

## Features

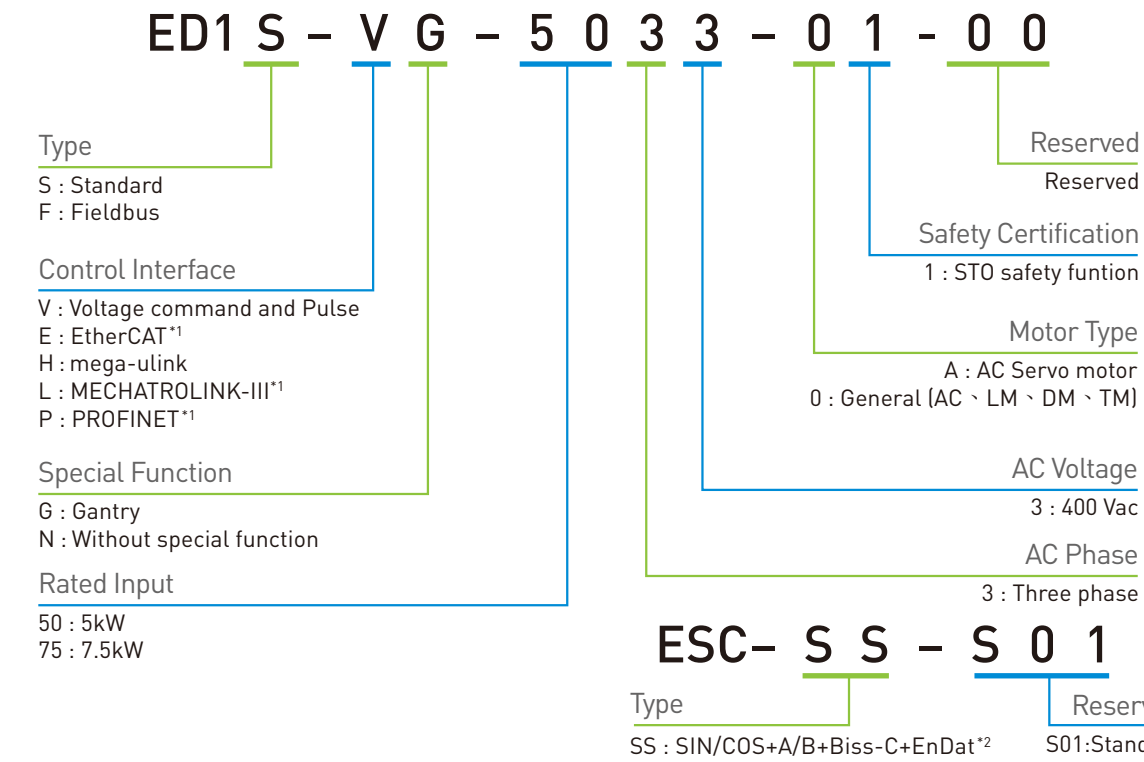
- Advanced auto-tuning
- Ripple compensation
- Drive-level gantry control hardware
- Industrial motion fieldbus
- Support AC, Linear and Direct Drive Motors
- Integrated STO function
- Excellent smart cube supports Digital, Analog, Tamagawa, EnDat and BiSS-C encoders

### Applications

Semiconductor Automated Optical Inspection, Bio-sequencing, Lab automation, Laser/Plasma cutting, Additive manufacturing, 3D printint, CNC parts feed/orientation, PCB assembly,etc.

