Motor & Drive Solutions

Nidec Automation

Driving Industry Forward


# Standard Products

# EXCEPTIONAL AUTOMATION

Headquartered in St. Louis, Missouri, Nidec Automation designs and manufactures innovative precision electric motors, gearmotors and drives for modern automation applications. Nidec Automation's sophisticated solutions increase the speed, reliability and safety of autonomous guided vehicles, automated storage & retrieval systems, conveyance systems, and robotics applications.

Nidec Automation also delivers geared solutions and other specialty motor and drive technologies for applications including HVLS fans, marine motors, door access & entrance systems, pellet stoves & grills, pool pumps, floor care, commercial kitchen automation equipment and wind energy. With manufacturing and engineering operations worldwide, Nidec Automation is your strategic partner for meeting the productivity demands of a busy world.

From concept to completion, you can rest assured that we'll use our Nidec know-how to help make your dreams of exceptional automation come true.

## Driving Industry Forward

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## Unimotor HD™

Unimotor HD is a high dynamic brushless electronically commutated AC servo motor range designed for use in pulse duty applications where rapid acceleration and deceleration are required. The motors are available in frame sizes from 060 to 142. Unimotor HD is suitable for a wide range of automation applications, due to its extensive range of features. Please use the information below to create an order code for a Unimotor HD **220V** and **400V**.

## Ordering Information

**Frame Size, Motor Voltage, Stator Length, Rated Speed, Brake, Connection Type, Output Shaft, Feedback Device and Thermistor**

# 220V & 400V

| Frame size | Motor voltage | Stator length | Rated speed | Brake | | | Connection type** | Output shaft | Feedback device | Thermistor |
|---|---|---|---|---|---|---|---|---|---|---|
| 060<br>067<br>089<br>115<br>142 | ED = 220V<br>UD = 400V | A to C | 30 = 3000 rpm<br>60 = 6000 rpm | 060 – 142 frame:<br>060 – 142B frame:<br>142C frame: | 0 = Not Fitted (Std)<br>6 = Parking Brake<br>5 = Parking Brake | | T = YTEC type<br>**Size 1**<br>B = Power and signal 90° rotatable<br>**Size 1.5**<br>J = Power and signal 90° rotatable | F = Key and Half-Key Supplied Separately | 060: CN, EG<br>067: CR, EG<br>089-142: CA, EF | C = KTY Thermistor (KTY84.130) |
| Example | 060 | UD | B | 60 | 0 | | T | F | CN | C |

## Features & Benefits

- Torque range: from 0.64 Nm to 85 Nm
- High torque to inertia ratio for high dynamic performance
- Compact but powerful
- High energy dissipation parking brakes
- Thermal protection by PTC thermistor/optional KTY84.130 sensor
- Segmented stator design
- World class performance
- Supported by rigorous testing for performance and reliability
- Winding voltage for inverter supply of 400 V and 220 V
- Rated speeds from 1,000 to 6,000 rpm
- Larger shafts to increase torsional rigidity
- IP65 conformance; sealed against water spray & dust when mounted and connected

### Encoder Options

| Order code | Feedback type | Voltage | Resolution |
|---|---|---|---|
| CN | Incremental | 5 Vdc ± 10% | 4096ppr |
| CR | | | |
| CA | | | |
| CJ | 5PP push-pull comms | | |
| EG | Absolute multi-turn | 3.6 – 14 Vdc | 4096ppr (12 bits) |
| EF | | | |

**Not all speeds are available on all motors. Please refer to the following pages for performance information.*

# Low Voltage Servo Motor Ratings – 60mm Frame

Ratings for 3 Phase VPWM drives:
060ED (200 - 240Vrms) or 060UD (380 - 480Vrms)

| Motor Frame Size (mm) | 060ED | | | 060UD | | |
|---|---|---|---|---|---|---|
| Voltage | 200-240Vrms | | | 380-480Vrms | | |
| Frame length | A | B | C | A | B | C |
| Continuous stall torque (Nm) | 0.64 | 1.28 | 1.92 | 0.64 | 1.28 | 1.92 |
| Peak torque (Nm) | 2.24 | 4.48 | 6.72 | 2.24 | 4.48 | 6.72 |
| Standard inertia (kg $cm^2$) | 0.18 | 0.33 | 0.48 | 0.18 | 0.33 | 0.48 |
| Winding thermal time constant (sec) | 48 | 55 | 61 | 48 | 55 | 61 |
| Standard motor weight (kg) | 1.6 | 2.0 | 2.2 | 1.6 | 2.0 | 2.2 |
| Number of poles | 10 | 10 | 10 | 10 | 10 | 10 |
| **Speed (rpm)** | 3000 | | | | | |
| Kt (Nm/A) | 0.80 | | | | | |
| Ke (V/krpm) | 49 | | | | | |
| Rated Torque (Nm) | 0.64 | 1.28 | 1.92 | ♦ | ♦ | ♦ |
| Stall Current (A) | 0.80 | 1.60 | 2.40 | ♦ | ♦ | ♦ |
| Rated Power (kW) | 0.40 | 0.80 | 1.21 | ♦ | ♦ | ♦ |
| R (ph-ph) (Ohms) | 24.00 | 10.10 | 5.90 | ♦ | ♦ | ♦ |
| L (ph-ph) (mH) | 91.5 | 46.8 | 32.6 | ♦ | ♦ | ♦ |
| Recommended power conn' size | Y-TEC | | | ♦ | ♦ | ♦ |
| **Speed (rpm)** | 6000 | | | | | |
| Kt (Nm/A) | 0.47 | | | 0.80 | | |
| Ke (V/krpm) | 28.5 | | | 49 | | |
| Rated Torque (Nm) | 0.64 | 1.28 | 1.92 | 0.64 | 1.28 | 1.92 |
| Stall Current (A) | 1.36 | 2.72 | 4.09 | 0.80 | 1.60 | 2.40 |
| Rated Power (kW) | 0.40 | 0.80 | 1.20 | 0.40 | 0.80 | 1.21 |
| R (ph-ph) (Ohms) | 6.04 | 2.52 | 1.56 | 24.00 | 10.10 | 5.90 |
| L (ph-ph) (mH) | 15.27 | 11.30 | 8.04 | 91.5 | 46.8 | 32.6 |
| Recommended power conn' size | Y-TEC | | | Y-TEC | | |

Δt= 100°C winding 40°C maximum ambient. All data subject to +/-10% tolerance. Stall torque, rated torque and power relate to maximum continuous operation tested in a 20°C ambient at 12kHz drive switching frequency. All other figures relate to a 20°C motor temperature. Maximum intermittent winding temperature is 140°C

♦ *not available*

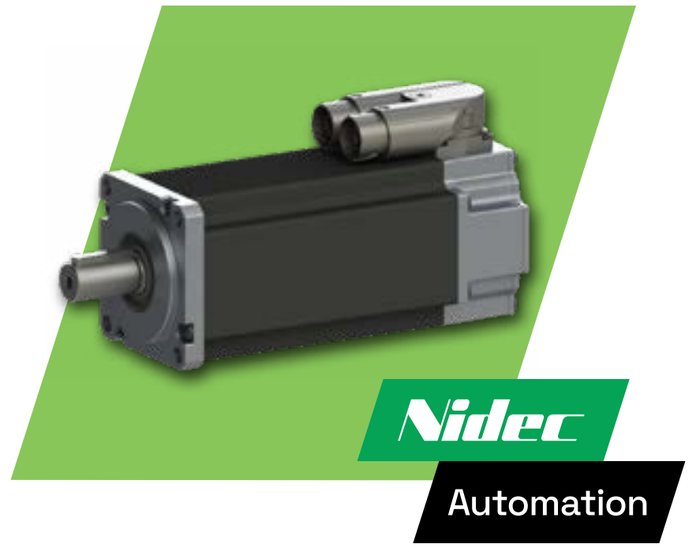
# Dimensions – 060 Unimotor HD

## Motor dimensions ( all measurements shown are in mm )

| 060 | Unbraked length | Braked length | Flange thickness | Register length | Register diameter | Overall height | Flange square | Fixing hole diameter | Fixing hole PCD | Motor housing | Mounting bolts |
|---|---|---|---|---|---|---|---|---|---|---|---|
| A | 82.5 | 119.5 | 7.5 | 3.0 | 50.0 | 80.0 | 60.0 | 5.5 | 70.0 | 60.0 | M5 |
| B | 102.5 | 139.5 | | | | | | | | | |
| C | 122.5 | 159.5 | | | | | | | | | |

## Shaft dimensions – 060ED and 060UD ( all measurements shown are in mm )

| Shaft diameter | Shaft length | Key height | Key length | Key to shaft end | Key width | Tapped hole thread size | Tapped hole depth |
|---|---|---|---|---|---|---|---|
| 14.0 | 30.0 | 16.0 | 22.0 | 1.5 | 5.0 | M5 x 0.8 | 10.0 |



# Low Voltage Servo Motor Ratings – 67mm Frame

**Ratings for 3 Phase VPWM drives:**
**067ED (200 - 240Vrms) or 067UD (380 - 480Vrms)**

| Motor Frame Size (mm) | 067ED | | | 067UD | | |
|---|---|---|---|---|---|---|
| Voltage | 200-240Vrms | | | 380-480Vrms | | |
| Frame length | A | B | C | A | B | C |
| Continuous stall torque (Nm) | 1.44 | 2.55 | 3.70 | 1.44 | 2.55 | 3.70 |
| Peak torque (Nm) | 4.35 | 7.65 | 11.10 | 4.35 | 7.65 | 11.10 |
| Standard inertia (kg cm2) | 0.30 | 0.53 | 0.75 | 0.30 | 0.53 | 0.75 |
| Winding thermal time constant (sec) | 54 | 61 | 65 | 54 | 61 | 65 |
| Standard motor weight (kg) | 1.96 | 2.56 | 3.16 | 1.96 | 2.56 | 3.16 |
| Number of poles | 10 | 10 | 10 | 10 | 10 | 10 |
| Speed (rpm) | 3000 | | | | | |
| Kt (Nm/A) | 0.93 | | | 0.80 | 1.6 | |
| Ke (V/krpm) | 57 | | | 49 | 98 | |
| Rated Torque (Nm) | 1.40 | 2.45 | 3.50 | 1.40 | 2.45 | 3.50 |
| Stall Current (A) | 1.55 | 2.74 | 3.98 | 1.80 | 1.59 | 2.31 |
| Rated Power (kW) | 0.44 | 0.77 | 1.10 | 0.44 | 0.77 | 1.10 |
| R (ph-ph) (Ohms) | 15.16 | 5.85 | 3.33 | 11.69 | 18.55 | 10.70 |
| L (ph-ph) (mH) | 46.7 | 20.6 | 12.7 | 35.2 | 65.6 | 40.8 |
| Recommended power conn' size | 1 | 1 | 1 | 1 | 1 | 1 |
| Speed (rpm) | 6000 | | | | | |
| Kt (Nm/A) | 0.47 | | | 0.80 | | |
| Ke (V/krpm) | 28.5 | | | 49 | | |
| Rated Torque (Nm) | 1.30 | 2.20 | 3.10 | 1.30 | 2.20 | 3.10 |
| Stall Current (A) | 3.06 | 5.43 | 7.87 | 1.80 | 3.19 | 4.63 |
| Rated Power (kW) | 0.82 | 1.38 | 1.95 | 0.82 | 1.38 | 1.95 |
| R (ph-ph) (Ohms) | 3.79 | 1.46 | 0.76 | 11.69 | 4.64 | 2.73 |
| L (ph-ph) (mH) | 11.70 | 5.20 | 3.60 | 35.2 | 16.4 | 10.2 |
| Recommended power conn' size | 1 | 1 | 1 | 1 | 1 | 1 |

Δt= 100°C winding 40°C maximum ambient. All data subject to +/-10% tolerance. Stall torque, rated torque and power relate to maximum continuous operation tested in a 20°C ambient at 12kHz drive switching frequency. All other figures relate to a 20°C motor temperature. Maximum intermittent winding temperature is 140°C

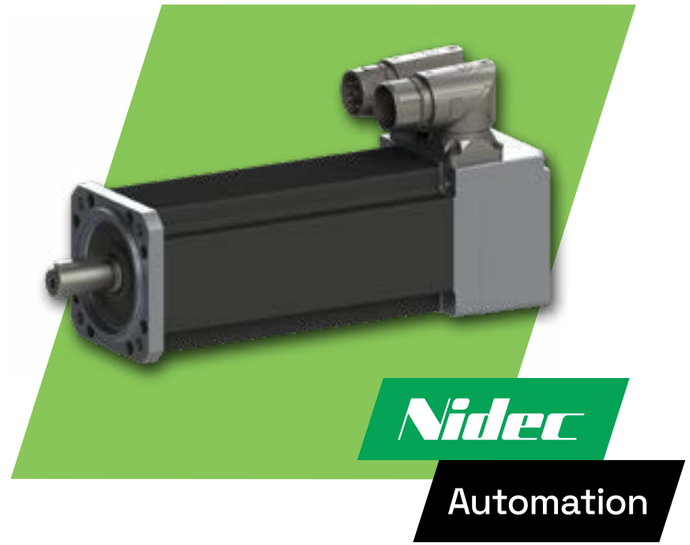
# Dimensions – 067 Unimotor HD

## Motor dimensions ( all measurements shown are in mm )

| 067 | Unbraked length | Braked length | Flange thickness | Register length | Register diameter | Overall height | Flange square | Fixing hole diameter | Fixing hole PCD | Motor housing | Mounting bolts |
|---|---|---|---|---|---|---|---|---|---|---|---|
| A | 142.9 | 177.9 | 7.7 | 2.5 | 60.0 | 111.5 | 70.0 | 5.8 | 75.0 | 67.0 | M5 |
| B | 172.9 | 207.9 | | | | | | | | | |
| C | 202.9 | 237.9 | | | | | | | | | |

## Shaft dimensions – 067ED and 067UD ( all measurements shown are in mm )

| Shaft diameter | Shaft length | Key height | Key length | Key to shaft end | Key width | Tapped hole thread size | Tapped hole depth |
|---|---|---|---|---|---|---|---|
| 14.0 | 30.0 | 16.0 | 25.0 | 1.5 | 5.0 | M5 x 0.8 | 13.5 |



