Ezi-ROBO®

CC-Link IE TSN

VZR

Precise Actuator System

- Slim Actuator with Hollow Shaft Motor & Ball Screw Spline
- Vacuum(V) + Linear(Z) + Rotary(R), 3-in-1 Actuator
- Repeatability (Z Axis : ±0.01 mm / R Axis : ±0.1°)
- CiA402 Drive Profile
- CC-Link IE TSN-compatible Closed Loop Stepper System
- Tuning Not Required, No Hunting
- Low Heat Generation, High Torque, High Resolution, Fast Response



FASTECH

Fast Accurate Smooth Motion

Ezi-ROBO®

Precise Actuator System

CC-LinkIE TSN

VZR

*VZR : Vacuum, Z-axis Linear, Rotation



Multi-functional Slim Actuator

Ezi-ROBO VZR is a hybrid product that integrates a precision ball screw spline※and a hollow shaft motor. Without using connecting components such as belt pulleys, the ball screw nut and ball spline nut are directly coupled to the motor shaft, resulting in a simple structure and a slim size that are highly effective in space saving.

※ Ball Screw Spline: A composite part where the ball screw and ball spline are machined on the same shaft.



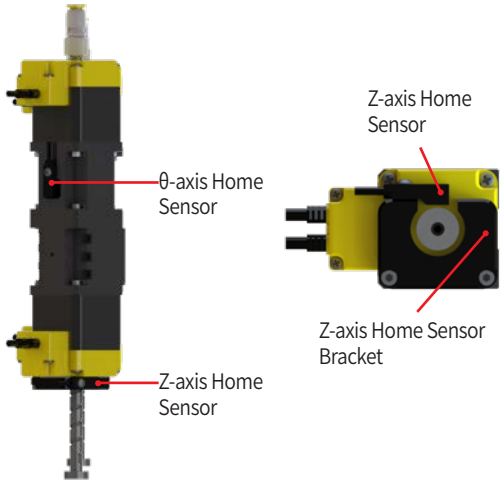
Example) VZR-28 type

Model name	Motor size [Z-axis, θ-axis]	Applicable tube outer diameter
VZR-28	28 mm	Φ6
VZR-42	42 mm	Φ6

Simple Homing

The Ezi-ROBO VZR comes with a home sensor set by default to simplify home return operations. This set includes all the components needed for home return.

ex) VZR-42 type

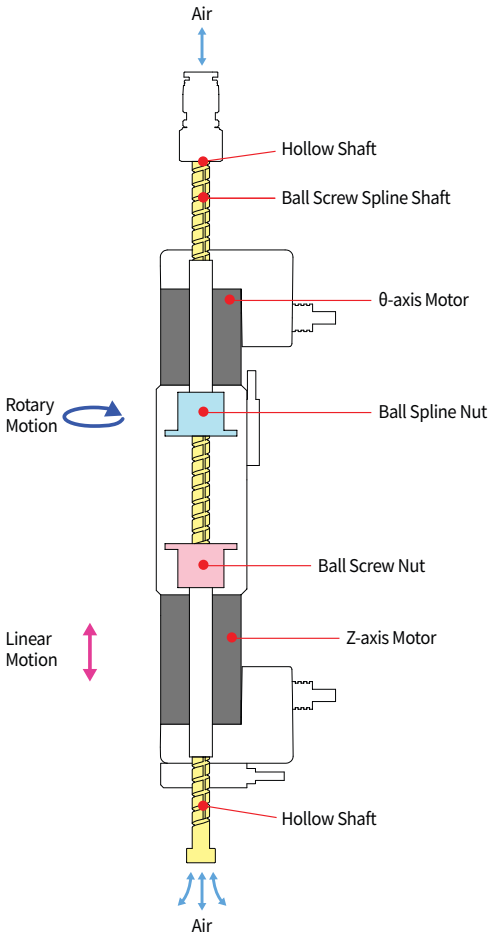


Please ensure that the axis is within a safe range before executing homing. We recommend executing homing for the θ-axis first, followed by the Z-axis. For more details, please refer to the relevant user manual.

Three Functions in One Product

The Ezi-ROBO VZR integrates three functions: vacuum (V), Z-axis linear motion (Z) and rotational motion (R) in a single product.

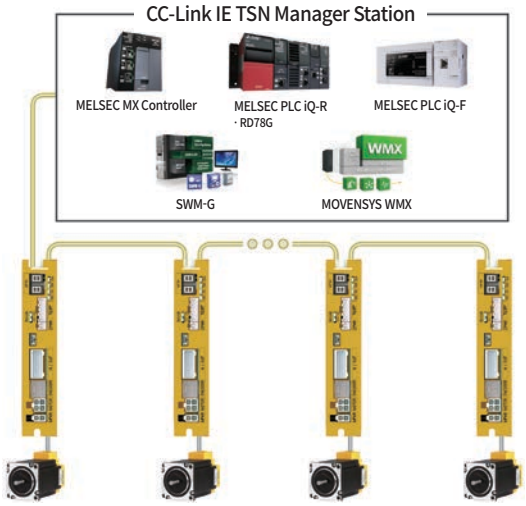
Function Name	Function Description
Vacuum (V)	• The hollow shaft can be used for various applications such as chip mounters and test tube inspection devices.
Z-axis Linear Motion (Z)	• When the Z-axis motor rotates, the ball screw nut rotates, causing the shaft to move linearly. • The θ-axis motor remains stationary, with the ball spline nut acting as a rotation prevention device for the shaft. • With the combination of both motors' operations, the shaft moves linearly without rotating.
Rotational Motion (R)	• Both the Z-axis motor and θ-axis motor rotate simultaneously, causing the ball screw nut and ball spline nut to rotate as well. • With the combination of both motors' operations, the shaft rotates in place without moving linearly.



