

# Products for Washdown, Food Grade & Hygienic Environments

Undeniably Clean Solutions.



NIDEC DRIVE TECHNOLOGY CORPORATION

# 70 years of gear drive development. Your competitive advantage

Since 1952, Nidec Drive Technology Corporation has been synonymous with innovation, quality and reliability in the development and manufacturing of precision gearboxes for motion control applications. Our company ships north of 150,000 units a month out of our manufacturing plants throughout Asia-Pacific and Europe. Core technologies include planetary, worm, hypoid, bevel, strain wave and cycloidal gearing. Our diverse product portfolio, state-of-the-art equipment, engineering knowhow and manufacturing scale allow our customers to compete and expand their businesses globally. Our aim is to continue to innovate and provide best-in-class products and services for our customers.

# Serving Your Industry





**Dairy Applications** 

Milk, Cheese, Yogurt, Egg Processing, Pasteurization, Homogenization, Churning, Filling, Capping, Labeling, Conveying, Cartoning, Case Packing

#### Seafood Applications

Heading, Gutting, Deboning, Mincing, Filleting, Trimming, Descaling, Grading, Packing, Labeling, Conveying, Palletizing







#### Fruit & Vegetable Applications

Sorting, Splitting, Peeling, Coring, Stemming, Slicing, Dicing, Canning, Conveying, Case Packing, Palletizing

#### Meat & Poultry Applications

Skinning, Trimming, Deboning, Portion Cutting, Grading, Batching, Coating, Frying, Marinating, Packing, Labeling, Tray Handling

#### Bakery & Snack Food Applications

Frying, Baking, Decorating, Seasoning, Tray Forming, Conveying, Weighing, Case Packing



#### Pharmaceutical Applications

Mixing, Forming, Dosing, Filling, Vial handling, Blister Packing, Cartoning, Case Packing, Palletizing

#### **Cosmetics Applications**

Mixing, Dosing, Filling, Capping, Labeling, Feeding, Sorting, Cartoning, Case Packing, Palletizing

# Optimal protection & reliability upstream through end-of-line

Food, beverage, pharmaceutical and cosmetics equipment builders compete on their ability to deliver more innovative processing and packaging, with higher throughput and less downtime. Strict hygiene regulations require equipment to be cleaned often with water, steam and harsh chemicals that can quickly destroy ordinary machine components. These operating conditions pose challenges for gearbox manufacturers and we are up to the task. Nidec Drive Technology offers both, standard options and dedicated products designed to meet the needs of these challenging environments.

We start by modifying our core VR series product with features such as stainless-steel output shaft and fasteners, IP65 ingress protection, food grade paint, nickel plating and food grade lubrication. These features can handle anything from dry or wipe-down applications to mid-range wash down requirements. Standard off-the-shelf components allow us to deliver a solution quickly and cost-effectively. By offering a wide range of stand-alone options, our customer gets exactly what they need–nothing more, nothing less. These options have been highly successful in secondary packaging applications such as cartoners and case packers where there is no direct contact with food but corrosion resistance is still of importance.

As we move further upstream, the pressure at which machines are cleaned and the caustic agents used to clean them create additional challenges for mechanical components. Drive systems may also be located directly above the food line. Our HRL series inline planetary takes things up a notch by offering an all-stainless design with IP66 ingress protection. HRL can handle a significantly higher level of pressurized water spray compared to our VR products. The all-stainless design means absolutely no chance for corrosion or oxidation that can be found in carbon steel, painted or aluminum surface finishes. Adaptation is available to any standard servomotor.

For environments where sterile production and cleanliness are of the utmost importance, our HRV series inline planetary and EJS series right angle worm offer hygienic solutions that are virtually unmatched in the industry. Smooth rolled 316L grade stainless housing surfaces help eliminate free standing water. Rounded corners and edges eliminate dead spaces to prevent bacteria growth. IP69K rating means these products can withstand high pressure, high temperature cleaning with caustic chemicals or steam. These features allow direct contact with food, ease of cleaning and seamless machine integration, giving our customers safety and peace of mind. The HRV and EJS series are 3A, NSF and EHEDG and certified, meeting the most stringent regulatory standards for sterile manufacturing.