# Low Voltage Servo Motor Ratings – 89mm Frame

**Ratings for 3 Phase VPWM drives:**
**089ED (200 - 240Vrms) or 089UD (380 - 480Vrms)**

| Motor Frame Size (mm) | 089ED | | | 089UD | | |
|---|---|---|---|---|---|---|
| Voltage | 200-240Vrms | | | 380-480Vrms | | |
| Frame length | A | B | C | A | B | C |
| Continuous stall torque (Nm) | 3.20 | 5.50 | 8.00 | 3.20 | 5.50 | 8.00 |
| Peak torque (Nm) | 9.60 | 16.50 | 24.00 | 9.60 | 16.50 | 24.00 |
| Standard inertia (kg cm$^2$) | 0.87 | 1.61 | 2.34 | 0.87 | 1.61 | 2.34 |
| Winding thermal time constant (sec) | 85 | 93 | 98 | 85 | 93 | 98 |
| Standard motor weight (kg) | 3.18 | 4.28 | 5.38 | 3.18 | 4.28 | 5.38 |
| Number of poles | 10 | 10 | 10 | 10 | 10 | 10 |
| **Speed (rpm)** | 3000 | | | | | |
| Kt (Nm/A) | 0.93 | | | 1.6 | | |
| Ke (V/krpm) | 57 | | | 98 | | |
| Rated Torque (Nm) | 3.00 | 4.85 | 6.90 | 3.00 | 4.85 | 6.90 |
| Stall Current (A) | 3.44 | 5.91 | 8.60 | 2.00 | 3.44 | 5.00 |
| Rated Power (kW) | 0.94 | 1.52 | 2.17 | 0.94 | 1.52 | 2.17 |
| R (ph-ph) (Ohms) | 4.10 | 1.64 | 0.93 | 10.80 | 5.18 | 2.79 |
| L (ph-ph) (mH) | 25.0 | 11.8 | 7.1 | 66.8 | 36.7 | 21.7 |
| Recommended power conn' size | 1 | 1 | 1 | 1 | 1 | 1 |
| **Speed (rpm)** | 6000 | | | | | |
| Kt (Nm/A) | 0.47 | | | 0.80 | | |
| Ke (V/krpm) | 28.5 | | | 49 | | |
| Rated Torque (Nm) | 2.65 | 3.80 | 5.00 | 2.65 | 3.80 | 5.00 |
| Stall Current (A) | 6.93 | 11.70 | 17.02 | 4.00 | 6.88 | 10.00 |
| Rated Power (kW) | 1.67 | 2.39 | 3.14 | 1.67 | 2.39 | 3.14 |
| R (ph-ph) (Ohms) | 1.03 | 0.41 | 0.24 | 2.70 | 1.30 | 0.67 |
| L (ph-ph) (mH) | 6.20 | 2.96 | 1.77 | 16.7 | 9.2 | 5.4 |
| Recommended power conn' size | 1 | 1 | 1 | 1 | 1 | 1 |

Δt= 100°C winding 40°C maximum ambient. All data subject to +/-10% tolerance. Stall torque, rated torque and power relate to maximum continuous operation tested in a 20°C ambient at 12kHz drive switching frequency. All other figures relate to a 20°C motor temperature.
Maximum intermittent winding temperature is 140°C

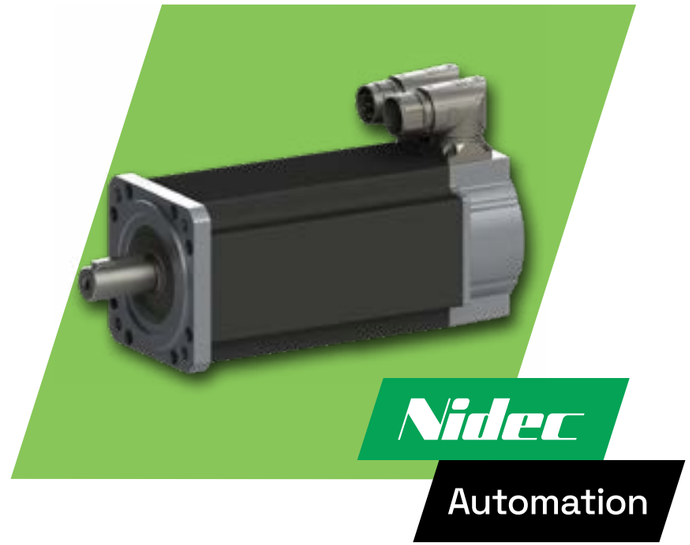
# Dimensions – 089 Unimotor HD

**Motor dimensions** ( all measurements shown are in mm )

| 089 | Unbraked length | Braked length | Flange thickness | Register length | Register diameter | Overall height | Flange square | Fixing hole diameter | Fixing hole PCD | Motor housing | Mounting bolts |
|---|---|---|---|---|---|---|---|---|---|---|---|
| A | 160.8 | 200.9 | 10.3 | 2.2 | 80.0 | 130.5 | 91.0 | 7.0 | 100.0 | 89.0 | M6 |
| B | 190.8 | 230.9 | | | | | | | | | |
| C | 220.8 | 260.9 | | | | | | | | | |

**Shaft dimensions – 089ED and 089UD** ( all measurements shown are in mm )

| Shaft diameter | Shaft length | Key height | Key length | Key to shaft end | Key width | Tapped hole thread size | Tapped hole depth |
|---|---|---|---|---|---|---|---|
| 19.0 | 40.0 | 21.5 | 32.0 | 3.7 | 6.0 | M6 x 1.0 | 17.0 |



# Low Voltage Servo Motor Ratings – 115mm Frame

**Ratings for 3 Phase VPWM drives:**
**115ED (200 - 240Vrms) or 115UD (380 - 480Vrms)**

| Motor Frame Size (mm) | 115ED | | | 115UD | | |
|---|---|---|---|---|---|---|
| Voltage | 200-240Vrms | | | 380-480Vrms | | |
| Frame length | A | B | C | A | B | C |
| Continuous stall torque (Nm) | 5.80 | 10.20 | 14.60 | 5.80 | 10.20 | 14.60 |
| Peak torque (Nm) | 17.40 | 30.60 | 43.80 | 17.40 | 30.60 | 43.80 |
| Standard inertia (kg cm$^2$) | 2.40 | 4.41 | 6.39 | 2.40 | 4.41 | 6.39 |
| Winding thermal time constant (sec) | 161 | 164 | 168 | 161 | 164 | 168 |
| Standard motor weight (kg) | 5.20 | 6.95 | 8.72 | 5.20 | 6.95 | 8.72 |
| Number of poles | 10 | 10 | 10 | 10 | 10 | 10 |
| Speed (rpm) | 3000 | | | | | |
| Kt (Nm/A) | 0.93 | | | 1.6 | | |
| Ke (V/krpm) | 57 | | | 98 | | |
| Rated Torque (Nm) | 4.80 | 7.70 | 10.50 | 4.80 | 7.70 | 10.50 |
| Stall Current (A) | 6.24 | 10.97 | 15.70 | 3.63 | 6.38 | 9.13 |
| Rated Power (kW) | 1.51 | 2.42 | 3.30 | 1.51 | 2.42 | 3.30 |
| R (ph-ph) (Ohms) | 1.59 | 0.58 | 0.39 | 5.00 | 1.90 | 1.21 |
| L (ph-ph) (mH) | 12.8 | 5.4 | 4.0 | 40.3 | 18.0 | 12.7 |
| Recommended power conn' size | 1 | 1 | 1 | 1 | 1 | 1 |
| Speed (rpm) | 6000 | | | | | |
| Kt (Nm/A) | 0.47 | | | 0.80 | | |
| Ke (V/krpm) | 28.5 | | | 49 | | |
| Rated Torque (Nm) | 3.60 | 4.80 | ♦ | 3.60 | 4.80 | ♦ |
| Stall Current (A) | 12.34 | 21.70 | ♦ | 7.25 | 12.75 | ♦ |
| Rated Power (kW) | 2.26 | 3.02 | ♦ | 2.26 | 3.02 | ♦ |
| R (ph-ph) (Ohms) | 0.40 | 0.09 | ♦ | 1.25 | 0.47 | ♦ |
| L (ph-ph) (mH) | 3.20 | 2.80 | ♦ | 10.1 | 4.50 | ♦ |
| Recommended power conn' size | 1 | 1 | ♦ | 1 | 1 | ♦ |

♦ *not available*

Δt= 100°C winding 40°C maximum ambient. All data subject to +/-10% tolerance. Stall torque, rated torque and power relate to maximum continuous operation tested in a 20°C ambient at 12kHz drive switching frequency. All other figures relate to a 20°C motor temperature.
Maximum intermittent winding temperature is 140°C

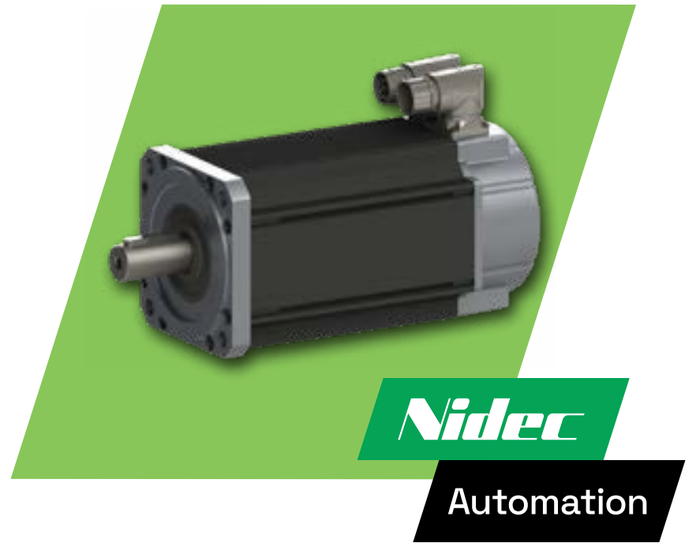
# Dimensions – 115 Unimotor HD

## Motor dimensions ( all measurements shown are in mm )

| 115 | Unbraked length | Braked length | Flange thickness | Register length | Register diameter | Overall height | Flange square | Fixing hole diameter | Fixing hole PCD | Motor housing | Mounting bolts |
|---|---|---|---|---|---|---|---|---|---|---|---|
| A | 176.8 | 213.9 | 13.2 | 2.7 | 110.0 | 156.5 | 116.0 | 10.0 | 130.0 | 115.0 | M8 |
| B | 206.8 | 243.9 | | | | | | | | | |
| C | 236.8 | 273.9 | | | | | | | | | |

## Shaft dimensions – 115ED and 115UD ( all measurements shown are in mm )

| Shaft diameter | Shaft length | Key height | Key length | Key to shaft end | Key width | Tapped hole thread size | Tapped hole depth |
|---|---|---|---|---|---|---|---|
| 24.0 | 50.0 | 27.0 | 40.0 | 5.3 | 8.0 | M8 x 1.25 | 20.0 |



# Low Voltage Servo Motor Ratings – 142mm Frame

**Ratings for 3 Phase VPWM drives:**
**142ED (200 - 240Vrms) or 142UD (380 - 480Vrms)**

| Motor Frame Size (mm) | 142ED | | | 142UD | | |
|---|---|---|---|---|---|---|
| Voltage | 200-240Vrms | | | 380-480Vrms | | |
| Frame length | A | B | C | A | B | C |
| Continuous stall torque (Nm) | 10.10 | 17.40 | 25.00 | 10.10 | 17.40 | 25.00 |
| Peak torque (Nm) | 30.30 | 52.20 | 75.00 | 30.30 | 52.20 | 75.00 |
| Standard inertia (kg cm²) | 5.60 | 11.00 | 17.00 | 5.60 | 11.00 | 17.00 |
| Winding thermal time constant (sec) | 235 | 240 | 245 | 235 | 240 | 245 |
| Standard motor weight (kg) | 7.40 | 10.10 | 12.74 | 7.40 | 10.10 | 12.74 |
| Number of poles | 10 | 10 | 10 | 10 | 10 | 10 |
| **Speed (rpm)** | 3000 | | | | | |
| Kt (Nm/A) | 0.93 | | | 1.6 | | |
| Ke (V/krpm) | 57 | | | 98 | | |
| Rated Torque (Nm) | 8.20 | 14.00 | 18.40 | 8.20 | 14.00 | 18.40 |
| Stall Current (A) | 10.86 | 18.71 | 26.88 | 6.31 | 10.88 | 15.63 |
| Rated Power (kW) | 2.58 | 4.40 | 5.78 | 2.58 | 4.40 | 5.78 |
| R (ph-ph) (Ohms) | 0.38 | 0.22 | 0.12 | 1.50 | 0.63 | 0.34 |
| L (ph-ph) (mH) | 6.3 | 2.8 | 1.9 | 18.1 | 8.6 | 5.3 |
| Recommended power conn' size | 1 | 1.5 | 1.5 | 1 | 1 | 1 |
| **Speed (rpm)** | 6000 | | | | | |
| Kt (Nm/A) | 0.47 | | | 0.80 | | |
| Ke (V/krpm) | 28.5 | | | 49 | | |
| Rated Torque (Nm) | ♦ | ♦ | ♦ | ♦ | 7.00 | ♦ |
| Stall Current (A) | ♦ | ♦ | ♦ | ♦ | 21.75 | ♦ |
| Rated Power (kW) | ♦ | ♦ | ♦ | ♦ | 4.40 | ♦ |
| R (ph-ph) (Ohms) | ♦ | ♦ | ♦ | ♦ | 0.17 | ♦ |
| L (ph-ph) (mH) | ♦ | ♦ | ♦ | ♦ | 3.2 | ♦ |
| Recommended power conn' size | ♦ | ♦ | ♦ | ♦ | 1.5 | ♦ |

♦ *not available*

Δt= 100°C winding 40°C maximum ambient. All data subject to +/-10% tolerance. Stall torque, rated torque and power relate to maximum continuous operation tested in a 20°C ambient at 12kHz drive switching frequency. All other figures relate to a 20°C motor temperature.
Maximum intermittent winding temperature is 140°C

# Dimensions – 142 Unimotor HD

**Motor dimensions** ( all measurements shown are in mm )

| 142 | Unbraked length | Braked length | Flange thickness | Register length | Register diameter | Overall height | Flange square | Fixing hole diameter | Fixing hole PCD | Motor housing | Mounting bolts |
|---|---|---|---|---|---|---|---|---|---|---|---|
| A | 157.0 | 222.5 | 14.0 | 3.4 | 130.0 | 183.5 (Size 1)<br>204.5 (Size 1.5) | 142.0 | 12.0 | 165.0 | 142.0 | M10 |
| B | 187.0 | 252.5 | | | | | | | | | |
| C | 217.0 | 282.5 | | | | | | | | | |

**Shaft dimensions – 142ED and 142UD** ( all measurements shown are in mm )

| Shaft diameter | Shaft length | Key height | Key length | Key to shaft end | Key width | Tapped hole thread size | Tapped hole depth |
|---|---|---|---|---|---|---|---|
| 32.0 | 58.0 | 35.0 | 50.0 | 3.0 | 10.0 | M12 x 1.75 | 29.0 |

## Unimotor HD

Unimotor HD is a high dynamic brushless electronically commutated servo motor range designed for use in pulse duty applications where rapid acceleration and deceleration are required. With either 24 Vdc or 48 Vdc input voltage, this ultra low voltage range is designed to be compact, precise motion and reliable on long-term and energy-efficient battery-operated applications. The following pages provide standard performance specifications.

