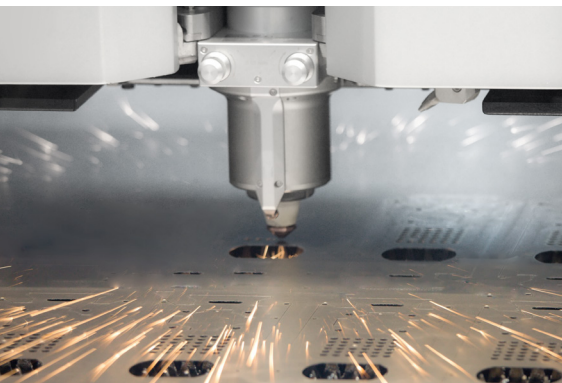




# ***FLEXWAVE***

An evolution in strain wave gear technology



**NIDEC DRIVE TECHNOLOGY CORPORATION**



## Take your robot to the next level with **FLEXWAVE**

**Nidec Drive Technology Corporation** has a history of supplying the leading robotics and machine tool manufacturers in Japan. Our loyal customers within these industries strongly urged us to develop our own harmonic gear technology and leverage our primary competencies – modularity and flexibility of the core design and highly consistent production in mass volume – to help them become more competitive in the global marketplace. After extensive effort to refine harmonic gear technology and to manufacture at a level that exceeds customer expectations, Nidec Drive Technology has released **FLEXWAVE**.

**FLEXWAVE** is a compact harmonic gear reduction mechanism that achieves zero backlash, as well as exceptional positioning accuracy, torque density and repeatability. **FLEXWAVE** consists of three internal elements – the flexspline, the circular spline and the wave generator. The elasticity properties of the flexspline and the teeth differential between the flexspline and the circular spline result in its unique reduction characteristics.

**FLEXWAVE** comes in various form factors, including component sets, simple contained assemblies and complete gear units. Cup, hat, solid and hollow input shaft configurations give engineers true freedom in design. **FLEXWAVE** is also available in Ultra-Flat and High Torque variations for applications with demanding footprint and performance requirements. Dimensions are interchangeable against industry standards, making it easier to implement in legacy equipment. When compared with other gear technologies, **FLEXWAVE** offers the following advantages:

- › ***Exceptional Repeatability and Positional Accuracy***
- › ***Zero Backlash***
- › ***High Torque Density***
- › ***High Efficiency Ratings***
- › ***High Reduction Ratios in a Single Stage***
- › ***Lightweight and Compact***
- › ***High Torsional Stiffness***
- › ***Fully Back Drivable***

These characteristics enable **FLEXWAVE** to be the superior choice for Robotics, Machine Tool, Medical Equipment, Semiconductor Manufacturing, Satellite Communications and Assembly Automation applications.

WPC SERIES

Component Sub-assembly

The core strain wave gear elements without any supplemental components that provide additional bearing support, the structure for containment, and specialized input or output configurations.

Series Features

- › Simplest and most flexible design option
- › Cost effective at high volumes
- › Allows complete integration into equipment
- › Most compact of all series
- › High torque option available

|                    |                            |
|--------------------|----------------------------|
| Frame Sizes        | 20, 28, 35, 42, 50, 63, 80 |
| Reduction Ratios   | 50, 80, 100, 120, 160      |
| Max. Output Torque | 8.3 Nm - 484 Nm            |
| Form Factors       | Cup, Hat, Ultra-Flat       |



WPS SERIES

Simple Contained Assembly

The core strain wave gear elements, with additional cross roller bearing support is included within this assembly. No housing is provided for containment, requiring the designer to integrate into their equipment substructure.

Series Features

- › Self-supported output section
- › Versatile to allow for total integration
- › Variety of output mounting options
- › Compact design
- › High torque option available

|                    |                         |
|--------------------|-------------------------|
| Frame Sizes        | 28, 35, 42, 50, 63, 80  |
| Reduction Ratios   | 50, 80, 100, 120, 160   |
| Max. Output Torque | 8.3 Nm - 484 Nm         |
| Form Factors       | Hat, Hollow, Ultra-Flat |



WPU SERIES

Complete Unit Assembly

The core strain wave gear elements and cross roller bearing completely contained within a substructure. Also included is an output flange to enable a variety of mounting configurations. The Complete Unit Assembly would be partially integrated into machinery.