Ezi-ROBO VZR Product Structure

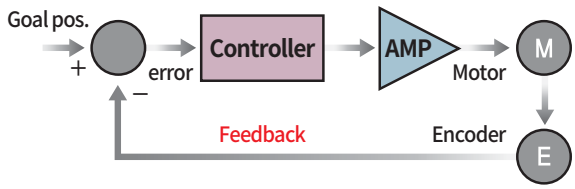
CC-Link IE TSN-compatible Motion Control

Ezi-SERVO CC-Link IE TSN is stepper motor control system that supports CC-Link IE TSN, an industrial network based on high-speed Ethernet (1 Gbps, full-duplex communication).
Ezi-SERVO CC-Link IE TSN employs CiA402 drive profile and supports Profile Position Mode (PP Mode), Homing Mode (HM Mode) and Cyclic Synchronous Position Mode (CSP Mode).



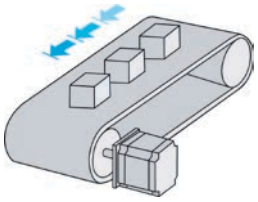
Closed-Loop System

Ezi-SERVO is an innovative Closed-Loop System that utilizes a high-resolution motor mounted encoder constantly to monitor the current position. The encoder feedback allows the Ezi-SERVO to update the current position every 50 µs. It allows the Ezi-SERVO drive to compensate for the loss of position, ensuring accurate positioning. For example, due to a sudden load change, a conventional stepper motor and drive could lose a step but Ezi-SERVO automatically correct the position by encoder feedback.



Tuning Not Required

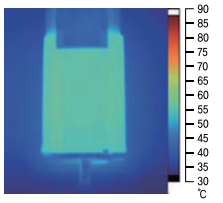
To ensure machine performance, conventional servo systems require the adjustment of its servo's gains as an initial crucial step. Even systems that employ auto-tuningrequire manual tuning after the system is installed.Ezi-SERVO employs the best characteristics of the stepper motor to eliminate the need of tedious gain tuning required for conventional closed-loop servo systems. Ezi- SERVO is especially well suited for low-rigidity loads (e.g., a belt and pulley system) that sometimes require conventional servo systems to use the additional bulky and expensive gearbox.



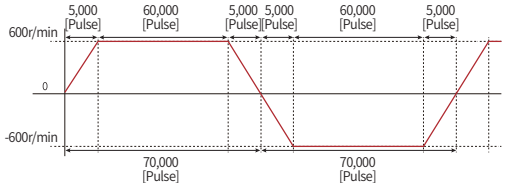
Low Heat Generation / Energy Savings

(Motor Current Control according to load)

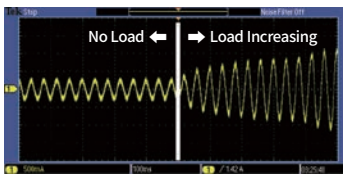
Ezi-SERVO automatically controls motor current according to load. Ezi-SERVO reduces motor current when motor load is low and increases motor current when load is high. By optimizing the motor current, motor heat can be minimized and energy can be saved.



Motor temperature [Measured by Thermal Imaging Camera]



Condition to measure the motor temperature
[4 hours operation, Motor surface temperature saturation]

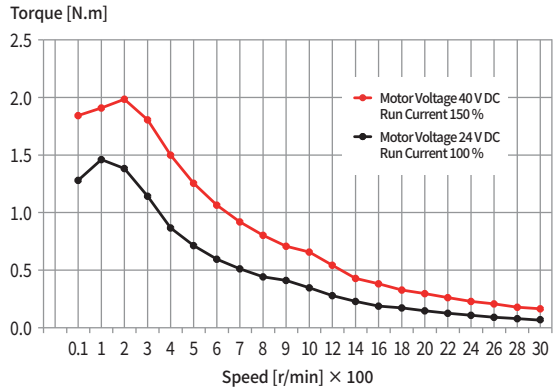


Motor Current
[Example of the Motor Current Control according to load]

High Torque

(Motor Voltage Increasing and Motor Current Setting)

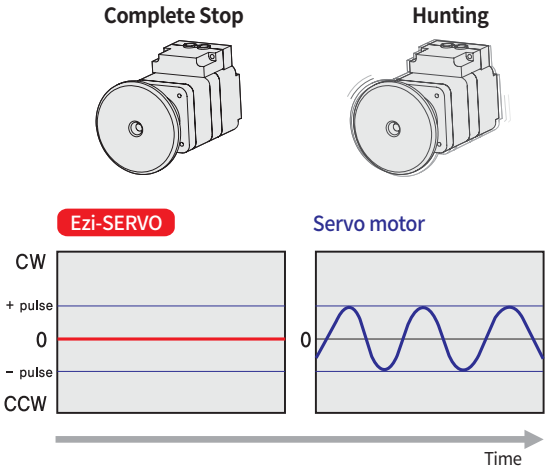
Ezi-SERVO features an internal voltage boosting circuit that increases the motor supply voltage above the drive's input voltage. This elevated motor voltage enhances torque at high speeds and allows the run current to be set up to 150 %. As a result, torque is also improved at low speeds. Ezi-SERVO can achieve approximately 30 % torque improvement across the entire speed range.