- IP65 conformance, sealing against water spray & dust when mounted & connected with optional connectors (reduced to IP50 with flying leads)
- Low winding voltages of 24 Vdc to 50 Vdc
- Rated speeds from 1,000 to 6,000 rpm
- Variety of flange possibilities (IEC/NEMA)
- Connector variants, flying leads & 90° rotatable
- Thermal protection by a KTY84.130 sensor
- Torque range from 0.64 Nm to 10.2 Nm

## Ordering Information

**Frame Size, Motor Voltage, Stator Length, Rated Speed, Brake, Connection Type, Output Shaft, Feedback Device and Thermistor**

# 24V & 48V

### 24V

| Frame size | Motor voltage | Stator length | Rated speed | Brake | Connection type | | Output shaft | Feedback device Type | Thermistor |
|---|---|---|---|---|---|---|---|---|---|
| 060 | AD = 24V | A to B | 30 = 3000 rpm | 0 = Not Fitted (Std)<br>6 = Parking Brake | F = Flying Leads - Cut Ends (0.5m Standard)<br>L = Flying Leads - RoboteQ SBL Drive Connections (0.5m Standard)<br>Q = Flying Leads - RoboteQ FBL Drive Connections (0.5m Standard)<br>G = Flying Leads - RoboteQ GBL Drive Connections (0.5m Standard) | | F = Key and Half-Key Supplied Separately | 060: CN<br>067-089: CR, CJ | C = Standard + KTY Thermistor (KTY84) |
| 067 | | A to C | 10 = 1000 rpm<br>15 = 1500 rpm<br>30 = 3000 rpm | | | | | | |
| 089 | | A | 15 = 1500 rpm | | | | | | |
| EXAMPLE | 060 | AD | B | 30 | 0 | F | | F | CN | C |

### 48V

| Frame size | Motor voltage | Stator length | Rated speed | Brake | Connection type | | Output shaft | Feedback device Type | Thermistor |
|---|---|---|---|---|---|---|---|---|---|
| 060 | LD = 48V | A to B | 60 = 6000 rpm | 0 = Not Fitted (Std)<br>6 = Parking Brake | F = Flying Leads - Cut Ends (0.5m Standard)<br>L = Flying Leads - RoboteQ SBL Drive Connections (0.5m Standard)<br>Q = Flying Leads - RoboteQ FBL Drive Connections (0.5m Standard)<br>G = Flying Leads - RoboteQ GBL Drive Connections (0.5m Standard) | | F = Key and Half-Key Supplied Separately | 060: CN<br>067-142: CR, CJ | C = Standard + KTY Thermistor (KTY84) |
| 067 | | A to C | 20 = 2000 rpm<br>30 = 3000 rpm<br>60 = 6000 rpm | | | | | | |
| 089 | | A to C | 10 = 1000 rpm<br>15 = 1500 rpm<br>30 = 3000 rpm | | | | | | |
| 115 | | A to B | 10 = 1000 rpm | | | | | | |
| 142 | | A | 20 = 2000 rpm | | | | | | |
| EXAMPLE | 060 | LD | B | 60 | 0 | F | | F | CN | C |

### Encoder Options

| Order code | Feedback type | Voltage | Resolution |
|---|---|---|---|
| CN | Incremental | 5 Vdc ± 10% | 4096ppr |
| CR | | | |
| CA | | | |
| CJ | 5PP push-pull comms | | |
| EG | Absolute multi-turn | 3.6 – 14 Vdc | 4096ppr (12 bits) |
| EF | | | |

**Not all speeds are available on all motors. Please refer to the following pages for performance information.*

# Ultra Low Voltage Servo Motor Ratings – 60mm Frame

**Ratings for 3 Phase VPWM drives:**
**060AD (24 - 30Vrms) or 060LD (48 - 60Vrms)**

| Motor Frame Size (mm) | 060AD | | 060LD | |
|---|---|---|---|---|
| Voltage | 24 | | 48 | |
| Frame length | A | B | A | B |
| Continuous stall torque (Nm) | 0.64 | 1.15 | 0.64 | 1.15 |
| Peak torque (Nm) | 1.92 | 3.45 | 1.92 | 3.45 |
| Standard inertia (kg cm$^2$) | 0.18 | 0.33 | 0.18 | 0.33 |
| Winding thermal time constant (sec) | 48 | 55 | | 55 |
| Standard motor weight (kg) | 1.6 | 2.0 | 1.6 | 2.0 |
| Number of poles | 10 | 10 | 10 | 10 |
| Speed | 3000 | | 6000 | |
| Kt (Nm/A) | 0.07 | | 0.07 | |
| Ke (V/krpm) | 4.4 | | 4.4 | |
| Rated Torque (Nm) | 0.64 | 1.15 | 0.64 | 1.16 |
| Stall Current (A) | 9.14 | 17.00 | 9.14 | 17.00 |
| Rated Power (kW) | 0.20 | 0.36 | 0.40 | 0.73 |
| R (ph-ph) (Ohms) | 0.18 | 0.07 | 0.18 | 0.07 |
| L (ph-ph) (mH) | 0.43 | 0.21 | 0.43 | 0.21 |
| Recommended power conn' size | Flying Leads | | Flying Leads | |

Δt= 100°C winding 40°C maximum ambient. All data subject to +/-10% tolerance. Stall torque, rated torque and power relate to maximum continuous operation tested in a 20°C ambient at 12kHz drive switching frequency. All other figures relate to a 20°C motor temperature.
Maximum intermittent winding temperature is 140°C

# Dimensions – 060 Unimotor HD

## Motor dimensions ( all measurements shown are in mm )

| 060 | Unbraked length | Braked length | Flange thickness | Register length | Register diameter | Overall height | Flange square | Fixing hole diameter | Fixing hole PCD | Motor housing | Mounting bolts |
|---|---|---|---|---|---|---|---|---|---|---|---|
| A | 82.5 | 119.5 | 7.5 | 3.0 | 50.0 | 80.0 | 60.0 | 5.5 | 70.0 | 60.0 | M5 |
| B | 102.5 | 139.5 | | | | | | | | | |

## Shaft dimensions – 060AD and 060LD Std ( all measurements shown are in mm )

| Shaft diameter | Shaft length | Key height | Key length | Key to shaft end | Key width | Tapped hole thread size | Tapped hole depth |
|---|---|---|---|---|---|---|---|
| 14.0 | 30.0 | 16.0 | 22.0 | 1.5 | 5.0 | M5 x 0.8 | 10.0 |

Nidec Automation

# Ultra Low Voltage Servo Motor Ratings – 67mm Frame

**Ratings for 3 Phase VPWM drives:**
**067AD (24 - 30Vrms) or 067LD (48 - 60Vrms)**

| Motor Frame Size (mm) | 067AD | | | 067LD | | |
|---|---|---|---|---|---|---|
| Voltage | 24 | | | 48 | | |
| Frame length | A | B | C | A | B | C |
| Continuous stall torque (Nm) | 1.44 | 2.55 | 3.70 | 1.44 | 2.55 | 3.70 |
| Peak torque (Nm) | 4.32 | 7.65 | 11.10 | 4.32 | 7.65 | 11.10 |
| Standard inertia (kg cm$^2$) | 0.30 | 0.53 | 0.75 | 0.30 | 0.53 | 0.75 |
| Winding thermal time constant (sec) | 54 | 61 | 65 | 54 | 61 | 65 |
| Standard motor weight (kg) | 2.0 | 2.6 | 3.2 | 2.0 | 2.6 | 3.2 |
| Number of poles | 10 | 10 | 10 | 10 | 10 | 10 |
| **Speed (rpm)** | 1500 | | | 3000 | | |
| Kt (Nm/A) | 0.14 | | | 0.14 | | |
| Ke (V/krpm) | 8.5 | | | 8.5 | | |
| Rated Torque (Nm) | 1.40 | 2.45 | tba | 1.40 | 2.45 | ♦ |
| Stall Current (A) | 10.29 | 18.21 | tba | 10.29 | 18.21 | ♦ |
| Rated Power (kW) | 0.22 | 0.38 | tba | 0.44 | 0.77 | ♦ |
| R (ph-ph) (Ohms) | 0.27 | 0.10 | tba | 0.27 | 0.10 | ♦ |
| L (ph-ph) (mH) | 0.82 | 0.34 | tba | 0.82 | 0.34 | ♦ |
| Standard Connection | Flying Leads | | | Flying Leads | | |
| **Speed (rpm)** | 3000 | | | 6000 | | |
| Kt (Nm/A) | 0.07 | | | 0.07 | | |
| Ke (V/krpm) | 4.3 | | | 4.3 | | |
| Rated Torque (Nm) | 1.30 | ♦ | ♦ | 1.30 | ♦ | ♦ |
| Stall Current (A) | 20.57 | ♦ | ♦ | 21.00 | ♦ | ♦ |
| Rated Power (kW) | 0.41 | ♦ | ♦ | 0.82 | ♦ | ♦ |
| R (ph-ph) (Ohms) | 0.08 | ♦ | ♦ | 0.08 | ♦ | ♦ |
| L (ph-ph) (mH) | 0.21 | ♦ | ♦ | 0.21 | ♦ | ♦ |
| Standard Connection | Flying Leads | | | Flying Leads | | |

♦ *not available*

Δt= 100°C winding 40°C maximum ambient. All data subject to +/-10% tolerance. Stall torque, rated torque and power relate to maximum continuous operation tested in a 20°C ambient at 12kHz drive switching frequency. All other figures relate to a 20°C motor temperature.
Maximum intermittent winding temperature is 140°C

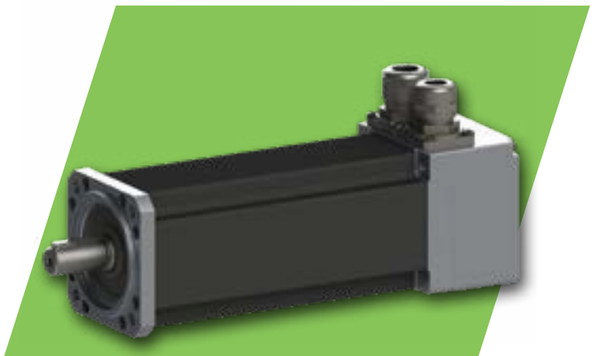
# Dimensions – 067 Unimotor HD

## Motor dimensions ( all measurements shown are in mm )

| 067 | Unbraked length | Braked length | Flange thickness | Register length | Register diameter | Overall height | Flange square | Fixing hole diameter | Fixing hole PCD | Motor housing | Mounting bolts |
|---|---|---|---|---|---|---|---|---|---|---|---|
| A | 142.9 | 177.9 | 7.7 | 2.5 | 60.0 | 111.5 | 70.0 | 5.8 | 75.0 | 67.0 | M5 |
| B | 172.9 | 207.9 | | | | | | | | | |
| C | 202.9 | 237.9 | | | | | | | | | |

## Shaft dimensions – 067AD and 067LD Std ( all measurements shown are in mm )

| Shaft diameter | Shaft length | Key height | Key length | Key to shaft end | Key width | Tapped hole thread size | Tapped hole depth |
|---|---|---|---|---|---|---|---|
| 14.0 | 30.0 | 16.0 | 25.0 | 1.5 | 5.0 | M5 x 0.8 | 13.5 |



Nidec Automation

# Ultra Low Voltage Servo Motor Ratings – 89mm Frame

**Ratings for 3 Phase VPWM drives:**
**089AD (24 - 30Vrms) or 089LD (48 - 60Vrms)**

| Motor Frame Size (mm) | 089AD | 089LD | | |
|---|---|---|---|---|
| Voltage | 24 | 48 | | |
| Frame length | A | A | B | C |
| Continuous stall torque (Nm) | 3.20 | 3.20 | 5.50 | 8.00 |
| Peak torque (Nm) | 9.60 | 9.60 | 16.50 | 24.00 |
| Standard inertia (kg cm$^2$) | 0.87 | 0.87 | 1.61 | 2.34 |
| Winding thermal time constant (sec) | 85 | 85 | 93 | 98 |
| Standard motor weight (kg) | 3.18 | 3.18 | 4.28 | 5.50 |
| Number of poles | 10 | 10 | 10 | 10 |
| Speed (rpm) | 1500 | 1500 | | |
| Kt (Nm/A) | 0.14 | 0.24 | | |
| Ke (V/krpm) | 8.50 | 15.17 | | |
| Rated Torque (Nm) | 3.00 | 3.00 | 5.20 | ♦ |
| Stall Current (A) | 22.86 | 13.00 | 25.10 | ♦ |
| Rated Power (kW) | 0.47 | 0.50 | 0.82 | ♦ |
| R (ph-ph) (Ohms) | 0.07 | 0.26 | 0.11 | ♦ |
| L (ph-ph) (mH) | 0.41 | 1.64 | 0.78 | ♦ |
| Standard Connection | Flying Leads | Flying Leads | | |
| Speed (rpm) | ♦ | 3000 | | |
| Kt (Nm/A) | ♦ | 0.14 | | |
| Ke (V/krpm) | ♦ | 8.5 | | |
| Rated Torque (Nm) | ♦ | 3.00 | ♦ | ♦ |
| Stall Current (A) | ♦ | 22.66 | ♦ | ♦ |
| Rated Power (kW) | ♦ | 0.94 | ♦ | ♦ |
| R (ph-ph) (Ohms) | ♦ | 0.07 | ♦ | ♦ |
| L (ph-ph) (mH) | ♦ | 0.41 | ♦ | ♦ |
| Standard Connection | ♦ | Flying Leads | | |