Series Features

- › Simplified configuration for installation
- › A stand-alone structurally rigid assembly
- › Self-supported output section
- › Hollow, solid or flange input
- › High torque option available

|                    |                                      |
|--------------------|--------------------------------------|
| Frame Sizes        | 28, 35, 42, 50, 63, 80               |
| Reduction Ratios   | 50, 80, 100, 120, 160                |
| Max. Torque Output | 8.3 Nm - 346 Nm                      |
| Form Factors       | Cup, Hollow, Input Shaft, Ultra-Flat |



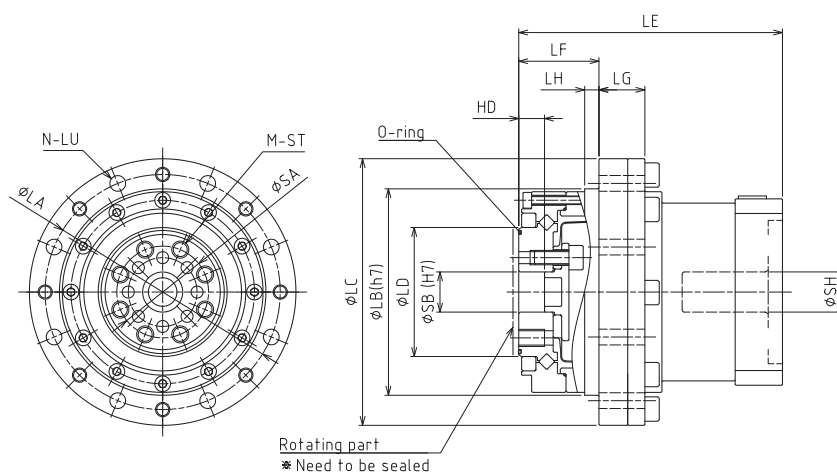
# Gearhead

## The Gearhead Type - new series

The WPG series gearheads combine the industry leading accuracy, repeatability and torque-to-weight ratio of our WPU high torque strain wave units with the modularity, installation ease and universal motor mounting of VR planetary products.

The result is a compact, versatile zero backlash gearhead in 5 frame sizes with ratios as high as 160:1 in a single stage.

The WPG can be implemented into a wide range of robotics, machine tool and general automation applications and allows customers with limited experience or integration capability to deploy an off-the-shelf solution and bring their product to market faster than ever before.



## Gearhead Specification

|      |         | *1                    | *2                    | *3                    | *4                  | *5                  | *6         |
|------|---------|-----------------------|-----------------------|-----------------------|---------------------|---------------------|------------|
| Size | Ratio R | Nominal output torque | Maximum output torque | Emergency stop torque | Nominal input speed | Maximum input speed | Life cycle |
|      |         | [Nm]                  | [Nm]                  | [Nm]                  | [r/min]             | [r/min]             | hours      |
| 35   | 50      | 7                     | 23                    | 46                    | 3000                | 8500                | 10 000     |
|      | 80      | 10                    | 30                    | 61                    |                     |                     |            |
|      | 100     | 10                    | 36                    | 70                    |                     |                     |            |
| 42   | 50      | 21                    | 44                    | 91                    | 3000                | 7300                |            |
|      | 80      | 29                    | 56                    | 113                   |                     |                     |            |
|      | 100     | 31                    | 70                    | 143                   |                     |                     |            |
|      | 120     | 31                    | 70                    | 112                   |                     |                     |            |
| 50   | 50      | 33                    | 73                    | 127                   | 3000                | 6500                |            |
|      | 80      | 44                    | 96                    | 165                   |                     |                     |            |
|      | 100     | 52                    | 107                   | 191                   |                     |                     |            |
|      | 120     | 52                    | 113                   | 191                   |                     |                     |            |
|      | 160     | 52                    | 120                   | 191                   |                     |                     |            |
| 63   | 50      | 51                    | 127                   | 242                   | 3000                | 5600                |            |
|      | 80      | 82                    | 178                   | 332                   |                     |                     |            |
|      | 100     | 87                    | 204                   | 369                   |                     |                     |            |
|      | 120     | 87                    | 217                   | 395                   |                     |                     |            |
|      | 160     | 87                    | 229                   | 408                   |                     |                     |            |
| 80   | 50      | 99                    | 281                   | 497                   | 3000                | 4800                |            |
|      | 80      | 153                   | 395                   | 738                   |                     |                     |            |
|      | 100     | 178                   | 433                   | 841                   |                     |                     |            |
|      | 120     | 178                   | 459                   | 892                   |                     |                     |            |
|      | 160     | 178                   | 484                   | 892                   |                     |                     |            |

\*1 The maximum allowable value at the input rotation speed of 2000 r/min.

