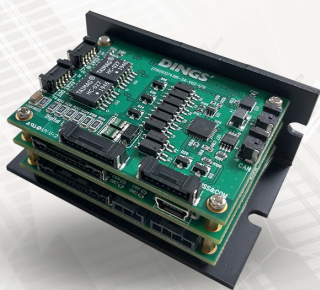


# DINGS

Precision Motion Specialist

## MOTION CONTROLLER PRODUCT CATALOG



DINGS' offers various motion controllers includes drivers and programmable controllers with our hybrid stepper linear actuators, rotary stepper, hollow shaft motors, brushless DC motors and voice coil motors as one package. From step and direction microstepping driver but also RS485, CANopen and EtherCAT supported open loop / closed loop of motion controllers are available.

DINGS' motion controllers are very specialized for all types of linear actuators includes External, Non-Captive, Captive and Kaptive actuators with encoder or without encoder. These stepper electronics also can be available for regular rotary steppers and also for hollow shaft motors too. Both open and closed loop controls are available.

For Brushless DC motor, DINGS' provides standard and Mini type of motion controllers via CANopen and EtherCAT field bus. These combination can be low-voltage DC Servo which can be alternatives for conventional closed loop stepping control system and AC Servo for certain applications.



# MOTION CONTROLLER

# CONTENTS

Stand alone stepper motor driver part number construction

Integrated stepper motor driver part number construction

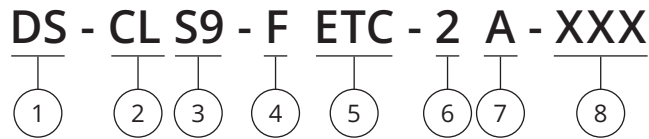
Stand alone stepper electronics

Stand alone brushless DC motor electronics

Integrated stepper electronics



# Stand Alone Stepper Motor Driver Part Number Construction



① DINGS' Brand

② Series

OL = Open Loop

CL = Closed Loop

BV = BLDC / VCM

OLB = Open Loop Brushless

CLB = Closed Loop Brushless

CLS = Closed Loop Servo

③ Frame Number / Size Code

20/28/35/42/57/60 = Frame number

S(x) = S series

M = M series

C(x) = Custom series

ST(x) = ST series

D(x) = D series

W(x) = W series

④ Structure Type

I = Integrated

F = Stand Alone

⑤ Control Mode

PD = Pulse / Direction

SC = Speed Control

RS4 = RS485

CAO = CANopen

ETC = EtherCAT

SA = Step Servo

⑤ Axis Count

1 = Single-axis

2 = Dual-axis

4 = 4-axis

8 = 8-axis

⑥ Encoder Mode

I = Incremental

A = Absolute

N = None

⑦ Customization Requirements

00(XX) = Custom serial number

L = Side Mounting

T = End Mounting

24V = 24V Signal Voltage

H = Hollow shaft

C = Closed type

I = Incremental

A = Absolute

Example

Part Number DS-OL42-FPD

Description Open Loop  
42 Series  
Integrated  
Pulse Direction

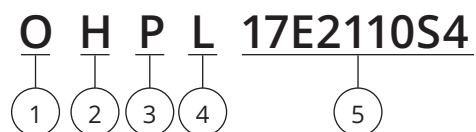
Example

Part Number DS-CLS9-FETC-2A

Description Closed Loop  
S9 Series  
Stand Alone Type  
EtherCAT  
Dual Axis  
Absolute Type



## Integrated Stepper Motor Driver Part Number Construction



- ① Control Type
  - O = Open Loop
  - C = Closed Loop
- ② Structure
  - H = Hollow Shaft Type
  - B = Blocking Closed Type
- ③ Control Method
  - P = Pulse / Direction
  - S = Speed Regulation Type
  - R = RS485 Communication
  - C = CANopen Communication
  - E = EtherCAT Communication
- ④ Mounting Type
  - L = Side Mounting
  - T = Back Mounting
- ⑤ Product Model

### Example

Part Number	OHRT17E2110S4
Description	Open Loop Hollow Shaft RS485 Communication Back Mounting

# Integrated Stepper Motor Driver Part Number Construction

## ■ DS-OLF2-FPD Open-Loop Control - 5 Phase Pulse type

### ● Features

1. Input power : DC 24V - 48V
2. Output rated current: 0.2A - 2.4A (max)
3. Compatible with five-phase hybrid stepper motor
4. 3 inputs, 2 outputs
5. Single / dual pulse selection

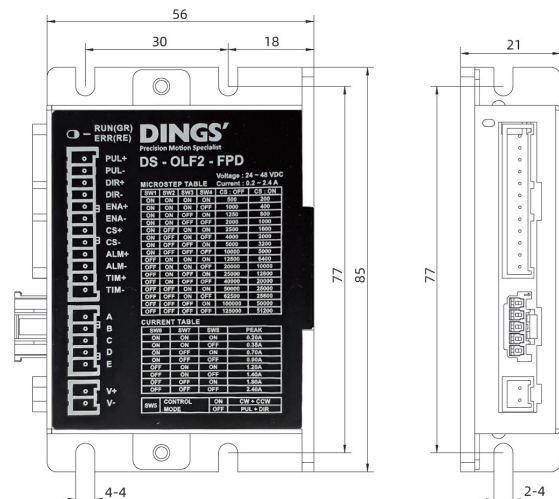


### ● Specification

Adapted motor		5-phase hybrid stepper motor
Power supply		24 ~ 48VDC
Output current		0.2A - 2.4A (max)
Driving method		Full-bridge bipolar PWM
Control Method		Pulse direction control
Encoder support		No
Input signal	Pulse signal	Optocoupler input voltage H = 3.5 - 5 V , L = 0 - 0.8 V, Current 5 - 8 mA
	Enable signal	
	Direction signal	
	Select signal	
Output signal	Alarm output	Optocoupler isolation output, max. withstand voltage 30VDC, max. saturation current 10mA
	TIM signal	
Size (mm)		85 × 21 × 56
Weight		about 96g
Operating environment	Application	Avoid dust, oil mist and corrosive gas
	Humidity	< 85% RH, no condensation
	Temperature	0 ~ 40°C
	Heat dissipation	Install in a ventilated environment

### ● Installation (unit : mm)

1. When designs installation, please consider the size of terminals and pace required for heat dissipation.
2. The reliable working temperature of the driver is usually within 60°C and motor is within 80°C.
3. When install driver, please install it vertically and laterally to make the radiator from strong air convection, when necessary, install a fan near the driver to force heat dissipation to ensure that the driver works within reliable working temperature range.



# Stand Alone Stepper Electronics

## ■ DS-OLS2-FPD Driver

### ● Features

- 32-bit DSP Technology
- Anti-Resonance for optimal torque, extra smooth motion, low motor heating and noise
- 3-digit dialing code adjustable, 8 output current settings
- Power-on automatic setting, automatic current halving at rest
- Precise current control significantly reduces motor heating
- Support single and double pulses, dial selection
- Drive 4,6,8-wire two-phase stepper motor
- Optically isolated inputs
- 70KHz max pulse input frequency
- 8 output current settings of 0.3 – 2.2A via DIP Switches
- Over-voltage and over-current protections
- External alarm output, maximum output current 100mA, withstand 24Vdc

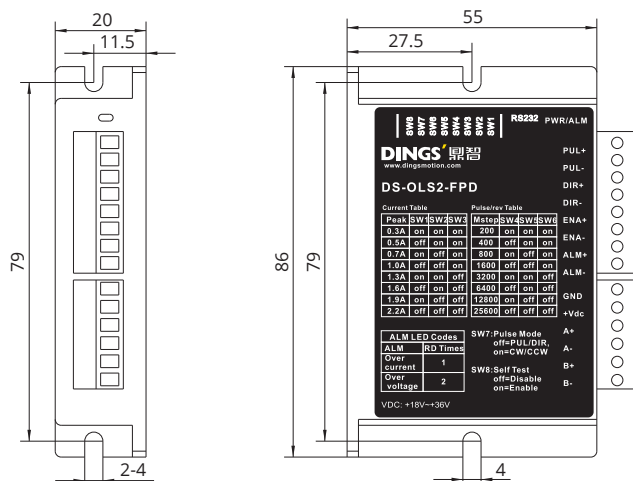


### ● Specification

Adapted motor		2-phase hybrid stepper motor			
Project	Min	Typical	Max	Unit	
Output current	0.3	-	2.2	A	
Input power voltage	18	24	36	VDC	
Control signal input current	7	10	16	mA	
Pulse input frequency	0	-	200	KHz	
Isolation resistance	100			MΩ	
Cooling		Natural Cooling or Forced Cooling			
Operating environment	Environment	- It should not be placed next to other heating equipment. - It should avoid dust, oil mist, corrosive gas and places with too high humidity and strong vibration. Flammable gas and conductive dust are prohibited.			
	Humidity	40 ~ 90%RH			
	Temperature	0 ~ 50°C			
	Vibration	10 ~ 55Hz / 0.15mm			
Storage temperature		-20 ~ 65°C			
Weight		150g			

### ● Installation (unit : mm)

\* Side/Vertical mounting is recommended for better heat cooling. Terminal size and heat dissipation space need to be considered in installation design.