♦ *not available*

Δt= 100°C winding 40°C maximum ambient. All data subject to +/-10% tolerance. Stall torque, rated torque and power relate to maximum continuous operation tested in a 20°C ambient at 12kHz drive switching frequency. All other figures relate to a 20°C motor temperature.
Maximum intermittent winding temperature is 140°C

# Dimensions – 089 Unimotor HD

**Motor dimensions** ( all measurements shown are in mm )

| 089 | Unbraked length | Braked length | Flange thickness | Register length | Register diameter | Overall height | Flange square | Fixing hole diameter | Fixing hole PCD | Motor housing | Mounting bolts |
|---|---|---|---|---|---|---|---|---|---|---|---|
| A | 137.8 | 177.9 | 10.3 | 2.2 | 80.0 | 130.5 | 91.0 | 7.0 | 100.0 | 89.0 | M6 |
| B | 167.8 | 207.9 | | | | | | | | | |
| C | 197.8 | 237.9 | | | | | | | | | |

**Shaft dimensions – 089AD and 089LD Std** ( all measurements shown are in mm )

| Shaft diameter | Shaft length | Key height | Key length | Key to shaft end | Key width | Tapped hole thread size | Tapped hole depth |
|---|---|---|---|---|---|---|---|
| 19.0 | 40.0 | 21.5 | 32.0 | 3.7 | 6.0 | M6 x 1.0 | 17.0 |

Nidec Automation

# Ultra Low Voltage Servo Motor Ratings – 115mm Frame

**Ratings for 3 Phase VPWM drives:**
**115LD (48 - 60Vrms)**

| Motor Frame Size (mm) | 115LD | |
|---|---|---|
| Voltage | 48 | |
| Frame length | A | B |
| Continuous stall torque (Nm) | 5.80 | 10.20 |
| Peak torque (Nm) | 17.40 | 30.60 |
| Standard inertia (kg cm$^2$) | 2.40 | 4.41 |
| Winding thermal time constant (sec) | 161 | 164 |
| Standard motor weight (kg) | 5.13 | 7.00 |
| Number of poles | 10 | 10 |
| Speed (rpm) | 1000 | |
| Kt (Nm/A) | 0.42 | |
| Ke (V/krpm) | 25.6 | |
| Rated Torque (Nm) | 5.20 | 8.60 |
| Stall Current (A) | 27.75 | 48.81 |
| Rated Power (kW) | 0.54 | 0.90 |
| R (ph-ph) (Ohms) | 0.07 | 0.03 |
| L (ph-ph) (mH) | 0.55 | 0.25 |
| Standard Connection | Flying Leads | |

∆t= 100°C winding 40°C maximum ambient. All data subject to +/-10% tolerance. Stall torque, rated torque and power relate to maximum continuous operation tested in a 20°C ambient at 12kHz drive switching frequency. All other figures relate to a 20°C motor temperature.
Maximum intermittent winding temperature is 140°C

# Dimensions – 115 Unimotor HD

**Motor dimensions** ( all measurements shown are in mm )

| 115 | Unbraked length | Braked length | Flange thickness | Register length | Register diameter | Overall height | Flange square | Fixing hole diameter | Fixing hole PCD | Motor housing | Mounting bolts |
|---|---|---|---|---|---|---|---|---|---|---|---|
| A | 153.8 | 190.9 | 13.2 | 2.7 | 110.0 | 156.5 | 116.0 | 10.0 | 130.0 | 115.0 | M8 |
| B | 183.8 | 220.9 | | | | | | | | | |

**Shaft dimensions – 115LD Std** ( all measurements shown are in mm )

| Shaft diameter | Shaft length | Key height | Key length | Key to shaft end | Key width | Tapped hole thread size | Tapped hole depth |
|---|---|---|---|---|---|---|---|
| 24.0 | 50.0 | 27.0 | 40.0 | 5.3 | 8.0 | M8 x 1.25 | 20.0 |

Nidec Automation

# Ultra Low Voltage Servo Motor Ratings – 142mm Frame

**Ratings for 3 Phase VPWM drives: 142LD (48 - 60Vrms)**

| Motor Frame Size (mm) | 142LD |
|---|---|
| Voltage | 48 |
| Frame length | A |
| Continuous stall torque (Nm) | 10.10 |
| Peak torque (Nm) | 30.30 |
| Standard inertia (kg cm$^2$) | 5.60 |
| Winding thermal time constant (sec) | 235 |
| Standard motor weight (kg) | 7.44 |
| Number of poles | 10 |
| Speed (rpm) | 2000 |
| Kt (Nm/A) | 0.18 |
| Ke (V/krpm) | 10.9 |
| Rated Torque (Nm) | 8.6 |
| Stall Current (A) | 48.33 |
| Rated Power (kW) | 1.80 |
| R (ph-ph) (Ohms) | 0.02 |
| L (ph-ph) (mH) | 0.21 |
| Standard Connection | Flying Leads |

∆t= 100°C winding 40°C maximum ambient. All data subject to +/-10% tolerance. Stall torque, rated torque and power relate to maximum continuous operation tested in a 20°C ambient at 12kHz drive switching frequency. All other figures relate to a 20°C motor temperature.
Maximum intermittent winding temperature is 140°C

# Dimensions – 142 Unimotor HD

**Motor dimensions** ( all measurements shown are in mm )

| 142 | Unbraked length | Braked length | Flange thickness | Register length | Register diameter | Overall height | Flange square | Fixing hole diameter | Fixing hole PCD | Motor housing | Mounting bolts |
|---|---|---|---|---|---|---|---|---|---|---|---|
| A | 157.3 | 255.8 | 14.0 | 3.4 | 130.0 | 170.6 | 142.0 | 12.0 | 165.0 | 142.0 | M10 |

**Shaft dimensions – 142LD Std** ( all measurements shown are in mm )

| Shaft diameter | Shaft length | Key height | Key length | Key to shaft end | Key width | Tapped hole thread size | Tapped hole depth |
|---|---|---|---|---|---|---|---|
| 32.0 | 58.0 | 35.0 | 50.0 | 3.0 | 10.0 | M12 x 1.75 | 29.0 |

Nidec Automation

# RoboG4™ Ultra Low Voltage Servo Drives

The RoboG4 range includes three main families of single-channel and dual-channel drives from 1500W to 19kW max. A major new addition is an integrated unit that merges Roboteq's motion control technology with Nidec's servo motor expertise. RoboG4 drives deliver world-class performance, functional safety, and exceptional connectivity to all major fieldbuses. All RoboG4 drives are compatible with each other and can scale to meet the needs of most applications.

## RoboG4 is our fourth generation family of ultra low voltage (under 60 V) servo drives

S1 series
1x40A

F series
2x60A
1X120A

S2 series
2x30A
1X60A

G series
2x180A
1X360A

RoboteQ
a Nidec brand





RoboG4™ Ultra Low Voltage Servo Drives

RoboG4™
Engineered for Your Success

### Ultimate Precision and Control

Current is measured and adjusted every 62 microseconds to produce smooth and precise torque. Three cascaded loops for position, speed and current, each with its own PID and Feed-forward gains, resulting in easier tuning, and optimal performance and system responsiveness.

### Faster Processing

New, faster motion algorithms.

### Get More Torque & Speed

RoboG4 drives include automatic field weakening, allowing the motor to reach a higher speed than its maximum rating or produce additional torque at the motor's rated top speed. Important: Field weakening may enable higher speeds, but always consult the motor manufacturer to ensure safe operation within your motor's capabilities.

### Adapt Automatically to Load Changes

Adaptive control continuously observes the system's inertia and applies new gains on the fly, resulting in optimal performance.

### Works with Virtually any Motor

Wide range of supported rotor sensor types including Hall, Quadrature Encoders, Analog, Sin-Cos, Resolver, and SSI.

### Major Connectivity

Drives include traditional RS232/485/USB communication ports compatible with major Fieldbus standards. Can be tightly coupled with other drives, computers, or PLCs in factory installations and robotics systems.

### Scripting = Ultimate Flexibility

Think of it as having a PLC built right into the drive, at no extra cost. This Roboteq exclusive feature lets you tailor the drive to meet challenging requirements.

### Fast & Automated Setup/Tuning

Free PC Utility cuts development time from hours to minutes! Attach a motor and the drive automatically characterizes it, calibrates the rotor sensor, and tunes the torque and speed control loops. Monitor and troubleshoot with the powerful multichannel chart recorder.

### Stay Ahead of Technology

RoboG4 drives have the necessary circuitry and control algorithms for today's most popular motor types: Surface Permanent Magnets (SPM) or Internal Permanent Magnets (IPM) brushless motors, DC brushed motors, and AC Induction motors.

CANopen PROFINET EtherCAT EtherNet/IP

RoboG4™

## S1-Series Compact Low-Power Single-Channel

Roboteq offers both dual-channel drives as well as single-channel versions. The SBLMG1360T is a single-channel drive that offers many of the same features as our dual-channel drives such as a fourth generation MCU, 16 kHz current control and advanced control features. By supporting only one channel, the drives incorporate less hardware and are more compact. Plus, they're useful in improving heat dissipation when mounted on separate heatsinks. Configuration is quick and easy via the mini USB, as well as the configuration wizard which helps guide you through the setup process.

Roboteq drives are high performance, microcontroller-based drives, loaded with numerous features and operating modes. Yet, for all their sophistication, the drives are very simple to install and operate. Their many configuration options are programmed using a PC utility with a convenient Graphical User Interface. Once programmed, the configuration data is stored permanently in the drives' nonvolatile memory, eliminating the need for cumbersome and unreliable jumpers.

**SBLMG1360T**
**1x40A**


RoboteQ a Nidec brand

Roboteq drives are fitted with many safety features including a secure power-on start, automatic stop in case of command loss, overcurrent protection, and overheat protection.

**Delivering versatility for your applications: From a few Watts to 30kW – if your motor has permanent magnets and 3 power wires, Roboteq has one or more controllers that will make it turn.**

Roboteq drives are designed to support the most common motor types, including Surface Permanent Magnets (SPM) or Internal Permanent Magnets (IPM) Brushless, and Brushed DC.

| Part Number | SBLMG1360T |
|---|---|
| Power | |
| Number of Channels | 1 |
| Max Amps/ch | 40 |
| Cont Amps/ch | 20 |
| Max Voltage | 60 |
| Power Connections | Fast-on |
| STO | Y |
| Communication | |
| RS232 | Y |
| CANbus | Y |
| Rotor Sensor | |
| Encoder | Y |
| Hall | Y |
| Sin/Cos | Y |
| SSI Single-turn | Y |
| SSI Multi-turn | Y |
| Resolver | Y |
| Sensor Connector | Molex Nanofit |
| Input/Outputs | |
| Max Analog Inputs | 6 |
| Max Digital Inputs | 6 |
| Max Pulse Inputs | 6 |
| Max Digital Outputs | 2 |
| PWM Brake Outputs | 1 |
| Brake Resistor Outputs | 1 |
| I/O Connector | Molex Nanofit |
| Mechanical | |
| Dimensions | 70x70x27mm |
| Cooling | Conduction |
| IP Rating | IP40 |

## S2-Series Compact Low-Power Dual-Channel

RoboG4™

### SBLG2360T
**2x30A / 1x60A**


CANopen

TÜV SÜD
**STO**

**Product Variants:**
**-S** Single-Channel

### SBLMG2360T
**2x30A / 1x60A**


CANopen

TÜV SÜD
**STO**

**Product Variants:**
**-S** Single-Channel







RoboG4™

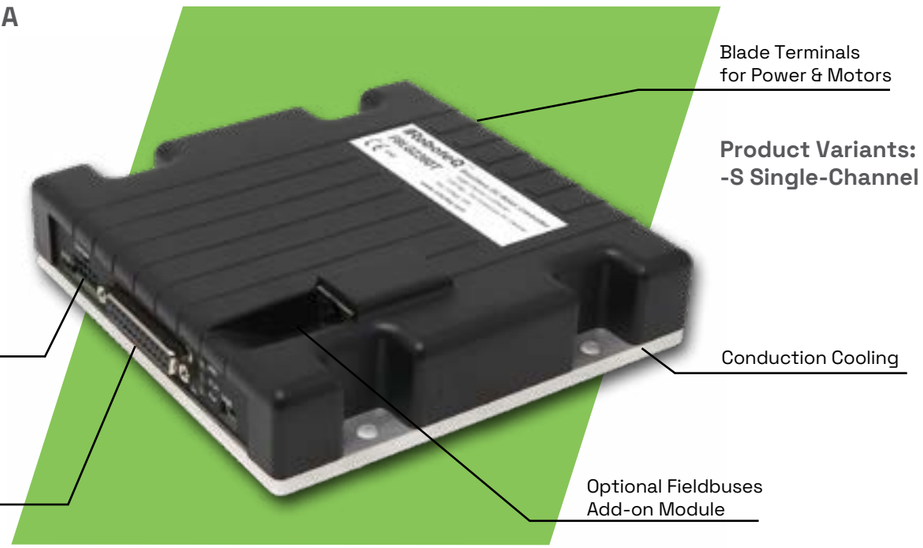
| Part Number | SBLG2360T | SBLMG2360T |
|---|---|---|
| Power | | |
| Number of Channels | 2 (1) | 2 (1) |
| Max Amps/ch | 30 (60) | 30 (60) |
| Cont Amps/ch | 16 (40) | 20 (40) |
| Max Voltage | 60 | 60 |
| Power Connections | Screw Terminal | Molex Megafit |
| STO | Y | Y |
| Communication | | |
| RS232 | Y | Y |
| RS485 | Y | |
| CANbus | Y | Y |
| Ethernet | | |
| Profinet | | |
| EthernetIP | | |
| EtherCAT | | |
| Rotor Sensor | | |
| Encoder | Y | Y |
| Hall | Y | Y |
| Sin/Cos | Y | Y |
| SSI Single-turn | Y | Y |
| SSI Multi-turn | Y | Y |
| Resolver | | |
| Sensor Connector | Molex Microfit | Molex Microfit |
| Input/Outputs | | |
| Max Analog Inputs | 8 | 8 |
| Max Digital Inputs | 10 | 10 |
| Max Pulse Inputs | 8 | 8 |
| Max Digital Outputs | 4 | 4 |
| PWM Brake Outputs | | 2 |
| Brake Resistor Outputs | | |
| I/O Connector | DSub25 | Molex Nanofit |
| Mechanical | | |
| Dimensions | 123x83x25mm | 123x83x25mm |
| Cooling | Conduction | Conduction |
| IP Rating | IP40 | IP40 |

