Rotary AC Servo with Built-in Encoder, 100mm diameter frame, triple stack-length and hollow shaft configuration

MDH-10018



Nippon Pulse

has provided a wide array of motion control solutions, including industry leading stepper motors, the innovative Linear Shaft Motor, controllers, drivers and networks.

A wide range of product offerings and expertise in application engineering makes NPM a discerning partner in motion control technology and implementation

Miniature AC servomotor with high torque and high-resolution

Delivering a lineup with a wide range of application options of compact high-performance next-generation servo motors with built in encoders.

the servo motor has high acceleration and positioning,suitable in using as gearless.

The motor has characterristics of low speed and high torque (compared to general servo motors) because this motor is assumed that it will drive directry without using a gear(a deceleration mechanism).The integrated sensor realize high-precision positioning, and able to receive a direct load on the shaft by adopting high-load bearing as standard.

advantages:

- silent: since it has no vibraition sound.
- High precision: positioning by eliminating a machanical error due to backlash.
- Weight and space saving
- Improving acceleration
- feedback for master-slave control.
- that can be generally obtained by using a

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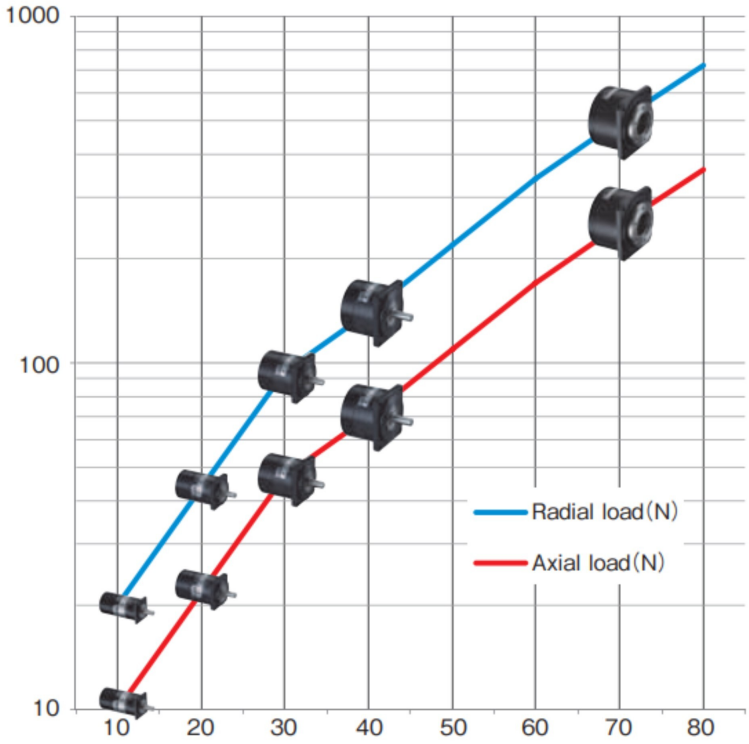
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gearless structure

The world's smallest servo motor of all hollow-shaft type.It is ideal for end effectors (hand, gripper, Zθ unit) and also small robot hands with a combination of low reduction ratio gears.



Example specifications

- Built-in absolute encoder (11 to 21 bits)
- Built-in electromagnetic encoder
- Hollow shaft structure
- Design with customized speed and torque characteristics
- Ripple reducing design (torque/speed)
- Clean room ready

Application examples

- Gearless structures
- High precision positioning applications

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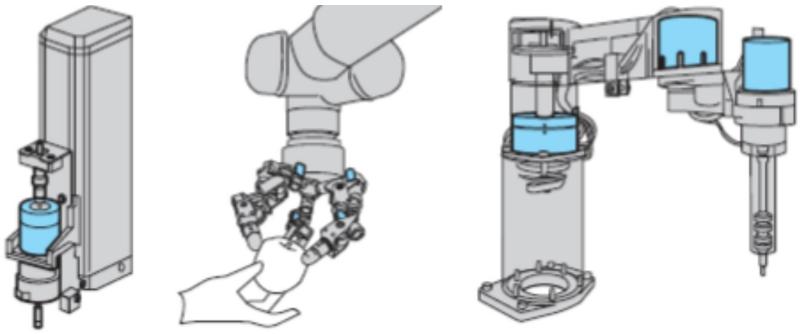
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- Robot arms
- Small scalar robots
- Bilateral master/slave control



MDH-100 series

- Built-in high-performance encoder that enables direct fine positioning from resolutions of 1 arc/sec.
- Delivers high torque using high-performance magnets and high-density winding technology.
- Small size with motor and encoder as a single unit.
- Able to bear large loads directly due to high stiffness bearing.
- Able to support hollow-shaft structures.
- Body diameter: 100mm
- Body lenght: 70mm
- Max torque: 9,6 N□m (with DC48V drive)
- Max speed: 200rpm
- Max resolution: 216,000 pulses (×4: 864,000 pulses) / 21 bit
- Hollow diameter: 40mm (MDH type)

video:

- See the video on YOUTUBE: a Gimbal application; image inspection system; a robot hand; reproduce the feel of an object
- And another VIDEO of the Micro Direct Drive Motor Miniature AC servomotor in a scalar robot with the repeatability of ±1µm

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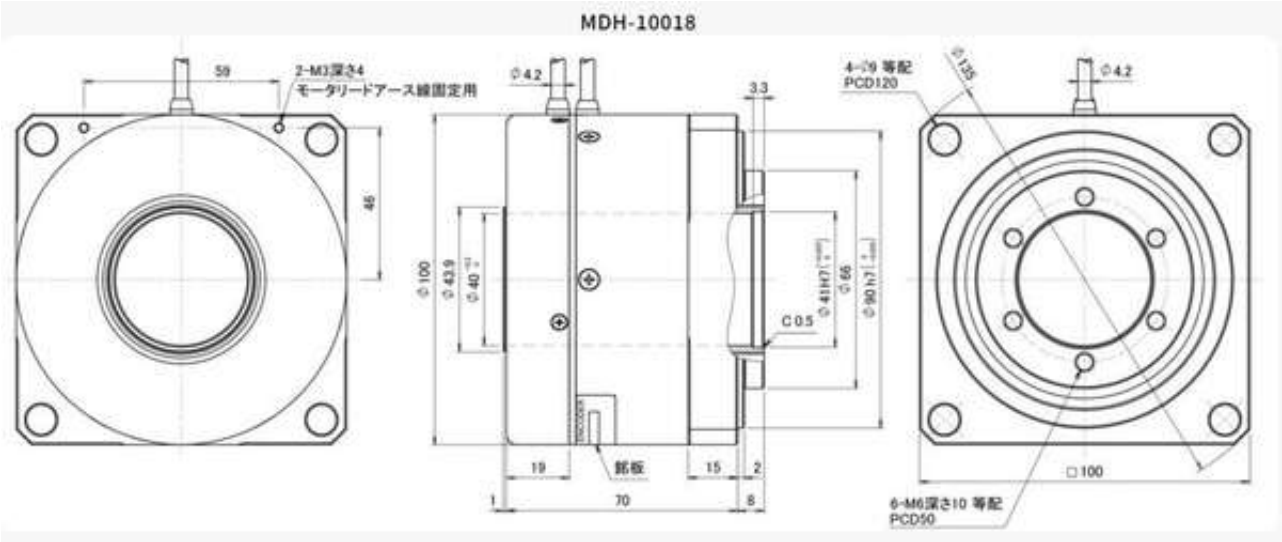
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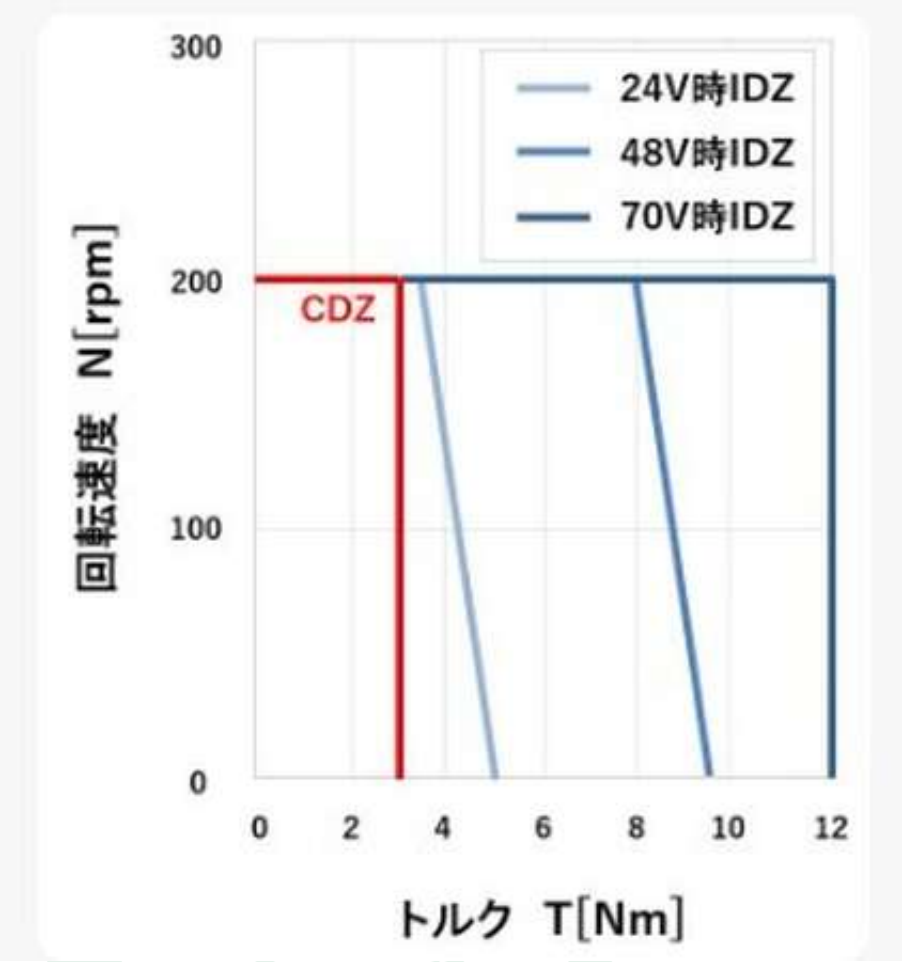
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Details