# Stand Alone Stepper Electronics

## ■ DS-OLS22-FPD Open-Loop Control - Pulse type

### ● Features

1. Input power : DC 12V - 48V
2. 8 Output current settings
3. PWM constant current bipolar subdivision drive
4. 16 Micro-step resolutions of DIP
5. Single / Double pulse selection
6. Optically isolated input function
7. Motor short circuit protection
8. Compact design, low noise, low vibration.
9. With off-line function

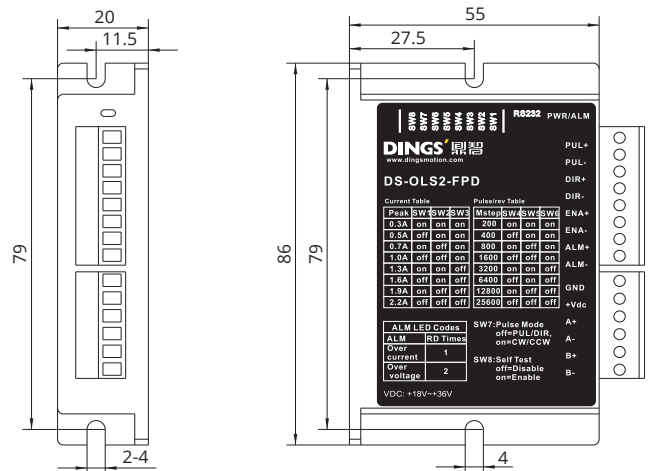


### ● Specification

Adapted motor		2-phase hybrid stepper motor
Power supply		DC 12 ~ 48V
Output current		0.3A - 3A (max)
Driving method		Full-bridge bipolar PWM
Input signal	Pulse signal	Optocoupler input voltage H = 3.5 - 26 V , L = 0 - 0.8 V, Current 6 - 15 mA
	Offline signal	
	Direction signal	
Size (mm)		92.5 × 21 × 56
Weight		about 96g
Operating environment	Application	Avoid dust, oil mist and corrosive gas
	Humidity	< 85% RH, no condensation
	Temperature	0 ~ 40°C
	Heat dissipation	Install in a ventilated environment

### ● Installation (unit : mm)

1. When designs installation, please consider the size of terminals and pace required for heat dissipation.
2. The reliable working temperature of the driver is usually within 60°C and motor is within 80°C.
3. When install driver, please install it vertically and laterally to make the radiator from strong air convection, when necessary, install a fan near the driver to force heat dissipation to ensure that the driver works within reliable working temperature range.





# Stand Alone Stepper Electronics

## ■ DS-OLS4-FPD Open-Loop Control - Pulse type

### ● Features

1. 32-bit DSP Technology
2. Anti-Resonance for optimal torque, extra smooth motion, low motor heating and noise
3. Built-in Micro-stepping
4. Power-on automatic setting, automatic current halving at rest
5. Precise current control significantly reduces motor heating
6. Automatic idle current reduction to 50% , SW4 selection
7. Support single and double pulses, dial selection
8. Drive 4,6,8-wire two-phase stepper motor
9. Optically isolated inputs
10. 200KHz max pulse input frequency
11. 4-digit dialing code, adjustable 16 output current settings
12. Over-voltage and over-current protections
13. External alarm output, maximum output current 100mA, withstand 24Vdc

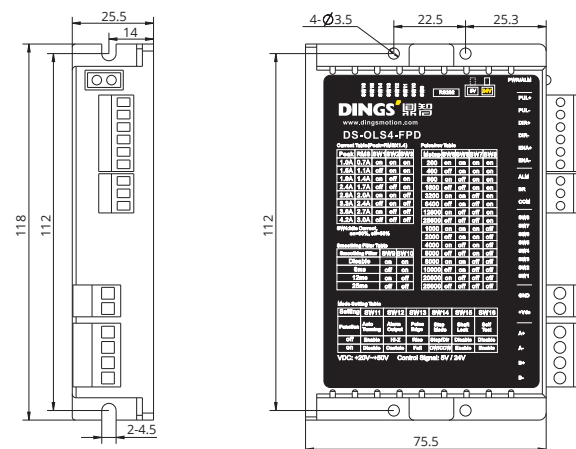


### ● Specification

Adapted motor	2-phase hybrid stepper motor			
Project	Min	Typical	Max	Unit
Output current	1	-	4.2	A
Input power voltage	20	24 / 36	50	VDC
Control signal input current	7	10	16	mA
Pulse input frequency	0	-	200	KHz
Isolation resistance	100			MΩ
Cooling	Natural Cooling or Forced Cooling			
Operating environment	Environment	- It should not be placed next to other heating equipment. - It should avoid dust, oil mist, corrosive gas and places with too high humidity and strong vibration. Flammable gas and conductive dust are prohibited.		
	Humidity	40 ~ 90%RH		
	Temperature	0 ~ 50°C		
	Vibration	10 ~ 55Hz / 0.15mm		
Storage temperature	-20 ~ 65°C			
Weight	250g			

### ● Installation (unit : mm)

\* Side/Vertical mounting is recommended for better heat cooling. Terminal size and heat dissipation space need to be considered in installation design.



# Stand Alone Stepper Electronics

## ■ DS-OLS8-FPD Open-Loop Control - Pulse type

### ● Features

1. Input power : DC 24V - 72V
2. 8 Output current settings
3. PWM constant current bipolar subdivision drive
4. 16 Micro-step resolutions of DIP
5. Single / Double pulse selection
6. Optically isolated input function, 5 - 24VDC compatible input
7. Motor short circuit protection
8. Control signal to realize the functions of driver enable, start stop, emergency stop, limit, etc.
9. Compact design, low noise, low vibration
10. With off-line function

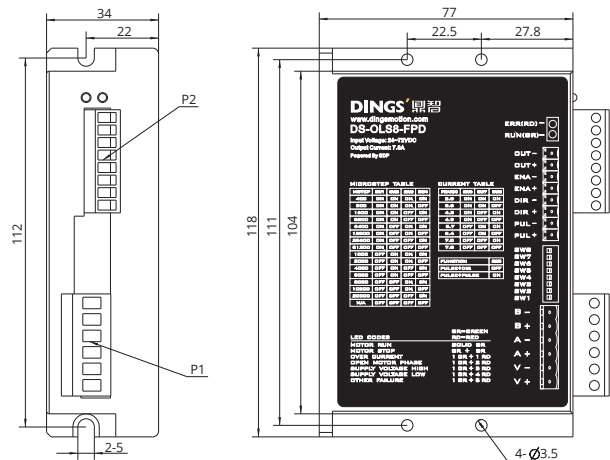


### ● Specification

Adapted motor		2-phase hybrid stepper motor
Power supply		DC 24 ~ 72V
Output current		2.8A - 7.8A (max)
Driving method		Full-bridge bipolar PWM
Input signal	Pulse signal	Optocoupler input voltage H = 3.5 – 26 V , L = 0 – 0.8 V, Current 6 - 15 mA
	Offline signal	
	Direction signal	
Output signal	Alarm output	Optocoupler isolation output, max. withstand voltage 30VDC, max. saturation current 50mA
Size (mm)		118 × 78 × 34
Weight		about 300g
Operating environment	Application	Avoid dust, oil mist and corrosive gas
	Humidity	< 85% RH, no condensation
	Temperature	0 ~ 40°C
	Heat dissipation	Install in a ventilated environment

### ● Installation (unit : mm)

1. When designs installation, please consider the size of terminals and pace required for heat dissipation.
2. The reliable working temperature of the driver is usually within 60°C and motor is within 80°C.
3. When install driver, please install it vertically and laterally to make the radiator from strong air convection, when necessary, install a fan near the driver to force heat dissipation to ensure that the driver works within reliable working temperature range.



