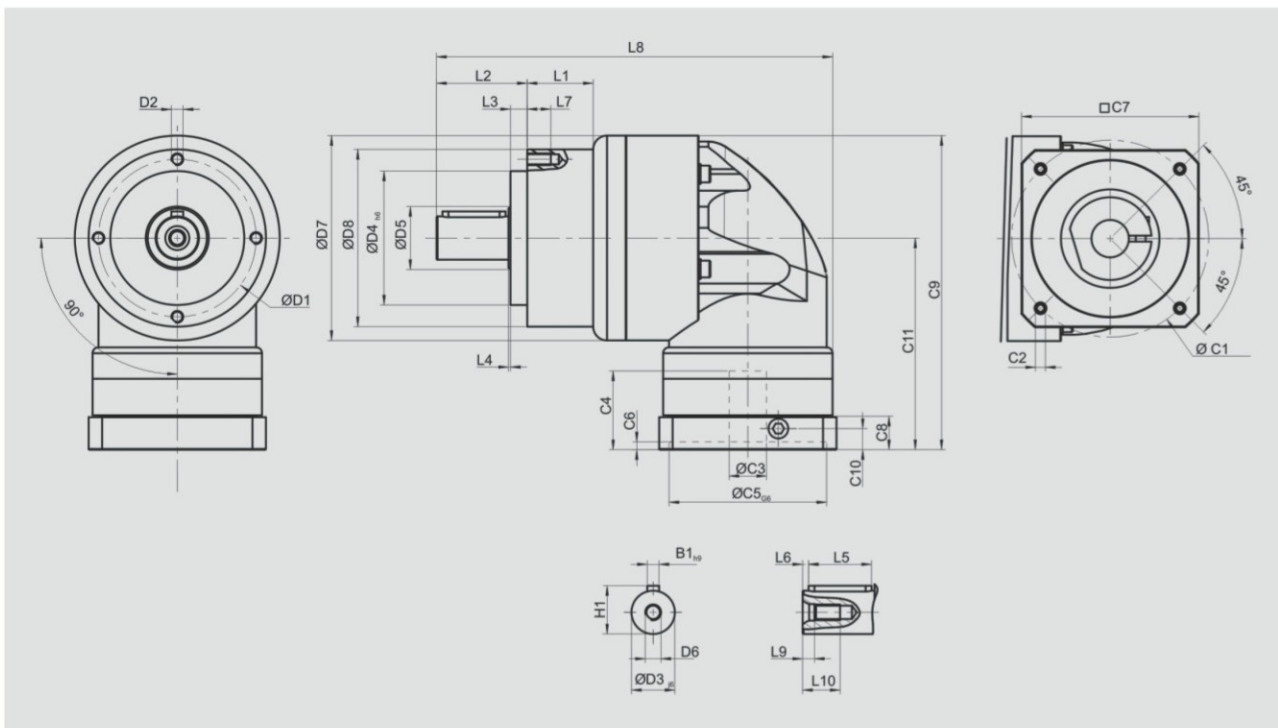
2. Applied to the output shaft center @ 100 rpm