## Key features for your environment



Environment	Dry	Wipe Down	Light-Medium Washdown	Light-Medium Washdown	Heavy Washdown	Sterile
Surface Finish	Standard Paint	White Epoxy Paint	Steel-it Paint	Nickel Plating	Stainless Steel	Hygienic Stainless Steel
IP Rating	IP54	IP65	IP65	IP65	IP66	IP69K
Lubrication	Standard	NSF H1 Food Grade	NSF H1 Food Grade	NSF H1 Food Grade	NSF H1 Food Grade	NSF H1 Food Grade
Mounting Flange Style	B5	B5	B5	B5	B5, B14	B14
Product Nameplate	Sticker Label	Sticker Label	Sticker Label	Sticker Label	Laser Etch	Laser Etch

Contact our technical support team today so we can select the optimal solution for your unique application. Our products are lubricated for life and completely maintenance-free, helping our customers eliminate risk. Whether we supply an off-the-shelf product or a fully-engineered solution–quality, reliability and value will be delivered.

## Solutions for General Purpose Washdown Applications

Our VR series planetary products have revolutionized the precision servo gearbox market and we've continued to innovate. We've expanded our wash down options to include additional features in a wider breadth of series and frame sizes. These features can handle wipe-down and light-to-medium wash down requirements in different areas of the manufacturing floor, from primary processing to secondary packaging. Common configurations are stocked and assembled in North America for high flexibility and quick turnaround at the most cost-effective price point in the market. Our modular adapter system allows for simple, streamlined mounting to any standard or white epoxy painted servo motor. For axes with space constraints, we offer several of these features in a right-angle configuration, utilizing planetary, worm, hypoid or bevel gearing technology.



### VR Series at a glance

- ➤ VRL, VRB, VRS, VRT Series
- ▶ Ratios 3:1 100:1
- ► Stainless Steel Output Shaft & Fasteners
- ► White Epoxy, Steel-it or Nickel-Plated Housings
- ► IP65 Ingress Protection Rating
- ► NSF H1 Food Grade Grease
- Robust internal construction with helical gears and fully captured planet carrier
- Cost-effective, readily available products for light to medium duty applications
- > Mix and match options for a tailor-made solution
- Select options available in right angle planetary, worm, hypoid or bevel form factors

## **Design Features & Benefits**

Input and output seals provide IP65 protection against low pressure water jets from any direction, as well as condensation and water spray

White epoxy or Steel-it paint applied to nonmachined housing surfaces for improved longevity in wipe down or wash down applications. Ideal match for white epoxy painted servo motors.

Aluminum motor adapter plates are fully sealed on both sides and can be painted to match gearbox and motor. Stainless steel plugs and fasteners



400 Grade Stainless steel output shaft and key for perfect blend of corrosion resistance and tensile strength

Nickel-plated output housings and mounting flanges provide a paint-free solution with no chance of peeling or flaking

NSF H1 high performance 100% synthetic food grade lubrication allows incidental contact with food and can be used in processing areas. Allows flexible mounting in any orientation

Product Series <sup>1</sup>	VRL, VRB, VRS, VRT		
Available Frame Size Range	042 - 155		
Reduction Ratios	3, 4, 5, 7, 10, 15, 16, 20, 25, 28, 30, 35, 40, 50, 70, 100		
Nominal Output Torque Range	6 Nm - 590 Nm		
Maximum Acceleration Torque Range	14 Nm - 840 Nm		
Emergency Stop Torque Range	30 Nm - 1250 Nm		
Output Bearing Style	Ball, Tapered Roller		
Maximum Radial Load Range	710 N - 19,000 N		
Maximum Axial Load Range	640 N - 14,000 N		
Standard Backlash Range	≤3 - ≤5 arc-min		
Efficiency Range	90-95%		
Service Life	20,000 Hours		
Ambient Temperature	0°C to 40°C		
Permitted Housing Temperature	90°C		
IP Rating	Standard IP54, Optional IP65		
Seal Material	Standard NBR, Optional FKM		
Lubrication Standard Grease, Optional NSF H1 Food Grade Grease			
Output Shaft Material	Standard Carbon Steel, Optional 400 Grade Stainless Steel		
Housing Surface Finish <sup>2</sup>	Standard Silver Paint, Optional White Epoxy Paint, Steel-it Paint, Nickel Plating		
Input Bore Diameters <sup>3</sup>	8mm, 14mm, 19mm, 28mm, 38mm, 48mm		

\*1) Also available in various right angle configurations. Contact us for assistance