## Stand Alone Stepper Electronics

### ■ DS-OLS7-FRS4 Stand Alone Open Loop - RS485

#### ● Features

1. Input power : DC 24V - 48V
2. PWM constant current bipolar subdivision drive
3. Single / Double pulse selection
4. Optically isolated input function
5. Motor short circuit protection
6. Compact design, low noise and low vibration
7. Adjustable driving current below 3.2 A
8. Support RS 485 communication

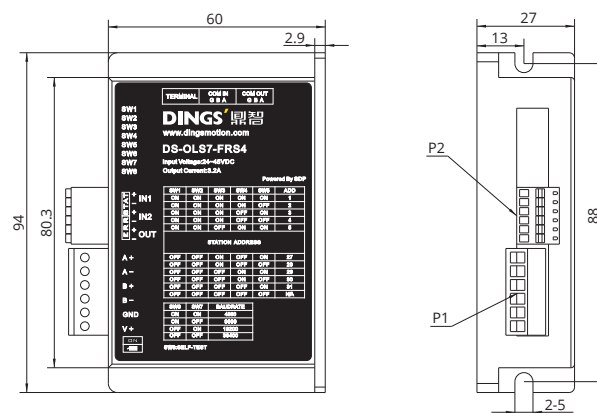


#### ● Specification

Adapted motor		2-phase hybrid stepper motor
Power supply		DC 24 ~ 48V
Output current		0.1A - 3.2A (max)
Driving method		Full-bridge bipolar PWM
Input signal	IN1 (DIR) signal	Optocoupler input voltage H = 3.5 – 26 V , L = 0 – 0.8 V, Current 6 - 15 mA
	IN2 (STEP) signal	
Output signal	Alarm output	Optocoupler isolation output, max. withstand voltage 30VDC, max. saturation current 50mA
Size (mm)		94 × 77 × 27 (including terminal block)
Weight		about 175g
Operating environment	Application	Avoid dust, oil mist and corrosive gas
	Humidity	< 85% RH, no condensation
	Temperature	0 ~ 40°C
	Heat dissipation	Install in a ventilated environment

#### ● Installation (unit : mm)

1. When designs installation, please consider the size of terminals and pace required for heat dissipation.
2. The reliable working temperature of the driver is usually within 60°C and motor is within 80°C.
3. When install driver, please install it vertically and laterally to make the radiator from strong air convection, when necessary, install a fan near the driver to force heat dissipation to ensure that the driver works within reliable working temperature range.



# Stand Alone Stepper Electronics

## ■ DS-OLS8-FRS4 Stand Alone Open Loop - RS485 type

### ● Features

1. Input power : DC 24V - 72V
2. PWM constant current bipolar subdivision drive
3. Single / Double pulse selection
4. Optically isolated input function
5. Motor short circuit protection
6. Compact design, low noise and low vibration
7. Adjustable driving current below 6.5A
8. Support RS 485 communication

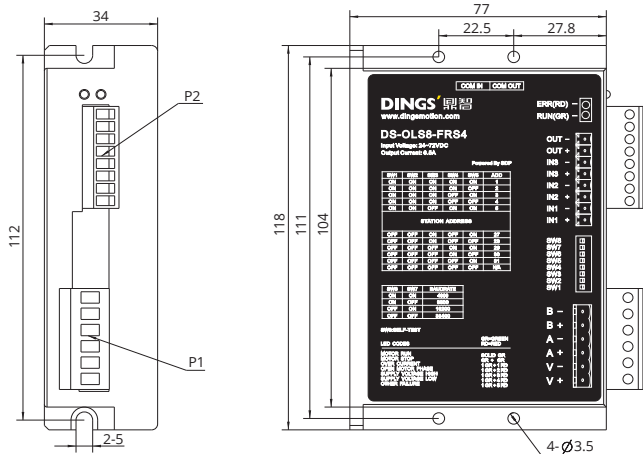


### ● Specification

Adapted motor		2-phase hybrid stepper motor
Power supply		DC 24 ~ 72V
Output current		0.1A - 6.5A (max)
Driving method		Full-bridge bipolar PWM
Input signal	Pulse signal	Optocoupler input voltage H = 3.5 - 26 V , L = 0 - 0.8 V, Current 6 - 15 mA
	Offline signal	
	Direction signal	
Output signal	Alarm output	Optocoupler isolation output, max. withstand voltage 30VDC, max. saturation current 50mA
Size (mm)		118 × 78 × 34
Weight		about 300g
Operating environment	Application	Avoid dust, oil mist and corrosive gas
	Humidity	< 85% RH, no condensation
	Temperature	0 ~ 40°C
	Heat dissipation	Install in a ventilated environment

### ● Installation (unit : mm)

1. When designs installation, please consider the size of terminals and pace required for heat dissipation.
2. The reliable working temperature of the driver is usually within 60°C and motor is within 80°C.
3. When install driver, please install it vertically and laterally to make the radiator from strong air convection, when necessary, install a fan near the driver to force heat dissipation to ensure that the driver works within reliable working temperature range.





## Stand Alone Stepper Electronics

### ■ DS-CLS9-FRS4 Stand Alone Closed Loop - RS485 - Communication type

#### ● Features

1. Input power : DC 24V - 48V
2. Output rated current : 0 - 4.5A (max)
3. Pulse direction and RS485 control mode are optional to support MODBUS RTU

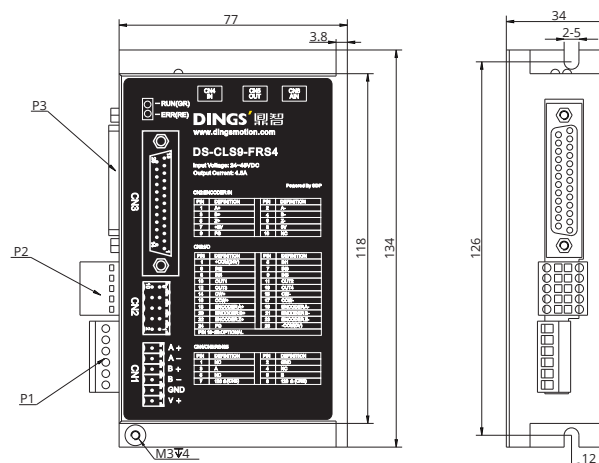


#### ● Specification

Project	Content	Remarks								
Power supply	DC 24 ~ 48 V									
Output current	4.5 A (max)									
Adapted motor	2-phase hybrid stepper motor with encoder									
Drive mode	PWM constant current drive									
I/O signals	<table border="0"> <tr> <td>[Input]</td> <td>[Output]</td> </tr> <tr> <td>- Pulse, direction input (configurable as digital input)</td> <td>- 4 digital outputs</td> </tr> <tr> <td>- 5 Digital input</td> <td>- Encoder signal output (differential A, B, Z)</td> </tr> <tr> <td>- Encoder input (A, B, Z)</td> <td></td> </tr> </table>	[Input]	[Output]	- Pulse, direction input (configurable as digital input)	- 4 digital outputs	- 5 Digital input	- Encoder signal output (differential A, B, Z)	- Encoder input (A, B, Z)		The rest of input /output can be freely configured via communication, except that the encoder output is fixed.
[Input]	[Output]									
- Pulse, direction input (configurable as digital input)	- 4 digital outputs									
- 5 Digital input	- Encoder signal output (differential A, B, Z)									
- Encoder input (A, B, Z)										
Digital input details	/SV ON (Servo On) /RESET (Alarm reset) /START (Motor start / stop) /JOG (Motor jog) /HOME (Zero point)									
Digital output details	/IN-POSITION /ALARM									
LED indication	Status, fault	2 indicators								
Communication I/F	RS485, up to 32 nodes	MODBUS RTU protocol								
Control mode	Position control mode	Pulse / RS485								
Dimensions (mm)	77 x 134 x 34	Without terminal block								
Weight	about 350 g	Without terminal block								
Operating temperature / humidity	0~45°C, 85% RH or less	Prevent condensation								
Storage temperature	0~85°C, 85% RH or less	Prevent condensation								
Ambient gas	Prevent corrosive gases									

#### ● Installation (unit : mm)

1. When designs installation, please consider the size of terminals and pace required for heat dissipation.
2. The reliable working temperature of the driver is usually within 60°C and motor is within 80°C.
3. When install driver, please install it vertically and laterally to make the radiator from strong air convection, when necessary, install a fan near the driver to force heat dissipation to ensure that the driver works within reliable working temperature range.



# Stand Alone Stepper Electronics

## ■ DS-CLS9-FRS4-01 Stand Alone Closed Loop - RS485 - Communication type

### ● Features

1. Input power : DC 24V - 48V
2. Output rated current : 0 - 4.5A (max)
3. Pulse / Direction, RS-485 communication selection support MODBUS-RTU protocol
4. Torque control mode
5. Encoder signal output

