

- Unit solution of Ezi-SERVO + Hollow rotary index table

HB

- Accurate timing belt driven(Lost motion 6min)
- · Realize long-life durability
- · Economic solution
- EtherCAT, Ethernet, CC-Link Support















Large Diameter hollow bore to penetrate the output table equipped HB Series ensure flexibility and con-venience in the design of equipment when install complex wiring and piping.

Model Name	Size of plinth(Frame Size)	Hollow Bore Diameter
HB60	60mm	Ø27mm
HB85	85mm	Ø37mm
HB130	130mm	Ø55mm



2) Accurate Timing Belt Driven

Extremely low backlash timing belt direct drive, so that repetitive posi-tioning accuracy from single direction is +/-30sec and lost motion by positioning two directions for less than 6min and the precise positioning can be determined. Involute teeth type of timing belt enables Max. electric capacity and low noise operation.



Involute teeth type of High performance timing belt

3 High Rigidity

High rigidity of 2 Deep Groove Ball Bearing and hollow rotary table integ-rated HB Series maximizes allowable thrust load and moment load. Also high rigidity carbon steel timing pulley reinforce durability of abrasion and innovate durability.

Carbon Steel material output table Carbon steel driven shaft timing pulley Carbon steel drive shaft timing pully

Long & Durable Life

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To solve most common fracture of the motor shaft at timing belt drive actuator, HB series dramatically improves endurance to resolve driven motor shaft's fatigue from the timing belt tension of the driven motor shaft fatigue with bearings firmly supports driven pulley directly coupled with motor shaft.



6 Supporting Various Field Network

Ezi-Robo HB is a unit that combines Ezi-SERVO, a high performance closed loop step drive. Ezi-SERVO drives that support field networks such as EtherCAT, Ethernet and CC-Link can be connected to master controllers such as PC/PLC through corresponding field networks.

In case of Ezi-SERVOII Plus-E products, motion library (DLL) for Windows 7/8/10 can be provided.





The combination of a high-rigidity hollow rotary table and Ezi-SERVO, a high-precision closed loop stepping motor control system, can significantly reduce positioning time even with large inertial loads.



Applicable to Abrupt Load Fluctuations and Rapid Acceleration Applications

The Ezi-Robo HB Series driven by Ezi-SERVO, a closed-loop stepping motor control system without step-out, has no fine vibrations, i.e. hunting problem unlike general servo system.

In addition, It is Tuning Free Actuator that does not require gain adjustment for abrupt load fluctuation.



Avaliable I/O signal

The Ezi–SERVO drive offers the ability to process multiple input and output signals. Equipment can be configured without a separate I/O device.

· EtherCAT: 7 inputs / 6 outputs

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- · CC-Link : 7 inputs / 6 outputs
- · Ethernet : 9 inputs / 9 outputs
- * For more details on I/O signals, Please refer to the catalog or manual of each drive.









Applications for air

Applications for a precise positioning using hollow bore





Position Table Function

Position Table can be used for motion control by digital input and output signals of host controller. You can operate the motor directly by sending the position table number, start / stop, origin search and other digital input values from a PLC. The PLC can monitor The In–Position, origin search, moving / stop, servo ready and other digital output signals from a drive. A maximum of 256 positioning points can be set from PLC.



Ezi-Robo HB Part Numbering

RB-HB6	<u>60–05–42XL–A–ST</u>
Product Name	
Ezi-Robo HB	
Frame Size	
60 : 60mm 85 : 85mm 130 : 130mm	
Reduction Gear Ratio	
05 - 1:5	
Motor Flange Size	
56 : 56mm 60 : 60mm	
Motor Length	
L : Large XL : Extra Large	
Encoder Resolution	
A: 10,000[ppr] B: 20,000[ppr]	
Drive Type	
EC : EtherCAT EC-4X : EtherCAT 4 axes PE : Ethernet CL : CC-Link ST : Pulse Input	

Applicable Product Line-up

Product	Specification
Ezi-SERVO EtherCAT	Embedded EtherCAT
Ezi-SERVO EtherCAT 4X	Embedded EtherCAT 4 axes
Ezi-SERVO Plus-E	Ethernet based controller integrated product
Ezi-SERVO CC-Link	Embedded CC-Link
Ezi-SERVO ST	Pulse Input Type



Ezi-SERVO || EtherCAT (EtherCAT)



Ezi-SERVOII EtherCAT 4X (EtherCAT)



Ezi-SERVO || Plus-E (Ethernet)



Ezi-SERVOII CC-Link (CC-Link)



Ezi-SERVO ST (Pulse Input)