# AER Series

## Dimensions (1-stage, Ratio $i=3\sim 20$ )



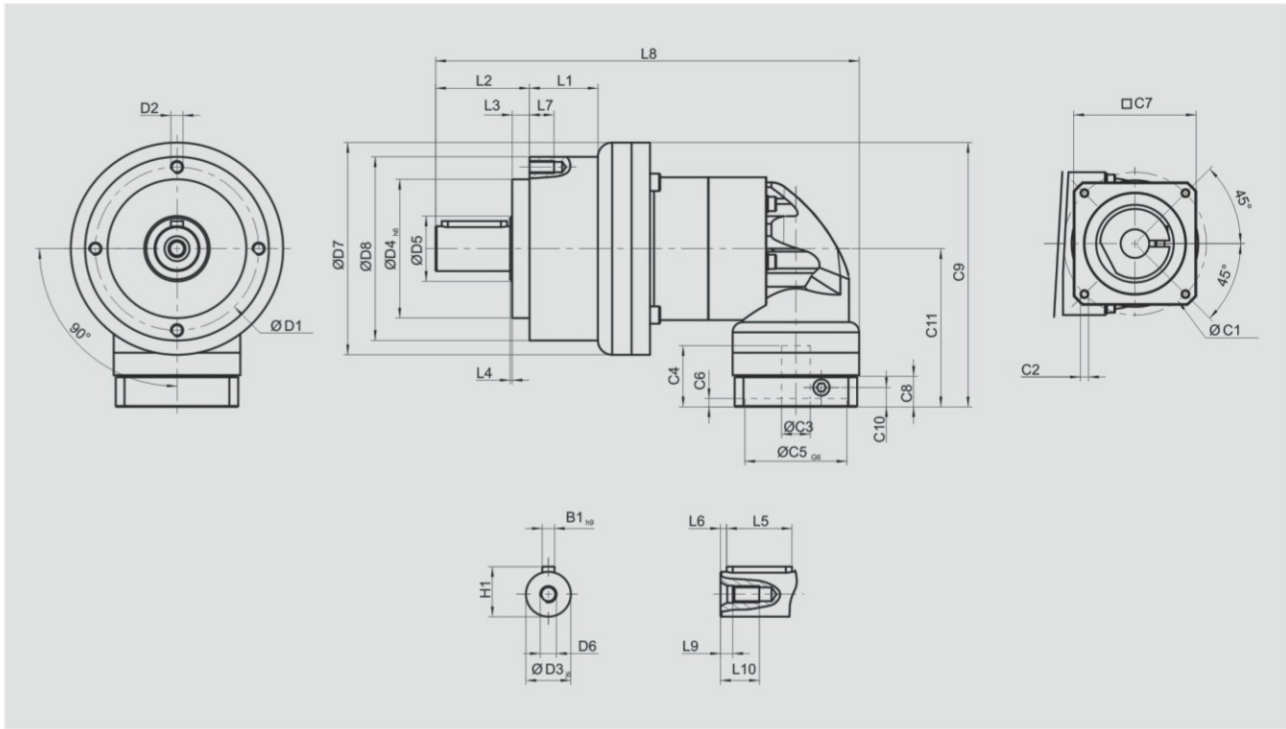
[unit: mm]

| Dimension                     | AER050    | AER070    | AER090     | AER120      | AER155     | AER205      | AER235      |
|-------------------------------|-----------|-----------|------------|-------------|------------|-------------|-------------|
| D1                            | 44        | 62        | 80         | 108         | 140        | 184         | 210         |
| D2                            | M4 x 0.7P | M5 x 0.8P | M6 x 1P    | M8 x 1.25P  | M10 x 1.5P | M12 x 1.75P | M16 x 2P    |
| D3 <sub>j6</sub>              | 12        | 16        | 22         | 32          | 40         | 55          | 75          |
| D4 <sub>h6</sub>              | 35        | 52        | 68         | 90          | 120        | 160         | 180         |
| D5                            | 22        | 22        | 30         | 40          | 75         | 95          | 115         |
| D6                            | M4 x 0.7P | M5 x 0.8P | M8 x 1.25P | M12 x 1.75P | M16 x 2P   | M20 x 2.5P  | M20 x 2.5P  |
| D7                            | 53        | 70        | 104        | 130         | 162        | 205         | 260         |
| D8                            | 50        | 70        | 90         | 120         | 155        | 205         | 235         |
| L1                            | --        | --        | 33.5       | 38          | 50         | --          | 70          |
| L2                            | 24.5      | 36        | 46         | 70          | 97         | 100         | 126         |
| L3                            | 4         | 6.5       | 8.5        | 17.5        | 15         | 15          | 18          |
| L4                            | 1         | 1         | 1          | 1.5         | 3          | 3           | 3           |
| L5                            | 14        | 25        | 32         | 40          | 63         | 70          | 90          |
| L6                            | 2         | 2         | 3          | 5           | 5          | 6           | 7           |
| L7                            | 8         | 10        | 12         | 16          | 20         | 22          | 28          |
| L8                            | 115.5     | 146       | 201        | 252         | 324.5      | 379.5       | 461.5       |
| L9                            | 3.2       | 4         | 6          | 9.5         | 12         | 15          | 15          |
| L10                           | 10        | 12.5      | 19         | 28          | 36         | 42          | 42          |
| 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>               | 100.5     | 116.5     | 159.5      | 199         | 245.5      | 316         | 398.5       |
| C10 <sup>3</sup>              | 13.25     | 13.5      | 10.75      | 13          | 15         | 20.75       | 53.5        |
| C11 <sup>3</sup>              | 74        | 81.5      | 107.5      | 134         | 164.5      | 213.5       | 268.5       |
| B1 <sub>h9</sub>              | 4         | 5         | 6          | 10          | 12         | 16          | 20          |
| H1                            | 14        | 18        | 24.5       | 35          | 43         | 59          | 79.5        |