# RoboG4™ Ultra Low Voltage Servo Drives

## F-Series Mid-Power Dual-Channel

RoboG4™

### FBLG2360T
**2x60A / 1x120A**




| Power | |
|---|---|
| Number of Channels | 2 (1) |
| Max Amps/ch | 60 (120) |
| Cont Amps/ch | 40 (90) |
| Max Voltage | 60 |
| Power Connections | Fast-on |
| STO | Y |
| **Communication** | |
| RS232 | Y |
| RS485 | Y |
| CANbus | Y |
| Ethernet | -E -P versions |
| Profinet | -P versions |
| EthernetIP | -I versions |
| EtherCAT | -C versions |
| **Rotor Sensor** | |
| Encoder | Y |
| Hall | Y |

| Rotor Sensor (Continued) | |
|---|---|
| Sin/Cos | Y |
| SSI Single-turn | Y |
| SSI Multi-turn | Y |
| Resolver | Y |
| Sensor Connector | Molex Microfit |
| **Input/Outputs** | |
| Max Analog Inputs | 10 |
| Max Digital Inputs | 8 |
| Max Pulse Inputs | 8 |
| Max Digital Outputs | 4 |
| I/O Connector | DSub25 |
| **Mechanical** | |
| Dimensions | 140x140x25mm |
| Cooling | Conduction |
| IP Rating | IP40 |

CANopen STO EtherCAT EtherNet/IP PROFINET



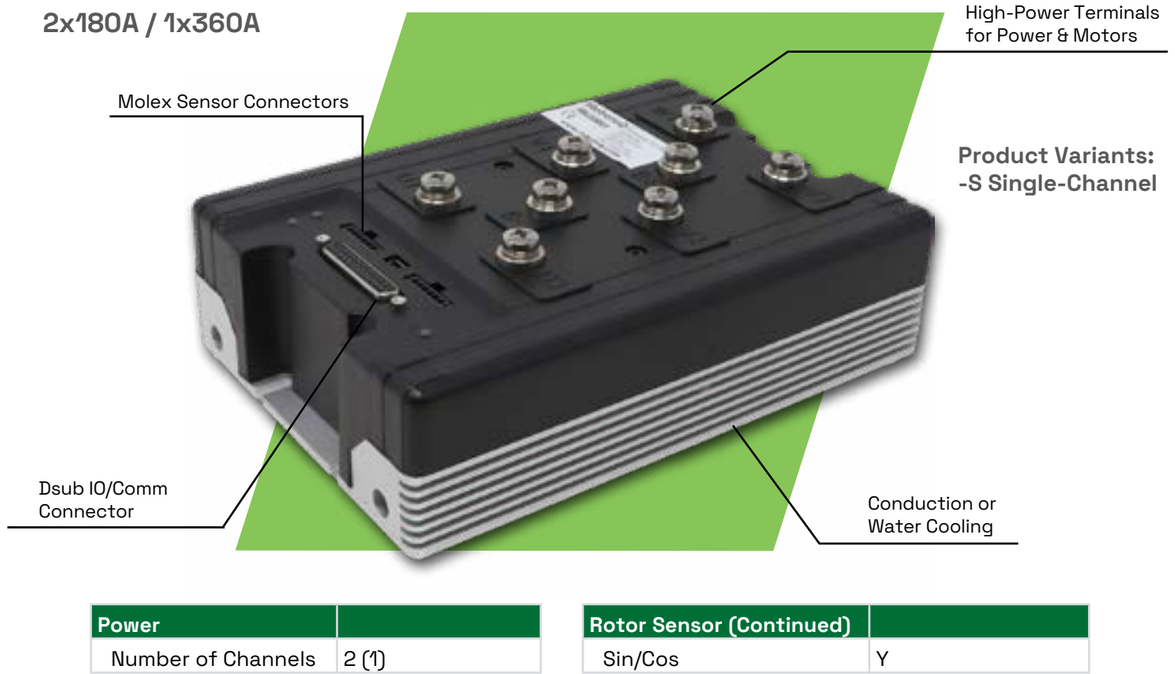


# RoboG4™ Advanced Servo Drives – High Power

## G-Series Compact High-Power Dual-Channel

RoboG4™

### GBLG2660T
**2x180A / 1x360A**



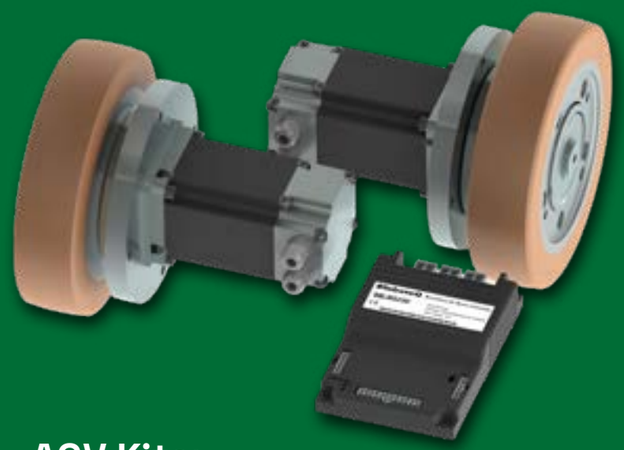

| Power | |
|---|---|
| Number of Channels | 2 (1) |
| Max Amps/ch | 180 (360) |
| Cont Amps/ch | 120 (240) |
| Max Voltage | 60 |
| Power Connections | Power Terminals |
| STO | Y |
| **Communication** | |
| RS232 | Y |
| RS485 | Y |
| CANbus | Y |
| Ethernet | -E version |
| **Rotor Sensor** | |
| Encoder | Y |
| Hall | Y |

| Rotor Sensor (Continued) | |
|---|---|
| Sin/Cos | Y |
| SSI Single-turn | Y |
| SSI Multi-turn | Y |
| Resolver | Y |
| Sensor Connector | Molex Microfit |
| **Input/Outputs** | |
| Max Analog Inputs | 8 |
| Max Digital Inputs | 8 |
| Max Pulse Inputs | 8 |
| Max Digital Outputs | 4 |
| I/O Connector | DSub25 |
| **Mechanical** | |
| Dimensions | 140x200x58mm |
| Cooling | Conduction (Water) |
| IP Rating | IP40 |

STO

# AGV Kits

Robot building can be faster and easier, with our Roboteq brand of integrated Motor/Gearbox/Wheels with matching, pre-configured and tuned drive. AGVs need two motors to move and steer. We can make this work with a single drive. Compared to the traditional One Motor/One Drive approach, the Dual Channel is simpler, cheaper, safer and easier to integrate and maintain. Two drives can even team up to drive four motors with Mecanum wheels to move Omnidirectional robots.



**Integrated Motor/ Gearbox/Wheels with Matching, Pre-Configured & Tuned Drive**

## AGV Kits:

- 2 x AGV motors (each includes VRLZ090 gearbox & AGV wheel)
- 1 x Dual-channel drive
- 1 x Drive control cable

Our RoboteQ branded drives deliver precise speed, torque, and position control; exceptional power density, dual-channel, battery operation support, regenerative braking, fieldbus connectivity, rugged construction, Safe Torque Off function, and advanced protection.

Motor frame sizes from 60mm to 142mm and payloads up to 2000kg

Both motors are supplied fitted with industry standard AGV wheels (156.4mm diameter).

With our direct mounting designs, the need for other mechanical parts is reduced along with the setup time.

RoboteQ a Nidec brand





# Integrated Motor/Gearbox/Wheels & Drive

## Ideal for:

- AGVs
- Small Electric Vehicles
- Terrestrial and Underwater Robotic Vehicles
- Hazardous Material Handling Robots
- Balancing Robots

## AGV Motor Wheel Part Numbers

| Part Number | Frame Motor Size (mm) | Brake |
|---|---|---|
| 060LDB300ROB | 60 | No |
| 060LDB30XROB | 60 | Yes |
| 089LDA300ROB | 89 | No |
| 089LDA30XROB | 89 | Yes |
| 142LDA300ROB | 142 | No |
| 142LDA30XROB | 142 | Yes |

Motor frame sizes from 60mm to 142mm and payloads up to 2000kg

## AGV Kit Part Numbers

| Part Number | Frame Motor Size (mm) | Robot Size (kg) | Brake | Motor Controller | Ethernet | Maximum RPM |
|---|---|---|---|---|---|---|
| AGV060B01G | 60 | 500 | No | SBLG2360T | No | 3000 |
| AGV060B02G | 60 | 500 | Yes | SBLG2360T | No | 3000 |
| AGV089A01G | 89 | 1000 | No | FBLG2360T | No | 3000 |
| AGV089A01G-E | 89 | 1000 | No | FBLG2360TE | Yes | 3000 |
| AGV089A02G | 89 | 1000 | Yes | FBLG2360T | No | 3000 |
| AGV089A02G-E | 89 | 1000 | Yes | FBLG2360TE | Yes | 3000 |
| AGV089A03G | 89 | 1000 | No | FBLG2360T | No | 1500 |
| AGV089A03G-E | 89 | 1000 | No | FBLG2360TE | Yes | 1500 |
| AGV089A04G | 89 | 1000 | Yes | FBLG2360T | No | 1500 |
| AGV089A04G-E | 89 | 1000 | Yes | FBLG2360TE | Yes | 1500 |
| AGV142A01G | 142 | 2000 | No | GBLG2660T | No | 2000 |
| AGV142A02G | 142 | 2000 | Yes | GBLG2660T | No | 2000 |

The 60S is an all-in-one compact package with IP54 60mm integrated servo motor and 4th generation drive precisely matched and fully optimized to deliver efficiency, performance and accuracy. The iHD60S is a space-saving integrated unit incorporating motor, encoder and drive for easy installation and serviceability for a multitude of robotics and industrial automation applications. Powered from any 20 to 60V DC power source to deliver up to 725W of smooth rotation, 3.46Nm peak at 2000 RPM. Multiple iHD60S's can be connected and work together.

## Integrated Servo Motor & Drive

- MOTOR CONTROLLER
- BRUSHLESS SERVO MOTOR
- DIGITAL SERVO DRIVE
- HIGH RESOLUTION ENCODER


| Integrated Servo Motor & Drive | | |
|---|---|---|
| Feature | Value | |
| Motor Type | Permanent magnet electronically commutated three-phase synchronous motor | |
| Feedback | 12 bit absolute encoder | |
| Frame | Flange-mounted 60mm | |
| Cooling | Convection | |
| IP Protection Class | IP54 | |
| Ambient Temperature | 0 to +40 deg C | |
| Storage Temperature | -25 to +85 deg C | |
| | A Length | B Length |
| Stall Torque | 0.64 Nm | 1.15 Nm |
| Rated Torque | 0.64 Nm | 1.15 Nm |
| Peak Torque | 1.92 Nm | 3.46 Nm |
| Rated Power | 200W | 360W |

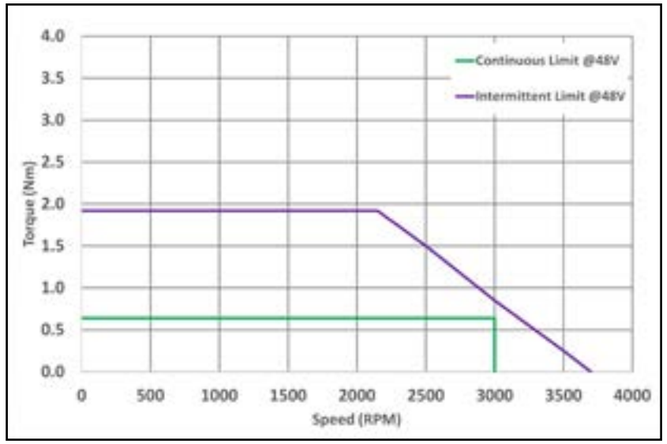
CANopen PROFINET



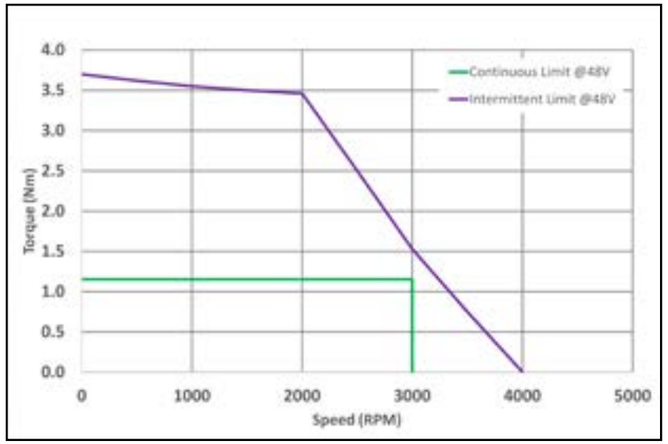


Integrated Servo Motor & Drive

A-Length Speed-Torque Curve




B-Length Speed-Torque Curve




**Stand-Alone or Multi-Axis**
Versatility for your Applications

**Fully Integrated System**
Simple, Configuration & Analysis

**Decentralized Solution**
Flexible Design & Reduced Machine Footprint

**No Cable between Motor & Drive**
Simplifies & Optimizes, Costs Less

- Compact 60mm servo motor
- Built-in, high-efficiency three-phase 4th generation motor controller
- Low-voltage, 20-60VDC operation
- Four quadrant operation. Supports regeneration
- Available 200W (0.64Nm) and 360W (1.15Nm) continuous rating at 3000 RPM and up to 3.46Nm Peak Torque at 48V
- Smooth & quiet sinusoidal commutation with field oriented control (vector control)
- Fast 16kHz current loop control
- Absolute SSI Encoder, 4096 counts per revolution
- RS485 Serial port
- IP54 protection
- MODBUS ASCII and RTU support
- STO - Safe Torque Off support. Design complies with EN/IEC 61800-5-2 (Certification Pending)
- User programmable current limit up to 40A for protecting the drive
- Built-in Basic-like scripting language. Execution speed up to 100,000 lines per second
- Automatic tuning of torque, speed and position loops plus automatic field weakening for maximum speed & torque
- Accurate speed and odometry measurement
- Optional integrated mechanical brake with efficient PWM control

# Frameless Motors

Lightweight, frameless motors delivering low inertia, high efficiency and high torque density in compact sizes for applications in the fields of robotics, automation, medical, industrial, semiconductors and more. What makes frameless brushless DC motors so unique, is their versatility in a wide range of applications.