MDH-10018 Rotary AC Servo with Built-in Encoder, 100mm diameter frame, triple stack-length and hollow shaft configuration

Supply voltage (driver input) (※1)	DC V	48
Max speed (※2)	rpm	200
Rated speed	rpm	200

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Peak (instantaneous) torque (※1)	N·m	9.6
Continuous stall torque	N·m	3.1
Continuous rated torque	N·m	3.1
Peak output power (※3)	W	168
Peak power rate	kW/s	15.5
Peak current	Arms	19
Continuous rated current (※4)	Arms	2.9
Back-EMF constant (equiv.)	V/krpm	109
Torque constant (equiv., at 25 °C) (※5)	N·m/Arms	1.05
Phase-to-phase resistance (at 25 °C)	Ω	3.3
Phase-to-phase inductance	mH	8.2
Rotor pole pairs	P	20
Max encoder resolution (※6)	P/R	Incremental: 216,000 pulses (×4: 864,000 pulses)
Moment of inertia J	kg·cm²	6.69
Allowable radial load Fr	N	1
Allowable axial load Fa	N	500
Allowable moment	N·m	33.25
Bi-directional repeatability	Pulses	±1
Mass	kg	2
Recommended drivers		MC-200-7220 / MC-200C-6018
Reference heat sink		300 × 300 × 15 (Aluminum)

Notes:

- Specs above are at DC 48 V. Peak torque varies with other supply voltages. See the motor driver datasheet for

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supply range.

- If you have a target speed, please contact us.
- Peak output power is at 48 V supply and 200 rpm.
- Continuous rated current measured at 40 °C ambient using the reference heat sink mounted to the motor.
- Torque constant listed is within the continuous rated torque range. Characteristics may change beyond this range.
- If you need a specific resolution, please contact us.

1. In case you use with 24V, please contact us since peak torque would change.
2. Please contact us if there is a speed you prefer.
3. Rated armature current is the value measured with the standard heat sink attaxhed to the motor at an ambient temperature of 40? .
4. Please ask if there is a particular resolution you prefer.

suitable drivers

Manufacturer	Driver (amplifier) model	Interface	Power
MTL	MC-200-7220A	Pulses, USB	DC 24/48/70 V
	MC-200-7220B	EtherCAT, USB	DC 24/48/
	MC-200-7220D	SPI, USB	DC 24/48/
	MC-200C-6018D	SPI, USB	DC 24/48

- MC-200-7220 (box version) click for more details
- MC-200C-6018D (Ultra-small OEM servo driver) click for more detals
- Synapticon (click for more details)

MTLParam App

Overview

This PC application controls the MC-200 / MC-200C series.It supports parameter setup, status monitoring, and command control, plus a programmable mode for executing motion profiles.With the Auto-Tuning feature, control gains can be adjusted easily.Supported OS: Windows 10 (32-bit / 64-bit)

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Download

Please inquire via the form.For MDH-100 series, a dedicated version is required. If your driver firmware is Ver. 3.02.05 or earlier, Auto-Tuning is not supported. Contact us if you wish to update to firmware that supports Auto-Tuning.

Examples of the use:

- MC-200-7220A

Specifications

Product type	MDH-10018	**Diameter/ sq size**	100 mm	**Body Length**	70 mm
Peak Torque	9.6 N·m	**Continuous Rated Torque(mNm)**	3100 mN·m	**Rated torque**	3100 mNm
Max Speed	200 rpm	**Speed**	200 rpm	**Max Encoder Resolution**	Incremental: 216,000 pulses (×4: 864,000 pulses) P/R
Input Voltage (driver input)	48 DCV	**Peak Power**	15.5 W	**Peak Current (Arms)**	19 Arms
Permissible Radial Load(Fr)	1 N	**Moment of Inertia**	6.69 kg·m2	**Current (rating)**	2900 mA
Rotor Poles	20 P	**Permissible Axial Load(Fa)**	500 N	**Supplier**	NPM
Nominal speed	200 rpm	**Encoder type**	absolute or incremental	**NominalTorque**	3,1 Nm
Shaft version	hollow shaft hollow shaft	**Inertia level**	low	**Rated output**	168 kW

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