• Motor, Drive Combination

Unit Part Number	Gearbox Model Number	Motor Model Number	DRIVE				
			Ezi–SERVO ST	Ezi-SERVO EtherCAT	Ezi-SERVOII EtherCAT 4X	Ezi–SERVO Plus–E	Ezi–SERVO CC–Link
RB-HB60-05-42XL-A-□	HB60-05	EzM-42XL-A	0	0	0	0	0
RB-HB85-05-56L-A-□	HB85-05	EzM-56L-A	0	0	0	0	0
RB-HB130-05-60L-A-□	HB130-05	EzM-60L-A	0	0	0	0	0

① Ezi-SERVO || series motors are applied to EzM2 series motors
② Encoder resolution can be specified by customer.

• How to Read Specifications

Model Name		RB-HB60-05-42XL
① Type of output table supporting bearing		Ball Bearing
② Permissible torque	[N·m]	2.7
③ Inertia moment	[kg⋅m²]	500 × 10 ⁻⁷
④ Permissible speed	[rpm]	300
⑤ Gear ratio		1:5
6 Maximum holding torque	[N·m]	1.3
⑦ Repetitive positioning accuracy	[arcsec]	±30(0.0083°)
8 Lost motion	[arcmin]	6
	[arcmin]	10
1 Permissible axial load	[N]	100
① Permissible moment load	[N·m]	2
2 Runout of output table surface	[mm]	0.015
(3) Runout of output table inner/outer diameter	[mm]	0.015
(4) Parallelism of output table	[mm]	0.03
(5) Degree of protection ^{*1}		IP40
16 Mass	[kg]	1,1

*1: IP20 for motor connector

Description of Specification Items

① Type of output table supporting bearing The type of the bearing used for the output table.

② Permissible torque	The mechanical strength limit of reduction mechanism. Make sure that the applied torque, including ac- celeration and load fluctuations, does not exceed this permissible torque.
③ Inertia moment	The total of inertia moment of rotor of motor, reduction mechanism and output table converted from output table side.
④ Permissible speed	The output table speed can be tolerated by the mechanical strength of the reduction gear mechanism.
⑤ Gear ratio	The tooth ratio of the two gears constituting the reduction mechanism.
6 Maximum holding torque	The maximum torque that the output table can maintain the current position when the motor is excited.
$\ensuremath{\overline{\mathcal{O}}}$ Repetitive positioning accuracy	The degree of error when repeatedly positioning to the same location in the same direction,
	The difference between forward and reverse stop positions for the same destination. It is mainly caused by backlash of gears.
(9) Angular transmission error	The difference between the target rotation angle and the actual rotation angle of the output table
1 Permissible axial load	The permissible value of thrust load applied to the output table in the axial direction.
1 Permissible moment load	When load is applied to a position deviating from the center of rotation of the output table, a tilting force acts on the output table. This is the allowable value of the moment load calculated by multiplying the displacement from the center of rotation and the load.
⑦ Runout of output table surface	The maximum value of runout of the mounting surface of the output table when the output table rotates without load,
Runout of output table inner/outer diameter diameter	The maximum value of runout of the inner diameter or outer diameter of the table when the output table rotates without load,
@ Parallelism of output table	The angle at which the mounting surface of the actuator body and the mounting surface of the output table are inclined
(5) Degree of protection	The grade of the equipment classified as dustproof and waterproof based on IEC 60529, EN60034-5 (=IEC60034-5)
[®] Mass	The total weight of all parts, including the output table, reduction mechanism, motor and so on that make up the actuator.

• Specifications of Motor [HB60 Series]

Model Name		RB-HB60-05-42XL
Type of output table supporting bearing		Ball Bearing
Permissible torque	[N·m]	2.7
Inertia moment	[kg⋅m²]	500×10^{-7}
Permissible speed	[rpm]	300
Gear ratio		1:5
Maximum holding torque	[N·m]	1.3
Repetitive positioning accuracy	[arcsec]	±30(0.0083°)
Lost motion	[arcmin]	6
Angular transmission error	[arcmin]	10
Permissible axial load	[N]	100
Permissible moment load	[N·m]	2
Runout of output table surface	[mm]	0.015
Runout of output table inner/outer diameter	[mm]	0.015
Parallelism of output table	[mm]	0.03
Degree of protection ^{*1}		IP40(IP20 for motor Connector)
Mass	[kg]	1,1

*1 : IP20 for motor connector

Ezi-Robo-HB60 series



• Specifications of Motor [HB85 Series]