**Torque Range (Continuous):** 0.145 Nm to 2.97 Nm
**Torque Range (Peak):** 0.457 Nm to 9.68 Nm
**Power:** 73 W to 498 W
**Warranty:** One-year limited warranty

## Frameless Motor Features & Benefits

- High torque density in a space-saving package
- High torque to inertia ratio for quick responsiveness and precision control
- Large rotor interior diameter for convenient cable routing
- Standard 200 mm lead lengths
- Low cogging torque for a smooth, steady operation
- Machine wound for high reliability with bondable magnet wire for a compact, self-supporting coil
- Constructed with corrosion-inhibitive materials
- Supported by rigorous testing for performance and reliability
- Class F insulation
- UL agency recognition
- RoHS compliant





Frameless Motors

Frameless BLDC motors fit more easily into a vast array of smaller machines that require precision and higher torque density. Additionally, frameless motors are increasingly used to replace heavier, less efficient hydraulic components in machines, that cost less to operate and maintain, with the added benefit of being environmentally friendly.

| Frameless Motors – D Series | | | | | |
|---|---|---|---|---|---|
| Part Number | D35 | D52 | D64 | D77 | D100 |
| Standard bus voltage (Vdc) | 48 | 48 | 48 | 48 | 48 |
| Standard stack heights (mm) | 20.5 | 18.5 | 25.5 | 28 | 32 |
| Data Below is Based on Standard Stack Height at 48V | | | | | |
| Rated Speed (RPM) | 4800 | 2400 | 2400 | 2400 | 1600 |
| No-load Speed (RPM) | 10000 | 4500 | 3500 | 3300 | 2900 |
| Rated torque (Nm) | 0.145 | 0.39 | 0.76 | 1.69 | 2.97 |
| Continuous Stall Torque (Nm) | 0.183 | 0.46 | 0.86 | 1.88 | 3.23 |
| Peak torque (Nm) | 0.457 | 1.38 | 2.59 | 5.63 | 9.68 |
| Rated power (W) | 73 | 98 | 191 | 425 | 498 |
| Ke (Vrms/kRPM) | 3.21 | 7.42 | 9.55 | 10.15 | 11.44 |
| Kt (Nm/Arms) | 0.053 | 0.123 | 0.158 | 0.168 | 0.189 |
| Rated current (Arms) | 3.14 | 3.61 | 5.41 | 11.19 | 17.44 |
| Peak current (Arms) | 9.68 | 12.46 | 18.03 | 36.47 | 55.63 |
| Standard inertia (kgcm2) | 0.013 | 0.047 | 0.158 | 0.45 | 1.6 |
| Stator insulation rating (deg C) | 155 | 155 | 155 | 155 | 155 |
| Stator weight (kg) | 0.077 | 0.172 | 0.417 | 0.635 | 1.193 |
| Rotor weight (kg) | 0.027 | 0.045 | 0.099 | 0.158 | 0.326 |
| Number of poles | 6 | 6 | 8 | 10 | 10 |
| R (ph-ph) (Ohms) | 2.41 | 1.6 | 0.752 | 0.244 | 0.1 |
| L (ph-ph) (mH) | 1.4 | 2.5 | 1.51 | 0.74 | 0.33 |
| Air gap (mm) | 0.50 | 0.50 | 0.50 | 0.50 | 0.76 |

Nidec Automation

High Precision Right Angle Gearboxes & Components

DYNABOX® is a high precision right angle gearbox. This product exists as a gearbox or as a worm/wheel component, DYNASET®, to be integrated into your machine or transmission box. Based on a dual-lead worm design, this precision worm-wheel technology is very suitable for any high precision and dynamic application like robotic arms, cartesian robots, gantry, printing, medical and healthcare, CNC rotating table applications and many other industrial applications.

# DYNABOX®

XL size in cast iron

| DYNABOX® HIGH PRECISION RIGHT ANGLE GEARBOXES & COMPONENTS | | | | | | |
|---|---|---|---|---|---|---|
| **Dynabox size / Backlash** | **S1 Torque (Nm) @ 3000rpm** | **S5 torque (Nm) @ 3000rpm** | **S5 torque (Nm) @ 6000rpm** | | **Ratios** | **Output Shaft Option** |
| 25 / B | 9 - 12 | 14 - 20 | 11 – 15 | | 5,2 / 7,25 / 10,25 / 14,5 / 19,5 / 30 / 45 / 60 | CR |
| 35 / E-M-B | 18 – 25 | 31 – 40 | 23 – 30 | | 5,2 / 7,25 / 10,25 / 14,5 / 19,5 / 30 / 45 / 60 / 90 | C / CR / P / 2P / CF |
| 45 / E-M-B | 38 – 61 | 60 – 98 | 54 – 74 | | 3,125 / 5,2 / 7,25 / 10,25 / 14,5 / 19,5 / 30 / 45 / 60 / 90 | C / CR / P / 2P / RF / CF |
| 55 / E-M-B | 56 – 94 | 89 – 148 | 85 – 110 | | 3,125 / 5,2 / 7,25 / 10,25 / 14,5 / 19,5 / 30 / 45 / 60 / 90 | C / CR / P / 2P / RF / CF |
| 63 / E-M-B | 103 – 155 | 174 – 245 | 123 – 179 | | 5,2 / 7,25 / 10,25 / 14,5 / 19,5 / 30 / 45 / 60 / 90 | C / CR / P / 2P / RF / CF |
| 75 / E-M-B | 161 – 212 | 269 – 334 | 187 – 252 | | 5,2 / 7,25 / 10,25 / 14,5 / 19,5 / 30 / 45 / 60 / 90 | C / CR / P / 2P / RF / CF |
| 90 / E-M-B | 306 – 385 | 460 – 599 | 332 – 454 | | 5,2 / 7,25 / 10,25 / 14,5 / 19,5 / 30 / 45 / 60 / 90 | C / CR / P / 2P / RF / CF |
| 110 / E-M-B | 458 – 688 | 779 – 1100 | 567 – 790 | | 5,2 / 7,25 / 10,25 / 14,5 / 19,5 / 30 / 45 / 60 / 90 | C / CR / P / 2P / RF / CF |
| 125 / E-M | 716 – 952 | 1181 – 1571 | 792 – 1142 | | 5,125 / 7,2 / 10,25 / 15,25 / 20,5 / 29,5 / 45 / 60 / 90 | C / P / CF |
| 160 / E-M | 1266 – 1858 | 2089 – 3066 | 1411 – 2219 | | 5,125 / 7,2 / 10,25 / 15,25 / 20,5 / 29,5 / 45 / 60 / 90 | C / P / CF |
| 200 / E-M | 2392 – 3154 | 3947 – 5204 | 2592 – 3747 | | 5,125 / 7,2 / 10,25 / 15,25 / 20,5 / 29,5 / 45 / 60 / 90 | C / P / CF |

EXPERT: E (≤1 arcmin) / MEDIUM: M (≤5 arcmin) / BASIC: B (≤10 arcmin)

DYNABOX servo gearboxes are designed to reduce the speed and increase the torque of servo motors and to optimize the ratio of inertia between the driven load and the motor. The high efficiency worm gear provides very low backlash and high torsional stiffness with quiet operation for precision applications.

## DYNABOX Gearboxes – Precision and High Dynamics

- Multiple mounting options for space savings and easy integration
- Compact right angle design
- Solid output shaft single/double/hollow shaft – keyed or with shrink disc
- Maintenance-free
- Pre-lubricated Gearboxes
- Available with Unimotor HD motors for continuous duty applications with either high inertia loads or for pulse duty applications requiring high dynamics
- Motor speed up to 6000 rpm
- Available in 3 output backlash levels:
  EXPERT: E (≤1 arcmin) / MEDIUM: M (≤5 arcmin) / BASIC: B (≤10 arcmin)

Hollow Output shaft:
C / CR / CF with Shrink disk

Plain Output shaft: P / 2P

Robot Output shaft: CR

## Features & Benefits

- Easy connection with Unimotor HD
- Space-saving right angle design
- Very low backlash
- High efficiency worm
- Quiet operation
- Very high torsional stiffness

## Codification HD Precision Worm Geared Motor

**067UDB300BFCRC-DYN-35E-5,2-CH1F**

**Gearbox Range**

**Gearbox Frame Size & Backlash**

**Gearbox Ratio**

**Gearbox Output Shaft**

- CH1F: Hollow Shaft with Shrink Disk on Right
- CH2F: Hollow Shaft with Shrink Disk on Left
- CR: Hollow Shaft with Keyway
- 2P: Dual Output Shaft
- PH1: Single Output Shaft on Left
- PH2: Single Output Shaft on Right

## HD Motor Features & Benefits

- Delivered assembled and tested in factory
- Optimized for:
  - Stall Torque Range
  - Rated Torque Range
  - Inertia
- Speed:
  - 3000rpm
  - 6000 rpm available for S5 duty
  - 2000rpm available for HD190
- Braked or Unbraked
- Speed Feedback
  - Incremental 4096ppt (CT, CR,CA)
  - Absolute Multi EnDat2,2 (EG,EF)
- Connector 1 version(T,B,J) depending on frame size
- Shaft 1 version (F)- Half/full key

Nidec Automation





DYNABOX® with Unimotor HD

| DYNABOX Servo-Gearmotor | | | | | | | |
|---|---|---|---|---|---|---|---|
| | Ratio | Dynabox Size | S1 Torque up to | Dynabox Size | S1 Torque up to | Dynabox Size | S1 Torque up to |
| HD055 & HD060 & DYNABOX | 5,2-90 | DYN-25 BASIC Backlash ≤15' | 11 Nm | – | | – | |
| HD055 & HD060/067 & DYNABOX | 5,2-90 | DYN-35 BASIC Backlash ≤10' | 23 Nm | DYN-35 MEDIUM Backlash ≤5' | 23 Nm | DYN-35 EXPERT Backlash ≤1' | 23 Nm |
| HD067 & HD089 & DYNABOX | 3,125-90 | DYN-45 BASIC Backlash ≤10' | 61 Nm | DYN-45 MEDIUM Backlash ≤5' | 61 Nm | DYN-45 EXPERT Backlash ≤1' | 61 Nm |
| HD067 & HD089 & DYNABOX | 3,125-90 | DYN-55 BASIC Backlash ≤10' | 94 Nm | DYN-55 MEDIUM Backlash ≤5' | 94 Nm | DYN-55 EXPERT Backlash ≤1' | 94 Nm |
| HD067 & HD089 & DYNABOX | 5,2-90 | DYN-63 BASIC Backlash ≤10' | 155 Nm | DYN-63 MEDIUM Backlash ≤5' | 155 Nm | DYN-63 EXPERT Backlash ≤1' | 155 Nm |
| HD089 & HD115 & DYNABOX | 5,2-90 | DYN-75 BASIC Backlash ≤10' | 212 Nm | DYN-75 MEDIUM Backlash ≤5' | 212 Nm | DYN-75 EXPERT Backlash ≤1' | 212 Nm |
| HD089 & HD115 DYNABOX | 5,2-90 | DYN-90 BASIC Backlash ≤10' | 385 Nm | DYN-90 MEDIUM Backlash ≤5' | 385 Nm | DYN-90 EXPERT Backlash ≤1' | 385 Nm |
| HD115 & HD142 & DYNABOX | 5,2-90 | DYN-110 BASIC Backlash ≤10' | 688 Nm | DYN-110 MEDIUM Backlash≤5' | 688 Nm | DYN-110 EXPERT Backlash ≤1' | 688 Nm |

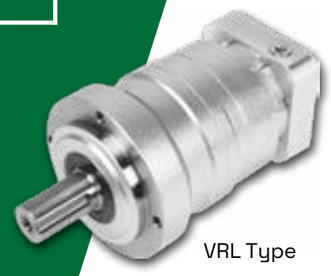
GIRARD TRANSMISSIONS
A Nidec Group Company

## Codification HD Planetary Geared Motor

**067UDB300BFCRC-PRE-062-5-K**
**067UDB300BFCRC-VRL-070C-5-K**
**067UDB300BFCRC-VRS-075C-5-K**

- **Gearbox Range**
- **Gearbox Frame Size**
- **Gearbox Ratio**
- **Gearbox Output Shaft**
  **K: Keyed Shaft**

PRE Type

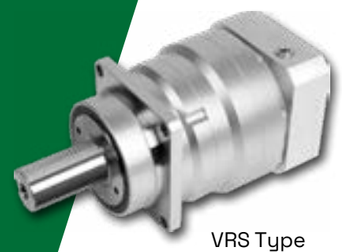


VRL Type

**High load carrying capacity combined with high levels of precision, Nidec's planetary drives have the necessary power reserves for challenging power transmission requirements. Low noise, low backlash and high efficiency are achieved through the pinpoint accuracy of the helical gearing and optimum tooth engagement conditions.**

## Features & Benefits

- Compact design
- High level of efficiency
- High torsional rigidity
- Low mass moment of inertia
- High overload capacity
- Highly-dynamic
- Large transmission ratios
- Flange mount B5 or B14



VRS Type





Planetary Gearboxes with Unimotor HD

| Planetary Servo-Gearmotor | | | | | | | |
|---|---|---|---|---|---|---|---|
| | | Gear PRE | Torque up to | Gear VRL | Torque up to | Gear VRS | Torque up to |
| | Ratio | BASIC 8-10 arcmin | | MEDIUM <5 arcmin | | EXPERT <3 arcmin | |
| HD060 & HD067 & Planetary | ≤10 1-stage | PRE-062<br>PRE-082 | 46 Nm<br>120 Nm | VRL-070C<br>VRL-090C | 28 Nm<br>84 Nm | VRS-060C<br>VRS-075C | 28 Nm<br>84 Nm |
| | >10 2-stages | PRE-062<br>PRE-082 | 46 Nm<br>120 Nm | VRL-070C<br>VRL-090C | 45 Nm<br>118 Nm | VRS-060C<br>VRS-075C | 45 Nm<br>118 Nm |
| HD089 & Planetary | ≤10 1-stage | PRE-082<br>PRE-120 | 120 Nm<br>280 Nm | VRL-090C<br>VRL-120C | 84 Nm<br>190 Nm | VRS-075C<br>VRS-100C | 84 Nm<br>190 Nm |
| | >10 2-stages | PRE-120 | 280 Nm | VRL-120C | 280 Nm | VRS-100C | 280 Nm |
| HD115 & Planetary | ≤10 1-stage | PRE-120<br>PRE-160 | 280 Nm<br>700 Nm | VRL-120C<br>VRL-155C | 190 Nm<br>380 Nm | VRS-100C<br>VRS-140C<br>VRS-180C | 190 Nm<br>380 Nm<br>910 Nm |
| | >10 2-stages | PRE-160 | 700 Nm | VRL-155C | 590 Nm | VRS-140C | 590 Nm |
| HD142 & Planetary | ≤10 1-stage | PRE-160 | 700 Nm | VRL-155C | 380 Nm | VRS-140C<br>VRS-180C | 380 Nm<br>910 Nm |
| | >10 2-stages | PRE-160 | 700 Nm | VRL-155C | 590 Nm | VRS-140C<br>VRS-180C | 590 Nm<br>1300 Nm |
| HD190 & Planetary | ≤10 1-stage | – | | – | | VRS-180 | 910 Nm |
| | >10 2-stages | – | | – | | VRS-180C | 1300 Nm |

