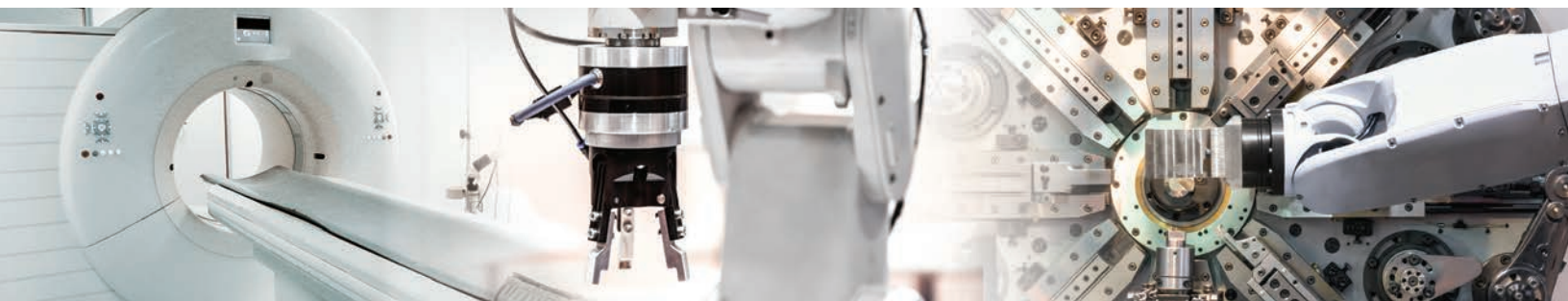


Nidec

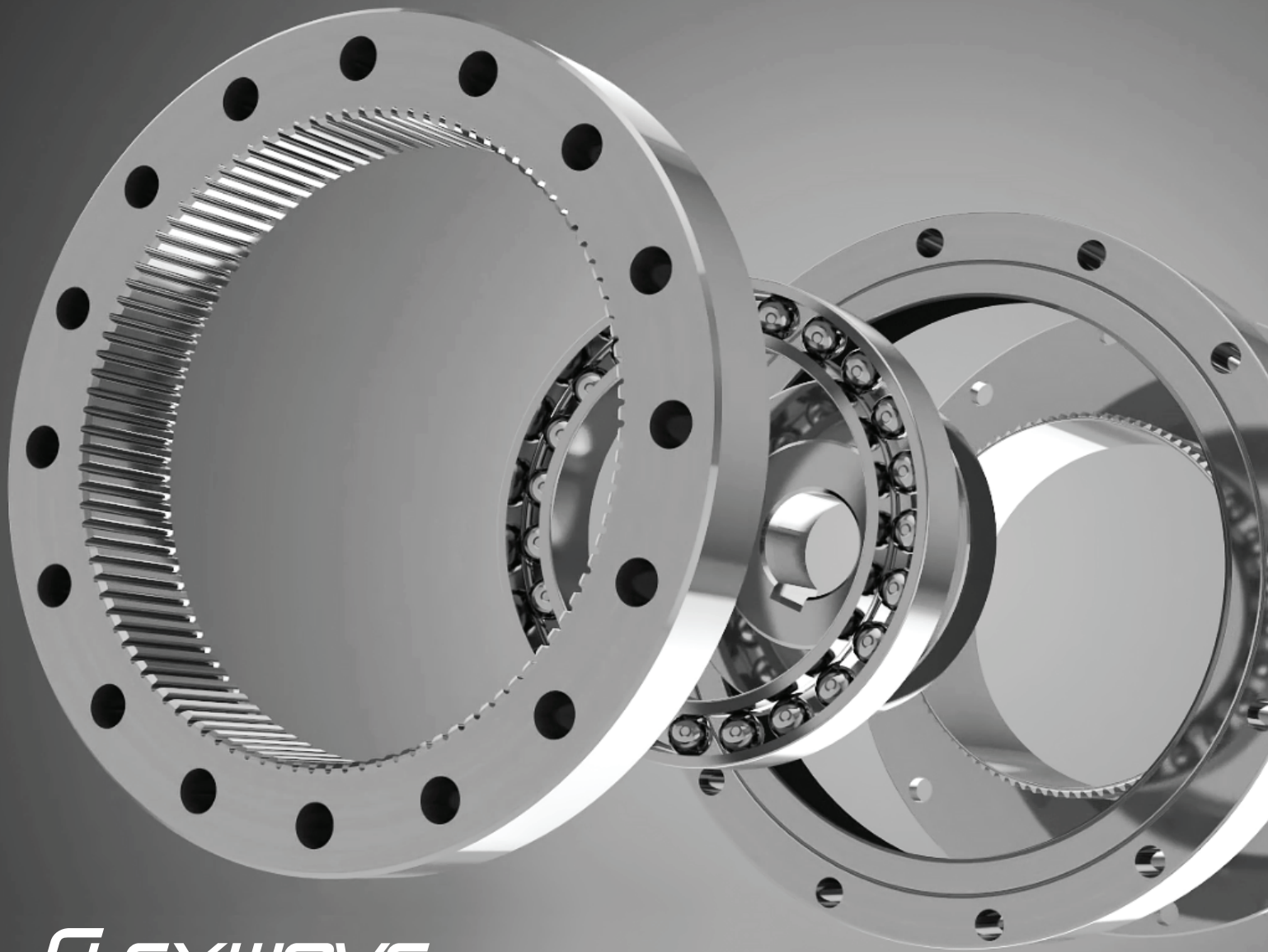
FLEXWAVE

The Next Generation



WP Series
The Highest Precision

NIDEC DRIVE TECHNOLOGY CORPORATION



FLEXWAVE

Relentless Refinement of Technology

The *Next Generation* Nidec FLEXWAVE high precision gear reducers offer machine designers virtually unlimited flexibility and adaptability when designing highly innovative drive mechanisms. Standard configurations include; component sets, self-contained assemblies, and complete gear units ready to mount to standard servomotors with pre-assembled innovative standard motor mounting kits.

The *Next Generation* Nidec FLEXWAVE optimized tooth profiles combined with the Nidec Corporation core competencies of manufacturing high precision components at scale offer the most robust solutions with the highest reliability rates available to meet the most demanding application requirements where performance is guaranteed.

The *Next Generation* Nidec FLEXWAVE Cup style and Top Hat style Flex gears combined with solid or hollow input shafts extend the possibilities for integrating into unique designs with Ultra Flat versions available for when space is tight and High Torque versions for the more demanding applications requiring high torque density.

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All *Next Generation* Nidec FLEXWAVE high precision gear reducers are fully interchangeable with industry standards allowing designers to upgrade performance to existing designs by simply changing part numbers on the bills of materials.

- Exceptional Repeatability and Positional Accuracy
- Zero Backlash
- High Torque Density
- High Efficiency Ratings
- Lightweight and Compact
- High Torsional Stiffness

The *Next Generation* Nidec FLEXWAVE - proving to be the superior choice for the next generation drive mechanisms in Robotics, Machine Tool, Medical Equipment, Semiconductor Manufacturing, Satellite Communications and Assembly Automation applications.