3. C1~C11 are motor specific dimensions (metric std shown). Refer to apexdyna.com and design tool to view your specific motor mounting system.



# Dimensions (2-stage, Ratio i=25~200)

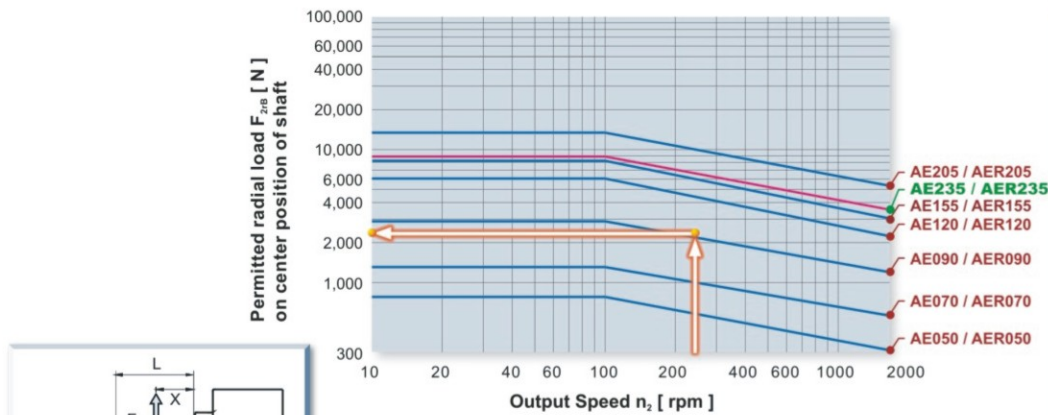


[unit: mm]