Model Name		RB-HB85-05-56L
Type of output table supporting bearing		Ball Bearing
Permissible torque	[N·m]	7
Inertia moment	[kg·m²]	3,800 × 10 ⁻⁷
Permissible speed	[rpm]	300
Gear ratio		1:5
Maximum holding torque	[N·m]	3.6
Repetitive positioning accuracy	[arcsec]	±30(0.0083°)
Lost motion	[arcmin]	6
Angular transmission error	[arcmin]	10
Permissible axial load	[N]	200
Permissible moment load	[N·m]	3
Runout of output table surface	[mm]	0.015
Runout of output table inner/outer diameter	[mm]	0.015
Parallelism of output table	[mm]	0.03
Degree of protection ^{*1}		IP40
Mass	[kg]	3.1

*1 : IP20 for motor connector

Ezi-Robo-HB85 series





• Specifications of Motor [HB130 Series]

Model Name		RB-HB130-05-60L
Type of output table supporting bearing		Ball Bearing
Permissible torque	[N·m]	12,8
Inertia moment	[kg·m²]	$15,500 \times 10^{-7}$
Permissible speed	[rpm]	300
Gear ratio		1:5
Maximum holding torque	[N·m]	6.2
Repetitive positioning accuracy	[arcsec]	±30(0.0083°)
Lost motion	[arcmin]	6
Angular transmission error	[arcmin]	10
Permissible axial load	[N]	500
Permissible moment load	[N·m]	5
Runout of output table surface	[mm]	0.015
Runout of output table inner/outer diameter	[mm]	0.015
Parallelism of output table	[mm]	0.03
Degree of protection ^{*1}		IP40
Mass	[kg]	4.0

*1: IP20 for motor connector

Ezi-Robo-HB130 series



• Dimensions of Motor [mm]



RB-HB85-05-56L-A-D



RB-HB130-05-60L-A-0



※ The above drawing is made based on EzM series. □ is the type of drive.

Mechanical Part Option [Home-sensor Set]

In order to simplify configuring the homing operation on the rotary table, there is an option to configure the home sensor set with Photo Micro Sensor, connector cable, shield plate and mounting screw. Since all the parts necessary for home detection are provided, it is possible to save the effort to design, manufacture and procure parts when the origin sensor is needed and it can be installed and used immediately.

1. Type

Model	Sensor output	Applicable product
OSHG-A	NPN	HR60 HR85 HR130
OSHG-B	PNP	

2. Home-sensor Set Composition OSHB-A



3. Specifications

Times	NPN Type	PNP Type	
Sensor Model	EE-SX672A(OMRON Product)	EE-SX672A(OMRON Product)	
Input Voltage	5~24VDC ±10% Ripple(P-P) 10% less	5~24VDC ±10%, Ripple(P-P) 10% less	
Current Consumption	35mA less	30mA less	
Control Output	NPN Open Collector output 5~24VDC 100mA less Residual Voltage 0.8V less(at load current of 100mA)	PNP Open Collector output 5~24VDC 100mA less Residual Voltage 1.3V less(at load current of 100mA)	
Display LED	Detection(Red)	Detection(Red)	
Sensor Logic	Normally Open / Normally Closed (Switchable, Depending on connection)	Normally Open / Normally Closed (Switchable, Depending on connection)	

4. Cable with connector(OMRON robot ode attached connector EE1010-R)

· Terminal Layout

1	Ð	Brown	
2	L	Pink	19999
3	OUT	Black	
4	Θ	Blue	
		13.5 20±5	2000 25±5 15±5

5. Precautions for installing home sensor.

Please note the followings when installing the home sensor set.

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- · Keep the operating temperature below 40°C and the motor surface temperature below 90°C
- · When configuring the homing function using the shaft of the motor, Prepare an individual sensor and bracket.

6. Precautions for extending the sensor cable

Sensor shield should be cabled and grounded if extended to more than 2m long.

Mechanical Part Option [Home-sensor Installation]

1. NPN Type

Please use $5\sim$ 24VDC power supply and configure the active current to $5\sim$ 20mA. Connect external resistor if it exceeds 20mA. The GND of the power supplies of the sensor and user controller must be common.

· Pulse Train Input unit



N.C (Normal Closed) : Connect Pink lead wire with Brown lead wire.

N.O (Normal Open) : Do not connect Pink lead wire.

· Controller integrated unit (Example of Ezi-SERVO || Plus-E)



2. PNP Type

Please use $5\sim$ 24VDC power supply and configure the active current to $5\sim$ 20mA. Connect external resistor if it exceeds 20mA. The GND of the power supplies of the sensor and user controller must be common.