※ The torque at low speed and high speed is improved about 30 %.
Measured Condition: Drive = Ezi-SERVO-CT-56L
· Motor Voltage = 40 V DC
· Input Voltage = 24 V DC

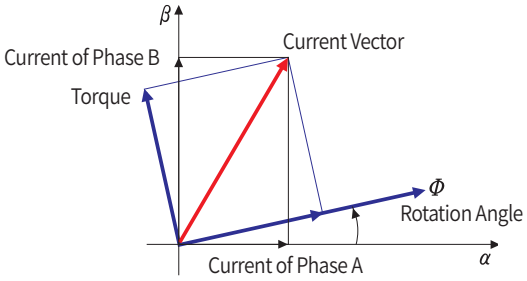
No Hunting

Ezi-SERVO utilizes the unique characteristics of stepper motors and locks itself into the desired target position, preventing vibration and eliminating Null Hunt which happens to the conventional servo systems.
This feature is especially useful in applications such as vision systems in which system oscillation and vibration could be a problem.



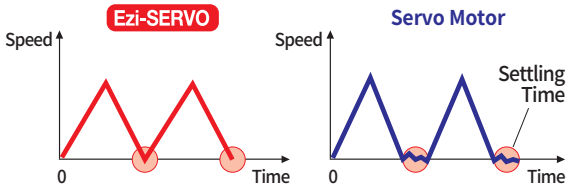
Smooth and Accurate Operation

Ezi-SERVO is a high-precision servo drive, using a high-resolution encoder with 20,000 pulse/revolution. Unlike a conventional Microstep drive, the on-board high performance MCU (Micro Controller Unit) performs vector control and filtering, producing a smooth rotational control with minimum ripples.



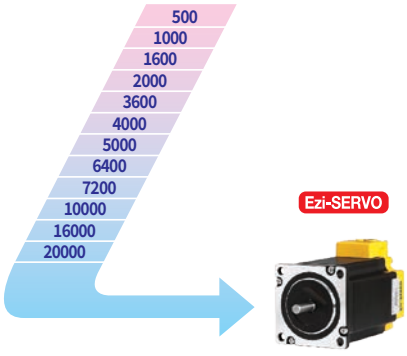
Fast Response

Similar to conventional stepper motors, Ezi-SERVO instantly synchronizes with command pulses providing fast positional response. Ezi-SERVO is the optimum choice when zero-speed stability and rapid motions within a short distance are required. Traditional servo motor systems have a natural delay called settling time between the command input signals and the resultant motion because of the constant monitoring of the current position.



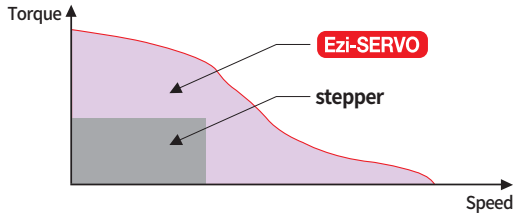
High Resolution

The unit of the position command can be divided precisely. (Max. 20,000 pulse/revolution)



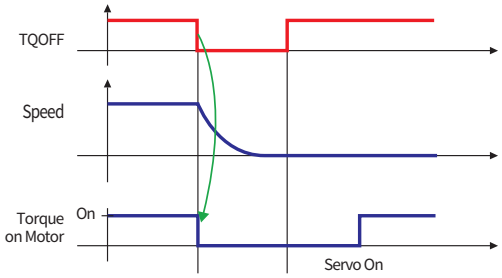
High Torque / Continuous Operation

Compared with common stepper motors and drives, Ezi-SERVO motion control systems can maintain a high torque state over relatively long period of time. This means that Ezi-SERVO continuously operates without loss of position under 100 % of the load. Unlike conventional Micro-step drives, Ezi-SERVO exploits continuous high torque operation during high speed motion due to its innovative optimum current phase control.



Torque-Off Function

Ezi-SERVO CC-Link IE TSN has an input connector (TQOFF) that can Servo OFF through an external signal, regardless of CC-Link IE TSN communication, to stop and protect the motor in an emergency. When the TQOFF signal is detected, the drive immediately turns off the servo, and the motor stops.

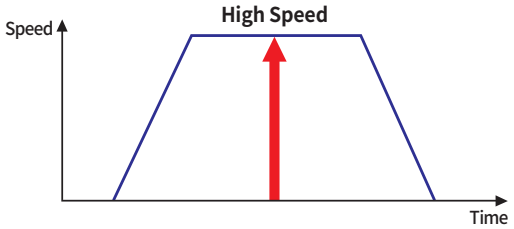


CAUTION

DO NOT use the Torque-Off function to stop or decelerate motors.

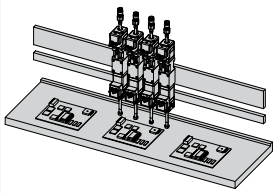
High Speed

The Ezi-SERVO operates well at high speed without the loss of synchronism or positioning error. Ezi-SERVO 's ability to monitor current position continuously enables the stepper motor to generate high torque, even under a 100 % load condition.

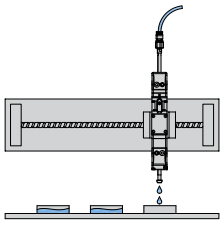


Examples

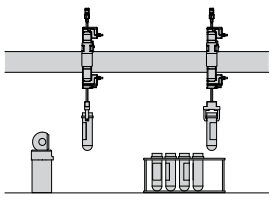
Chip Mounter



Dispenser



Test Tube Inspection Device



Ezi-ROBO VZR Part Numbering

Ezi-ROBO-VZR-28-50-P 6-28-D-N-CT

- **Series**
- **Model Type**
- **Installation Dimensions**
  - 28 : 28 mm
  - 42 : 42 mm
- **Stroke**
  - 50 : 50 mm
- **Ball screw grade**
  - P : Precision
- **Lead**
  - 06 : 6 mm
  - 10 : 10 mm
- **Motor Size**
  - 28 : 28 mm
  - 42 : 42 mm
- **Encoder Resolution**
  - B : 20,000 P/R
  - D : 16,000 P/R
- **Home Sensor**
  - P : PNP Type
  - N : NPN Type
- **Drive Series**
  - CT : CC-Link IE TSN