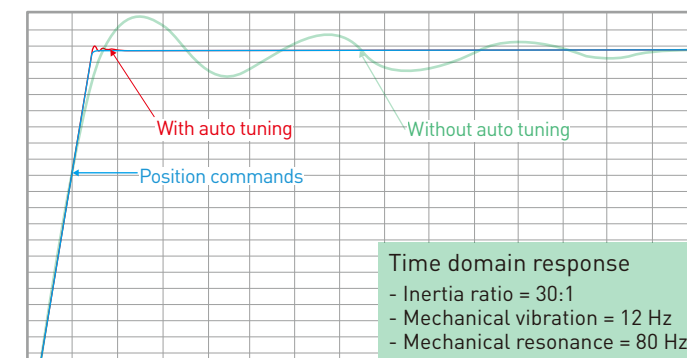


## Model Explanation



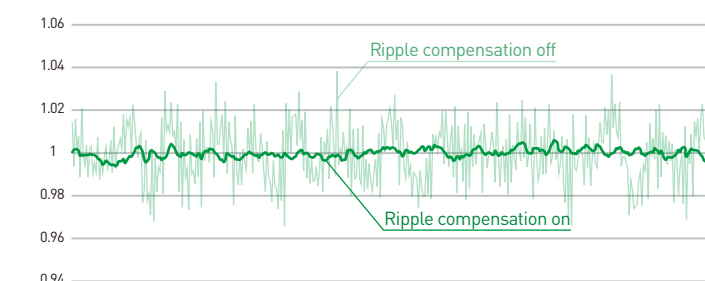
### 1 Advanced Auto-Tuning

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



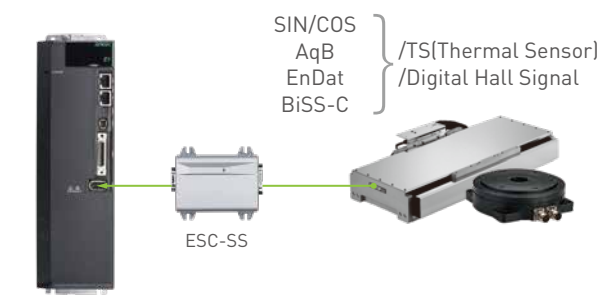
### 2 Ripple Compensation

Effectively suppresses the speed ripple caused by motor cogging. This function is especially useful for mechanism in which high control gains are not allowed.



### 5 Compatible Encoder Types

Built-in interface to receive digital encoder signals. Tamagawa serial encoder interface is also supported. With an ESC [Excellent Smart Cube], E1 can support other types of encoders, such as analog (SIN/COS), EnDat<sup>®</sup> and BiSS<sup>®</sup>-C.\*



Note 1.  
EtherCAT<sup>®</sup> is a registered trademark of Beckhoff Automation Co., Ltd.  
MECHATROLINK is a registered trademark of MECHATROLINK Members Association.  
PROFINET<sup>®</sup> is a registered trademark of PROFIBUS & PROFINET International (PI).  
Note 2.  
EnDat<sup>®</sup> is a registered trademark of HEIDENHAIN GmbH.  
BiSS<sup>®</sup> is a registered trademark of iC-Haus GmbH.

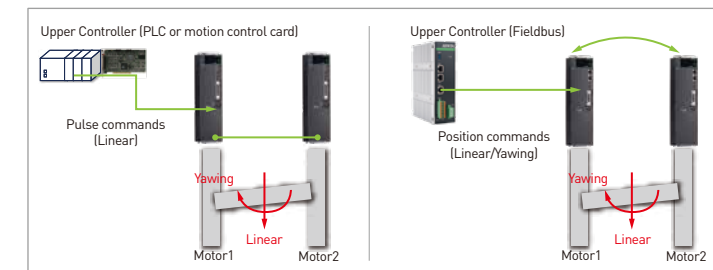
### 7 Integrated STO function

Integrated STO functions per EN 61800-5-2 and approval option.

Product	Model	UL Approval	Federal Communications Commission	EU Directives		UK Conformity Assessed
					RoHS Directive	
E1 Series Servo Drive	ED1□-□□-5033	✓	—	✓	✓	✓
	ED1□-□□-7533	—	—	✓	✓	✓
Excellent Smart Cube (ESC)	ESC-□□□□□	—	✓	✓	✓	—

### 3 Drive-level Gantry Control Hardware

With the connection of two E1 drives, the linear and yawing movement of a gantry can be easily optimized.



### 4 Industrial Motion Fieldbus

Supports EtherCAT<sup>®</sup>, MECHATROLINK-III and PROFINET<sup>®</sup>.<sup>1)</sup> 16 E1 axes can be synchronized in 250 μs with Hiwin Motion Controller (HIMC).