FLEXWAVE Lineup

Open type



Hollow unit

WPU-□-□-SNH
WPU-□-□-SDH
WPU-□-□-SRH



Input shaft unit

WPU-□-□-SNJ
WPU-□-□-SRJ



Simple unit

WPS-□-□-SN
WPS-□-□-SD
WPS-□-□-SR

Closed type



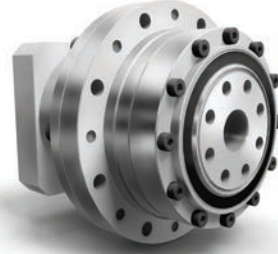
Component

WPC-□-□-CF
WPC-□-□-CN
WPC-□-□-CR
WPC-□-□-CD



Unit

WPU-□-□-CF
WPU-□-□-CN
WPU-□-□-CR
WPU-□-□-CD
WPU-□-□-CDH

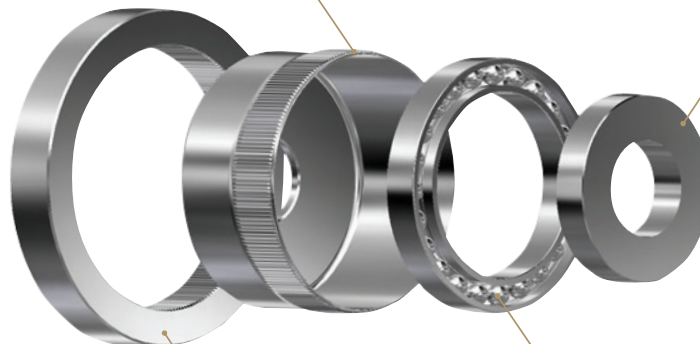


Gearhead

WPG-□-□-CR

Parts configuration

Flex gear (thin / flexible)



Cam (elliptic)

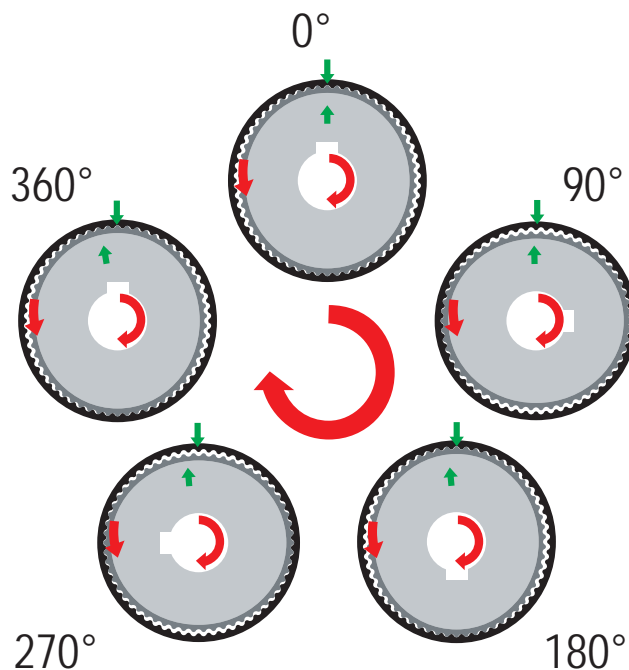
Elastic bearing (thin / flexible)

Internal gear

Strain Wave Technology

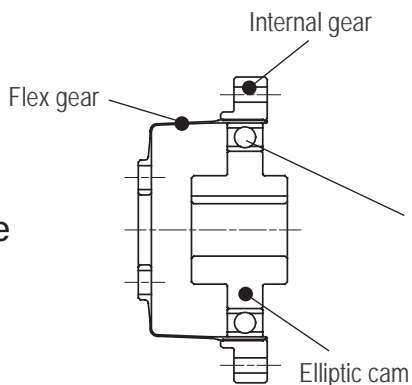
Reduction mechanism

- Flex gear and elastic bearing take elliptic shape with cam inserted.
- Elliptical cam input is inserted into Flex gear and then mounted into internal gear; the flex gear engages the internal gear in 2 locations 180° apart. This allows for high torque in a compact stable manner.
- With internal gear fixed and cam (input) rotated clockwise, the flex gear (output) rotates counter clockwise. Direction and speed of rotation is determined by tooth count of gears and mounting geometry.

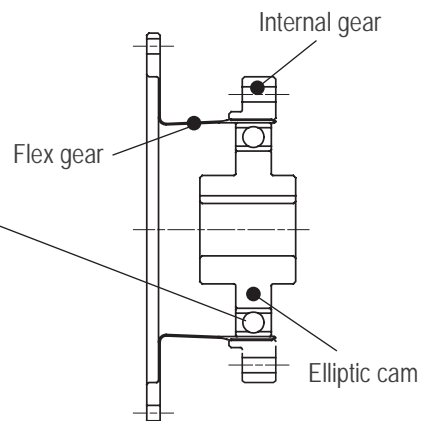


Closed type

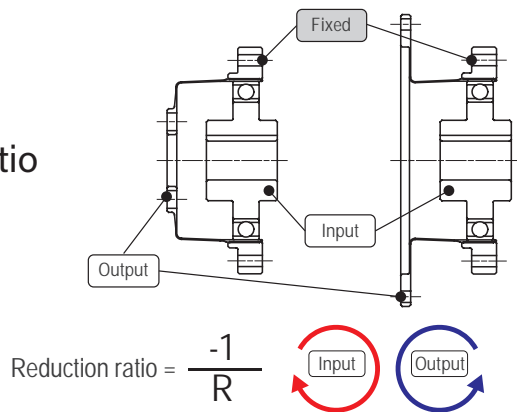
Parts name



Open type

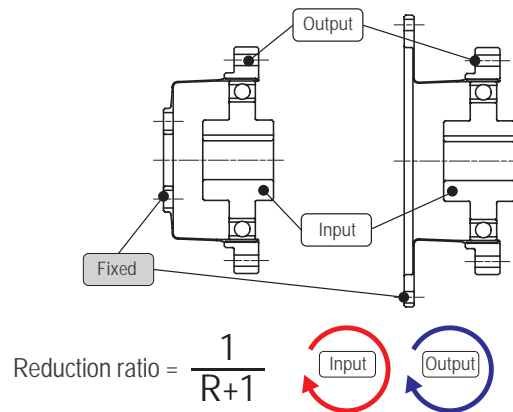


Reduction ratio



* The input and output rotation directions are opposite.