Applicable Product Series

Product	Specifications
Ezi-SERVO CC-Link IE TSN	CC-Link IE TSN Compatible, Built-in Torque-Off Function



Ezi-SERVO CC-Link IE TSN

Actuator and Drive Combination

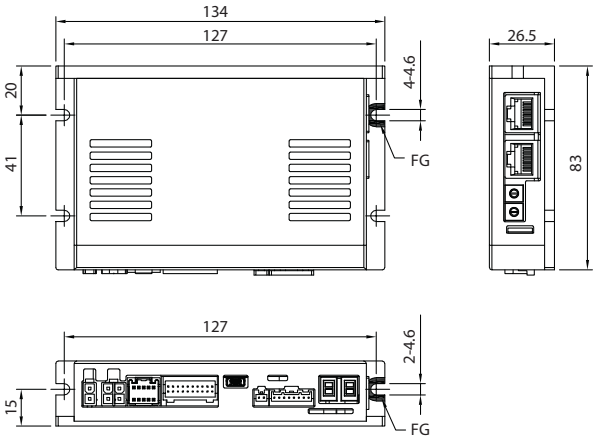
Unit Part Number	Motor Model Number	Drive Model Number
Ezi-ROBO-VZR-28-50-P6-28-D-N-CT	HSE-RBP28MM-D	EzS2-CT-28M-D
Ezi-ROBO-VZR-28-50-P6-28-D-P-CT	HSE-RBP28MM-D	EzS2-CT-28M-D
Ezi-ROBO-VZR-42-50-P10-42-B-N-CT	HSE-RBP42L-B	EzS2-CT-42L-B
Ezi-ROBO-VZR-42-50-P10-42-B-P-CT	HSE-RBP42L-B	EzS2-CT-42L-B

Specifications of Drive

Motor Model		HSE-RBP28 series	HSE-RBP42 series
Drive Model		EzS2-CT-28 series	EzS2-CT-42 series
Input Voltage		24 V DC ± 10 %	
Control Method		Closed loop control with 32 bit MCU	
Current Consumption		Max. 500 mA/axis (Except motor current)	
Operating Condition	Ambient Temperature	· In Use: 0 ~ 50 °C · In Storage: -20 ~ 70 °C	
	Humidity	· In Use: 35 ~ 85 % RH (Non-Condensing) · In Storage: 10 ~ 90 % RH (Non-Condensing)	
	Vib. Resist.	0.5 g	
Function	Rotation Speed	0 ~ 3,000 r/min *1	
	Resolution	Encoder Resolution [P/R] / Configurable Resolution [P/R] 4,000 / 500, 1,000, 1,600, 2,000, 3,600, 4,000, 5,000, 6,400, 7,200, 10,000 10,000 / 500, 1,000, 1,600, 2,000, 3,600, 5,000, 6,400, 7,200, 10,000 16,000 / 500, 1,000, 1,600, 2,000, 3,600, 5,000, 6,400, 7,200, 10,000, 16,000 20,000 / 500, 1,000, 1,600, 2,000, 3,600, 5,000, 6,400, 7,200, 10,000, 20,000 (Selectable by parameter)	
	Error Type	Over Current Error, Over Speed Error, Position Tracking Error, Over Load Error, Over Temperature Error, Over Regenerative Voltage Error, Motor Connection Error, Encoder Connection Error, Main Power Voltage Error, In-Position Error, ROM Error, Position Overflow Error, Torque Off Circuit Error	
	LED Display	Power status, In-Position status, Servo On status, Alarm status	
CC-Link IE TSN	Communication Protocol	CC-Link IE TSN Class B	
	Operation Mode	CiA402 Drive Profile: Cyclic Synchronous Position Mode, Profile Position Mode, Homing Mode	
	Synchronization	Minimum Cycle Time: 250 µs / Synchronous Comm. (CSP, PP, HM) / Asynchronous Comm. (PP, HM)	
I/O Signal	Input Signals	3 dedicated inputs (LIMIT+, LIMIT-, ORIGIN), 6 user inputs (photocoupler inputs), 2 Torque-Off signal inputs (TQOFF)	
	Output Signals	5 user outputs (photocoupler outputs), 1 brake signal output, 1 Torque-Off status output (TQMON)	

*1: Up to the resolution of 10,000 P/R, maximum speed can be reached by 3,000 r/min and with the resolution more than 10,000 P/R, maximum speed shall be reduced accordingly.

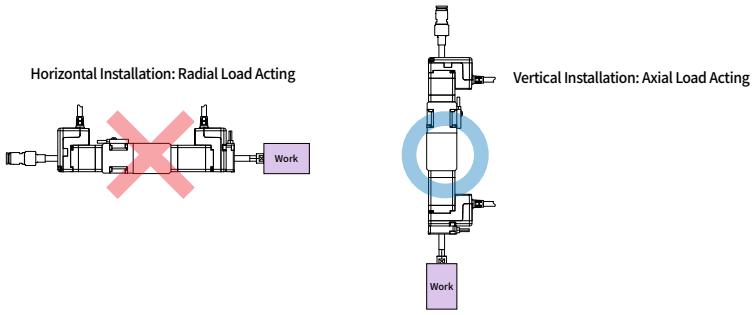
Dimensions of Drive [mm]



How to Read Specifications

Model			Ezi-ROBO-VZR-28-50-P6-28-D-□
① Lead		[mm]	6
② Ball screw grade			Precision
③ Repeatability	Z-axis	[mm]	±0.01
	θ-axis	[deg]	±0.1
④ Maximum speed	Z-axis	[mm/s]	72
	θ-axis	[rev/s]	3
⑤ Maximum acceleration	Z-axis	[m/s²]	0.6
	θ-axis	[rad/s²]	120 π
⑥ Permissible load*1		[kg]	0.5
⑦ Reference thrust force		[N]	7
⑧ Permissible moment		[kg · m²]	$0.15x10^{-4}$
⑨ Stroke		[mm]	50
⑩ Weight		[kg]	0.87
⑪ Operating temperature		[°C]	0 ~ 50(non-condensing)

*1: Radial loads cannot be applied to the Ezi-ROBO VZR. Always install the actuator in a vertical position.