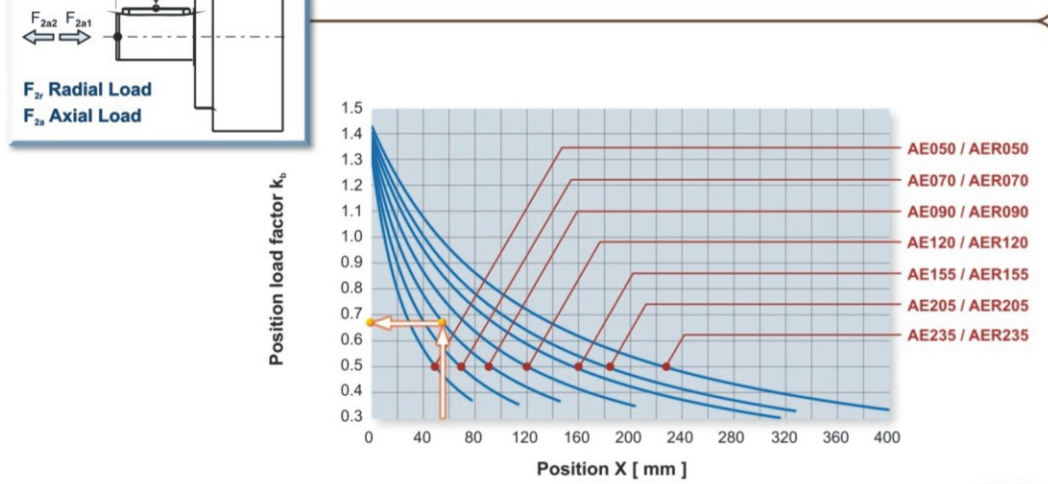
| Dimension          | AER050    | AER070    | AER090              | AER120      | AER155     | AER205      | AER235      |
|--------------------|-----------|-----------|---------------------|-------------|------------|-------------|-------------|
| D1                 | 44        | 62        | 80                  | 108         | 140        | 184         | 210         |
| D2                 | M4 x 0.7P | M5 x 0.8P | M6 x 1P             | M8 x 1.25P  | M10 x 1.5P | M12 x 1.75P | M16 x 2P    |
| D3 <sub>j6</sub>   | 12        | 16        | 22                  | 32          | 40         | 55          | 75          |
| D4 <sub>h6</sub>   | 35        | 52        | 68                  | 90          | 120        | 160         | 180         |
| D5                 | 22        | 22        | 30                  | 40          | 75         | 95          | 115         |
| D6                 | M4 x 0.7P | M5 x 0.8P | M8 x 1.25P          | M12 x 1.75P | M16 x 2P   | M20 x 2.5P  | M20 x 2.5P  |
| D7                 | 53        | 70        | 104                 | 130         | 162        | 205         | 260         |
| D8                 | 50        | 70        | 90                  | 120         | 155        | 205         | 235         |
| L1                 | --        | --        | 33.5                | 38          | 50         | --          | 70          |
| L2                 | 24.5      | 36        | 46                  | 70          | 97         | 100         | 126         |
| L3                 | 4         | 6.5       | 8.5                 | 17.5        | 15         | 15          | 18          |
| L4                 | 1         | 1         | 1                   | 1.5         | 3          | 3           | 3           |
| L5                 | 14        | 25        | 32                  | 40          | 63         | 70          | 90          |
| L6                 | 2         | 2         | 3                   | 5           | 5          | 6           | 7           |
| L7                 | 8         | 10        | 12                  | 16          | 20         | 22          | 28          |
| L8                 | 142.5     | 167.5     | 207.5               | 283         | 358        | 422.5       | 506.5       |
| L9                 | 3.2       | 4         | 6                   | 9.5         | 12         | 15          | 15          |
| L10                | 10        | 12.5      | 19                  | 28          | 36         | 42          | 42          |
| C1 <sup>4</sup>    | 46        | 46        | 70                  | 100         | 130        | 165         | 215         |
| 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> G6 | 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>    | 100.5     | 109       | 133.5               | 172.5       | 215        | 267         | 343.5       |
| C10 <sup>4</sup>   | 13.25     | 13.25     | 13.5                | 10.75       | 13         | 15          | 20.75       |
| C11 <sup>4</sup>   | 74        | 74        | 81.5                | 107.5       | 134        | 164.5       | 213.5       |
| B1 <sub>h9</sub>   | 4         | 5         | 6                   | 10          | 12         | 16          | 20          |
| H1                 | 14        | 18        | 24.5                | 35          | 43         | 59          | 79.5        |

4. C1-C11 are motor specific dimensions (metric std shown). Refer to Apexdyna.com and Design Tool to view your specific motor mounting system.

# Output Dimensions



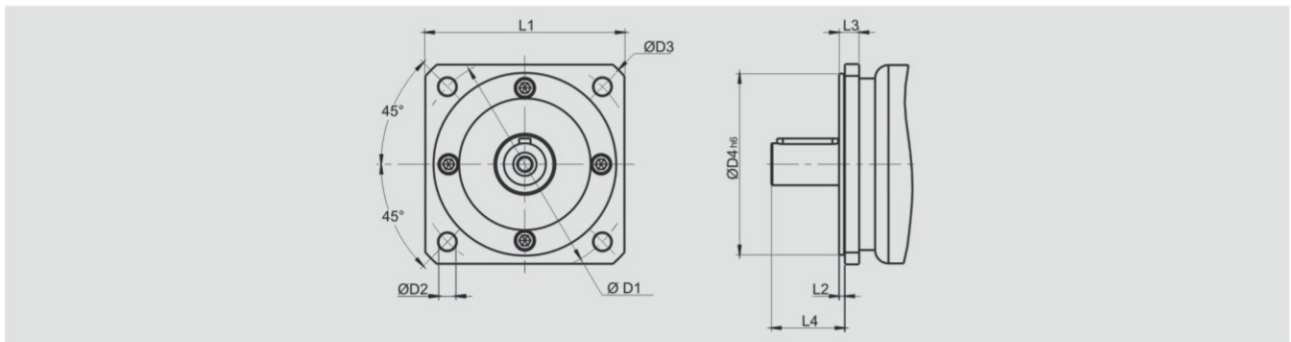
If radial force  $F_{2r}$  exert on the center of the output shaft  $X=1/2 \times L$ . Under various operating condition the lifetime is over 20,000\* hours. The permitted radial load is given on left diagram.