### 6 Support AC, Linear and Direct Drive Motors

E1 is designed as a general purpose drive applicable to AC servo, linear and direct drive motors.



**HIWIN<sup>®</sup>**

**E1**

400V Drive

**HIWIN<sup>®</sup>**

**HIWIN MIKROSYSTEM CORP.**  
No. 6, Jingke Central Rd.,  
Taichung Precision Machinery Park,  
Taichung 40852, Taiwan  
Tel: +886-4-2355-0110  
Fax: +886-4-2355-0123  
www.hiwinmikro.tw  
business@hiwinmikro.tw

### Global Sales And Customer Service Site

**HIWIN GmbH**  
OFFENBURG, GERMANY  
www.hiwin.de  
www.hiwin.eu  
info@hiwin.de

**HIWIN Schweiz GmbH**  
JONA, SWITZERLAND  
www.hiwin.ch  
info@hiwin.ch

**HIWIN KOREA**  
SUWON · CHANGWON, KOREA  
www.hiwin.kr  
info@hiwin.kr

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TOHOKU · SHIZUOKA · HOKURIKU ·  
HIROSHIMA · FUKUOKA · KUMAMOTO,  
JAPAN  
www.hiwin.co.jp  
info@hiwin.co.jp

**HIWIN s.r.o.**  
BRNO, CZECH REPUBLIC  
www.hiwin.cz  
info@hiwin.cz

**HIWIN CHINA**  
SUZHOU, CHINA  
www.hiwin.cn  
info@hiwin.cn

**HIWIN USA**  
CHICAGO, U.S.A.  
www.hiwin.us  
info@hiwin.com

**HIWIN FRANCE**  
STRASBOURG, FRANCE  
www.hiwin.fr  
info@hiwin.de

**Mega-Fabs Motion Systems, Ltd.**  
HAIFA, ISRAEL  
www.mega-fabs.com  
info@mega-fabs.com

**HIWIN Srl**  
BRUGHERIO, ITALY  
www.hiwin.it  
info@hiwin.it

**HIWIN SINGAPORE**  
SINGAPORE  
www.hiwin.sg  
info@hiwin.sg

## Drive Specification

Rated Output		5kW	7.5kW
Input Power	Three Phase Main Power	Rated Voltage (Line to Line) AC 380- 480 Vrms , 50-60 Hz	
		Rated Current (Arms)	12.6      17.6
		Inrush Current (Apk)	50
Control Power		DC 24 V±15% , 2A	
Output Power	Phase Voltage	3 Ø/AC 480 Vrms max.	
	Maximum Rated Power (W)	5k	7.5k
	Peak Current (Arms)	42	85
	Rated Current (Arms)	16	27.4
Power Loss Data (W)		<250	<525
PWM Modulation Frequency		8 kHz	
Dynamic Brake		Built-in dynamic brake circuit No built-in dynamic brake resistor Delay time of relay: 20 ms	
Lowest Value allowed for External Dynamic Brake Resistor		10 Ohm	
Regenerative Energy Protection	Regenerative Resistor	5 kW: With built-in regenerative resistor. Connect to external regenerative resistor to increase regenerative capacity. 7.5 kW: Without built-in regenerative resistor. Connect to external regenerative resistor if needed.	
	Built-in Regenerative Resistor	27 Ohm /180 W	-
	Power Capacity (uF)	560	840
	Protection of Regenerative Resistor Enabled	+HV : > 620 Vdc ~ 770 Vdc	
	Protection of Regenerative Resistor Disabled	+HV : < 600 Vdc ~ 755 Vdc	
Overvoltage Protection	800 Vdc		
Environment	Operating Temperature	0-40 °C	
Weight [kg]		4.0	5.3