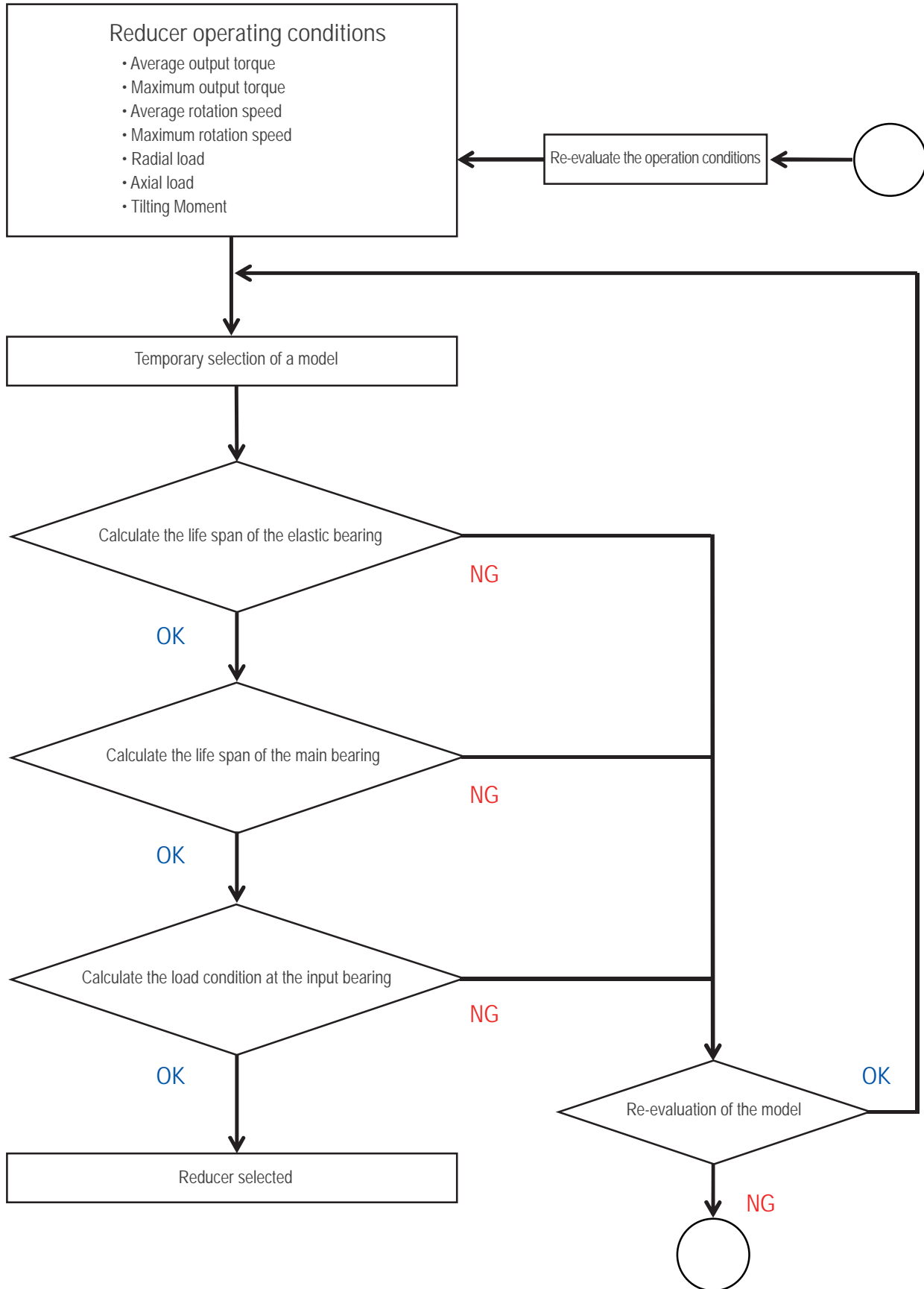
* "R" represents the "Ratio" figure in the specifications table on the next page.



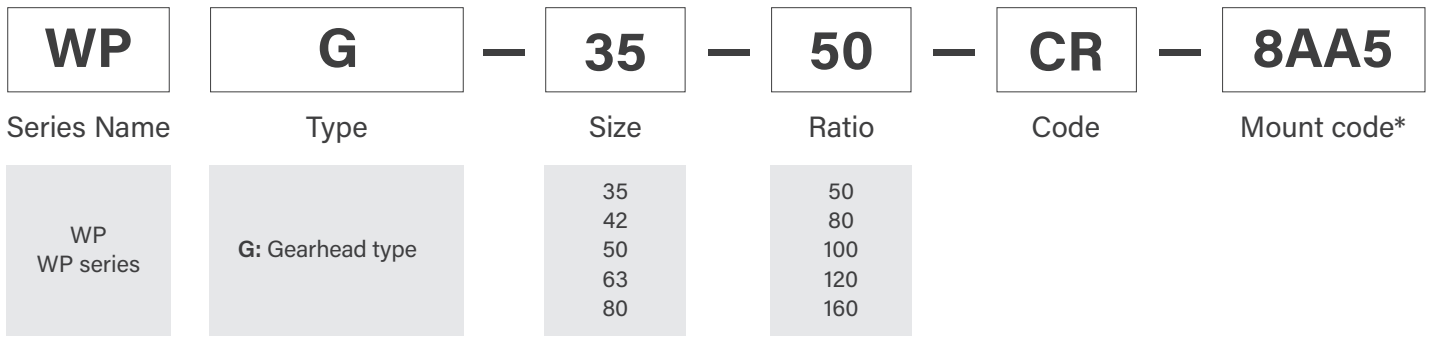
* The input and output rotation directions are same.

Model Selection

Model selection flow



Reducer Model Nomenclature



* Mount code varies depending on the motor selection. Please refer to the 'Reducer Selection Tool' found on our website for further details, or alternatively please contact us for more information.

Ratio Matrix Availability

| Frame Size | Reduction Ratio | | | | |
|------------|-----------------|----|-----|-----|-----|
| | 50 | 80 | 100 | 120 | 160 |
| 35 | | | | | |
| 42 | | | | | |
| 50 | | | | | |
| 63 | | | | | |
| 80 | | | | | |

Reducer Specifications

| Size | Ratio R*1 | Nominal Output Torque *2 | Maximum Output Torque *3 | Nominal Input Speed *4 | Maximum Input Speed *5 | Life *6 |
|------|-----------|--------------------------|--------------------------|------------------------|------------------------|---------|
| | | [Nm] | [Nm] | [r/min] | [r/min] | [hours] |
| 35 | 50 | 7 | 23 | 3000 | 8500 | 10000 |
| | 80 | 10 | 30 | | | |
| | 100 | 10 | 36 | | | |
| 42 | 50 | 21 | 44 | 3000 | 7300 | |
| | 80 | 29 | 56 | | | |
| | 100 | 31 | 70 | | | |
| | 120 | 31 | 70 | | | |
| 50 | 50 | 33 | 73 | 3000 | 6500 | |
| | 80 | 44 | 96 | | | |
| | 100 | 52 | 107 | | | |
| | 120 | 52 | 113 | | | |
| | 160 | 52 | 120 | | | |
| 63 | 50 | 51 | 127 | 3000 | 5600 | |
| | 80 | 82 | 178 | | | |
| | 100 | 87 | 204 | | | |
| | 120 | 87 | 217 | | | |
| | 160 | 87 | 229 | | | |
| 80 | 50 | 99 | 281 | 3000 | 4800 | |
| | 80 | 153 | 395 | | | |
| | 100 | 178 | 433 | | | |
| | 120 | 178 | 459 | | | |
| | 160 | 178 | 484 | | | |

*1 Reduction ratio is to be calculated by the formula in the previous page, using R value in this table.

*2 The maximum allowable value at the input rotation speed of 2000r/min

*3 The maximum torque when starting and stopping.

