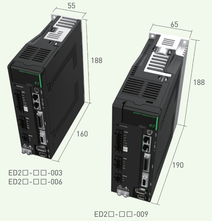
Features

- 3.2 kHz speed response
- Tuneless function
- Advanced auto tuning
- Ripple compensation
- Unique gantry control function
- Network with industrial communication devices
- Support various motor types
- Built-in STO function
- Support various encoder interface protocols such as Digital, Analog, Tamagawa, EnDat, and BiSS-C

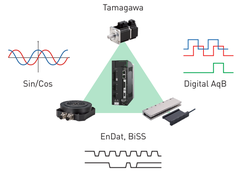
Applications

Industries related to VDU, semiconductor, automation, laser cutting, PCB, etc.



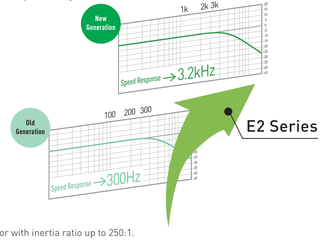
1 Support Various Encoder / Motor Types

Support AC Servo Motors, Direct Drive Motors, Linear Motors, and various encoder formats.



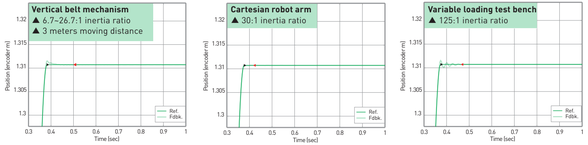
2 3.2 kHz Speed Response

Higher speed response, faster settling time, and higher productivity.



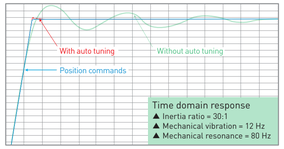
3 Tuneless Function

Maintain good performance and stable movement of the motor with inertia ratio up to 250:1. Auto gain tuning to be adapted to load changes.



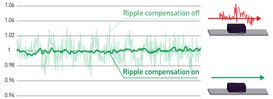
4 Advanced Auto Tuning

Automatic tuning of loop gains and adjustment of filters optimize machine performance by suppressing mechanical vibration and resonance.



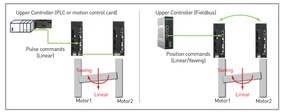
5 Ripple Compensation

Effectively suppress the speed ripple caused by motor cogging, and allow ironcore motor to achieve smooth motion in detection and scanning applications.



6 Unique Gantry Control Function

With the connection of two E2 servo drives, the linear and yawing movement of a gantry can be easily optimized.

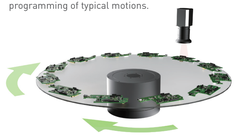


7 Network with Industrial Communication

Support EtherCAT®. E2 can also be connected to HIWIN EtherCAT (CoE) and mega-ulink (MoE) controllers.

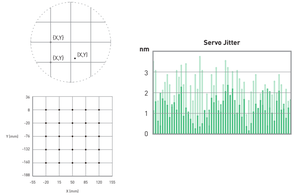
8 Built-in Multi-Motion Function

Tabulated pull-down menu of motion commands to simplify programming of typical motions.



9 High Accuracy in Nano-Positioning

GT model supports nano-positioning for semiconductor equipment with high accuracy and supports 2D error map by using two sets of servo drives.



10 Built-in STO Function

Built-in Safe Torque Off (STO) circuit can be integrated to STO system to protect personnel and equipment.

Note: STO certification is in progress.

Model Explanation

E D 2 S - V 0 - 0 0 3 - 1 - C - 0 0

Type
S: Standard
F: Fieldbus

Control Interface
S V0: Voltage command and Pulse
E0: EtherCAT (CoE)
F H3: mega-ulink (MoE) *1

Rated Output
003: 3 Arms (500 W)
006: 6.3 Arms (1 kW)
009: 9.4 Arms (1.2 kW)

Reserved

Function Model
AC: A
Basic: B
Advanced: C
GT: T

AC Power Input
1/3-phase 100-240 Vac: 1
(Rated 003, 006, 009)
3-phase 200-240 Vac: 2
(Not supported yet)
3-phase 380-480 Vac: 3
(Not supported yet)

Note:
*1 mega-ulink interface is applicable to HIWIN MoE HIMC motion controller or API/MPI library integrated in a computer. For API/MPI integration, refer to the related manuals to confirm if Windows system is supported.

