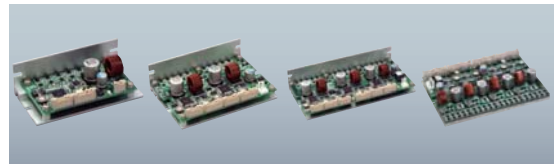


# DC Power Supply Driver Specification

## MD-55F / MD-255F / MD-355F / MD-455F

This micro-step driver for 5-phase stepper motor is compatible with all standard stage models. Compact size and low price. By controlling excitation to the motor, 16 types and 250 divisions step angle at maximum can be set, and smooth and high precision positioning are possible.

MD-55F    MD-255F    MD-355F    MD-455F



Model	Price
MD-55F	¥16,000
MD-255F	¥31,000
MD-355F	¥44,000
MD-455F	¥58,000

### Features

- Low price
- Micro step drive with 250 divisions at maximum
- Compact size and less heat generation
- DC power supply input, constant current drive

### Function

- Switch the pulse input method (1 pulse method/2-pulse method)
- Micro step setting with the rotary switch
- Motor driving current setting with the dip switch
- Automatic current down  
Motor driving current though the dip switch settings at stopping maintain the phase current to one of 25%, 50%, and 75%.
- Motor excitation OFF function

### Specification

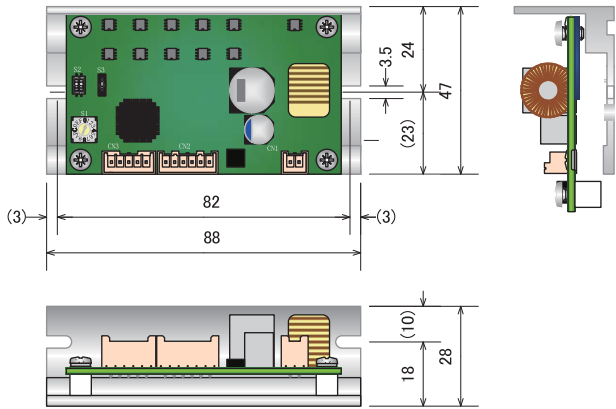
Model	MD-55F	MD-255F	MD-355F	MD-455F
Product Type	5-phase stepper motor driver			
Number of Axes	1	2	3	4
Dimension (mm)	W88xH28xD47	W100xH30xD73.5	W146xH30xD73.5	W143xH26.5xD101
Supply Voltage	DC+24V ±5%			
Supply Current	MAX 3A	MAX 6A	MAX 8A	MAX 10A
Operating Environment	Operating temperature: 0 ~ 40°C, Operating humidity: 0 ~ 85% (Should be no condensation)			
Weight (g)	81	145	200	275
Driving Method	Bipolar constant current pentagon			
Driving Current (A)	0.35A/phase, 0.75A/phase, 1.4A/phase Dip selector switch			
Stop Current (%)	Fix at approx. 50% of set driving current	25%, 50%, and 75% of set driving current Dip selector switch		
Micro-step Division	16 types, Rotary switch settings    Switch the function selector switch 2 and 3 series 2series: 1, 2, 4, 5, 8, 10, 20, 40, 80, 16, 25, 50, 100, 125, 200, 250 3series: 1, 2, 3, 6, 12, 18, 24, 32, 36, 48, 60, 72, 120, 160, 180, 240			
Input Signal	CW pulse, CCW pulse, H.O (Hold OFF): Photocoupler input			
Maximum Frequency	500kpps			

### Wiring cable set with connector(600mm each)

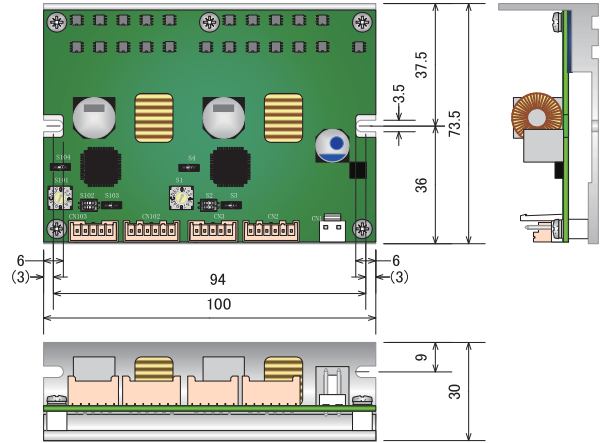
Model	CL-1F	CL-2F	CL-3F	CL-4F
Applicable Driver	MD-55F	MD-255F	MD-355F	MD-455F
Price (JPY)	¥2,000	¥2,500	¥3,000	¥3,500