\*2 The maximum allowable torque when starting and stopping.

\*3 The maximum allowable torque when it receives shock.

\*4 The maximum allowable average input speed in the case of intermittent operation. Continuous operation is not available.

\*5 The maximum allowable input speed.

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

## Dimension Table

| Size | LA  | LB  | LC  | LD | N  | LT | LU  | LE*  | LF | LG | SA | SB | LH  | M | ST     | HD  | SH from - to |
|------|-----|-----|-----|----|----|----|-----|------|----|----|----|----|-----|---|--------|-----|--------------|
| 35   | 65  | 56  | 73  | 31 | 8  | M4 | 4,5 | 81,5 | 27 | 14 | 23 | 11 | 3,5 | 6 | M4×8   | 9,5 | 5 - 8        |
| 42   | 71  | 63  | 79  | 38 | 8  | M4 | 4,5 | 84,5 | 29 | 14 | 27 | 10 | 4   | 6 | M5×8   | 9,5 | 5 - 14       |
| 50   | 82  | 72  | 93  | 45 | 8  | M5 | 5,5 | 87   | 28 | 16 | 32 | 14 | 5   | 8 | M6×9   | 9   | 5 - 14       |
| 63   | 96  | 86  | 107 | 58 | 10 | M5 | 5,5 | 100  | 36 | 16 | 42 | 20 | 5   | 8 | M8×10  | 12  | 9 - 19       |
| 80   | 125 | 113 | 138 | 78 | 12 | M6 | 6,5 | 118  | 45 | 20 | 55 | 26 | 5   | 8 | M10×12 | 15  | 9 - 19       |

\* Total length of LE depends on motor size.

This product is still in the development stage.  
Dimensions and specifications are subject to change.

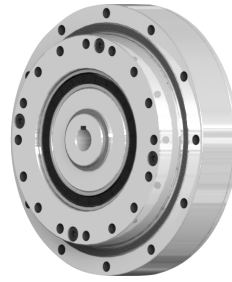
## FLEXWAVE FORM FACTORS AND MOUNTING CONFIGURATIONS



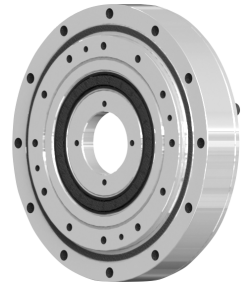
**WPC SERIES**  
Component Sub-assembly  
Cup Housing Style



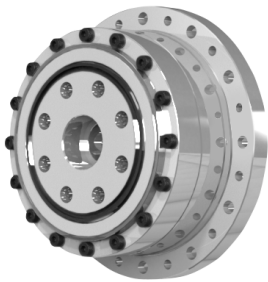
**WPC SERIES**  
Component Sub-assembly  
Cup Housing Style, Ultra-flat



**WPS SERIES**  
Simple Contained Assembly  
Hat Housing Style



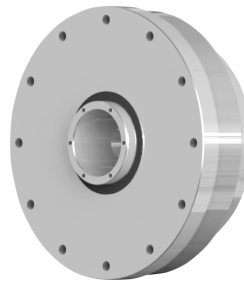
**WPS SERIES**  
Simple Contained Assembly  
Hat Housing Style, Ultra-flat



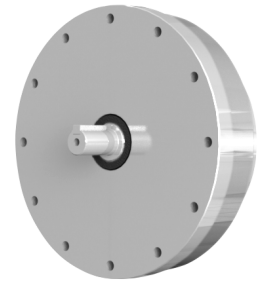
**WPU SERIES**  
Complete Unit Assembly  
Cup Housing Style



**WPU SERIES**  
Complete Unit Assembly  
Cup Housing Style, Ultra-flat



**WPU SERIES**  
Complete Unit Assembly  
Hat Housing Style, Hollow Shaft



**WPU SERIES**  
Complete Unit Assembly  
Hat Housing Style, Solid Shaft  
Input



**WPG SERIES**  
Gearhead



Nidec DESCH Antriebstechnik GmbH & Co. KG  
Kleinbahnstraße 21  
59759 Arnsberg  
Germany

T +49 2932 300 0  
info@desch.com  
www.desch.com