Nidec Automation

# Brushless DC Right Angle Gearmotors

Brushless DC right angle gearmotors have a distinct advantage of having very low audible noise. The right angle output configuration result in a compact, low profile mounting. High efficiency, relative to standard worm gear reducers, is achieved with the use of a custom-designed high-strength plastic worm wheel with optimized tooth profile. This special design allows the gearmotor to be easily back-driven.

| RA25-5700B Brushless DC Right Angle Gearmotor | | | | | |
|---|---|---|---|---|---|
| **Gear Reducer** | | **Motor** | | **Integrated Drive** | |
| Housing Material | Die Cast Zinc | Type | Electronically Commutated | Type | 2 Quadrant Trapezoidal Programmable |
| Axial Load / Radial Load | 200 N / 250 N | Voltage | 12Vdc to 32Vdc | Speed Control | 0 to 5Vdc or 0 to 10Vdc |
| Efficiency | 75 to 80% | Output Power | 45 to 140W with external drive | Protection | Over Current & Over Temperature |
| Lubrication | Synthetic Grease | Rotor Magnets | High Energy Skewed to Reduce Cogging | Braking | Dynamic |
| Output Speeds | 75 to 400 RPM | Insulation Class | F | Programming Options | Acceleration, Velocity, Current Limit |
| Gear Ratio | 10.25:1 | Rotation | Reversible | Tachometer Output | 2 Channels – 6 PPR |

RA25-5700B

# Brushless DC Right Angle Gearmotors

The high efficiency allows the use of a smaller, more energy efficient motor to achieve the same output power versus a standard worm gear reducer. The 5700B brushless motor offers extended life, high efficiency, and controllability for demanding applications

| RA31-5700B Brushless DC Right Angle Gearmotor | | | | | |
|---|---|---|---|---|---|
| **Gear Reducer** | | **Motor** | | **Integrated Drive** | |
| Housing Material | Die Cast Zinc | Type | Electronically Commutated | Type | 2 Quadrant Trapezoidal Programmable |
| Axial Load / Radial Load | 100 N / 300 N | Voltage | 12Vdc to 32Vdc | Speed Control | 0 to 5Vdc or 0 to 10Vdc |
| Efficiency | 75 to 80% | Output Power | 45 to 140W with external drive | Protection | Over Current & Over Temperature |
| Lubrication | Synthetic Grease | Rotor Magnets | High Energy Skewed to Reduce Cogging | Braking | Dynamic |
| Output Speeds | 75 to 400 RPM | Insulation Class | F | Programming Options | Acceleration, Velocity, Current Limit |
| Gear Ratio | 10:1, 15:1 | Rotation | Reversible | Tachometer Output | 2 Channels – 6 PPR |

RA31-5700B

# Brushless DC Parallel Shaft Gearmotors

Nidec's brushless DC gearmotors are designed for applications requiring a high degree of controllability and efficiency. The gearmotors come with either hall-only feedback or a fully integrated control board, internal to the motor. The integral control is a fully digital control with the latest in micro-processor technology on board. The motor can be mounted to our various parallel shaft gearboxes depending on the application requirements.

**Motor**

- Ball bearing construction
- Class F Insulation
- 3 phase stage – wye connection
- Integral hall sensors for rotor position

**Internal controller**

- Closed loop sinusoidal
- Speed control: Analog (0-10Vdc)
- Locked rotor protection
- Current limit: Internal 1 Amp
- Speed feedback 7.5 PPR
- Open loop Sinusoidal
- Speed control: PWM (20-30 kHz)
- Locked Rotor protection
- Speed feedback: 5 PPR

**Gearbox**

- Sintered or needle bearings: output shaft
- Sintered powder metal gearing
- Helical first stage for low audible noise

**Optional Features**

- Customized output shafts including dual output
- Various lead lengths, terminals, and connectors

MPG-42F

BLA-42F

Nidec Automation





Brushless DC Parallel Shaft Gearmotors

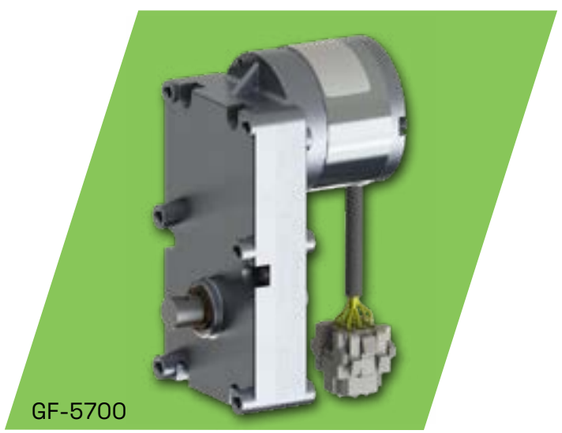
| MPG-42F Brushless DC Parallel Shaft Gearmotor | | | | | |
|---|---|---|---|---|---|
| **Gear Reducer** | | **Motor** | | **Integrated Drive** | |
| Housing Material | Glass Filled Plastic | Type | Electronically Commutated Outer Rotor | Type | Sinusoidal |
| Gears | Sintered Metal (Low Noise Plastic Helical Input) | Voltage | 24Vdc +/- 10% | Speed Control | 0 to 10Vdc |
| Bearings | Sintered | Output Power | 3 Watts | Protection | Over Current & Locked Rotor Temperature |
| Lubrication | Synthetic Grease | Rotor Magnets | Ferrite | Braking | None |
| Output Speeds | 0.5 to 4.5 RPM | Insulation Class | B | Programming Options | Constant Speed Profiles |
| Maximum Torque | 3 Nm (27 lb-in) | Rotation | Reversible | Tachometer Output | 7.5 PPR |
| Gear Ratio | 301:1 | Rotor Positioning | Hall Elements | Mating Connector | SMH250-05 |

| BLA-42F Brushless DC Parallel Shaft Gearmotor | | | | | |
|---|---|---|---|---|---|
| **Gear Reducer** | | **Motor** | | **Integrated Drive** | |
| Housing Material | Zinc Die Cast | Type | Electronically Commutated Outer Rotor | Type | Sinusoidal |
| Gears | Sintered Metal (Low Noise Plastic Helical Input) | Voltage | 24Vdc ± 10% | Speed Control | PWM (20 to 30 kHz) |
| Bearings | Ball Bearing Output | Output Power | 3W | Protection | Locked Rotor Protection detects no movement of rotor within 1 sec; Auto-recovery: 3 sec |
| Lubrication | Synthetic Grease | Rotor Magnets | Ferrite | Braking | Dynamic |
| Output Speeds | 0.5 to 4 RPM | Insulation Class | B | Current Limit | 1.7 Amps |
| Maximum Torque | 9 Nm (80 lb-in) | Rotation | Reversible | Speed Feedback | 5 PPR |
| Gear Ratio | 485:1 + | Rotor Positioning | Hall Elements | Mating Connector | JST PARP-05V |

# Brushless DC Parallel Shaft Gearmotors

Our parallel shaft BLDC gearmotors are designed and engineered for low audible noise, versatility and extended life with a wide choice of gear reductions and materials to suit various applications.

| GF-5700 Brushless DC Parallel Shaft Gearmotor | | | | | |
|---|---|---|---|---|---|
| **Gear Reducer** | | **Motor** | | **Integrated Drive** | |
| Housing Material | Zinc Die Cast | Type | Electronically Commutated | Type | 2 Quadrant Trapezoidal Programmable |
| Gears | Sintered Metal (Low Noise Plastic Helical Input Available) | Voltage | 12Vdc to 32Vdc | Speed Control | 0 to 5Vdc or 0 to 10Vdc |
| Bearings | Sintered or Needle | Output Power | 45 to 140W w/ external drive | Protection | Over Current & Over Temperature |
| Lubrication | Synthetic Grease | Rotor Magnets | High energy skewed to reduce cogging | Braking | Dynamic |
| Output Speeds | 1 to 35 RPM | Insulation Class | F | Programming Options | Acceleration, Velocity, Current Limit |
| Maximum Torque (Ratio Dependent) | 22.5 Nm (200 lbs-in) | Rotation | Reversible | Encoder Output | 2 Channels – 6 PPR |
| Gear Ratio | 1044:1, 495:1, 178:1 | Rotor Positioning | Three Hall Effect Sensors | | |



GF-5700

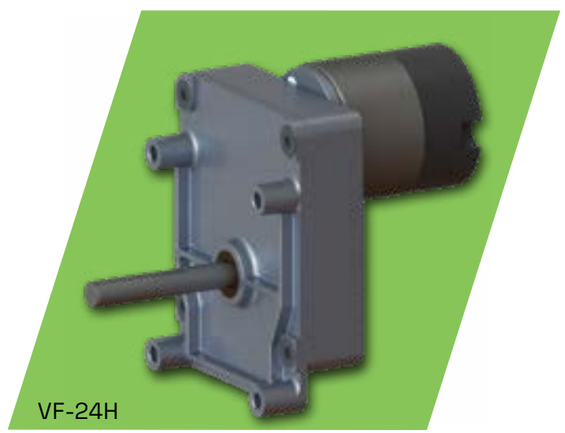




# Brushless DC Parallel Shaft Gearmotors

When teamed up with our brushless DC motors, the result is a combination that boasts high efficiency and controllability at a competitive price.

| VF-24H Brushless DC Parallel Shaft Gearmotor | | | | | |
|---|---|---|---|---|---|
| **Gear Reducer** | | **Motor** | | **Integrated Drive** | |
| Housing Material | Zinc Die Cast | Type | Electronically Commutated | Type | Sinusoidal |
| Gears | Sintered Metal (Low Noise Plastic Helical Input Available) | Voltage | 12Vdc or 24Vdc | Speed Control | PWM (20kHz) |
| Bearings | Sintered or Needle | Output Power | 10 to 30W w/ integral drive | Protection | Locked Rotor & Thermal (165° C) |
| Lubrication | Synthetic Grease | Rotor Magnets | High energy skewed to reduce cogging | Braking | Dynamic |
| Output Speeds | 25 TO 300 RPM | Insulation Class | B | Current Limit | 3 amps |
| First Gear | Powder Metal or Plastic | Rotation | Reversible | Encoder Output | 2 Channels – 100 PPR |
| Gear Ratio | 25:1 to 75:1 | Rotor Positioning | Three Hall Effect Sensors | Mating Connector | ZHR-8 |



VF-24H

# Brushless DC Planetary Gearmotors

The 52P planetary gear reducer has higher power density and larger reduction capability in a compact package over the standard parallel shaft reducer. The 5700B brushless motor offers extended life, high efficiency, and controllability for demanding applications. Additionally, the planetary gear system delivers high torque transmission in a small, space-saving package.

**Motor**

- Low cogging (skewed magnets)

Speed control: 0–5 or 0–10 Vdc

- Controls: Integral or hall only controls High efficiency
- Long life (dual ball bearing)

**Gearbox**

- Dual ball bearing output shaft
- Wide range of gear ratios
- Compact package size
- High torque density

**Optional Features**

- Helical first stage gear for low audible noise
- Various lead lengths, terminals and connectors
- Customized output shafts including dual output
- Brakes: Electromagnetic





Brushless DC Planetary Gearmotors

| 52P-5700B Brushless DC Planetary Gearmotor | | | | | |
|---|---|---|---|---|---|
| **Gear 52P Reducer** | | **Motor** | | **Integrated Drive** | |
| Housing Material | Sintered Metal | Type | Electronically Commutated | Type | 2 Quadrant Trapezoidal Programmable |
| Gears | Sintered Metal (Low Noise Plastic Helical Input Available) | Voltage | 12Vdc to 32Vdc | Speed Control | 0 to 5Vdc or 0 to 10Vdc |
| Bearings | Dual Ball Bearing on Output Shaft | Output Power | 45 to 140W with external drive | Protection | Over Current & Over Temperature |
| Lubrication | Synthetic Grease | Rotor Magnets | High Energy Skewed to Reduce Cogging | Braking | Dynamic |
| Output Speeds | 4 to 200 RPM | Insulation Class | F | Programming Options | Acceleration, Velocity, Current Limit |
| Maximum Torque (Ratio Dependent) | 20 Nm (177 lb-in) | Rotation | Reversible | Encoder Output | 2 Channels – 6 PPR |
| Gear Ratio | 4.5:1 to 512:1 | Rotor Positioning | Three Hall Effect Sensors | | |

52P-5700B

Nidec Automation

# PMDC Brushed Right Angle Gearmotors

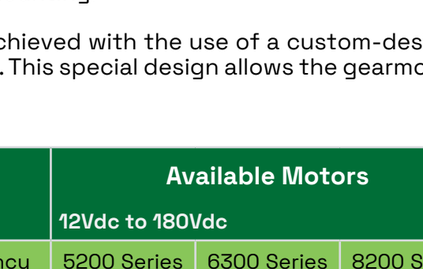
PMDC brushed right angle gearmotors feature a high efficiency worm gear design that allows you to downsize the motor and draw less current for a given load — creating a more energy efficient solution with a smaller footprint. These gearmotors have the distinct advantage of generating very low audible noise. The right angle output configuration results in a compact, low-profile mounting.