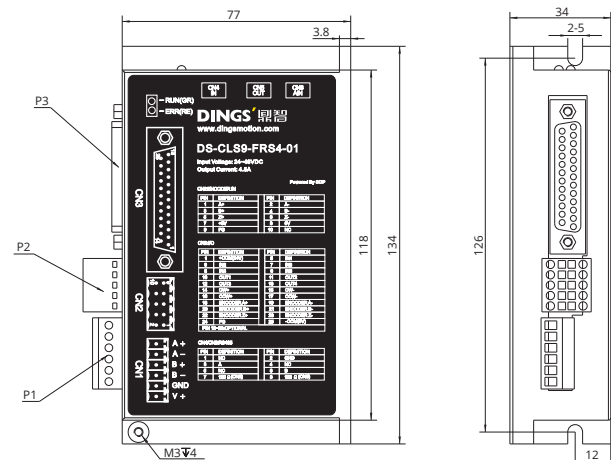
### ● Specifications



Project	Content		Remarks
Power supply	DC 24 ~ 48 V		
Output current	4.5 A (max)		
Adapted motor	2-phase hybrid stepper motor with encoder		
Drive mode	PWM constant current drive		
I/O signals	[Input] - Pulse, direction input (configurable as digital input) - 5 Digital input - Encoder input (A, B, Z)	[Output] - 4 digital outputs - Encoder signal output (differential A, B, Z)	The rest of input /output can be freely configured via communication, except that the encoder output is fixed.
Digital input details	/SV ON (Servo On) /RESET (Alarm reset) /START (Motor start / stop) /JOG (Motor jog) /HOME (Zero point)		
Digital output details	/IN-POSITION /ALARM		
LED indication	Status, fault		2 indicators
Communication I/F	RS485, up to 32 nodes		MODBUS RTU protocol
Control mode	Position control mode Torque control mode		Pulse / RS485
Dimensions (mm)	77 x 134 x 34		Without terminal block
Weight	about 350 g		Without terminal block
Operating temperature / humidity	0~45°C, 85% RH or less		Prevent condensation
Storage temperature	0~85°C, 85% RH or less		Prevent condensation
Ambient gas	Prevent corrosive gases		

### ● Installation (unit : mm)

1. When designs installation, please consider the size of terminals and pace required for heat dissipation.
2. The reliable working temperature of the driver is usually within 60°C and motor is within 80°C.
3. When install driver, please install it vertically and laterally to make the radiator from strong air convection, when necessary, install a fan near the driver to force heat dissipation to ensure that the driver works within reliable working temperature range.



## Stand Alone Stepper Electronics

### ■ DS-CLS10-FRS4 Stand Alone Closed Loop Control - RS485 type

#### ● Features

1. Input power : DC 24V - 72V
2. Output rated current : 0.4 ~ 6.0A (max)
3. PWM constant current bipolar micro-stepping drive
4. 2 high-speed inputs, 5 ordinary digital signal inputs, and 4 configurable digital outputs
5. Equipped with RS485 communication interface, supports MODBUS/RTU protocol, and can support up to 30 sites
6. Supports 0-5V analog control, pulse control, and serial communication control

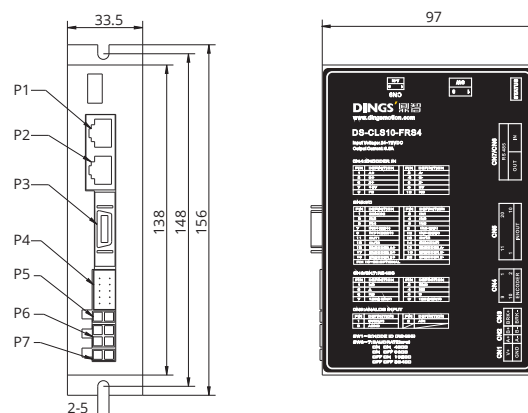


#### ● Specification

Project	Content		Remarks
Power supply	DC 24 ~ 72 V		
Output current	6.0 A (max)		
Adapted motor	2-phase hybrid stepper motor with encoder		
Drive mode	PWM constant current drive		
I/O signals	[Input] - Pulse, direction input (configurable as digital input) - 7 Digital input - Encoder input (A, B, Z)	[Output] - 3 digital outputs - Encoder signal output (differential A, B, Z)	The rest of input /output can be freely configured via communication, except that the encoder output is fixed.
Digital input details	/SV ON (Servo On) /RESET (Alarm reset) /START (Motor start / stop) /JOG (Motor jog) /HOME (Zero point)		
Digital output details	/IN-POSITION /ALARM		
LED indication	Status, fault		
Communication I/F	RS485, up to 30 nodes		MODBUS RTU protocol
Control mode	Position control mode Speed control mode		Pulse / RS485
Dimensions (mm)	156 x 97 x 33.5		Without terminal block
Weight	About 376 g		Without terminal block
Operating temperature / humidity	0~40°C, 85% RH or less		Prevent condensation
Storage temperature	-10~70°C, 85% RH or less		Prevent condensation
Ambient gas	Prevent corrosive gases		

#### ● Installation (unit : mm)

1. When designs installation, please consider the size of terminals and pace required for heat dissipation.
2. The reliable working temperature of the driver is usually within 60°C and motor is within 80°C.
3. When install driver, please install it vertically and laterally to make the radiator from strong air convection, when necessary, install a fan near the driver to force heat dissipation to ensure that the driver works within reliable working temperature range.



# Stand Alone Stepper Electronics

## ■ DS-CLS10-FRS4-1A Stand Alone Closed Loop Control - RS485 type

### ● Features

1. RS-485 communication type of Closed Loop 2-Phase Step Motor Drive
2. Input power : DC 24V - 72V
3. Output rated current : 6.5A (max)
4. Supporting up to 30 axes connection control through MODBUS-RTU protocol communication
5. Supporting ABS Encoder (Biss-C Type, Single-16bit / Multi-16bit)
6. Various parameters can be set through DINGS' Tuner Pro GUI
7. Command mode selectable (PULSE / RS-485 communication)

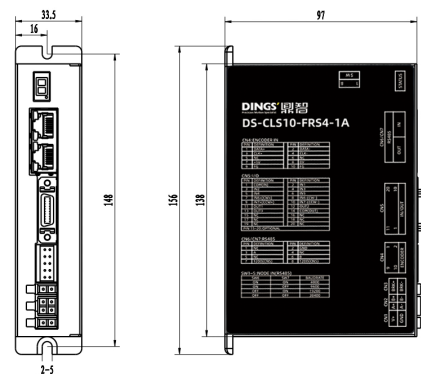


### ● Specification

Project	Content		Remarks
Power supply	DC 24 ~ 72 V		
Output current	6.5 A (max)		
Adapted motor	2-phase hybrid stepper motor with ABS encoder		
Drive mode	PWM constant current drive		
I/O signals	[Input] - Pulse, direction input (configurable as digital input) - 7 Digital input	[Output] - 3 digital outputs	The rest of input /output can be freely configured via communication, except that the encoder output is fixed.
Digital input details	/SV ON (Servo On) /RESET (Alarm reset) /START (Motor start / stop) /JOG (Motor jog) /HOME (Zero point)		
Digital output details	/IN-POSITION /ALARM		
LED indication	Status, fault		
Communication I/F	RS485, up to 30 nodes		MODBUS RTU protocol
Control mode	Position control mode		Pulse / RS485
Dimensions (mm)	156 x 97 x 33.5		Without terminal block
Weight	About 500 g		Without terminal block
Operating temperature / humidity	0~45°C, 85% RH or less		Prevent condensation
Storage temperature	0~85°C, 85% RH or less		Prevent condensation
Ambient gas	Prevent corrosive gases		

### ● Installation (unit : mm)

1. When designs installation, please consider the size of terminals and pace required for heat dissipation.
2. The reliable working temperature of the driver is usually within 60°C and motor is within 80°C.
3. When install driver, please install it vertically and laterally to make the radiator from strong air convection, when necessary, install a fan near the driver to force heat dissipation to ensure that the driver works within reliable working temperature range.





## Stand Alone Stepper Electronics

### ■ DS-CLS3-FETC-4I Stand Alone Closed Loop - EtherCAT type

#### ● Features

1. Input power : DC 24V - 36V
2. Output rated current : 0.4 - 3A (max)
3. PWM constant current bipolar micro-stepping drive
4. Support EtherCAT communication protocol, support control mode PP, PV, HM, CSP, CSV
5. Optically isolated inputs
6. Motor short circuit protection, under-voltage protection, over-voltage protection, overcurrent protection, etc.
7. Maximum support for 4-axis control

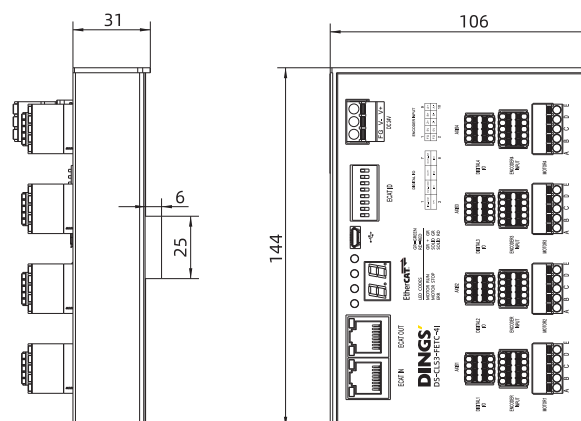


#### ● Specification

Adapted motor		2-phase hybrid stepper motor with INC encoder
Power supply		DC 24 ~ 36V
Output current		0.4A - 3A (max)
Driving method		Full-bridge bipolar PWM
Initialization time		2s
Input signal	1 probe input	Optocoupler input voltage H = 24 V , L = 0 - 0.8 V, Current 5 - 8 mA
	3 universal input signal	
Output signal	2 universal output signal	Optocoupler isolation output, max. withstand voltage 30VDC, max. saturation current 50mA
Size (mm)		144 × 106 × 31 (Excluding connectors)
Weight		about 450g
Operating environment	Application	Avoid dust, oil mist and corrosive gas
	Humidity	< 85% RH, no condensation
	Temperature	0 ~ 40°C
	Heat dissipation	Install in a ventilated environment

#### ● Installation (unit : mm)

1. When designs installation, please consider the size of terminals and pace required for heat dissipation.
2. The reliable working temperature of the driver is usually within 60°C and motor is within 80°C.
3. When install driver, please install it vertically and laterally to make the radiator from strong air convection, when necessary, install a fan near the driver to force heat dissipation to ensure that the driver works within reliable working temperature range.