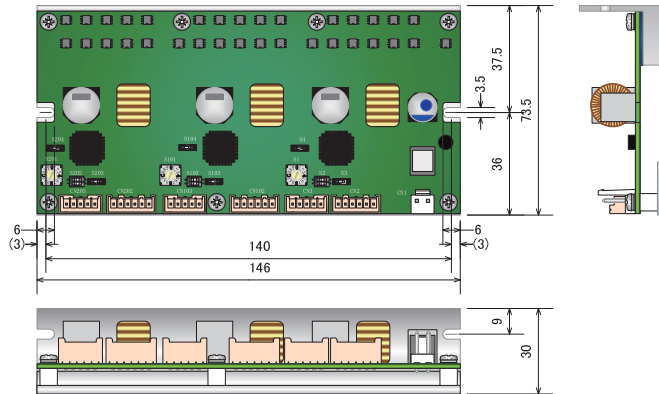
## MD-55F



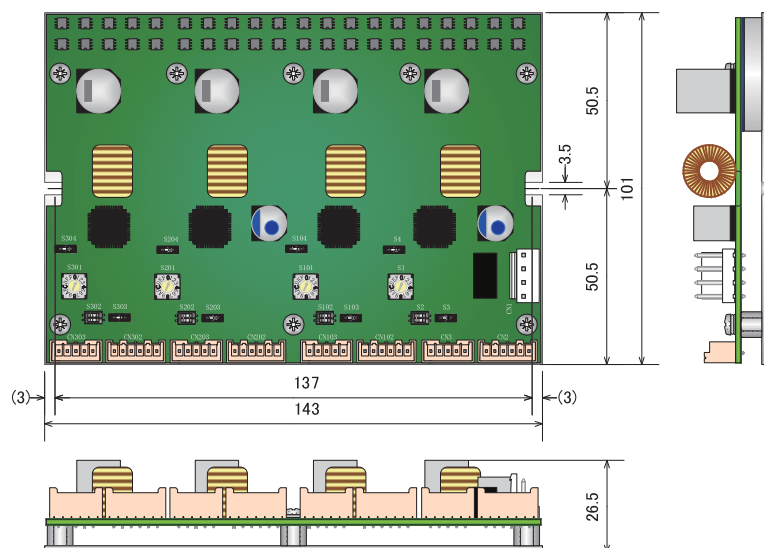
## MD-255F



## MD-355F



## MD-455F



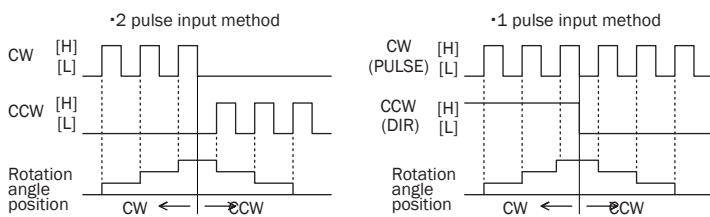
## Specifications/Rating

Product name	MD-55F	MD-255F	MD-355F	MD-455F
Input power	DC+24V±5%			
Power Consumption	3A(MAX)	6A(MAX)	8A(MAX)	10A(MAX)
Driving Current	0.35/phase, 0.75A/phase, 1.4A/phase switch			
Driving Method	Bipolar constant current pentagon			
Number of divisions	2 series:1,2,4,5,8,10,20,40,80,16,25,50,100,125,200,250 3 series:1,2,3,6,12,18,24,32,36,48,60,72,120,160,180,240			
CW/ CCW Input pulse	Pulse width	0.5μs or more (Duty 50% or less)		
	Pulse interval	0.5μs or more (Duty 50% or less)		
	Startup time, Fall time	1μs or less		
	Voltage	[H]:3~5VDC, [L]:3~0.5VDC ※1		
	Current	8~20mA		
Frequency	500kpps or less			
Ambient operating temperature	0~40°C, 0~85% (Should be no condensation)			
Main body weight	81g	145g	200g	275g

※1) [H]: Turn the photocoupler in the main body circuit ON, same for the following descriptions.  
[L]: Turn the photocoupler in the main body circuit OFF.