Function Explanation

Function Model	*AC*	*Basic*	*Advanced*	*GT*
Supported Motor	AC Servo Motor	Linear Motor, Direct Drive Motor	AC Servo Motor, Linear Motor, Direct Drive Motor	
Speed Response Bandwidth	3.2 kHz	0.3 kHz	3.2 kHz	3.2 kHz
Supported Function	• Multi-motion function • Velocity ripple compensation • Fast tuning function • Tuneless function of AC motor • Gantry control function • Position trigger	• Multi-motion function • Velocity ripple compensation • Fast tuning function	• Multi-motion function • Velocity ripple compensation • Fast tuning function • Tuneless function of AC motor • Gantry control function • Position trigger	• Multi-motion function • Velocity ripple compensation • Fast tuning function • Tuneless function of AC motor • Gantry control function • Position trigger • 2D error map • Nano-positioning

- ***AC:*** High-speed response drive that supports various functions. It is applicable to HIWIN EM1 series AC servo motors.
- ***Basic:*** It can be applied in the original application scenarios where HIWIN D1 series drives are used. It is applicable to linear motors and direct drive motors, and can be applied in general automatic transfer machines.
- ***Advanced:*** High-speed response drive that supports various functions. It supports EM1 series AC servo motors, linear motors, and direct drive motors.
- ***GT:*** Similar to Advanced model but has additional high-level functions of nano-positioning and 2D error map. If 2D error map function is applied, gantry control function is not available.

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HIWIN MIKROSYSTEM

HIWIN MIKROSYSTEM New Generation Servo Drives

E2

E2 Series Servo Drive

www.hiwinmikro.tw

Drive Specification

Servo Drive Model			ED2□-□□-003	ED2□-□□-006	ED2□-□□-009
Input Power	Single Phase Main Power	Rated Voltage (Line to Line)	AC 100 ~ 120 Vrms, 50 ~ 60 Hz AC 200 ~ 240 Vrms, 50 ~ 60 Hz		
		Rated Current (Arms)	5.8	9.0	12.8
	Three Phase Main Power	Rated Voltage (Line to Line)	AC 200 ~ 240 Vrms, 50 ~ 60 Hz		
		Rated Current (Arms)	2.5	5.0	6.8
	Control Power		1 Ø / AC 100 ~ 120 Vrms, 50 ~ 60 Hz 1 Ø / AC 200 ~ 240 Vrms, 50 ~ 60 Hz		
	Inrush Current of Main Power (Apk)		14.2	14.2	23.4
	Inrush Current of Control Power (Apk)		17.7	17.7	17.7
Output Power	Phase Voltage		3 Ø / AC 240 Vrms max		
	Max Rated Power (W)		500	1000	1200
	Peak Current (Arms)		12	18	28.3
	Rated Current (Arms)		3	6.3	9.4
Power Loss Data (W)			< 40	< 60	< 80
PWM Modulation Frequency			16 kHz		
Dynamic Brake			• Built-in dynamic brake circuit • ED2 □ - □□ - 003 / ED2 □ - □□ - 006: no built-in dynamic brake resistor • Delay time of relay: 20ms		
Built-in Resistor for Dynamic Brake			-	-	10.2 Ω / 7 W
Regenerative Energy Protection	Regenerative Resistor		• Without built-in regenerative resistor. Connect to external regenerative resistor if needed.		
	Built-in Regenerative Resistor		-	-	-
	Capacitance [uF]		780	780	1410
	Protection of Regenerative Resistor Enabled		+HV > 370 Vdc		
	Protection of Regenerative Resistor Disabled		+HV < 360 Vdc		
	Overvoltage Protection		390 Vdc		
Environment	Operating Temperature		0 ~ 45℃		
Fan cooling			No	Yes	Yes
Weight (kg)			Fieldbus : 1.20 Kg Standard: 1.18 Kg	Fieldbus : 1.20 Kg Standard: 1.22 Kg	Fieldbus : 1.72 Kg Standard: 1.76 Kg

Category				Servo Drive Specification
Control Method				IGBT PWM space vector control
Applicable Motor				AC Servo Motor, Direct Drive Motor, Linear Motor
STAT LED Indicator				• Blinking red: Error • Blinking green: Ready • Green: Enabled • There is no STAT LED indicator on Fieldbus servo drive
CHARGE LED Indicator				• Red: The main power is supplied • No light: The main power is not supplied
Analog Output				• Channel: 2 • Resolution: 12 bits • Output voltage range: ±10 V • Accuracy: ±2% • Maximum output current: ±10 mA
Control Function	Position Mode	Command Source		Pulse command from controller
		Signal Type		• Pulse / Direction • CW / CCW • AqB
		Isolated Circuit		High-speed optical coupler
		Input Signal		• Differential input (2.8 Vdc ≦ potential difference ≦ 3.7 Vdc) • Single-ended input (12~24 Vdc)
		Maximum Input Bandwidth		• Differential: 5 Mpps • Single-ended: 200 kpps
		Electronic Gear		Gear ratio: pulses / counts
				Pulses: 1~1,073,741,824
				Counts: 1~1,073,741,824
	Velocity Mode	Command Source		DC voltage command from controller
		Analog Input	Impedance	14 kΩ
			Signal Format	±10 Vdc
			Maximum Input Bandwidth	100 Hz
			Specification	16 bit A/D input (V-REF+/-)
	Torque Mode	Command Source		DC voltage command from controller
		Analog Input	Impedance	14 kΩ
			Signal Format	±10 Vdc
			Maximum Input Bandwidth	100 Hz
			Specification	16 bit A/D input (T-REF+/-)
Control Mode				1. Position mode 2. Velocity mode 3. Torque mode 4. Full-closed loop mode (Dual loop mode)
Computer Communication	Standard USB2.0 (Mini USB type)			Connect the servo drive with the computer to set parameters, monitor physical quantities and execute trial operation via Thunder.
Encoder	Power Supply			+5.1 Vdc ±5 %, 2000 mA
	Signal Format	Serial signal	TAMAGAWA	• Resolution: 23 bits • Bandwidth: 5 MHz
			BiSS-C	• Maximum Data Length: 64 bits • Bandwidth: 5 MHz
			EnDat	• Maximum Data Length: 64 bits • Bandwidth: 4 MHz
		Incremental signal	Digital	• AqB and Z-phase signals • The maximum input bandwidth of each phase is 12.5 MHz. • Quadruple frequency: 50 Mcounts/s
			Analog	• SIN/COS signal (differential signal) • The maximum input bandwidth is 1 MHz • Input signal is 0.3~1.2 Vpp