# Stand Alone Stepper Electronics

## ■ DS-CLS9-FETC Stand Alone Closed Loop - EtherCAT type

### ● Features

1. Input power : DC 24V - 48V
2. Output rated current : 6.5A (max)
3. PWM constant current bipolar micro-stepping drive
4. Support EtherCAT communication protocol, support control mode PP, PV, HM, CSP, CSV
5. Optically isolated inputs
6. Motor short circuit protection, under-voltage protection, over-voltage protection, over-current protection, etc.
7. Exquisite design, low noise and low vibration

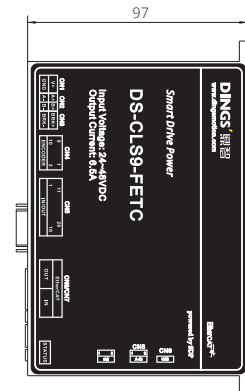
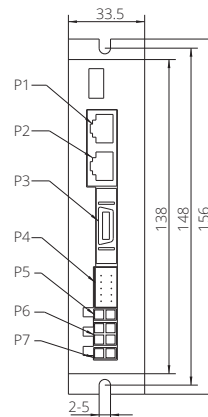


### ● Specification

Project	Content		Remarks
Power supply	DC 24 ~ 48 V		
Output current	6.5 A (max)		
Adapted motor	2-phase hybrid stepper motor with INC encoder		
Drive mode	PWM constant current drive		
I/O signals	[Input] - 2 High-speed inputs - 5 Digital inputs - Encoder input (A, B, Z)	[Output] - 3 digital outputs - Encoder signal output (differential A, B, Z)	The rest of input /output can be freely configured via communication, except that the encoder output is fixed.
Digital input details	Enable Alarm reset Positive limit Negative limit, Emergency stop Origin, etc		
Digital output details	/IN-POSITION /ALARM		
Brake	Brake output		
LED indication	Status, fault		
EtherCAT Communication Address (nodes)	1 - 255		
Control mode	PP, PV, Home, CSP		
Dimensions (mm)	156 x 97 x 33.5		Without terminal block
Weight	About 500 g		Without terminal block
Operating temperature / humidity	0~45°C, 85% RH or less		Prevent condensation
Storage temperature	0~85°C, 85% RH or less		Prevent condensation
Ambient gas	Prevent corrosive gases		

### ● Installation (unit : mm)

1. When designs installation, please consider the size of terminals and pace required for heat dissipation.
2. The reliable working temperature of the driver is usually within 60°C and motor is within 80°C.
3. When install driver, please install it vertically and laterally to make the radiator from strong air convection, when necessary, install a fan near the driver to force heat dissipation to ensure that the driver works within reliable working temperature range.



## Stand Alone Stepper Electronics

### ■ DS-CLS9-FETC-2I/2A Stand Alone Closed Loop - EtherCAT type

#### ● Features

1. Input power : DC 24V - 48V
2. Output rated current : 0.4 - 6.5A (max)
3. Maximum support for 2-axis control
4. Support EtherCAT communication protocol, support control mode PP, PV, TQ, HM, CSP, CSV
5. Optically isolated inputs
6. Motor short circuit protection, under-voltage protection, over-voltage protection, overcurrent protection, etc.

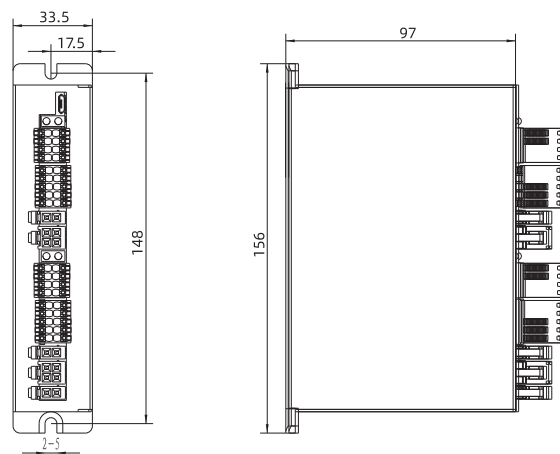


#### ● Specification

Drive model		DS-CLS9-FETC-2I	DS-CLS9-FETC-2A
Adapted motor		2-phase hybrid stepper motor with INC encoder	2-phase hybrid stepper motor with ABS encoder
Power supply		DC 24 ~ 48V	
Output current		0.4A - 6.5A (max)	
Driving method		Full-bridge bipolar PWM	
Initialization time		2s	
Input signal	1 probe input	Optocoupler input voltage H = 24 V , L = 0 - 0.8 V, Current 5 - 8 mA	
	3 universal input signal		
Output signal	2 universal output signal	Optocoupler isolation output, max. withstand voltage 30VDC, max. saturation current 50mA	
	1 circuit brake output	Optocoupler isolation output, max. withstand voltage 30VDC, max. saturation current 500mA	
Size (mm)		156 × 97 × 34 (Excluding connectors)	
Weight		about 500g	
Operating environment	Application	Avoid dust, oil mist and corrosive gas	
	Humidity	< 85% RH, no condensation	
	Temperature	0 ~ 40°C	
	Heat dissipation	Install in a ventilated environment	

#### ● Installation (unit : mm)

1. When designs installation, please consider the size of terminals and pace required for heat dissipation.
2. The reliable working temperature of the driver is usually within 60°C and motor is within 80°C.
3. When install driver, please install it vertically and laterally to make the radiator from strong air convection, when necessary, install a fan near the driver to force heat dissipation to ensure that the driver works within reliable working temperature range.



# Stand Alone Stepper Electronics

## ■ DS-CLS9-FCAO Stand Alone Closed Loop - CANopen type

### ● Features

1. Input power : DC 24V - 48V
2. Output rated current : 6.5A (max)
3. PWM constant current bipolar micro-stepping drive
4. Support CANopen communication protocol, support control mode PP, PV, HM, PT
5. Optically isolated inputs
6. Motor short circuit protection, under-voltage protection, over-voltage protection, over-current protection, etc.
7. Exquisite design, low noise and low vibration

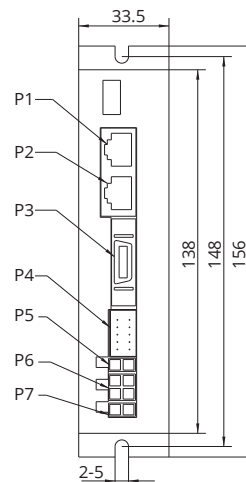


### ● Specification

Adapted motor		2-phase hybrid stepper motor
Power supply		DC 24 ~ 48V
Output current		0.1 – 6.5 A (max)
Driving method		Full-bridge bipolar PWM
Initialization time		2s
Input signal	2 high-speed input signals	Optocoupler input voltage H = 3.5 – 26 V, L = 0 – 0.8 V, Current 5 - 8 mA
	5 common input signals	Optocoupler input voltage H = 24 V, L = 0 – 0.8 V, Current 5 - 8 mA
Output signal	3 common output signals	Optocoupler isolation output, max. withstand voltage 30VDC, max. saturation current 50mA
Size (mm)		156 × 97 × 33.5
Weight		about 500g
Operating environment	Application	Avoid dust, oil mist and corrosive gas
	Humidity	< 85% RH, no condensation
	Temperature	0 ~ 40°C
	Heat dissipation	Install in a ventilated environment

### ● Installation (unit : mm)

1. When designs installation, please consider the size of terminals and pace required for heat dissipation.
2. The reliable working temperature of the driver is usually within 60°C and motor is within 80°C.
3. When install driver, please install it vertically and laterally to make the radiator from strong air convection, when necessary, install a fan near the driver to force heat dissipation to ensure that the driver works within reliable working temperature range.