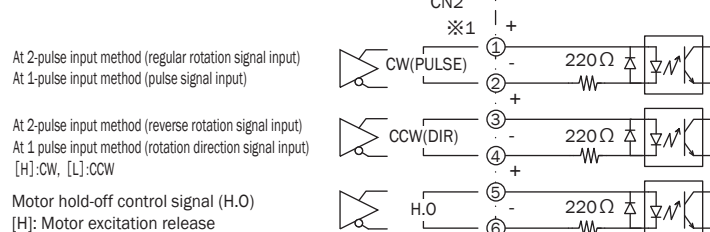
## Time chart

● CW and CCW input (CW: Clockwise direction viewed from the motor shaft side)

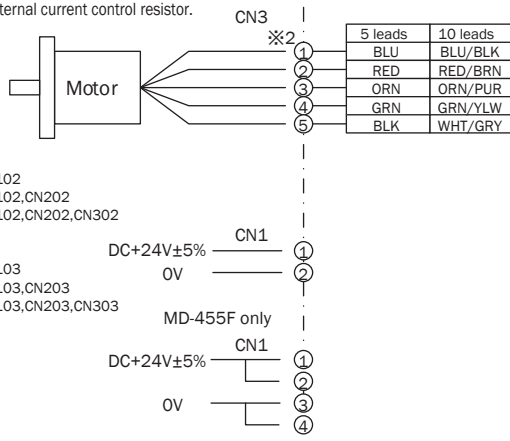


## Signal Input/Output Circuit and Connection Diagram

Input connection in the figure is a connection at line driver output. Also, it can be driven with open collector output.



Note: When input signal voltage is + 5VDC or more, use by installing an external current control resistor.



※1) MD-55F : CN2  
MD-255F : CN2,CN102  
MD-355F : CN2,CN102,CN202  
MD-455F : CN2,CN102,CN202,CN302

※2) MD-55F : CN3  
MD-255F : CN3,CN103  
MD-355F : CN3,CN103,CN203  
MD-455F : CN3,CN103,CN203,CN303

Note: The connectors for connection and crimping pins are all accessories. Refer to each operation manual for official model, etc. Also, a wiring cable set with connectors is available (sold separately). (Refer to N-015)

## Function Description

◎Function selector switch (S2,S102,S202,S302) All OFF at factory setting

Switch	NO	Function	Switch Position	
			ON	OFF
	1	Pulse input method switch	1 pulse input method	2 pulse input method
	2	2, 3 series switch	3 series	2 series

◇Pulse input method

※1 pulse input method: CW is driver pulse signal input of the motor, and CCW is signal input for the motor's rotation direction. When the rotation direction signal is [L], the motor rotates to CCW direction, and [H] to CW direction.

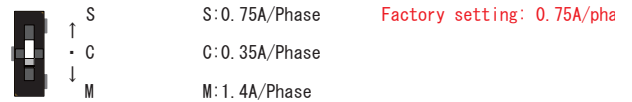
※2 pulse input method: When pulse input is to CW, and the motor rotates to CW direction. When pulse input is to CCW, and the motor rotates to CCW direction.

◇2, 3 series switch

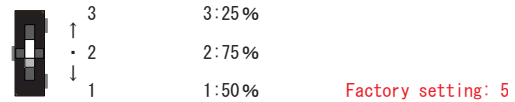
※3 series: Switch the micro step angle setting shown below to 3 series

※2 series: Switch the micro step angle setting shown below to 2 series

◎Driving current settings (S3,S103,S203,S303)



◎Stop current settings (S4,S104,S204,S304)



◇The stop current is a phase current supplied when the 5-phase stepper motor is stopped.

◇The stop current set value is the ratio (%) to the drive current setting value.

◇The stop current may have deviation from the motor's winding impedance.

◎Hold Off (H.O)

◇When H.O input is [H], the motor excitation is released, because the supply current to each phase is shutdown.

◇When H.O input is [L], it becomes the excitation state on the normal motor.

◇Used when manually correct position on the motor axis.

◇When not using this function, disconnect.

◎Micro step settings (S1,S101,S201,S301)



Setting table for number of divisions

2 series: When number 2 of S2, S102, S202 and S302 is OFF.

Switch No	0	1	2	3	4	5	6	7	8	9	A	B	C	D	E	F
Number of divisions	1	2	4	5	8	10	20	40	80	16	25	50	100	125	200	250

Setting table for number of divisions

3 series: When number 2 of S2, S102, S202 and S302 is ON.

Switch No	0	1	2	3	4	5	6	7	8	9	A	B	C	D	E	F
Number of divisions	1	2	3	6	12	18	24	32	36	48	60	72	120	160	180	240

◇Number of divisions setting

※Drive the motor by dividing the basic angle (0.72°) on the 5-phase stepper motor with the setting value.

※Divided step angle is obtained with the following formula.

$$\text{Motor 1 Step angle} = \frac{\text{Basic angle (0.72}^\circ\text{)}}{\text{Number of divisions}}$$

Note: A change of number of divisions is conducted when the motor is stopped. When a change of number of divisions is conducted during driving, power swing may be generated.

## Exterior Dimensions Diagram

◎Driver Exterior Dimensions Diagram Refer to [page N-016, N-017](#).

## Safety Precautions and Precautions for Using

◎Refer to each operation manual.