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.

\* Continuous running reduces service life by 50%

## Front plate option



[unit: mm]

| Dimension                 | D1      | D2  | D3   | D4 <sup>h6</sup> | L1   | L2  | L3   | L4   |
|---------------------------|---------|-----|------|------------------|------|-----|------|------|
| AE050(AER050)-NEMA 23     | 66.675  | 6   | 77   | 38.1             | 57.2 | 2   | 8    | 18.5 |
| AE050(AER050)-PX60        | 70      | 5.6 | 80.5 | 50               | 60   | 2.5 | 8.5  | 18.5 |
| AE070(AER070)-Metric      | 90      | 6.6 | 106  | 50               | 80   | 3   | 11   | 28   |
| AE070(AER070)-NEMA 34     | 98.425  | 5.6 | 115  | 73.08            | 86   | 2.5 | 8    | 30.5 |
| AE070(AER070)-DT90 / PX90 | 100     | 6.6 | 120  | 80               | 90   | 3   | 8    | 31   |
| AE090(AER090)-IEC 63D5 B5 | 115     | 9   | 140  | 95               | 105  | 3   | 10.5 | 38.5 |
| AE090(AER090)-NEMA 34     | 98.425  | 5.5 | 122  | 73.025           | 92   | 2.5 | 12.5 | 36   |
| AE090(AER090)-DT90 / PX90 | 100     | 6.5 | 122  | 80               | 92   | 2.5 | 12.5 | 36   |
| AE090(AER090)-NEMA 42     | 125.73  | 7   | 144  | 55.58            | 107  | 4   | 14.5 | 35.5 |
| AE120(AER120)-NEMA 42     | 125.73  | 7.1 | 170  | 55.499           | 127  | 1.5 | 21.5 | 50   |
| AE120(AER120)-NEMA 56     | 149.225 | 6.6 | 170  | 114.3            | 127  | 3   | 17.5 | 55.5 |
| AE155(AER155)-B5          | 175     | 11  | 196  | 130              | 160  | 5   | 20   | 82   |
| AE205(AER205)-B5          | 230     | 13  | 277  | 180              | 210  | 5   | 23   | 82   |
| AE235(AER235)-B5          | 275     | 17  | 317  | 235              | 240  | 5   | 23   | 108  |