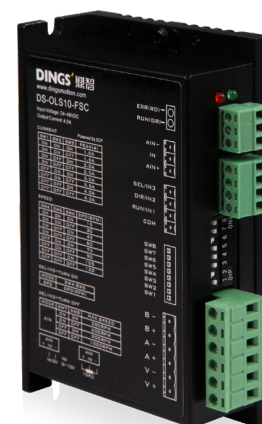


## Stand Alone Stepper Electronics

### ■ DS-OLS10-FSC Stand Alone Open Loop - Speed regulator

#### ● Features

1. Control mode : constant speed, analog variable speed
2. Optoelectronic isolation input function, 5 - 24VDC compatible input
3. Motor short-circuit protection function
4. Compact design, low noise, low vibration, no need for control units

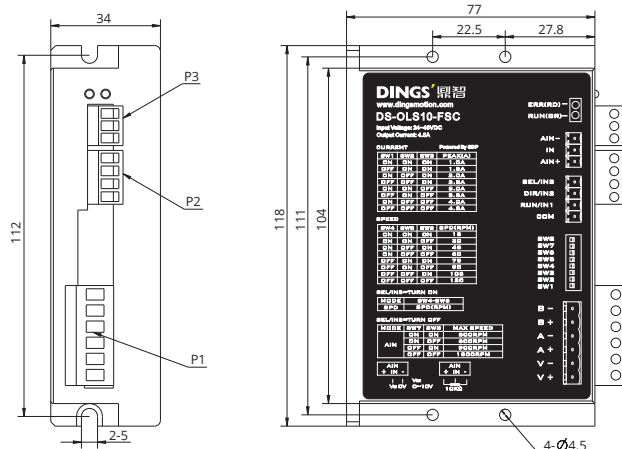


#### ● Specification

Adapted motor		2-phase hybrid stepper motor
Power supply		DC 24 ~ 48V
Output current		1.0 - 4.5 A (max)
Driving method		Full-bridge bipolar PWM
Input signal	IN 1 (Start) Signal	Optocoupler input voltage H = 3.5 - 26 V , L = 0 - 0.8 V, Current 6 - 15 mA
	IN 2 (Direction) Signal	
	IN 1 (Speed switch) Signal	
Analog adjustment		Connected to 10K potentiometer or 0 -10 V analog adjustment
Size (mm)		118 × 78 × 34
Weight		about 300g
Operating environment	Application	Avoid dust, oil mist and corrosive gas
	Humidity	< 85% RH, no condensation
	Temperature	0 ~ 40°C
	Heat dissipation	Install in a ventilated environment

#### ● Installation (unit : mm)

1. When designs installation, please consider the size of terminals and pace required for heat dissipation.
2. The reliable working temperature of the driver is usually within 60°C and motor is within 80°C.
3. When install driver, please install it vertically and laterally to make the radiator from strong air convection, when necessary, install a fan near the driver to force heat dissipation to ensure that the driver works within reliable working temperature range.





# Stand Alone Brushless Servo Driver

■ DS-BVS-FCAO/FETC Stand Alone Closed Loop - CANopen, EtherCAT

● Features

1. Input power: DC 12V-48V
2. Output current : Rated 10A, Peak 20A
3. Support DC, BLDC, PMSM, VCM
4. 6 Inputs and 2 Outputs
5. Support CANopen, EtherCAT protocol

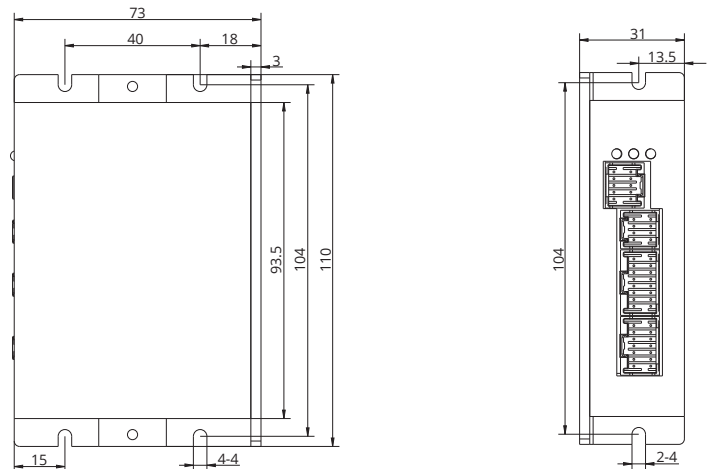


● Specification

Size (mm)		109.5 x 73.5 x 31
Weight		296g
Drive motor		DC / BLDC / PMSM / VCM
Input voltage		12 - 48V (DC)
Rated current		10A
Peak current		20A
Control mode		Current (Torque) / Speed / Position
Communication mode		EtherCAT, CANopen, RS485, USB
Position encoder		Incremental encoder, Digital hall sensor, Analog hall sensor, Sin/Cos encoder, BiSS/SSI ABS encoder
Operating environment	Application	Avoid dust, oil mist, and flammable gases
	Humidity	10% ~ 90%
	Temperature	0 ~ 50°C
	Heat dissipation	Install in a ventilated environment

● Installation (unit : mm)

1. When designs installation, please consider the size of terminals and pace required for heat dissipation.
2. The reliable working temperature of the driver is usually within 60°C and motor operating temperature is within 80°C.
3. When install driver, please install it vertically and laterally to make the radiator from strong air convection, when necessary, install a fan near the driver to force heat dissipation to ensure that the driver works within reliable working temperature range.



## Stand Alone Brushless Servo Driver

### ■ DS-BVM-FCAO/FETC Stand Alone Closed Loop - CANopen, EtherCAT

#### ● Features

1. Input power : DC12V~48V
2. Output current : Rated 3A, Peak 6A
3. Support DC, BLDC, PMSM, VCM
4. 6 Inputs, 2 Outputs
5. Support CANopen, EtherCAT Protocol

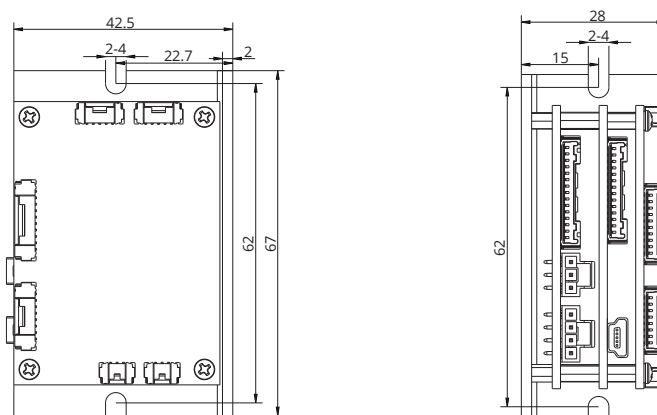


#### ● Specification

Size (mm)		without case : 67 × 42.5 × 28 / with case : 72 x 44.3 x 29.8
Weight		without case : 71g / with case : 90g
Drive motor		DC / BLDC / PMSM / VCM
Input voltage		12 - 48V (DC)
Rated current		3A
Peak current		6A
Control mode		Current (Torque) / Speed / Position
Communication mode		EtherCAT, CANopen, USB
Position encoder		Incremental encoder, Digital hall sensor, Analog hall sensor, Sin/Cos encoder, BiSS/SSI ABS encoder
Operating environment	Application	Avoid dust, oil mist, and flammable gases
	Humidity	10%-90%
	Temperature	0 ~ 50°C
	Heat dissipation	Install in a ventilated environment

#### ● Installation (unit : mm)

1. When designs installation, please consider the size of terminals and pace required for heat dissipation.
2. The reliable working temperature of the driver is usually within 60°C and motor operating temperature is within 80°C.
3. When install driver, please install it vertically and laterally to make the radiator from strong air convection, when necessary, install a fan near the driver to force heat dissipation to ensure that the driver works within reliable working temperature range.



# Stand Alone Brushless Speed Driver

## ■ DS-OLBD1-FRS4

### ● Features

1. Input power : DC12V-48V
2. Output current : Rated 6A, Peak 18A
3. Supports brushless DC motors
4. 3 input channels, 2 output channels
5. Analog command
6. Supports RS485 communication protocol

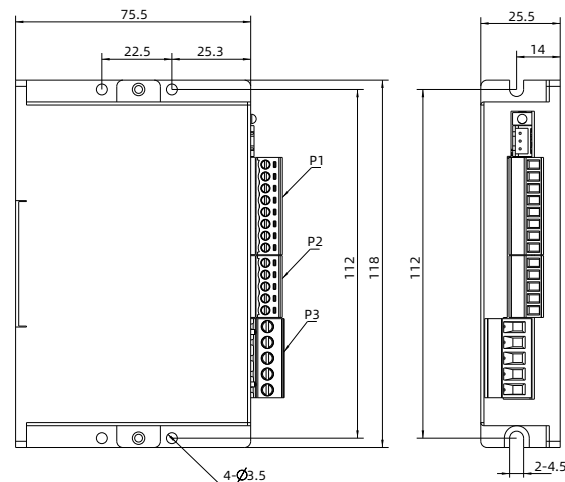


### ● Specification

Size (mm)		118 × 75.5 × 25.5
Weight		200g
Drive motor		Brushless DC
Input voltage		12 - 48V (DC)
Rated current		6A
Peak current		18A
Control mode		PID speed and current loop control
Communication mode		RS485
Sensing mode		Digital hall sensor
Operating environment	Application	Avoid dust, oil mist, and flammable gases
	Humidity	<85% RH, no condensation
	Temperature	-15°C ~ 50°C
	Heat dissipation	Install in a ventilated environment

### ● Installation (unit : mm)

1. When designs installation, please consider the size of terminals and pace required for heat dissipation.
2. The reliable working temperature of the driver is usually within 60°C and motor operating temperature is within 80°C.
3. When install driver, please install it vertically and laterally to make the radiator from strong air convection, when necessary, install a fan near the driver to force heat dissipation to ensure that the driver works within reliable working temperature range.