Description of Specification Items

No.	Item	Description
①	Lead	The distance that the ball screw travels in the linear direction when the motor rotates once.
②	Ball screw grade	It indicates accuracy grade of the ball screw.
③	Repeatability	This value indicates the amount of error that occurs when the same position is commanded repeatedly in the same direction. (The accuracy is the value when the temperature and load are constant.)
④	Maximum speed	This is the maximum speed at which the load can be reciprocated.
⑤	Maximum acceleration	This is the maximum acceleration at which the load can be reciprocated.
⑥	Permissible load	This is the maximum weight of the load that can be reciprocated.
⑦	Reference thrust force	This refers to the maximum force that can push the load during constant speed operation.
⑧	Permissible moment	This is the maximum value of the permissible load moment of inertia. Load moment of inertia refers to the inertia of the load that resists changes in rotational motion.
⑨	Stroke	This is the maximum distance that the load can be reciprocated.
⑩	Weight	This is the weight of the product excluding the drive and cable.
⑪	Operating temperature	This is the temperature range within which the product can operate normally.

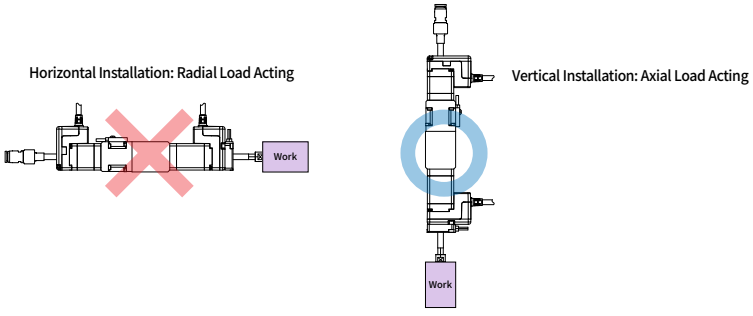
Specifications [VZR-28 Type]

Model			Ezi-ROBO-VZR-28-50-P6-28-D-N-□ Ezi-ROBO-VZR-28-50-P6-28-D-P-□
Lead		[mm]	6
Ball screw grade			Precision
Repeatability	Z-axis	[mm]	±0.01
	θ-axis	[deg]	±0.1
Maximum speed	Z-axis	[mm/s]	72
	θ-axis	[rev/s]	3
Maximum acceleration	Z-axis	[m/s²]	0.6
	θ-axis	[rad/s²]	120 π
Permissible load*1		[kg]	0.5
Reference thrust force		[N]	7
Permissible moment		[kg · m²]	$0.15x10^{-4}$
Stroke		[mm]	50
Weight		[kg]	0.87
Operating temperature		[°C]	0 ~ 50(non-condensing)

Specifications [VZR-42 Type]