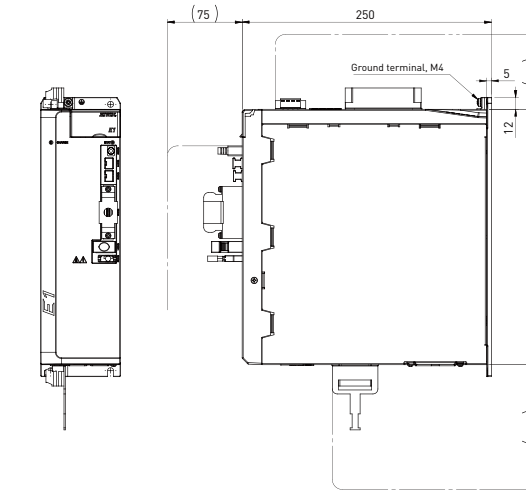
Category	Servo Drive Specification	
Cooling Method	Fan cooling	
Control Method	IGBT PWM space vector control	
Applicable Motor	AC/DM/LM [Depending on encoder type, Excellent Smart Cube (ESC) may be required.]	
STAT LED Indicator	Blinking red:Error ; Blinking green:Ready ; Green:Enabled ; There is no 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 bit ; Output voltage range: ±10 V ; Accuracy: ±2% ; Maximum output current: ± 10 mA	
Control Mode	Position mode Velocity mode Torque mode Full-closed loop mode [Dual loop mode]	
Computer Communication	Standard USB2.0 [Mini USB type]	Connect the E1 drive to a computer with Thunder software to set parameters, exercise motion profile in tuning and monitor motor/motion parameters.
Optional Function	Gantry synchronization control function	

Category	Servo Drive Specification			
Control Function	Position Mode	Command Source	Pulse command from controller	
		Signal Type	Pulse/Direction , CW/CCW , AqB	
		Isolated Circuit	High-speed optical coupler	
	Velocity Mode Torque Mode	Input Signal	Differential input (2.8 V ≤ high and low potential difference ≤ 3.7 V) or 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	
Encoder	Analog Input	Command Source	DC voltage command from controller	
		Specification	16 bit A/D input [Velocity Mode: V-REF+/- , Torque Mode: T-REF+/-]	
	Signal Format	Serial signal	Resolution: 23 bit (Single-turn/multi-turn absolute encoder) Bandwidth: 5 MHz	
		Incremental signal [Digital differential TTL signal]	AqB and Z-phase signals The maximum input bandwidth of each phase is 5 MHz. Quadruple frequency, 20 Mcounts/s	
Encoder Feedback	Safety Function	Encoder power malfunction detection ; Short circuit protection Undervoltage protection ; Encoder alarm protection [Digital differential TTL signal]		
	Position Counting Range	-2,147,483,648~2,147,483,647 [32 bit]		
	Linear Motor/Direct Drive Motor	Depending on encoder type, Excellent Smart Cube (ESC) may be required.		
	Emulated Encoder Output [Fieldbus servo drive does not support]	Z Phase	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. E1 series servo drive provides ten general-purpose inputs [I1 to I10]. Fieldbus servo drive only provides eight general-purpose inputs [I1 to I8] 24 V/5 mA [Each input pin]		
	Output	The functions of general-purpose outputs [Optical couplers] can be defined by users. E1 series servo drive provides five general-purpose outputs [O1 to O5] 24 V/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 3.3 V, maximum current 20 mA, maximum output bandwidth 10 MHz.		
Environment	Storage Temperature	-20°C~65°C		
	Humidity	Operating and storage temperature: 20 to 85% RH [Non-condensing]		
	Altitude	Altitude 1,000 M or lower above sea level [1000~2000M is acceptable when derated value is applied. Please refer to section 4.5]		
	Vibrating	Less than 0.5 G Frequency 10 to 500 Hz [No continuous use under resonance frequency]		
	IP Rating	IP20		