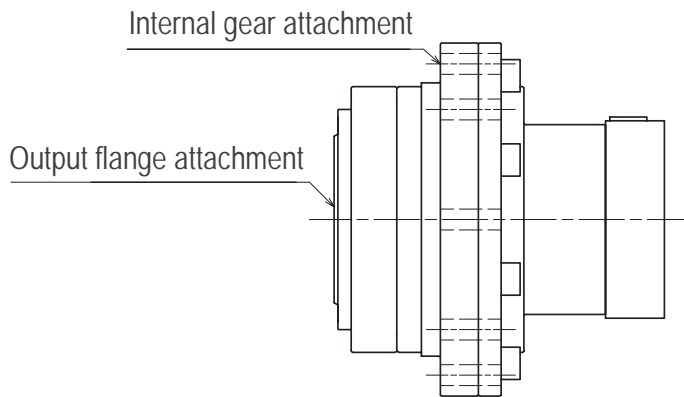
*4 The maximum average input speed.

*5 The maximum input speed.

*6 The life time at the input rotation speed of 2000 r/min and nominal output torque.

Dimensions

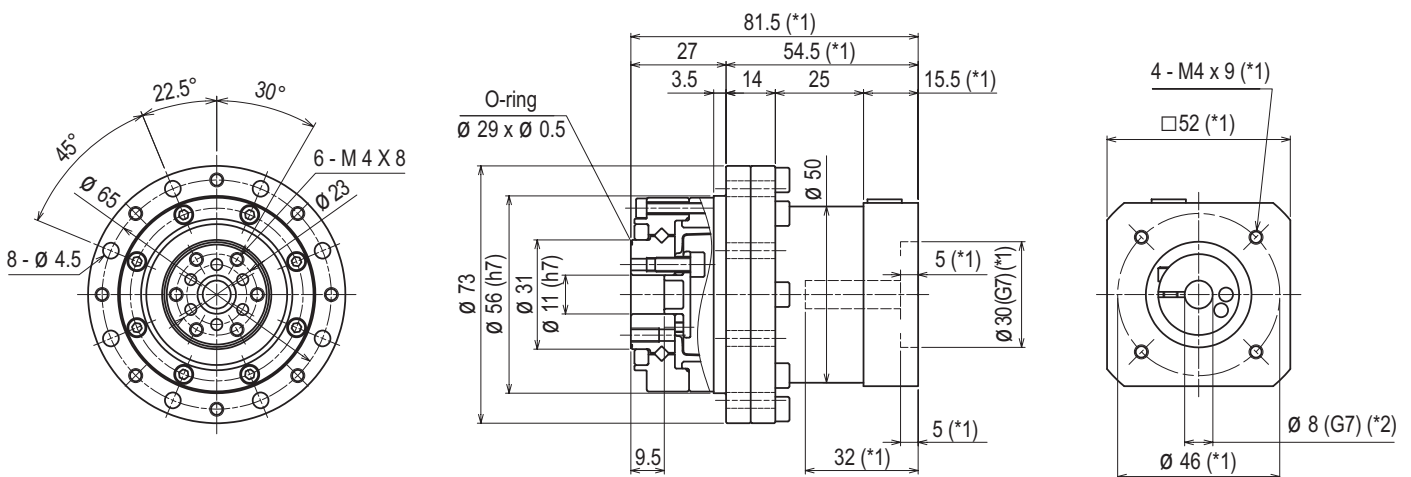
Gearhead Type



Precautions

When attaching equipment parts to the output flange, use the supplied O-rings or implement your own grease leakage prevention measures.

WPG-35-□-CR-8□ (Input shaft diameter ≤ 8)



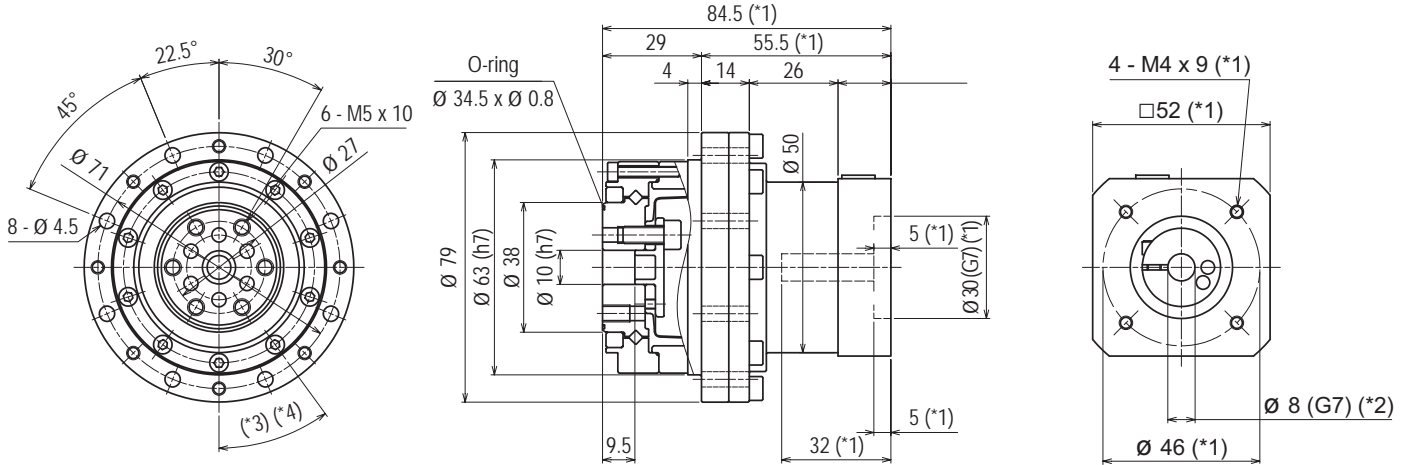
*1 The length depends on the motor.

*2 Bushing will be inserted to adapt to motor shaft.

| | | | | | |
|----------------------------------|------------|--------------------------------------|-----------------------------------|-----------------------|---------------------|
| Reducer Model/ Specifications | Dimensions | Life Estimation (Elastic Bearing) | Life Estimation (Main Bearing) | Lubricant Information | Transmitting Torque |
|----------------------------------|------------|--------------------------------------|-----------------------------------|-----------------------|---------------------|