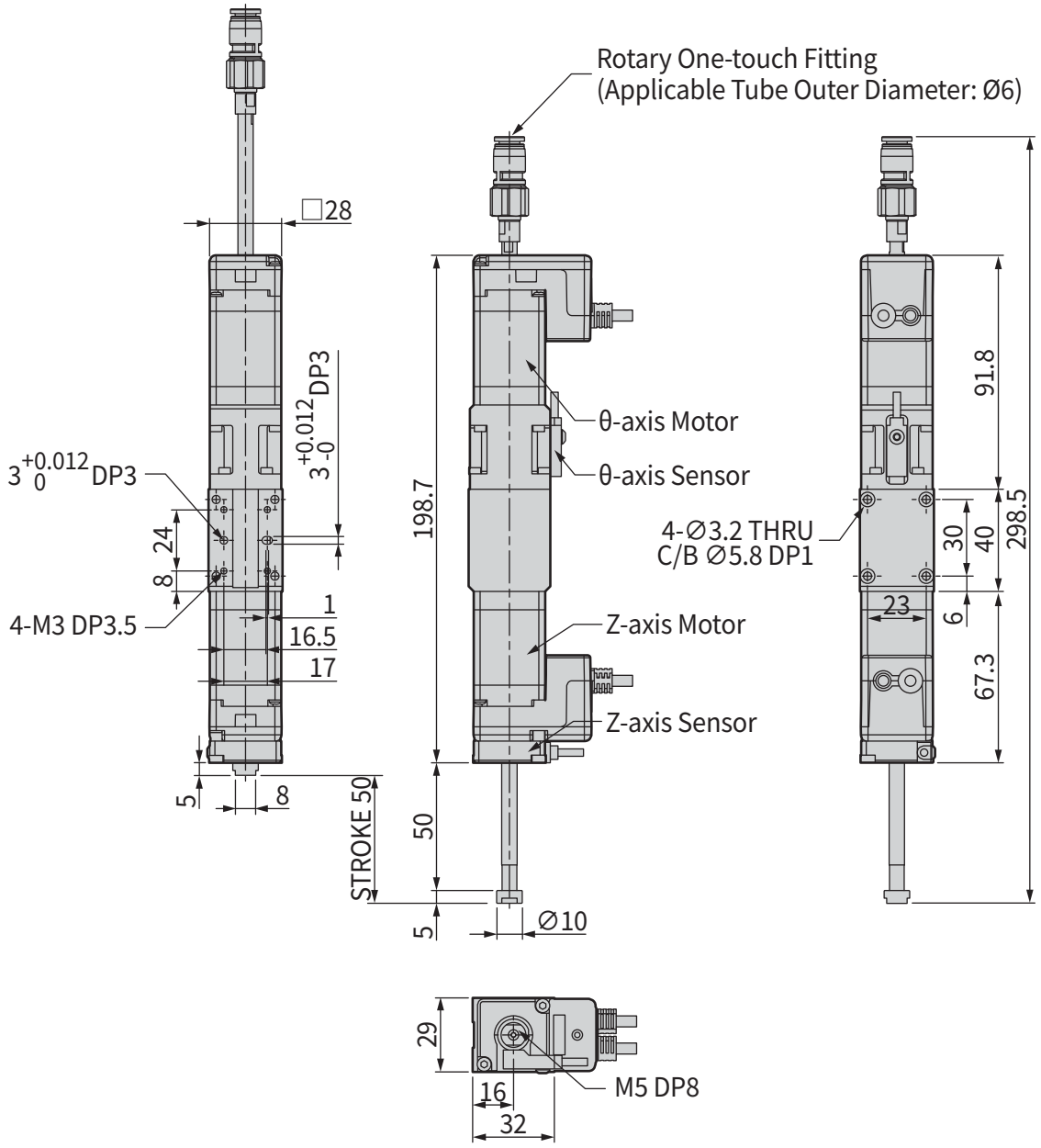
Model			Ezi-ROBO-VZR-42-50-P10-42-B-N-□ Ezi-ROBO-VZR-42-50-P10-42-B-P-□
Lead		[mm]	10
Ball screw grade			Precision
Repeatability	Z-axis	[mm]	±0.01
	θ-axis	[deg]	±0.1
Maximum speed	Z-axis	[mm/s]	200
	θ-axis	[rev/s]	3
Maximum acceleration	Z-axis	[m/s²]	1
	θ-axis	[rad/s²]	120 π
Permissible load*1		[kg]	1.5
Reference thrust force		[N]	15
Permissible moment		[kg · m²]	$0.35x10^{-4}$
Stroke		[mm]	50
Weight		[kg]	1.3
Operating temperature		[°C]	0 ~ 50(non-condensing)

*1: Radial loads cannot be applied to the Ezi-ROBO VZR. Always install the actuator in a vertical position.



Dimensions of Product [mm]

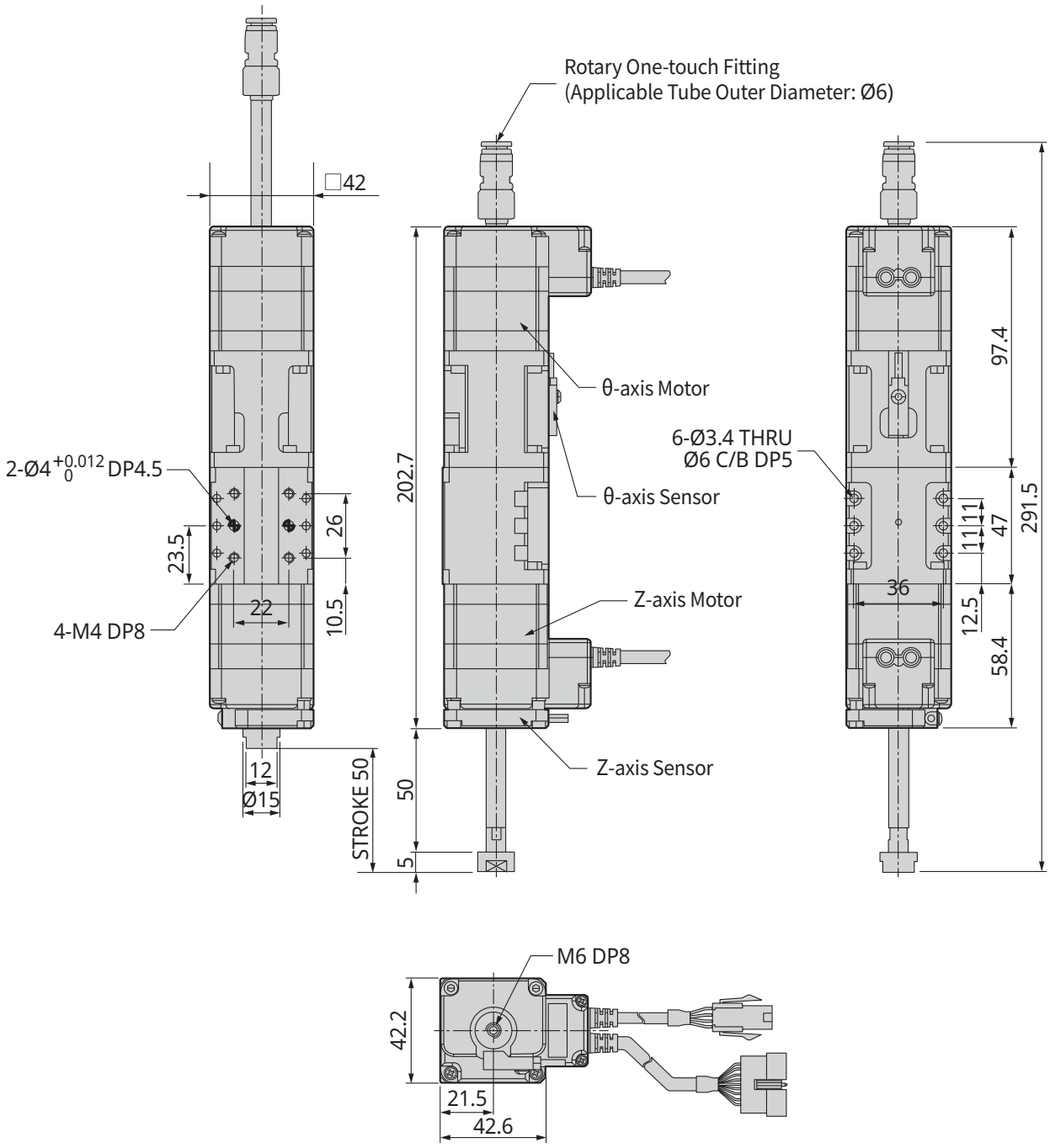
Ezi-ROBO-VZR-28-50-P6-28-D-N-□
Ezi-ROBO-VZR-28-50-P6-28-D-P-□