\*2) Nickel plated output housing not available for VRS and VRT

\*3) Bushing sleeves are used to accommodate your motor shaft diameter within these sizes



Code		Description of Features			
С		IP 65 Protection Only			
W		Standard Grease. Food Grade White Epoxy			
S		Standard Grease, Steel-It™ Paint			
J		Standard Grease, Nickel Plated Output Housing			
F		Food Grade Grease, Standard Paint			
Х		Food Grade Grease, Food Grade White Epoxy			
G		Food Grade Grease, Steel-It™ Paint			
К		Food Grade Grease, Nickel Plated Output Housing			
	V	Stainless Steel Shaft & Fasteners, IP65 Protection			
* First letter represents grease and coating combination. Second letter represents shaft material & ingress protection. Select "C" for IP65 protection only.					

# Solutions for Demanding Washdown Requirements

The HRL series from Nidec Drive Technology is a planetary product that excels in corrosive, high pressure washdown environments. Made completely from 303 grade austenitic stainless steel, HRL is a safe solution for servo drive systems close to or fully integrated in the process. A seamless, single piece housing helps reduce build-up of bacteria while its IP66 rating allows for high pressure cleaning with water, steam or caustic chemicals. HRL has flexible adaptation to standard B5 style servomotors as well as B14 style stainless servomotors. Available in three sizes and a complete range of reduction ratios, HRL is a robust, reliable, maintenance-free solution allowing our customers to reduce risk and increase productivity.



#### **HRL Series at a glance**

- ► Frame sizes 070, 090, 120
- Ratios from 3:1 100:1
- ▶ Backlash from ≤6 to ≤14 arc-min
- All-stainless construction
- ► IP66 Ingress Protection with Viton seals
- ► NSF H1 Synthetic Food Grade Grease
- Mounting for standard servomotors with B5 flanges or stainless servomotors with B14 flanges
- Cost-effective solution for highly corrosive environments with demanding washdown regimens

## **Design Features & Benefits**

Viton input and output radial shaft seals provide IP66 protection against powerful, direct water jets.

303 grade austenitic stainless steel housing for excellent corrosion resistance. Cylindrical single-piece design with no seams or flat surfaces

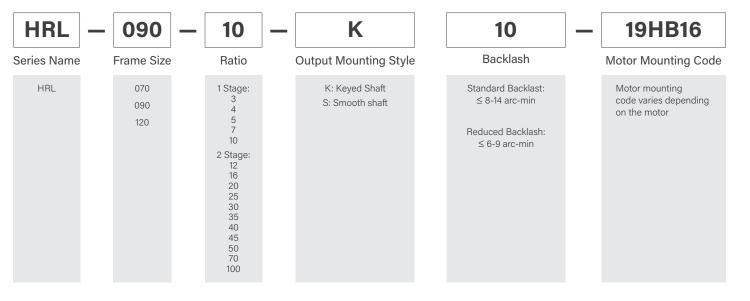


303 grade austenitic stainless steel output shaft and key for high resistance to corrosion and oxidation

NSF H1 high performance 100% synthetic food grade lubrication allows incidental contact with food and can be used in processing areas. Allows flexible mounting in any orientation

Stainless steel motor adapter plates, plugs and fasteners. Mounting available for B5 or B14 servomotor flanges