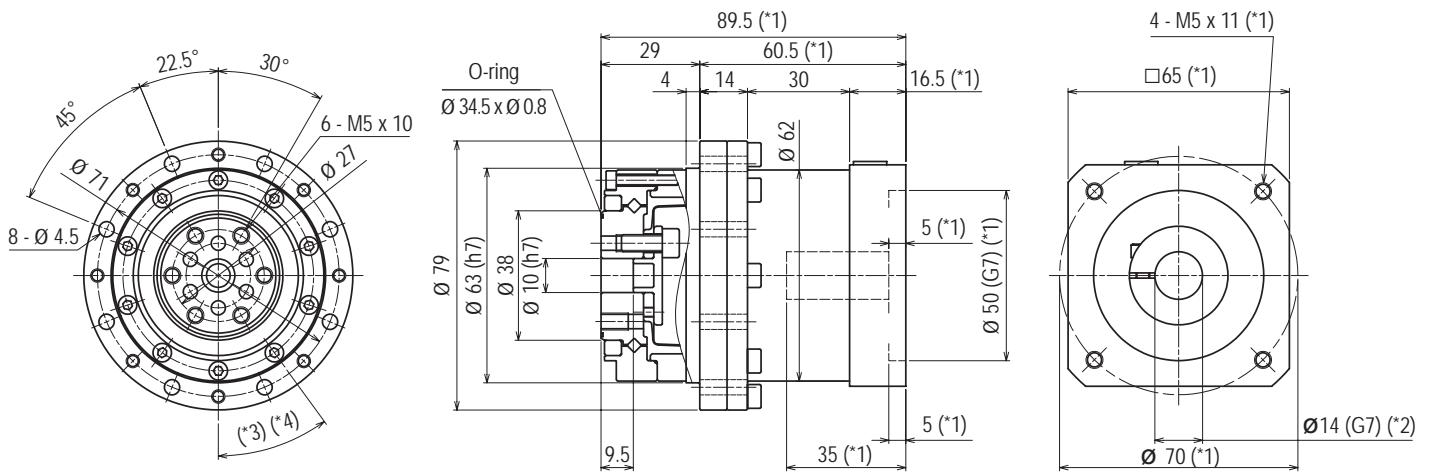
Dimensions

WPG-42-□-CR-8□ (Input shaft diameter ≤ 8)



- *1 The length depends on the motor.
- *2 Bushing will be inserted to adapt to motor shaft.
- *3 The actual placement may differ.
- *4 These bolts are for reducer assembly purposes and do not affect installation.

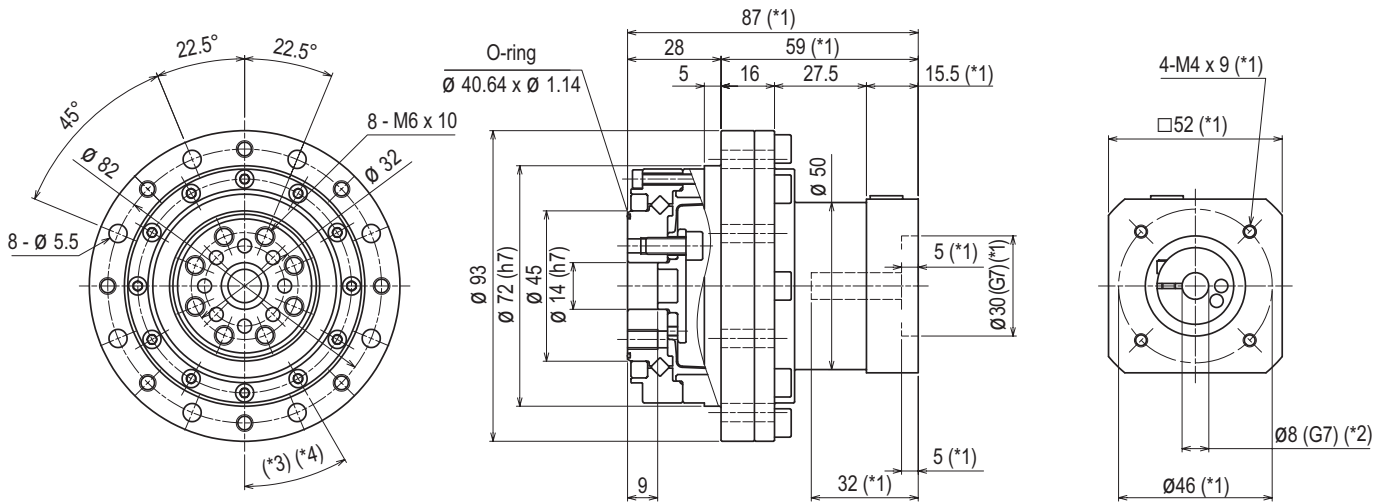
WPG-42-□-CR-14□ (8 < Input shaft diameter ≤ 14)



- *1 The length depends on the motor.
- *2 Bushing will be inserted to adapt to motor shaft.
- *3 The actual placement may differ.
- *4 These bolts are for reducer assembly purposes and do not affect installation.

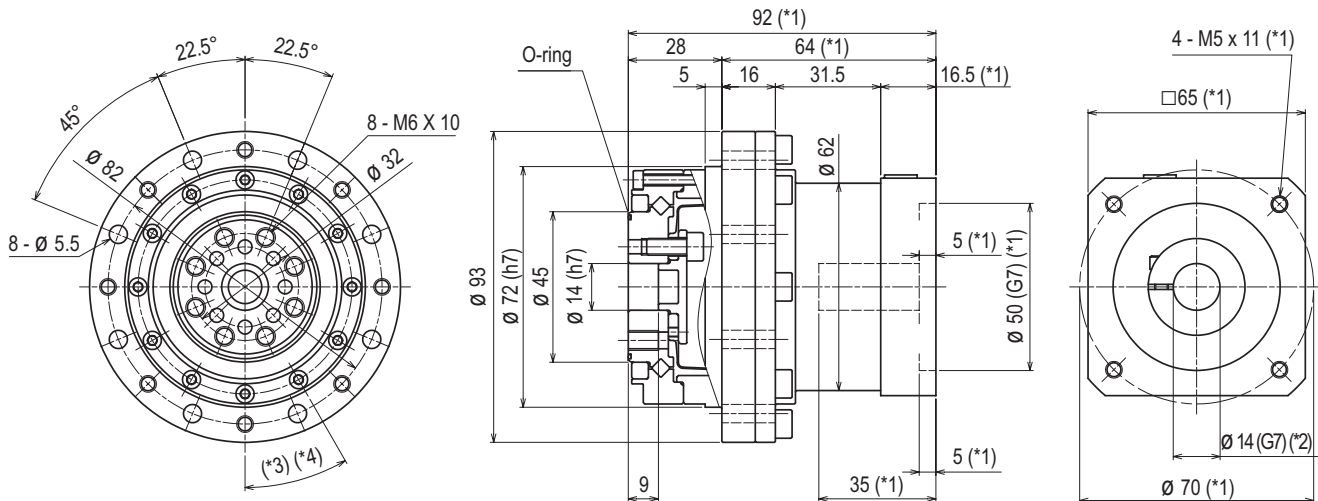
Dimensions

WPG-50-□-CR-8□ (Input shaft diameter ≤ 8)



- *1 The length depends on the motor.
- *2 Bushing will be inserted to adapt to motor shaft.
- *3 The actual placement may differ.
- *4 These bolts are for reducer assembly purposes and do not affect installation.