*□ is the drive type.

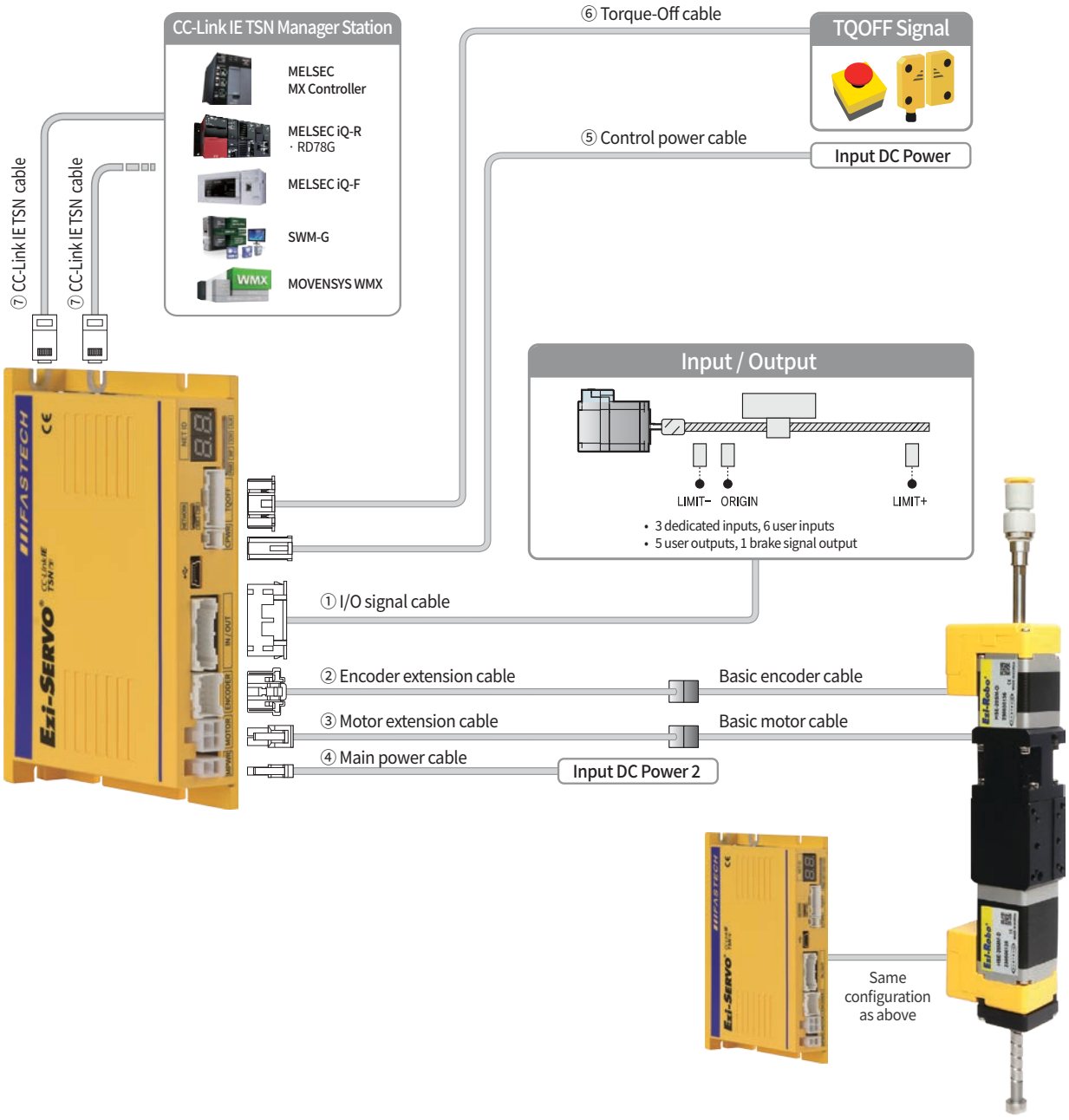
Dimensions of Product [mm]

Ezi-ROBO-VZR-42-50-P10-42-B-N-□
Ezi-ROBO-VZR-42-50-P10-42-B-P-□



*□ is the drive type.