# Ordering Code

## AE Series

**AE090**

–

**010**

–

**MOTOR**

**Gearbox Size:**

AE050, AE070, AE090  
AE120, AE155, AE205, AE235

**Motor Designation:**

Manufacturer Type  
And Model

**Ratio:**

1 Stage: 3, 4, 5, 6, 7, 8, 9, 10  
2 Stage: 15, 20, 25, 30, 35, 40, 45, 50, 60, 70, 80, 90, 100

**Ordering Example: AE090-010 / SIEMENS 1FT6 041-4AF71**

## AER Series

**AER050**

–

**010**

–

**MOTOR**

**Gearbox Size:**

AER050, AER070, AER090  
AER120, AER155, AER205, AER235

**Motor Designation:**

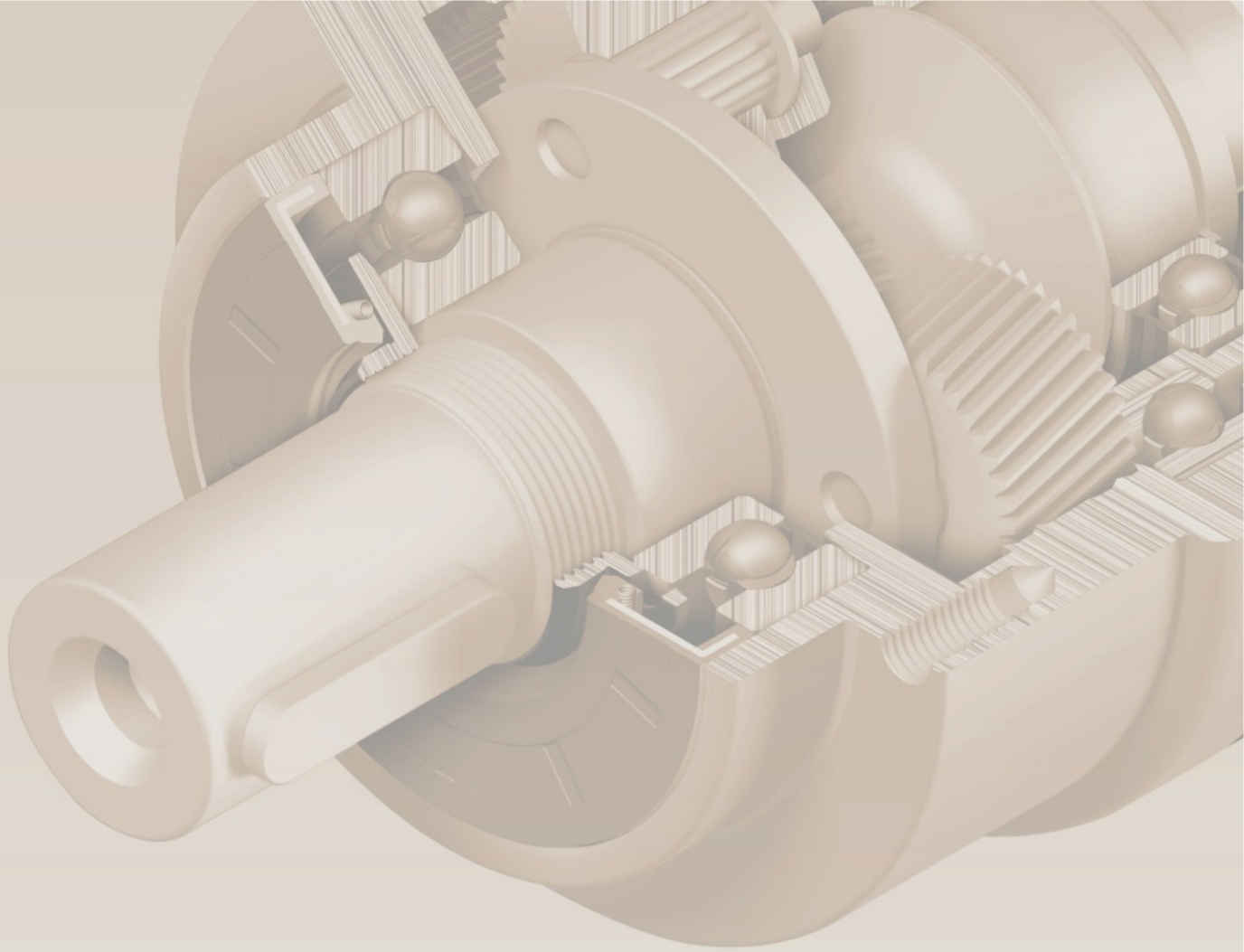
Manufacturer Type  
And Model

**Ratio:**

1 Stage: 3, 4, 5, 6, 7, 8, 9, 10, 14, 20  
2 Stage: 15, 20, 25, 30, 35, 40, 45, 50, 60, 70,  
80, 90, 100, 120, 140, 160, 180, 200

**Ordering Example: AER050-010 / SIEMENS 1FT5 034-OAK71**

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# **AE / AER Series**

[www.apexdyna.com](http://www.apexdyna.com)



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