WPG-50-□-CR-14□ (8 < Input shaft diameter ≤ 14)

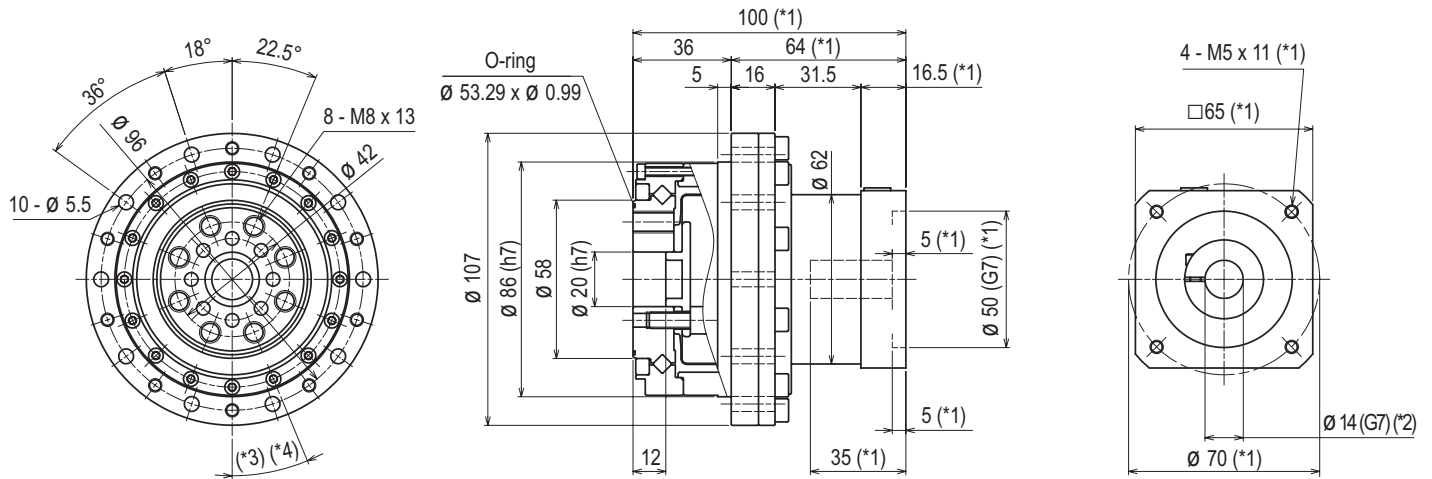


- *1 The length depends on the motor.
- *2 Bushing will be inserted to adapt to motor shaft.
- *3 The actual placement may differ.
- *4 These bolts are for reducer assembly purposes and do not affect installation.

| | | | | | |
|----------------------------------|------------|--------------------------------------|-----------------------------------|-----------------------|---------------------|
| Reducer Model/ Specifications | Dimensions | Life Estimation (Elastic Bearing) | Life Estimation (Main Bearing) | Lubricant Information | Transmitting Torque |
|----------------------------------|------------|--------------------------------------|-----------------------------------|-----------------------|---------------------|

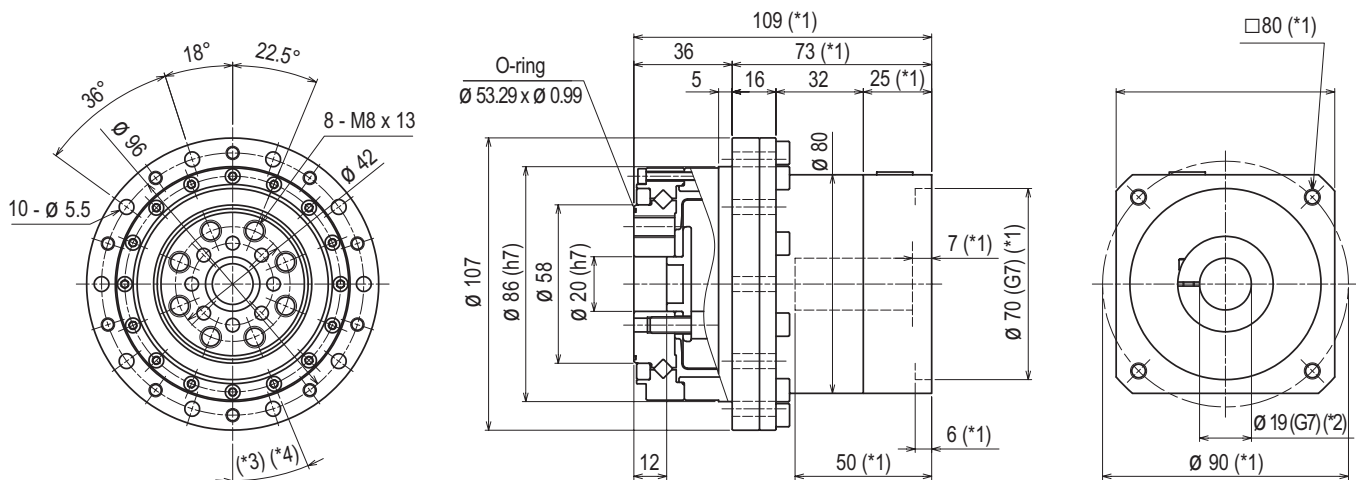
Dimensions

WPG-63-□-CR-14□ (8 < Input shaft diameter ≤ 14)



- *1 The length depends on the motor.
- *2 Bushing will be inserted to adapt to motor shaft.
- *3 The actual placement may differ.
- *4 These bolts are for reducer assembly purposes and do not affect installation.

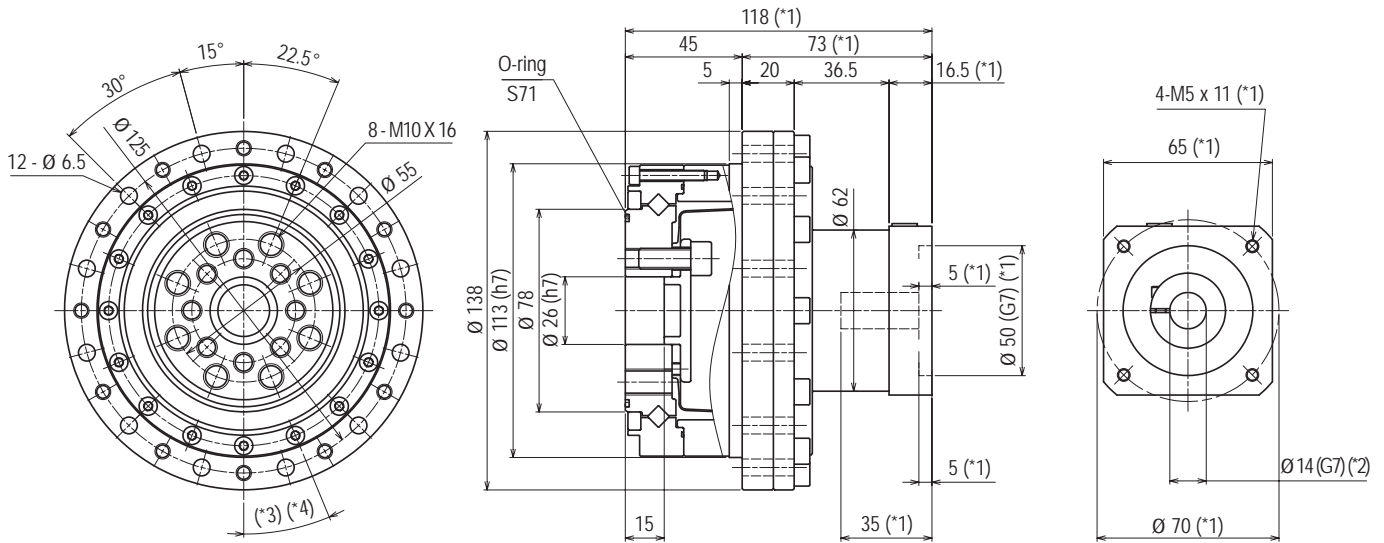
WPG-63-□-CR-19□ (14 < Input shaft diameter ≤ 19)



- *1 The length depends on the motor.
- *2 Bushing will be inserted to adapt to motor shaft.
- *3 The actual placement may differ.
- *4 These bolts are for reducer assembly purposes and do not affect installation.