System Configuration [Stnadard type Drive]



Cable Type	Max. Cable Type	Remarks
① I/O Signal Cable	20 m	Options (Sold separately)
② Encoder Extension Cable	20 m	
③ Motor Extension Cable	20 m	
④ Main Power Cable	2 m	
⑤ Control Power Cable	2 m	
⑥ Torque-Off Cable	20 m	
⑦ CC-Link IE TSN Cable	100 m	
Basic Encoder Cable	0.3 m (Basic length)	Basic cables are attached to motors.
Basic Motor Cable	0.3 m (Basic length)	

Home Sensor Set

1. Type

Part Number	Sensor output	Applicable products
E2S-W23	NPN	VZR-28, VZR-42
E2S-W25	PNP	

2. Components (E2S-W23)





Z-axis sensor mounting bracket

3. Specifications

Category	NPN Type	PNP Type
Sensor Part Number	E2S-W23 (OMRON product)	E2S-W25 (OMRON product)
Power Supply Voltage	12 ~ 24 V DC ± 10 % Ripple (P-P) 10 % or less	12 ~ 24 V DC ± 10 % Ripple (P-P) 10 % or less
Current Consumption	13 mA or less	13 mA or less
Control Output	NPN Open Collector Output 12 ~ 24 V DC 50 mA or less Residual voltage 1 V or less (at 50 mA load current)	PNP Open Collector Output 12 ~ 24 V DC 50 mA or less Residual voltage 1 V or less (at 50 mA load current)
Indicator LED	Detection Display (Red)	Detection Display (Red)
Sensor Logic	Normally open	Normally open

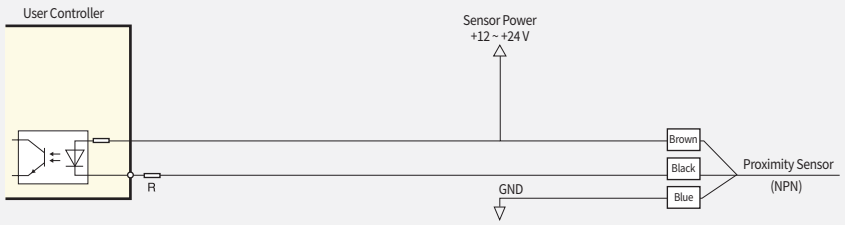
4. Precautions for Limit Sensor Set Installation

- Use the limit sensor set in environments where the installation surface temperature does not exceed 55 °C.
- Do not install the limit sensor while power is applied, as this may cause injury or equipment damage.
- After exposure to vibration or impact, check the sensor to ensure it remains properly mounted and functional.
- Accumulated dust on the sensor may cause malfunctions. Regular cleaning or replacement is recommended.

Home Sensor Cable Installation

1. NPN Type

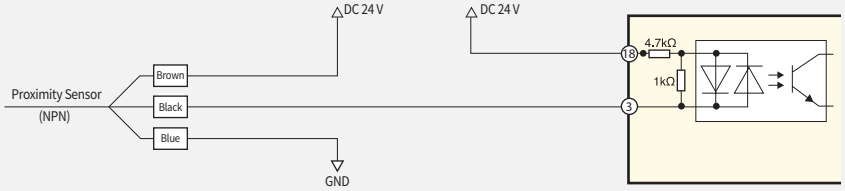
• With User's Controller



Only N.O. (normally open) output is supported.

The power voltage for the sensor can be 12 ~ 24 V DC and the signal current for the sensor can be up to 50 mA. For details, refer to the controller specifications for wiring. If the sensor's signal current exceeds the current range of the controller or sensor, connect a current limiting resistor (R).

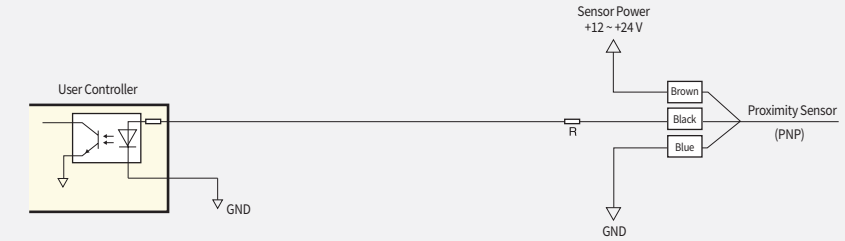
• With Embedded Motion Controller Type Products (e.g., Ezi-SERVO CC-Link IE TSN)



Only N.O. (normally open) output is supported.

2. PNP Type

• With User's Controller



Only N.O. (normally open) output is supported.

The power voltage for the sensor can be 12 ~ 24 V DC and the signal current for the sensor can be up to 50 mA. For details, refer to the controller specifications for wiring. If the sensor's signal current exceeds the current range of the controller or sensor, connect a current limiting resistor (R).

• With Embedded Motion Controller Type Products (e.g., Ezi-SERVO CC-Link IE TSN)



Only N.O. (normally open) output is supported.

Supported FASTECH Drive Types

Built-in Torque-Off Function Drive



Multi-Axis Drive (Max. 4-Axis)



- Further details on the products shown in the image above are available on our website.
- If you have questions regarding products not included in this catalog, or any other inquiries, please feel free to contact us.

Homepage cltsn.fastech-motions.com
E-mail sales@fastech-motions.com

MEMO

FASTECH

Fast Accurate Smooth Motion

FASTECH Co., Ltd.

FASTECH Headquarters : (Postal Code:14502) Rm#1201 ~ 1202, 401-dong, Bucheon Techno-Park, 655 Pyeongcheon-ro, Wonmi-gu, Bucheon-si, Gyeonggi-do, Republic of Korea
TEL : +82-32-234-6317 FAX : +82-32-234-6302 E-mail : sales@fastech-motions.com

FASTECH JAPAN : (〒 450-0001 Aichi) Nagoya, Nakamura Ward, Nagono, 1-Chome 47-1
Nagoya International Center Bldg. 18th Floor
TEL : +81-70-6588-5905 E-Mail : sales_japan@fastech-motions.com

Homepage : cltsn.fastech-motions.com/en | www.fastech-motions.com

※ Please note that the color and size of the products in this catalog may differ depending on the measurement method and the specifications can be changed without prior notice for quality improvement.

ⓒ Copyright 2025-2026 FASTECH Co., Ltd.
All Rights Reserved.
2026-10-27 Rev.2.5