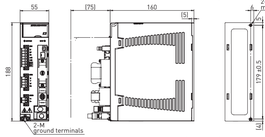
Category			Servo Drive Specification
Encoder	Safety Function		• Encoder power malfunction detection • Encoder alarm protection (Digital differential signal) • Main power overvoltage and undervoltage protection
	Maximum Position Counting Range		-2,147,483,648 ~ 2,147,483,647 (32 bit)

Encoder Output	Emulated Encoder Output	Z Phase (Fieldbus servo drive does not support)	• Serial encoder and incremental encoder (AqB, sin/cos) are supported
			• The width of output signal can be adjusted by parameter
			• Digital differential signal output
			• Z-phase open collector output is supported
			• Two output methods can be selected
			  • Only outputs one Z-phase signal for total travel distance
			  • Outputs one Z-phase signal per one revolution

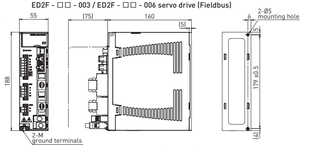
		A / B Phase	• Serial encoder and digital encoder (AqB) are supported • Differential signal output • The maximum output bandwidth is 18 Mcount/s • The scaling of output can be adjusted. For instance, ten encoder counts = one emulated encoder count.
	Buffered Encoder Output	Z Phase	• Only supports digital encoder (AqB) • Differential signal output • Supports Z phase open-collector output
		A / B Phase	• Only supports digital encoders (AqB) • Differential signal output, maximum output bandwidth 20 Mcount/s
General-purpose I/O	Input		• The functions of general-purpose inputs (Optical couplers) can be defined by users • E2 series servo drive provides ten general-purpose inputs (I1 to I10) Fieldbus servo drive only provides eight general-purpose inputs (I1 to I8) 5~24 Vdc/5 mA (Each input pin)
	Output		• The functions of general-purpose outputs (Optical couplers) can be defined by users • E2 series servo drive provides five general-purpose outputs (O1 to O5) 24 Vdc/0.1 A (Each output pin)
	Position Trigger (PT)*		• The pins for position trigger (PT) output function are CN6-46 and 47 (Differential signal) • Differential signal, maximum current 20 mA, maximum output bandwidth 1MHz
Other Function			• Gantry synchronization control function* • Motor over temperature protection (PTC)
Environment	Storage Temperature		-20°C ~ 65°C
	Humidity		Operating and storage temperature: 20 to 85% RH (Non-condensing)
	Altitude		Approved for use at 3,000 M or lower height above sea level
	Vibration		Less than 0.5 G, Frequency 10 to 500 Hz (No continuous use under resonance frequency)
	IP Rating		IP20

Note: * For some of the functions, the eleventh code number of the servo drive needs to be confirmed. Refer to 2.1.3 Function explanation in "E2 Series Servo Drive User Manual."

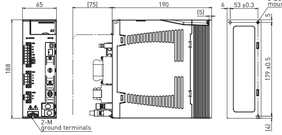
ED2S - □□ - 003 / ED2S - □□ - 006 servo drive (Standard)



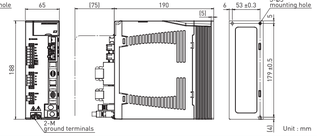
ED2F - □□ - 003 / ED2F - □□ - 006 servo drive (Fieldbus)



ED2S - □□ - 009 servo drive (Standard)

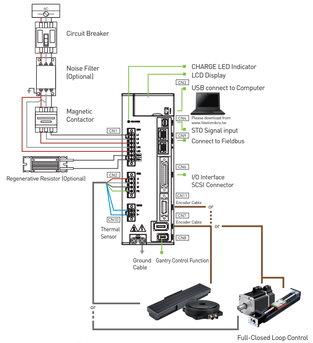


ED2F - □□ - 009 servo drive (Fieldbus)



Unit : mm

Hardware Interface



Product Architectural Diagram

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