Frame Size		HRL-070	HRL-090	HRL-120	
Reduction Ratios	Unit	Single Stage: 3, 4, 5, 7, 10	Single Stage: 3, 4, 5, 7, 10	Single Stage: 3, 4, 5, 7, 10	
Reduction Ratios		Two Stage: 12, 16, 20, 25, 30, 35, 40, 50, 70, 100	Two Stage: 12, 16, 20, 25, 30, 35, 40, 50, 70, 100	Two Stage: 12, 16, 20, 25, 30, 35, 40, 50, 70, 100	
Nominal Output Torque	Nm	16 - 44	40 - 100	100 - 210	
Maximum Output Torque	Nm	24 - 55	75 - 125	180 - 255	
Emergency Stop Torque	Nm	62 - 84	160 - 216	200 - 480	
Nominal Input Speed	rpm	3500	3000	2500	
Maximum Input Speed	rpm	6000	6000	5000	
No Load Running Torque	Nm	0.17	0.33	0.60	
Maximum Radial Load	N	910	1500	3000	
Maximum Axial Load	N	500	1000	1500	
Moment of Inertia (≤ Ø 14)	kg/cm <sup>2</sup>	0.32 - 0.43	0.69 - 1.15		
Moment of Inertia (≤ Ø 19)	kg/cm <sup>2</sup>	0.52 - 0.65	0.89 - 1.38	2.16 - 5.78	
Moment of Inertia (≤ Ø 24)	kg/cm <sup>2</sup>		1.81 - 2.67	2.59 - 6.25	
Moment of Inertia (≤ Ø 32)	kg/cm <sup>2</sup>			2.92 - 6.59	
Efficiency	%	1-Stage: 92 / 2-Stage: 90	1-Stage: 92 / 2-Stage: 90	1-Stage: 92 / 2-Stage: 90	
Torsional Rigidity	Nm/arc-min	1.3 - 2.4	3.4 - 7.1	8.3 - 17	
Maximum Torsional Backlash	arc-min	Standard: $\leq 10 - \leq 14 / \text{Reduced}$ : $\leq 7 - \leq 9$	Standard: $\leq 10 - \leq 14$ / Reduced: $\leq 6 - \leq 8$	Standard: $\leq 8 - \leq 12$ / Reduced: $\leq 6 - \leq 8$	
Noise Level	dB[A]	≤ 64	≤ 65	≤ 68	
Service Life	hrs	30,000	30,000	30,000	
Protection Class	IP	IP66	IP66	IP66	
Seal Material		Viton	Viton	Viton	
Lubrication		NSF H1 Food Grade Grease	NSF H1 Food Grade Grease	NSF H1 Food Grade Grease	
Output Shaft Material		303 Grade Stainless Steel	303 Grade Stainless Steel 303 Grade Stainless		
Housing Material		303 Grade Stainless Steel	303 Grade Stainless Steel	303 Grade Stainless Steel	
Ambient Temperature	°C	-20 to +90	-20 to +90	-20 to +90	
Permitted Housing Temperature	°C	90	90	90	
Weight	eight kg 2.0-2.3		3.9 - 4.7	8.8 - 10.9	



# Solutions for hygienic and sterile production

For motion control applications in hygienic and sterile production environments, Nidec Drive Technology offers products with optimal geometry and cleanability. The HRV inline planetary series features 316L stainless construction, allowing for direct integration into equipment and eliminating the need for protective covers. Smooth, rounded edges prevent bacteria growth and other contamination. IP69K rating along with high temperature seals and o-rings enable efficient, high-pressure cleaning with water, steam or caustic chemicals. A laser etched nameplate ensures traceability after several years of operation. The HRV is designed to mount seamlessly to stainless steel servomotors with B14 style output flanges.



## **HRV Series at a glance**

- Frame sizes 070, 090, 120
- Ratios 3:1 100:1
- Backlash from ≤8 to ≤14 arc-min
- Hygienic 316L stainless steel construction and smooth rounded surfaces with Ra value <0.8 µm
- ► IP69K Ingress Protection with FDA approved Viton seals
- NSF H1 Synthetic Food Grade Grease
- ► Certified FDA, NSF, EHEDG, 3A
- ► Mounting for stainless servomotors with B14 flanges such as Allen-Bradley VPH/VPS/MPS, Kollmorgen AKMH/AKMA, Beckhoff AM880, Yaskawa M5, Siemens S-1FS2 and others
- Maximum corrosion protection and cleanability

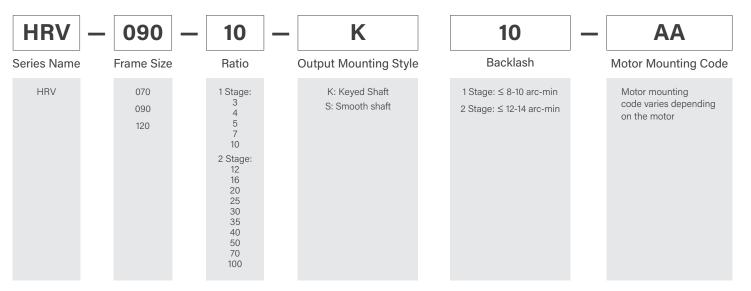
# **Design Features & Benefits** FDA approved Viton shaft seals and O-rings provide IP69K protection against high pressure, high temperature water jets and steam 316L grade austenitic stainless steel housing, smooth rolled finish to <0.8 µm Ra with rounded corners and edges Laser etched name plate ensures traceability after several years of operation