· Pulse Train Input unit





Product Installation Method [How to Install the Ezi-Robo HB]

Please refer to the installation method as shown in the picture when attach the actuator to mounting plate in the case of applying HB series.

How to Install to the Mounting Plate

(IF the Tab Hole is exist on the mountiong plate)



3 Installation guides with using TAP underneath surface of Actuator



Model Name	Dimension
Ezi-Robo HB60	M4 \times 45L
Ezi-Robo HB85	M6 × 55L
Ezi-Robo HB130	M8 × 70L

The Screw Specification

Please refer to the table to find the screw dimension. If nonstandard bolt is used, it may cause damage to the product, therefore the standard bolt must be used.

The Screw Specification

Model Name	Dimension
Ezi-Robo HB60	M5 × 15L
Ezi-Robo HB85	M8 × 20L
Ezi-Robo HB130	M10 × 25L

Please refer to the table to find the screw dimension. If nonstandard bolt is used, it may cause damage to the product, therefore the standard bolt must be used.



How to Install to the Actuator Plate



The Screw Specification

Model Name	Dimension
Ezi-Robo HB60	M5 × 15L
Ezi–Robo HB85	M8 × 20L
Ezi-Robo HB130	M10 × 25L

Pilot Dimension

Model Name	Dimension
Ezi-Robo HB60	$\Phi 58_{-0.05}$
Ezi-Robo HB85	Ø 81 – ⁰ _{0.05}
Ezi-Robo HB130	Ø 120 - 0.05



- \cdot Please fix work by screw at 6 positions of TAP Hole on output tabler
- \cdot Prepared 2 Pin Holes at Output table to set Work (Please use for accurate positioning)
- Please attach positioning pin at Pin Hole of Work in order to use Output Table Work Installation purpose Pin Hole.

Positioning Pin Hole

Model Name	Dimension	Pin Hole
Ezi-Robo HB60	Φ 4 $\stackrel{+}{_{-}} \overset{0.012}{_{-}}$ depth6	
Ezi-Robo HB85	Φ 5 $\stackrel{+}{_{-}} \stackrel{0.012}{_{-}}$ depth6	2
Ezi-Robo HB130	Φ 5 $\stackrel{+}{_{-}} \stackrel{0.012}{_{-}}$ depth6	

• System Configuration [EtherCAT (Ezi-SERVO || EtherCAT)]



Туре	Signal Cable	Encoder Cable	Motor Cable	Power Cable	EtherCAT Cable
Length supplied	-	30cm	30cm	-	-
Max. Length	20m	20m	20m	2m	100m

• Ezi-SERVO II EtherCAT is stepping motor control system using EtherCAT, high speed Ethernet(100Mbps full-duplex) based fieldbus. Ezi-SERVO II EtherCAT is EtherCAT slave module which support CAN application layer over EtherCAT(CoE). CiA 402 Drive profile implemented. Supported modes are Profile Position Mode, Homing Mode, Cyclic Synchronous Position Mode.

• Please refer to the Ezi-SERVO || EtherCAT catalog for optional cables, functions and operation.

• System Configuration [EtherCAT (Ezi-SERVOII EtherCAT 86mm)]



Туре	Signal Cable	Encoder Cable	Motor Cable	Power Cable	EtherCAT Cable
Length supplied	-	30cm	30cm	-	-
Max. Length	20m	20m	20m	2m	100m

• Ezi-SERVO II EtherCAT is stepping motor control system using EtherCAT, high speed Ethernet(100Mbps full-duplex) based fieldbus. Ezi-SERVO II EtherCAT is EtherCAT slave module which support CAN application layer over EtherCAT(CoE). CiA 402 Drive profile implemented. Supported modes are Profile Position Mode, Homing Mode, Cyclic Synchronous Position Mode.

• Please refer to the Ezi-SERVO || EtherCAT catalog for optional cables, functions and operation.

• System Configuration [EtherCAT 4X (Ezi-SERVOII EtherCAT 4X)]



Туре	Signal Cable	Encoder Cable	Motor Cable	Control Power Cable	Main Power Cable	EtherCAT Cable
Length supplied	—	30cm	30cm	-	-	-
Max. Length	20m	20m	20m	2m	2m	100m

• Ezi-SERVO || EtherCAT 4X is 4 axes stepping motor control system using EtherCAT, high speed Ethernet(100Mbps full-duplex) based fieldbus. Ezi-SERVO || EtherCAT 4X is EtherCAT slave module which support CAN application layer over EtherCAT(CoE). CiA 402 Drive profile implemented. Supported modes are Profile Position Mode, Homing Mode, Cyclic Synchronous Position Mode.