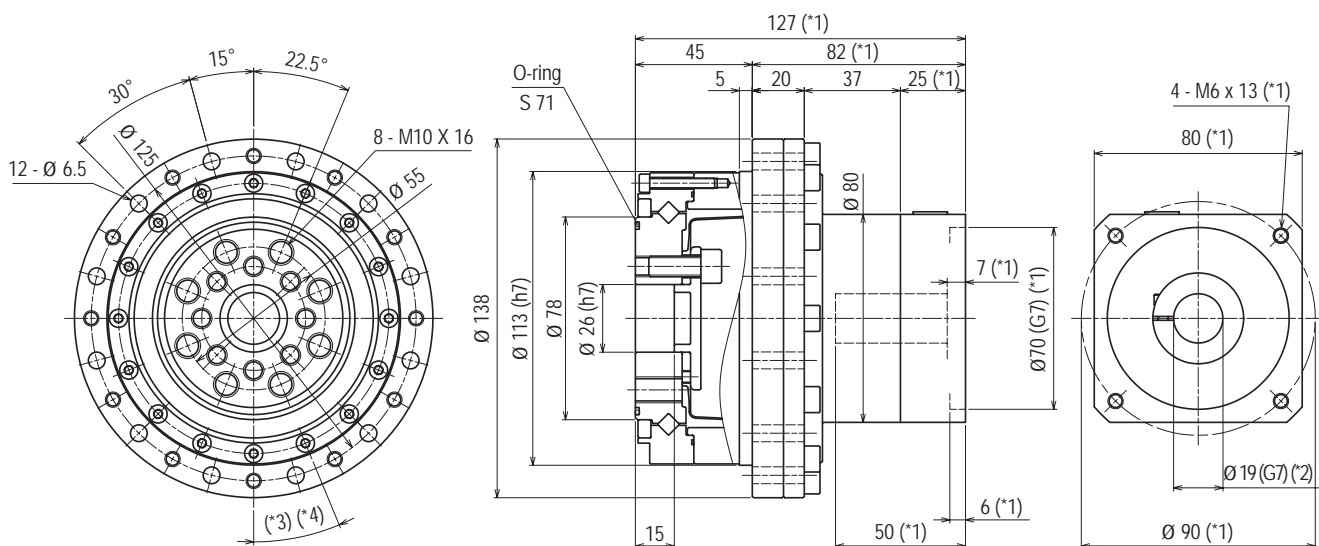
Dimensions

WPG-80-□-CR-14□ (8 < Input shaft diameter ≤ 14)



- *1 The length depends on the motor.
- *2 Bushing will be inserted to adapt to motor shaft.
- *3 The actual placement may differ.
- *4 These bolts are for reducer assembly purposes and do not affect installation.

WPG-80-□-CR-19□ (14 < Input shaft diameter ≤ 19)



- *1 The length depends on the motor.
- *2 Bushing will be inserted to adapt to motor shaft.
- *3 The actual placement may differ.
- *4 These bolts are for reducer assembly purposes and do not affect installation.

| | | | | | |
|----------------------------------|------------|--------------------------------------|-----------------------------------|-----------------------|---------------------|
| Reducer Model/ Specifications | Dimensions | Life Estimation (Elastic Bearing) | Life Estimation (Main Bearing) | Lubricant Information | Transmitting Torque |
|----------------------------------|------------|--------------------------------------|-----------------------------------|-----------------------|---------------------|

Life Estimation (Elastic Bearing)

Life estimation (Main bearing)

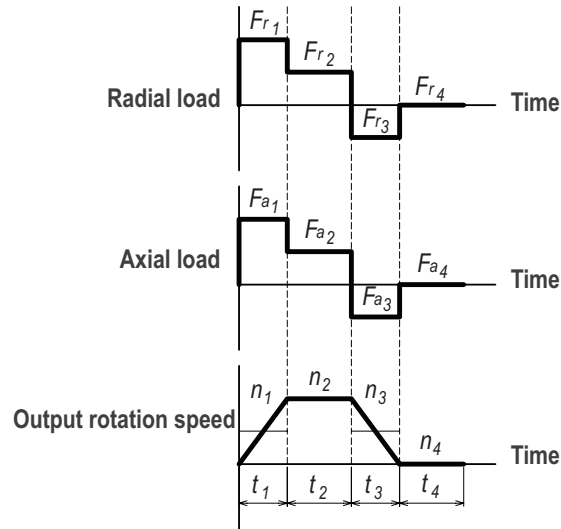
* Please check the formula on page 11

Life Estimation (Main Bearing)

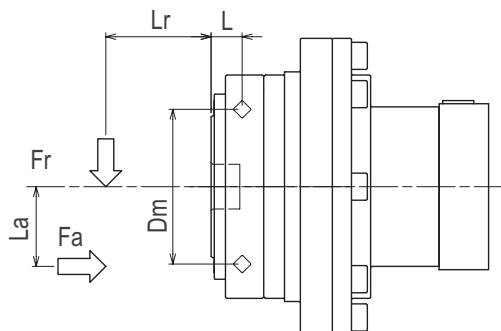
Main bearing specification (Cross roller bearing)

| Series | Size | Pitch Circle Diameter of the Bearing Rollers | Offset | Basic Dynamic Load Rating | Basic Static Load Rating | Allowable Moment | Moment Rigidity |
|------------|------|--|--------|---------------------------|--------------------------|------------------|----------------------|
| | | Dm | L | C | Co | Mal | Km |
| | | m | m | N | N | Nm | $\times 10^4$ Nm/rad |
| WPG-□-□-CR | 35 | 0.035 | 0.010 | 4700 | 6070 | 41 | 4.38 |
| | 42 | 0.043 | 0.010 | 5290 | 7550 | 64 | 7.75 |
| | 50 | 0.050 | 0.010 | 5780 | 9000 | 91 | 12.8 |
| | 63 | 0.062 | 0.012 | 9600 | 15100 | 156 | 24.2 |
| | 80 | 0.080 | 0.013 | 15000 | 25000 | 313 | 53.9 |

Operation cycle example



External load



* Please check the formula on page 13

Lubricant Information

Grease

Sumiplex SFB No.1 (SUMICO LUBRICANT CO., LTD.)

Operating temperature range: 0-40°C (ambient temperature)

Grease application

- Grease is already sealed inside the reducer at the factory, so it can be used as-is.

Transmitting Torque

Bolting

Please refer to the table below for the bolt tightening torque.

Please be noted that the transmittable torque varies depending on the bolt count (different between CF and CN) and tightening torque.