# Stand Alone Brushless Speed Driver

## ■ DS-OLBD3-FRS4

### ● Features

1. Input power : DC12V-48V
2. Output current : Rated 10A, Peak 30A
3. Supports brushless DC motors
4. 3 input channels, 2 output channels
5. Analog command
6. Supports RS485 communication protocol

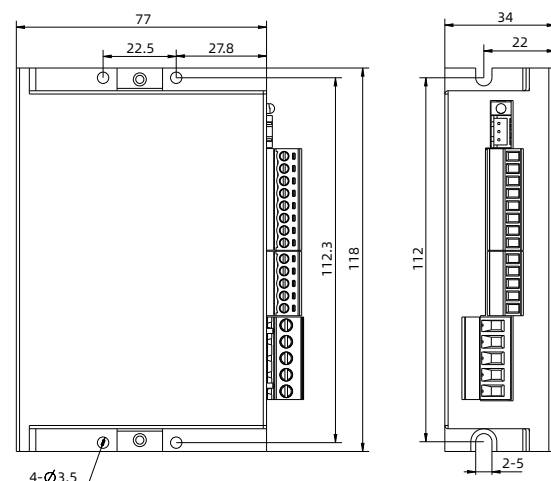


### ● Specification

Size (mm)		118 × 77 × 34
Weight		300g
Drive motor		Brushless DC
Input voltage		12 - 48V (DC)
Rated current		10A
Peak current		30A
Control mode		PID speed and current loop control
Communication mode		RS-485
Sensing mode		Digital hall sensor
Operating environment	Application	Avoid dust, oil mist, and flammable gases
	Humidity	<85% RH, no condensation
	Temperature	-15°C ~ 50°C
	Heat dissipation	Install in a ventilated environment

### ● Installation (unit : mm)

1. When designs installation, please consider the size of terminals and pace required for heat dissipation.
2. The reliable working temperature of the driver is usually within 60°C and motor operating temperature is within 80°C.
3. When install driver, please install it vertically and laterally to make the radiator from strong air convection, when necessary, install a fan near the driver to force heat dissipation to ensure that the driver works within reliable working temperature range.



# Integrated Stepper Electronics

## ■ DS-OL42-(ICAO/IPD/IRS4) Integrated Open Loop

### ● Features

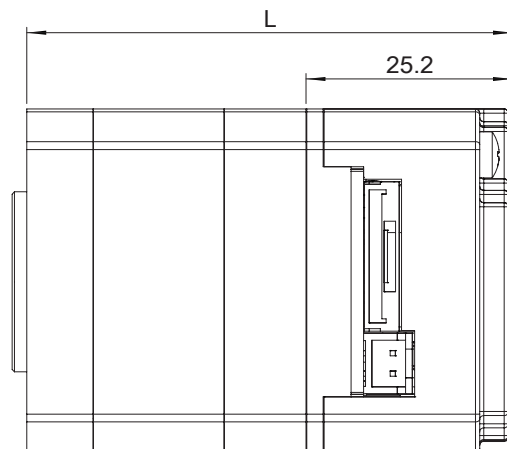
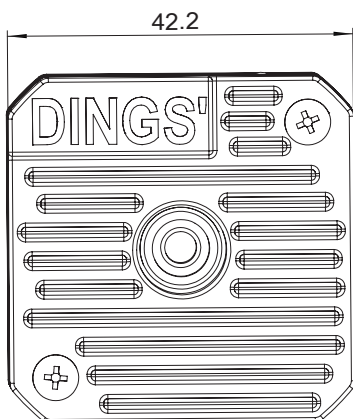
1. Input power : DC 24 - 36V
2. Output rated current : 0.5 ~ 3.0A (max)
3. IPD(IRS4) : Pulse, RS485 control, support MODBUS RTU communication protocol  
ICAO : Support CANopen communication protocol,  
Support control mode PP / PV / HM
4. Through hole type of Integrated Driver compatible DINGS' NEMA Size 17 step motor is diameter less than 11mm.



### ● Specification

Model		DS-OL42-ICAO	DS-OL42-IRS4 (IPD)
Adapted motor		2-phase hybrid stepper motor	
Power supply		DC 24V ~ 36V	
Output current		0.5A ~ 3.0A (max)	
Driving method		Full-bridge bipolar PWM	
Initialization time		2s	
Communication method		CANopen	RS485 / Pulse Direction
Input signal		4 high-speed input signals / 5V input	2 high-speed input signals / 5-24V input 2 common input signals / 5V input
Output signal		1 universal output signal, with a max. withstand voltage of 30VDC and a max. saturation current of 10mA	
Size (mm)		42.2 x 42.2 x 25.2	
Weight		60g	
Operating environment	Application	Avoid dust, oil mist and corrosive gas	
	Humidity	< 85% RH, no condensation	
	Temperature	0 ~ 40°C	
	Heat dissipation	Install in a ventilated environment	

### ● Installation (unit : mm)





## Integrated Stepper Electronics

### ■ DS-OL57-(ICAO/IRS4/ISC) Integrated Open Loop

#### ● Features

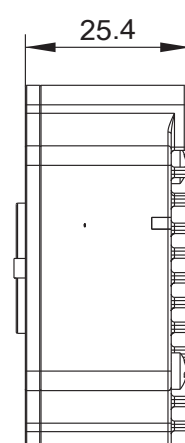
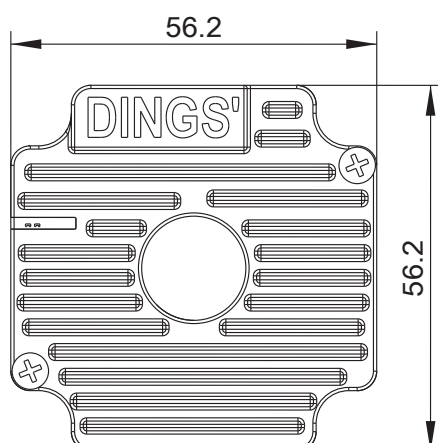
1. Input power : DC 24 - 48V
2. Output rated current : 5.6A (max)
3. Multiple control methods available: pulse, MODBUS-RTU communication, I/O trigger control, internal programming, CANopen, analog control
4. Through hole type of Integrated Driver compatible DINGS' NEMA Size 23 step motor is diameter less than 16mm.
5. Protection functions: over current, over voltage, under voltage



#### ● Specification

Model	DS-OL57-ICAO	DS-OL57-IRS4 (IPD)	DS-OL57-ISC
Adapted motor	2-phase hybrid stepper motor		
Power supply	DC 24V ~ 48V		
Output current	0.5A ~ 5.6A (max)		
Driving method	Full-bridge bipolar PWM		
Initialization time	2s		
Communication method	CANopen	RS485 / Pulse Direction	Speed regulation
Input signal	4 high-speed input signals 5V input	2 high-speed input signals 5V input	3 high-speed input signals 5V input
		2 common input signals 5V input	Analog input signal Connected to 10K potentiometer or 0~5V analog adjustment
Output signal	1 universal input signal, with a max. withstand voltage of 30VDC and a max. saturation current of 10mA		
Size (mm)	56.2 x 56.2 x 25.4mm		
Weight	60g		
Operating environment	Application	Avoid dust, oil mist and corrosive gas	
	Humidity	< 85% RH, no condensation	
	Temperature	0 ~ 40°C	
	Heat dissipation	Install in a ventilated environment	