• Please refer to the Ezi-SERVO || EtherCAT 4X catalog for optional cables, functions and operation.

• System Configuration [Ethernet (Ezi-SERVO || Plus-E)]



Туре	Signal Cable	Encoder Cable	Motor Cable	Power Cable	Ethernet Cable
Length supplied	-	30cm	30cm	-	-
Max. Length	20m	20m	20m	2m	100m

• Ezi-SERVO II Plus-E drive can drive up to 254 axes through Ethernet communication with master controller such as PC. Ethernet HUB is built-in and can be connected in Daisy-chain form. All motion control functions can be controlled through network communication, and motion related conditions(eg. acceleration/deceleration time, etc.) are stored in the ROM as parameters. A motion library(DLL) is provided for programming under Windows 7/8/10.

• Please refer to the Ezi-SERVO || Plus-E catalog for optional cables, functions and operation.

• System Configuration [Ethernet (Ezi-SERVOII Plus-E 86mm)]



Туре	Signal Cable	Encoder Cable	Motor Cable	Power Cable	Ethernet Cable
Length supplied	-	30cm	30cm	-	-
Max. Length	20m	20m	20m	2m	100m

• Ezi-SERVO II Plus-E drive can drive up to 254 axes through Ethernet communication with master controller such as PC. Ethernet HUB is built-in and can be connected in Daisy-chain form. All motion control functions can be controlled through network communication, and motion related conditions(eg. acceleration/deceleration time, etc.) are stored in the ROM as parameters. A motion library(DLL) is provided for programming under Windows 7/8/10.

• Please refer to the Ezi-SERVO || Plus-E catalog for optional cables, functions and operation.

• System Configuration [CC-Link (Ezi-SERVOII CC-Link)]



Туре	Signal Cable	Encoder Cable	Motor Cable	Power Cable	CC–Link Cable	RS-485 Cable
Length supplied	-	30cm	30cm	-	-	-
Max. Length	20m	20m	20m	2m	100m	2m

- Ezi-SERVO II CC-Link is a drive supporting CC-Link , a high speed fieldbus(max. 10Mbps). Ezi-SERVO II CC-Link is a Remote Device module supporting CC-Link network. Multi-function control is possible by occupying 1 station and 2 stations in CC-Link, and motion and monitoring functions are processed by device commands.
- Please refer to the Ezi-SERVO || CC-Link catalog for optional cables, functions and operation.

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• System Configuration [CC-Link (Ezi-SERVOII CC-Link 86mm)]



Туре	Signal Cable	Encoder Cable	Motor Cable	Power Cable	CC-Link Cable	RS-485 Cable
Length supplied	—	30cm	30cm	-	-	-
Max. Length	20m	20m	20m	2m	100m	2m

• Ezi-SERVO II CC-Link is a drive supporting CC-Link , a high speed fieldbus(max. 10Mbps). Ezi-SERVO II CC-Link is a Remote Device module supporting CC-Link network. Multi-function control is possible by occupying 1 station and 2 stations in CC-Link, and motion and monitoring functions are processed by device commands.

• Please refer to the Ezi-SERVO || CC-Link catalog for optional cables, functions and operation.

• System Configuration [Pulse Input Drive (Ezi-SERVO ST)]



Туре	Signal Cable	Encoder Cable	Motor Cable	Power Cable
Length supplied	-	30cm	30cm	-
Max. Length	20m	20m	20m	2m

• Ezi-SERVO ST is a pulse input type drive. It is controlled by using of Motion controller, standalone controller or PLC (with positioning module).

• Please refer to the Ezi-SERVO ST catalog for optional cables, functions and operation.

• System Configuration [Pulse Input Drive (Ezi-SERVO ST 86mm)]



Туре	Signal Cable	Encoder Cable	Motor Cable	Power Cable
Length supplied	-	30cm	30cm	-
Max. Length	20m	20m	20m	2m

• Ezi-SERVO ST is a pulse input type drive. It is controlled by using of Motion controller, standalone controller or PLC (with positioning module).

• Please refer to the Ezi-SERVO ST catalog for optional cables, functions and operation.

• Dimension of Home-sensor Installation [Ezi-Robo HB60]



HG60/HG85 Common Shielding plate Dimension

* The above drawing is made based on EzM series.

This is only example dimention of home-sensor installation and sensor braket and structures are not provided.

Dimension of Home-sensor Installation [Ezi-Robo HB85]



Dimension of Home-sensor Installation [Ezi-Robo HB130]



* The above drawing is made based on EzM series.

This is only example dimention of home-sensor installation and sensor braket and structures are not provided.

MEMO



Fast, Accurate, Smooth Motion

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