High efficiency — relative to standard worm gearboxes — is achieved with the use of a custom-designed, high-strength plastic worm wheel with optimized tooth profile. This special design allows the gearmotor to be easily back-driven.

| PMDC Brushed Right Angle Gearmotors | | | | | Available Motors 12Vdc to 180Vdc | | |
|---|---|---|---|---|---|---|---|
| Series | Axial Load/ Radial Load | Gear Ratios | Output Speeds RPM | Efficiency | 5200 Series | 6300 Series | 8200 Series |
| RA25 | 200 N / 250 N | 10.25:1 | 75 to 400 | 75 to 80% | ✔ | | |
| RA31 | 100 N / 300 N | 10:1<br>15:1 | 75 to 400 | 75 to 80% | | ✔ | |
| RA40 | 300 N / 500 N | 10:1<br>15:1<br>30:1 | 75 to 400 | 65 to 70% | | | ✔ |

- Three Gearbox Sizes: RA25, RA31, and RA40
- Gearbox Housing: Zinc Die-Cast
- High efficiency Gearing
- Worm Gears: Plastic or Bronze
- UL, CE, CCC, RoHS Agency Approvals
- Ball bearings in motor & gearbox
- Custom output shafts
- Gearboxes are permanently lubricated with synthetic gear grease
- Low audible noise
- Durable brushes
- Face or foot mounting

RA25 Series



RA31 Series

RA40 Series





# PMDC Brushed Right Angle Gearmotors

Our range of right angle worm gearmotors deliver excellent performance in a compact size. Economically priced, they're available with left- or right-handed configurations as well as double output shafts. The driven load can be connected by coupling, sprocket, pulley or gears. The design incorporates integral motors directly mounted to the gearcase. Features include forged bronze worm wheel, hardened steel worm shaft, high tensile strength diecast aluminum alloy gearcase, tapered roller and ball bearings with double lipped oil seals on the input and output shafts.

| PMDC Brushed Right Angle Gearmotors | | | | | | | |
|---|---|---|---|---|---|---|---|
| Model | Power | Voltage | Insulation Class | Max Speed | Shipping Weight | Gear Ratio | Example PN |
| MSB100 | 3/4 HP | 24 V | H | 160 RPM | 30 lbs | Bi-Directional | MSB1006959C8 |
| MC137 | 1/4 HP | 36 V | H | 90 RPM | 15 lbs | 27:1 | MC137C5199C27 |
| MC156 | 1 HP | 24 V | H | 240 RPM | 27 lbs | 10:1 | NA |
| MC200 | 1 HP | 24 V | H | 250 RPM | 30 lbs | 10:1 | MC200C4010C10 |

MSB100

MC137

MC156

MC200

# PMDC Brushed Parallel Shaft Gearmotors

Our line of PMDC Gearmotors offer maximum application flexibility in gearmotors designed to exacting specifications. All models offer custom windings, gear-ratios and a wide variety of accessories to meet specific performance requirements.

| PMDC Brushed Parallel Shaft Gearmotors | | | | |
|---|---|---|---|---|
| Series | Maximum Permissible Torque (lb/inch) | Output Speeds RPM | Output Shaft Diameters | 5000 Series |
| GF | 200 | 1 to 50 | 0.375”<br>0.5””<br>10mm | ✔ |
| VF | 50 | 20 to 150 | 0.3125”<br>0.375” | ✔ |
| KF | 30 | 50 to 500 | 0.25”<br>0.3125” | ✔ |

- Class B (130°C) or Class F (155°C) armature insulation
- EMI Suppression available
- Incremental Encoders: Magnetic, Optical, and Capacitive with various resolutions
- Gearboxes are permanently lubricated with synthetic gear grease
- Gearing Options: Sintered metal, hardened steel, and injection molded plastic
- Customized output shafts
- Double output shaft extension
- Various lead lengths, termination and custom harnesses
- Needle bearings for high radial loads
- Various mounting options including case mounting
- Durable Brushes
- Ball or Sintered Bearings for motors

GF Series

VF Series

KF Series

# PMDC Brushed Planetary Gearmotors

Compact and lightweight, planetary gearboxes have higher torque density and peak torque than parallel shaft or right angle gearboxes. The first stage planet gears are helical plastic for low noise. The pinion is hobbed directly on to the motor shaft. The ring gear and second stage planet gears are sintered powder metal. The output shaft is hardened steel and supported by dual ball bearings.

| PMDC Brushed Planetary Gearmotors | | | | | | |
|---|---|---|---|---|---|---|
| Series | Axial Load/ Radial Load | Gear Ratios | Output Speeds RPM | 5000 Series | 5200 Series | 6300 Series |
| 42P | 100 N / 300 N | 23:1 to 530:1 | 1 to 400 | ✔ | | |
| 52P | 300 N / 400 N | 4.5:1 to 512:1 | 4 to 200 | | ✔ | ✔ |

- Gearboxes are permanently lubricated with synthetic gear grease
- Incremental encoders: magnetic, optical, and capacitive with various resolutions
- Electromechanical brakes: power-on, power-off
- UL, CE, CCC, RoHS agency approvals
- Low noise, helical 1st stage gearing
- Dual ball bearings on output shaft
- Two gearbox sizes: 42P and 52P
- Compact, high torque design
- EMI suppression available
- High shock load capacity
- Custom output shafts
- Durable brushes
- Clutch

42P Series

52P Series

# PMDC Brushed Motors

PMDC Brushed Motors

Durable and economical, PMDC brushed motors can be found in demanding applications such as health care diagnostics, money handling systems, material transport, and door operators. Nidec offers a broad range of spur, planetary, and worm gearboxes are available to meet all your fractional horsepower gearmotor needs.

| PMDC Brushed Motors | | | | | | | | | | |
|---|---|---|---|---|---|---|---|---|---|---|
| Series | Voltage | Output Power (Watts) | Poles | Rotation | Termination | Insulation Class | Maximum Speed (RPM) | Temp. Range | Bearings | EMI Suppression |
| 3100 | 9Vdc to 48Vdc | 5 to 11 | 2 | Bi-Directional | #22 AWG Wire | F | 10,000 | -30°C to +80°C | Sintered Spherical or Ball Bearing | Internal to Motor End-Shield |
| 5000 | 6Vdc to 48Vdc | 8 to 30 | 2 | Bi-Directional | (2) 0.187" Spade Terminals or #22 AWG Wire | F | 8,000 | -30°C to +80°C | Sintered Spherical or Ball Bearing | External to Motor End-Shield |
| 5200 | 12Vdc to 150Vdc | 25 to 60 | 2 | Bi-Directional | #18 AWG Wire | B | 6,000 | -30°C to +80°C | Ball Bearing | Internal to Motor End-Shield |
| 6300 | 12Vdc to 180Vdc | 50 to 100 | 2 | Bi-Directional | #18 AWG Wire | F | 6,000 | -30°C to +80°C | Ball Bearing | Internal to Motor End-Shield |
| 8200 | 12Vdc to 240Vdc | 120 to 240 | 2 | Bi-Directional | #18 AWG Wire | F | 6,000 | -30°C to +80°C | Ball Bearing | Internal to Motor End-Shield |

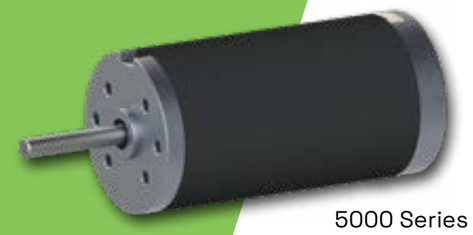
**Features**

- Continuous and intermittent duty
- UL recognized construction
- Ball or sintered bearings
- Durable brushes
- Multiple frame sizes and lengths
- Coated steel housings
- Die cast endbells
- High power density
- Robust design

**Optional Features**

- Incremental encoders: magnetic, optical, and capacitive with various resolutions
- Output shaft modifications
- Emi suppression available
- Custom wire harnesses
- Custom windings

3100 Series



5000 Series

5200 Series

6300 Series

8200 Series

Nidec Automation

# AC Induction Parallel Shaft Gearmotors

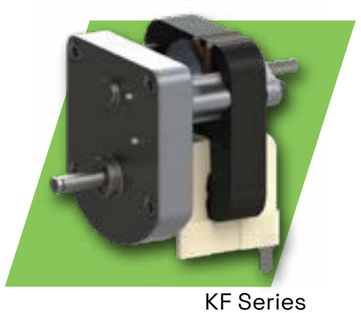
AC induction parallel shaft gearmotors are suitable for a number of different applications and requirements. Each series combines the very best of Nidec's AC induction parallel shaft gear reducers with outstanding single phase AC sub-fractional horsepower induction motors.

- Single Phase AC Sub-Fractional Horsepower Induction Motors (Shaded-Pole and Permanent Split Capacitor)
- Reversible Direction PSC Motors (3400 Series)
- Dual Frequency winding available (3700, 4400, 4500, and 6400 Series Motors)
- Customized output shafts
- Various lead lengths, termination and custom harnesses
- Various mounting options
- Cone brake, positive stop brake and coil spring break
- Needle bearings for high radial loads
- Gearboxes are permanently lubricated with synthetic gear grease
- Gearing Options: Sintered metal, hardened steel, and injection molded plastic
- Cooling fan
- UL, CSA, CE, CCC, RoHS, REACH compliant

| AC Induction Parallel Shaft Gearmotors | | | | Available Motors 120V/60Hz or230V/50Hz | |
|---|---|---|---|---|---|
| Series | Maximum Permissible Torque (lb/inch) | Output Speeds RPM | Output Shaft Diameters | 3400 Series Permanent Split Capacitor Reversible | 3700 Series Shaded-Pole Low Slip Uni-Directional |
| GF | 200 | 1 to 35 | 0.375"<br>0.5"<br>10mm | ✔ | ✔ |
| VF | 50 | 20 to 150 | 0.3125"<br>0.375" | | ✔ |
| KF | 30 | 50 to 400 | 0.25"<br>0.3125" | | ✔ |

GF Series

VF Series



KF Series

# High Volume, Low Speed (HVLS) Fan Motors

Blade Runner

Experience the innovation of Nidec's Blade Runner® direct-drive motor series, which delivers efficient, quiet and reliable operations in a compact design, providing the torque you need without the noise, weight and maintenance associated with gear-driven motors.

| Variation | Horse Power (REF) | Model Number | A, (in) | B, (in) | Shaft Type | Physical Configuration | Connection Type | Weight (lbs) | Rotor Inertia (kg*m^2) |
|---|---|---|---|---|---|---|---|---|---|
| 000 | 1 HP | M105EMC1020015H | 13.42 | 9.82 | Solid Shaft | Standard Endshield w/ Standard Bolt | Wago Connector | 77.93 | 0.0273 |
| 001 | 2 HP | M105EMC1021015H | 14.67 | 11.07 | Solid Shaft | Standard Endshield w/ Standard Bolt | Wago Connector | 116.02 | 0.0538 |
| 002 | 1 HP | M105DDD0000015H | 13.42 | 9.82 | Solid Shaft | Standard Endshield w/ Extended Bolt | Flying Leads | 77.93 | 0.0273 |
| 003 | 2 HP | M105DDD1019015H | 14.67 | 11.07 | Solid Shaft | Standard Endshield w/ Extended Bolt | Flying Leads | 116.02 | 0.0538 |
| 004 | 2 HP | M105NRT1022015H | 14.22 | 11.07 | Hollow Shaft | Dual Endshield w/ Extended Bolt | Flying Leads | 116.02 | 0.0538 |

| Description | 1HP – 230VAC | 1HP – 460VAC | 2HP – 230VAC | 2HP – 460VAC |
|---|---|---|---|---|
| $K_t$ (Nm/Arms) @ (Rated Torque/Speed) ± 10% | 13.71 | 27.42 | 28.80 | 57.60 |
| $K_e$ (Vrms/kRPM) ± 10% | 940 | 1880 | 1880 | 3600 |
| Resistance (L-L) ± 10%, (Ohms) | 3.03 | 10.24 | 4.40 | 16.55 |
| Inductance (mH @ 1kHz) ± 10% | 89.29 | 314 | 145.88 | 567 |
| Drive System Input Voltage | 230VAC | 460VAC | 230VAC | 460VAC |
| Rated Torque (N/m) | 86 | 86 | 170 | 170 |
| Rated Speed (RPM) | 90 | 90 | 60 | 60 |
| Motor Rated Input Current (Amps) | 6 | 3 | 6 | 3 |
| Motor Rated Power (kW) | 0.8 kW | 0.8 kW | 1.2 kW | 1.2 kW |
| Efficiency at Rated Torque/Speed ± 5% | 82% | 82% | 80% | 80% |

| Bearing | Dynamic Load (N) | Static Load (N) |
|---|---|---|
| 6310 Drive-End | 68,100 | 45,500 |
| 6207 Opposite Drive-End | 25,700 | 15,300 |

- Variable speed and variable output when paired with OEM variable frequency control
- High torque-to-weight ratio
- Advanced sensorless field orientated control
- Ultra-smooth, high-precision motion quality
- Ingress protection for harsh environments
- UL Class F insulation system (155°C)
- Performance in high ambient conditions (50°C)
- Over-current protection
- RoHS and REACH compliant
- Hollow shaft available for lighting and accessories
- ODE and DE mounting capabilities

# About Nidec

Nidec Automation
Head Office
St. Louis, Missouri USA
www.NidecAutomation.com

## Nidec Automation

Headquartered in St. Louis, Missouri, Nidec Automation designs and manufactures innovative precision electric motors, gearmotors and drives for modern automation applications. Nidec Automation's sophisticated solutions increase the speed, reliability and safety of autonomous guided vehicles, automated storage & retrieval systems, conveyance systems, and robotics applications.

Nidec Automation also delivers geared solutions and other specialty motor and drive technologies for applications including HVLS fans, marine motors, door access & entrance systems, pellet stoves & grills, pool pumps, floor care, commercial kitchen automation equipment and wind energy. With manufacturing and engineering operations worldwide, Nidec Automation is your strategic partner for meeting the productivity demands of a busy world.

Nidec Automation

Nidec Corporate
Head Office
Kyoto, Japan
www.Nidec.com

## Nidec Corporation

With headquarters in Kyoto, Japan, Nidec is the world's leading electric motor manufacturer, with 2023 revenues of over $18B USD and comprised of over 300 group companies and 122,000 employees. A pioneer in electrification, Nidec has worked across a wide array of industries ranging from information technology, automotive, appliance, commercial, industrial and machinery since its foundation in 1973. Nidec is a trusted development partner in multiple high-growth spaces including industrial automation, vehicle electrification and energy storage, providing world-class technology, support, and localized manufacturing to support industry leaders around the globe.

Nidec® All for dreams™