Tightening torque for bolts

| Bolt size | M3 | M4 | M5 | M6 | M8 | M10 |
|------------------------|-----|-----|-----|----|----|-----|
| Tightening torque [Nm] | 1.9 | 4.3 | 8.7 | 15 | 36 | 71 |

Recommended bolt: Strength rating above 12.9

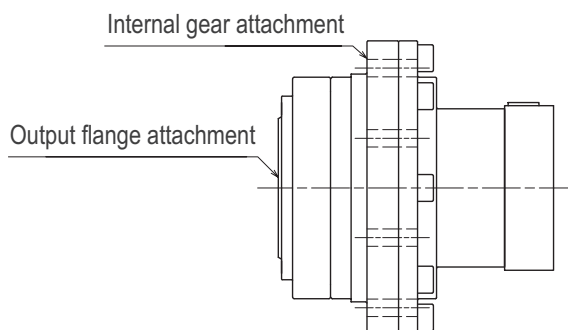
Bolt specifications and Transmitting torque

Output flange attachment

| Size | 35 | 42 | 50 | 63 | 80 |
|--------------------------|-----|-----|-----|-----|------|
| Bolt size | M4 | M5 | M6 | M8 | M10 |
| Bolt count | 6 | 6 | 8 | 8 | 8 |
| Bolt PCD [mm] | 23 | 27 | 32 | 42 | 55 |
| Tightening torque [Nm] | 4.3 | 8.7 | 15 | 36 | 71 |
| Transmitting torque [Nm] | 56 | 106 | 238 | 566 | 1177 |

Internal gear attachment (CR)

| Size | 35 | 42 | 50 | 63 | 80 |
|--------------------------|-----|-----|-----|-----|------|
| Bolt size | M4 | M4 | M5 | M5 | M6 |
| Bolt count | 8 | 8 | 8 | 10 | 12 |
| Bolt PCD [mm] | 65 | 71 | 82 | 96 | 125 |
| Tightening torque [Nm] | 4.3 | 4.3 | 8.7 | 8.7 | 15 |
| Transmitting torque [Nm] | 210 | 230 | 430 | 629 | 1392 |



Customer Service and Support

Distinction in Service and Support

Nidec Drive Technology Corporation has invested heavily in building a global customer service and application support network that will meet the evolving needs of our customers. By leveraging our global infrastructure, our OEM customers maintain their competitiveness and profitability at home while able to expand into emerging markets abroad without any drop-off of service and support.

Nidec DTC pledges that we will continue to expand our service and support network footprint globally, and continuously strive for perfection as a dependable partner to our customers. In this section you will learn about our service and support capabilities that we will leverage in order to provide you peace of mind.

Online and Phone Support

Resolve your technical issues quickly and accurately, without disrupting your business. When you do business with Nidec Drive Technology, your company and your customers have immediate access to our global network of support centers and resources. Whether you need help designing, installing, and maintaining equipment or diagnosing an operating issue, Nidec DTC will deliver the tools and information that you need in order to insure that your equipment is running to perfection.

Contact your local sales office for immediate support either over the phone or in the field. All customer accounts in North America have a dedicated Technical Support Engineer, knowledgeable about your business, on-standby ready to support you and your customers. If you do not know who to contact, please call our 1-800 number in order to get properly directed to the right person for help.

For online support, please visit our website in order to download any drawings, instruction manuals, or technical performance specifications that you require. All catalogs and brochures are easily downloadable on the website. If you prefer to inquire about an issue or for more information, please do not hesitate to submit your request online or email us at the address listed below.

Training Services

Investing our time in you, so together we build better, more competitive product for your customer. As the industrial world becomes increasingly competitive, new technologies are introduced every year requiring manufacturers to constantly rationalize and update existing designs. As a result, successful manufacturers realize the absolute need for product training.

Nidec DTC has a network of engineers that are factory trained and authorized to provide your workforce solid training on our products and basic power transmission concepts. The main objective of our standard program and materials is to better empower your workforce to size and select gearboxes for any motion control applications. We provide this service at no cost to our customers, because we see the value in building a more knowledgeable customer and helping them more quickly react to equipment design revisions when needed.

Other manufacturers are not as forthcoming with sharing information with their customers, an attempt to hide their higher manufacturing costs or to use unreleased performance data as a "product differentiator." Nidec DTC views their customers as long term partners and trains and shares information freely based on that vision.

Training classes can be conducted online, at any of our sales branches or offices, or at key distributor branches when requested. Nidec DTC can also bring the training session to your facility in order to make better use of your time and costs. A thorough hands-on training seminar can be provided at our North American headquarters in Glendale Heights, where customers can get the opportunity to completely assemble and test our products.

The Nidec DTC training program options provide support for any budget. Our training programs improve your employees' skill and knowledge competencies in the areas of power transmission and motion control while addressing any location, time, travel and productivity constraints. Contact your local sales office today in order to get a product refresher on your calendar.



Nidec Drive Technology Hotline:

Toll-free: (800) 842-1479

Email: info@nidec-dtc.com

Selection Tool Configurator

Nidec Drive Technology's Online Product Configurator makes it easier than ever for engineers to incorporate our products into their drive system design. Our configurator allows our customers to select from wide range of servo motor manufacturer models to ensure flawless fitment with our products. With over 75 motor manufacturers included, there is a good possibility we have a solution ready to go.

In addition to motor sizing, our configurator also allows our customers to select gearheads based on application. These applications include rotary tables, belt conveyors, rack and pinion drives, lifting and lowering devices, ball screws, drive gears, drive carriages and robot joints. After selecting the application template, customers can then input the application load parameters and motion profile. The proper frame size and reduction ratio are then determined, with motor selection as the final last step.

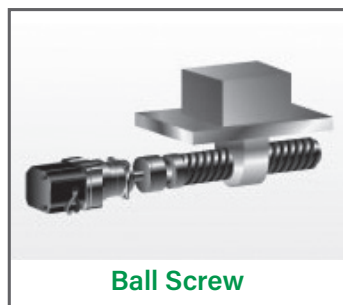
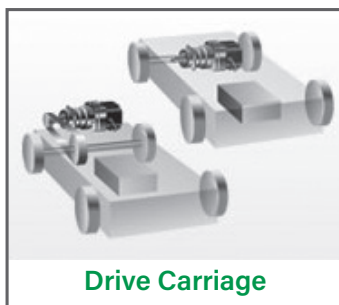
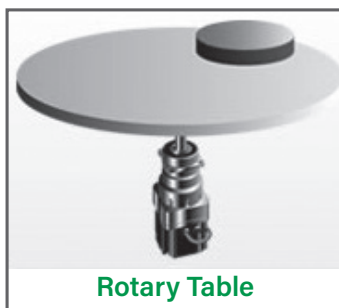
Once sizing is complete, our configurator will then display the full part number, along with gearbox and motor technical specifications. This part number includes the motor mounting adapter, which can be sent directly to our sales support team for pricing & delivery.



Drawings and models are also available in PDF, DXF, IGS and STEP formats, making it simple for machine designers to quickly drop them into machine schematics to check for proper fitment. We have seasoned application engineers standing by to assist with any sizing or selection questions.

<https://www.nidec-drivetechnology.co.jp/selection/all/>

Application Selection



www.nidec-dtc.com

Nidec

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