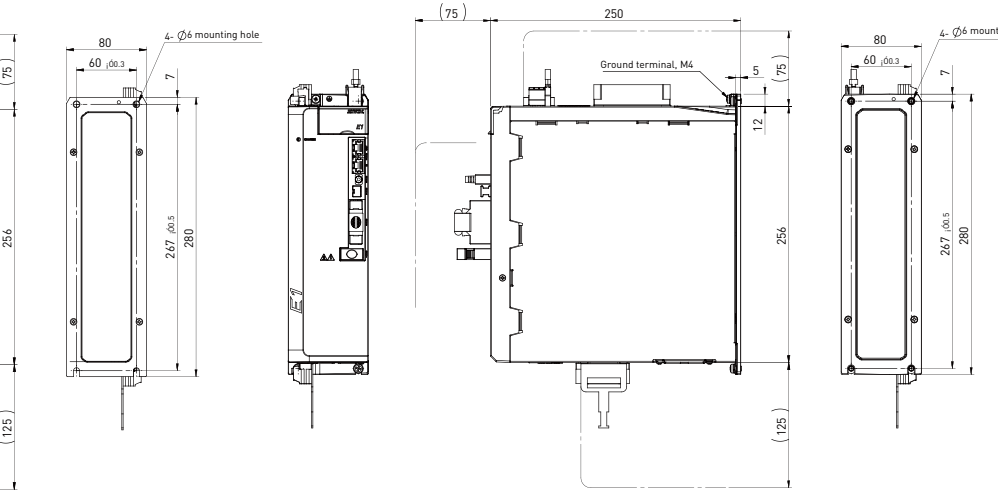
## Dimensions

### 5kW

#### Standard



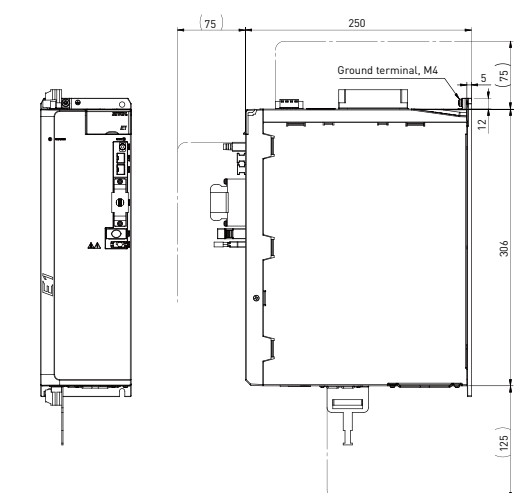
#### Fieldbus



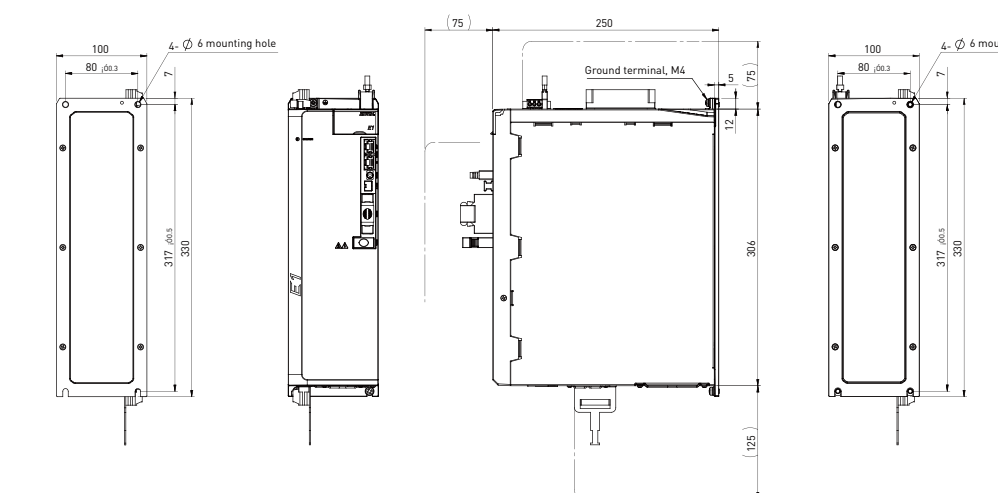
unit:mm

### 7.5kW

#### Standard



#### Fieldbus



unit:mm

## Wiring Diagrams