#### ● Installation (unit : mm)



# Integrated Stepper Electronics

## ■ DS-CL28-SA Integrated Closed Loop - RS485

### ● Features

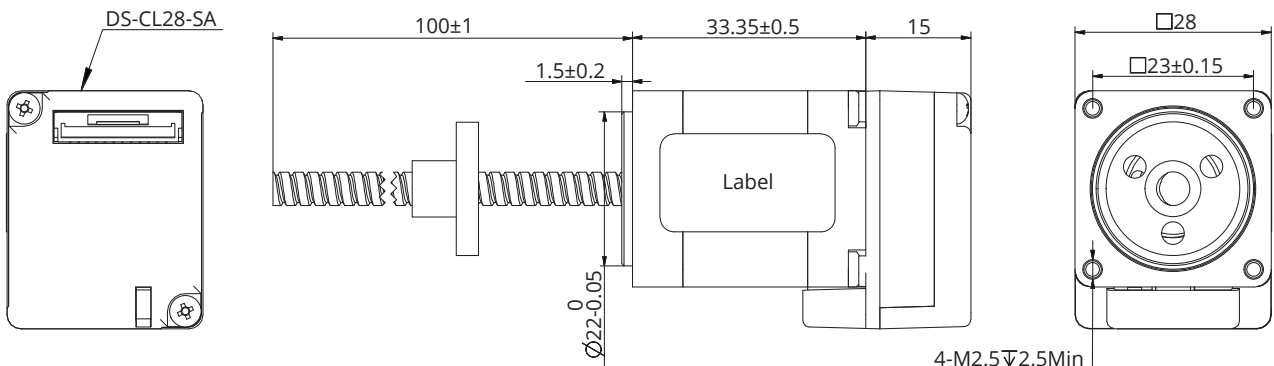
1. Input power : DC 24 ± 10%
2. Output rated current : 0 ~ 1.0A (max)
3. Integrated 28 step closed-loop control system, RS485 communication interface supports MODBUS-RTU communication protocol
4. 3 inputs and 1 output



### ● Specification

Input voltage	24 VDC ± 10 %	
Control method	Closed loop control with 32 bit ARM	
Multi axes driver	Max 16 axes through Star Topology	
Position table	64 movement command steps (continuous cycle jump etc)	
Board current consumption	Max 500mA (Except motor current)	
Ambient temperature	Use : 0 ~ 40°C	Storage : -20 ~ 70°C
Ambient humidity	Use : 35 – 86% RH (non-condensing)	Storage : 10 – 90% RH (non-condensing)
Vibration resistant	0.5 G	
Rotation speed	0 – 3000 rpm	
Encoder resolution (P/R)	Max 16000 PPR	
Protection functions	Multiple alarm function. For details, please refer to product manual	
Rotational direction	CW / CCW (Selectable by parameter)	
Digital inputs	4 programmable inputs (Photocoupler)	
Digital output	-	
Communication interface	RS-485 Serial communication with PC transmission speed : 115200 (bps)	
Position control	Incremental mode / Absolute mode Data range : -2147493648 ~ +2147483647 (pulse) Pulse speed : Max 800 kpps	
Return to origin	Origin sensor, ± Limit sensor, Z phase, Torque	
GUI	User interface program with in windows	
Software	Ezi-Motion GUI / Motion library (DLL) for Windows 2000/XP/7/8/10	

### ● Installation (unit : mm)

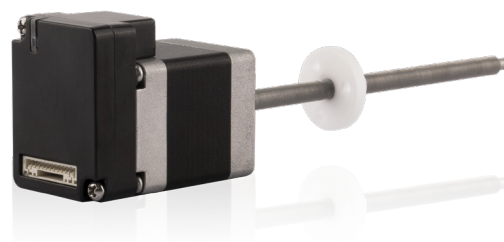


## Integrated Stepper Electronics

### ■ DS-CL28-IRS4(IPD) Integrated Open / Closed Loop

#### ● Features

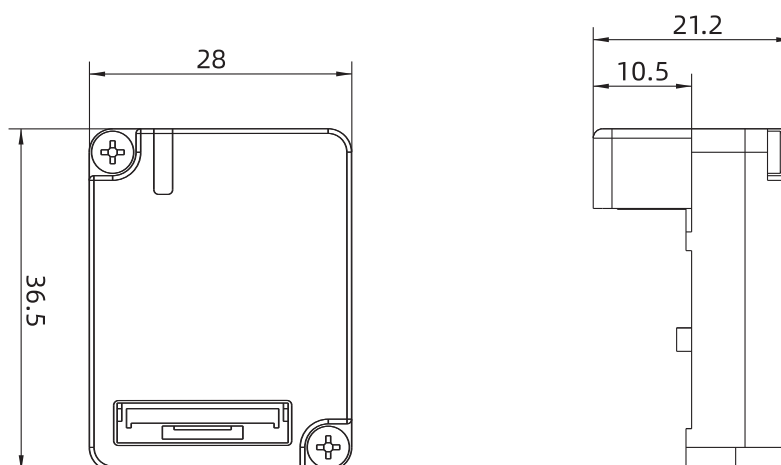
1. Max. frequency response: 500KHz (duty cycle 50%)
2. Supports pulse mode, internal pulse mode, I/O control, position pressing mode, and torque mode
3. 3 Input signals : pulse, direction, offline  
(optocoupler isolation, 5V signal drive, current limiting resistor required for exceeding 5V)
4. 1 output signal : alarm  
(optocoupler isolation, output when there is no alarm)
5. Protection functions : overcurrent, overvoltage, undervoltage, motor phase loss



#### ● Specification

Adapted motor		Suitable for two-phase hybrid stepping motor
Power supply		DC 24V
Output current		0.5A - 1.5A (max)
Driving method		Full-bridge bipolar PWM
Input signal	Pulse signal	Optocoupler input voltage H = 3.5 - 5 V , L = 0 - 0.8 V , Current 6 - 15 mA Signal power supply 12VDC series resistance R=1K Ω Signal power supply 24VDC series resistance R=2.2K Ω Optional configurations can also be made based on the input signal voltage, such as fixed 12V or 24V
	Offline signal	
	Direction signal	
Output signal	Alarm signal	Optocoupler isolation output, max. withstand voltage 30VDC, max. saturation current 10mA
Operating environment	Application	Avoid dust, oil mist and corrosive gas
	Humidity	< 85% RH, no condensation
	Temperature	0 ~ 40°C
	Heat dissipation	Install in a ventilated environment

#### ● Installation (unit : mm)



# Integrated Stepper Electronics

## ■ DS-CL42-SA Integrated Closed Loop - RS485

### ● Features

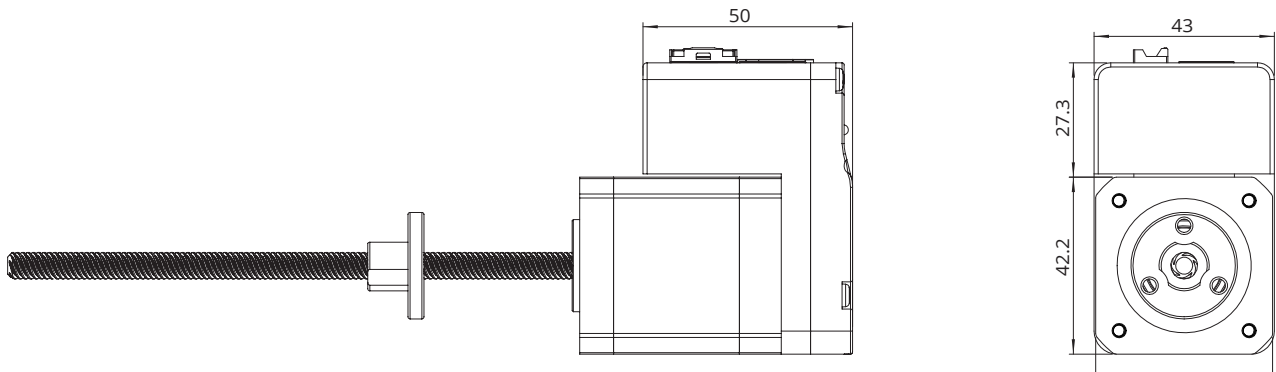
1. Input power: DC 24 Vdc  $\pm$  10%
2. Output rated current : 0 ~ 1.2A (max)
3. Integrated 42mm Stepper Closed Loop Series, RS485 Communication interface supports MODBUS RTU Communication protocol
4. 7 Inputs, 3 Outputs



### ● Specification

Input voltage	24 VDC $\pm$ 10 %	
Control method	Closed loop control with 32 bit ARM	
Multi axes driver	Max 16 axes through Star Topology	
Position table	64 movement command steps (continuous cycle jump etc)	
Board current consumption	Max 500mA (Except motor current)	
Ambient temperature	Use : 0 ~ 40°C	Storage : -20 ~ 70°C
Ambient humidity	Use : 35 – 86% RH (non-condensing)	Storage : 10 – 90% RH (non-condensing)
Vibration resistant	0.5 G	
Rotation speed	0 – 3000 rpm	
Encoder resolution (P/R)	Max 10000 PPR	
Protection functions	Multiple alarm function. For details, please refer to product manual	
Rotational direction	CW / CCW (Selectable by parameter)	
Digital inputs	7 programmable inputs (Photocoupler)	
Digital output	3 programmable outputs (Photocoupler)	
Communication interface	RS-485 Serial communication with PC transmission speed : 115200 (bps)	
Position control	Incremental mode Data range : -2147493648 ~ +2147483647 (pulse) Pulse speed : Max 800 kpps	
Return to origin	Origin sensor, $\pm$ Limit sensor, Z phase, Torque	
GUI	User interface program with in windows	
Software	Ezi-Motion GUI / Motion library (DLL) for Windows 2000/XP/7/8/10	

### ● Installation (unit : mm)





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Precision Motion Specialist

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