316L grade austenitic stainless steel output shaft and key for maximum resistance to corrosion and oxidation

NSF H1 high performance 100% synthetic food grade lubrication allows incidental contact with food and can be used in processing areas. Allows flexible mounting in any orientation

Seamless mounting for stainless steel servomotors with B14 flanges

Frame Size		HRV-070	HRV-090	HRV-120	
Reduction Ratios	Unit	Single Stage: 3, 4, 5, 7, 10	Single Stage: 3, 4, 5, 7, 10	Single Stage: 3, 4, 5, 7, 10	
Reduction Ratios		Two Stage: 12, 16, 20, 25, 30, 35, 40, 50, 70, 100	Two Stage: 12, 16, 20, 25, 30, 35, 40, 50, 70, 100	Two Stage: 12, 16, 20, 25, 30, 35, 40, 50, 70, 100	
Nominal Output Torque	Nm	16 - 44	40 - 100	100 - 210	
Maximum Output Torque	Nm	24 - 55	75 - 125	180 - 255	
Emergency Stop Torque	Nm	62 - 84	160 - 216	200 - 480	
Nominal Input Speed	rpm	3500	3000	2500	
Maximum Input Speed	rpm	6000	6000	5000	
No Load Running Torque	Nm	0.17	0.33	0.60	
Maximum Radial Load	N	910	950	2100	
Maximum Axial Load	N	500	1800	3200	
Moment of Inertia (≤ Ø 14)	kg/cm <sup>2</sup>	0.32 - 0.43	0.69 - 1.15		
Moment of Inertia (≤ Ø 19)	kg/cm <sup>2</sup>	0.52 - 0.65	0.89 - 1.38	2.16 - 5.79	
Moment of Inertia (≤ Ø 24)	kg/cm <sup>2</sup>		1.81 - 2.67	2.63 - 6.27	
Moment of Inertia ( $\leq Ø$ 32)	kg/cm <sup>2</sup>			2.97 - 6.60	
Efficiency	%	1-Stage: 92 / 2-Stage: 90	1-Stage: 92 / 2-Stage: 90	1-Stage: 92 / 2-Stage: 90	
Torsional Rigidity	Nm/arc-min	1.35 - 2.4	3.4 - 7.1	8.3 - 17	
Maximum Torsional Backlash	arc-min	1-Stage: ≤ 10 / 2-Stage ≤ 14	1-Stage: ≤ 10 / 2-Stage ≤ 14	1-Stage: ≤ 8 / 2-Stage ≤ 12	
Noise Level	dB[A]	≤ 64	≤ 65	≤ 68	
Service Life	hrs	30,000	30,000	30,000	
Protection Class	IP	IP69K	IP69K	IP69K	
Seal Material		FDA Viton	FDA Viton	FDA Viton	
Lubrication		NSF H1 Food Grade Grease	NSF H1 Food Grade Grease NSF H1 Food Grade		
Output Shaft Material		316L Grade Stainless Steel	316L Grade Stainless Steel	316L Grade Stainless Steel	
Housing Material		316L Grade Stainless Steel	316L Grade Stainless Steel	316L Grade Stainless Steel	
Ambient Temperature	°C	-25 to +90	-25 to +90	-25 to +90	
Permitted Housing Temperature	°C	90	90	90	
Weight	kg	3.0 - 3.5	8.5 - 9.4	13.5 - 16.1	



# Solutions for hygienic and sterile production

The EJS Series right angle worm gearbox from Nidec Drive Technology is a superior solution for hygienic and sterile manufacturing applications with space constraints. Smooth, rounded surfaces help eliminate free-standing water and prevent bacteria growth. IP69K protection combined with 316 stainless steel material and high temperature seals enable efficient, high-pressure cleaning with water, steam or caustic chemicals. A laser etched nameplate ensures traceability after several years of operation. A wide range of output mounting options are available. EJS is designed to mount to stainless steel servomotors with B14 style output flanges as well as stainless steel NEMA motors.



## **EJS Series at a glance**

- ► Right-angle worm gearbox with robust internal construction
- Five frame sizes with ratios from 5:1 to 60:1 available in a single stage
- > Hollow, solid, dual or shrink disc output styles
- Hygienic 316L stainless steel construction with smooth rounded surfaces
- IP69K Ingress Protection with NSF H1 Synthetic Food Grade Lubrication
- Certified FDA, NSF, EHEDG, 3A
- Mounting for stainless servomotors with B14 flanges such as Allen-Bradley VPH/VPS/MPS, Kollmorgen AKMH/AKMA, Beckhoff AM880, Yaskawa M5, Siemens S-1FS2 and others
- Maximum corrosion protection and cleanability

## **Design Features & Benefits**

Viton double input and output seals provide IP69K protection against high pressure, high temperature water jets and steam

Seamless mounting to stainless steel servomotors and NEMA motors

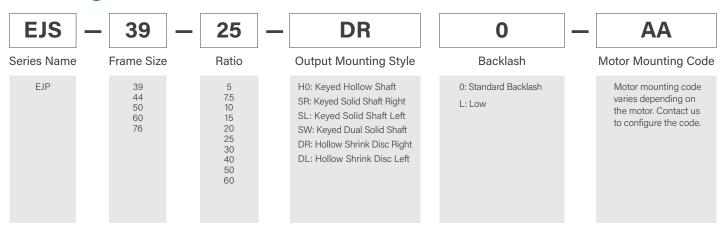


316L grade austenitic stainless steel housing with rounded corners and edges. Laser etched name plate

NSF H1 high performance 100% synthetic food grade lubrication allows incidental contact with food and can be used in processing areas.

303 Grade Stainless steel output shaft and fasteners. Stainless steel shrink disc also available for secure, keyless connection to load

Frame Size	Unit	EJS-39	EJS-44	EJS-50	EJS-60	EJS-76	
Reduction Ratios	Unit	5, 7.5, 10, 15, 20, 25, 30, 40, 50, 60					
Nominal Output Torque	Nm	42 - 70	58 - 92	77 - 130	123 - 188	237 - 396	
Maximum Acceleration Torque	Nm	56 - 93	78 - 122	104 - 172	170 - 276	330 - 535	
Emergency Stop Torque	Nm	84 - 141	116 - 184	155 - 260	246 - 376	474 - 792	
Nominal Input Speed	rpm	2000	2000	2000	2000	2000	
Maximum Input Speed	rpm	3000	3000	3000	3000	3000	
No Load Running Torque	Nm	0.45	0.68	0.74	0.79	1.24	
Maximum Radial Load	N	2670	4895	5340	8010	10,235	
Maximum Axial Load	N	2670	4895	5340	8010	10,235	
Moment of Inertia	kg/cm <sup>2</sup>	0.84 - 1.05	0.99 - 1.36	1.89 - 2.54	2.21 - 3.48	8.18 - 13.98	
Efficiency	%	70 - 92	70 - 92	70 - 92	70 - 92	70 - 92	
Torsional Rigidity	Nm/arc-min	5.8	7.6	10.4	17.7	41.6	
Maximum Torsional Backlash	arc-min	Standard $\leq$ 24 / Low $\leq$ 8	Standard $\leq 20$ / Low $\leq 7$	Standard $\leq$ 15 / Low $\leq$ 6	Standard $\leq$ 13 / Low $\leq$ 5	Standard $\leq 10$ / Low $\leq 4$	
Noise Level	dB[A]	≤ 73	≤ 75	≤ 80	≤ 80	≤ 83	
Service Life	hrs	20,000	20,000	20,000	20,000	20,000	
Protection Class	IP	IP69K	IP69K	IP69K	IP69K	IP69K	
Seal Material		NBR, FDA Viton	NBR, FDA Viton	NBR, FDA Viton	NBR, FDA Viton	NBR, FDA Viton	
Lubrication		NSF H1 Food Grade Oil	NSF H1 Food Grade Oil	NSF H1 Food Grade Oil	NSF H1 Food Grade Oil	NSF H1 Food Grade Oil	
Output Shaft Material		303 Grade Stainless Steel	303 Grade Stainless Steel	303 Grade Stainless Steel	303 Grade Stainless Steel	303 Grade Stainless Steel	
Housing Material		316L Grade Stainless Steel	316L Grade Stainless Steel	316L Grade Stainless Steel	316L Grade Stainless Steel	316L Grade Stainless Steel	
Ambient Temperature	°C	-23 to +93	-23 to +93	-23 to +93	-23 to +93	-23 to +93	
Permitted Housing Temperature	°C	100	100	100	100	100	
Weight	kg	14	15.5	16	21	41	



# www.nidec-dtc.com



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