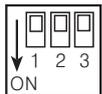




# MD5-HD14-2X, 3X

## ◎Function selection switch



NO	Name	Function	Switch position	
			ON	OFF
1	TEST	Self-diagnosis	Rotate in 30rpm	—
2	1/2 CLK	Pulse input method	1 Pulse input	2 Pulse input
3	C/D	Auto current down	Not using	Using

### ●TEST

- ※ Self-diagnosis function is to test motors and drivers.
  - ※ Motors rotate with 30 rpm in full-step. Motor rotation speed is subject to change depending on resolution setting.
  - ※ Rotation speed = 30 rpm / resolution
  - ※ The motor will rotate in CCW direction when in 1-pulse input mode and in CW direction when in 2-pulse input mode.
- Note) Make sure that TEST switch is set to OFF before supplying the power.  
It may cause injury or danger if TEST switch is set to ON when power is supplied.

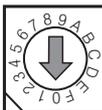
### ●1/2 CLK

- ※ 1/2 CLK switch is to select pulse input mode.
- ※ 1-pulse input mode : CW → operation command pulse input, CCW → rotation direction pulse input  
([H]: CW rotation, [L]: CCW rotation)
- ※ 2-pulse input mode : CW → CW direction rotation pulse input, CCW → CCW direction rotation pulse input

### ●C/D (Auto current down)

- ※ This function is reducing current automatically according to STOP current setting value in order to suppress generated heat when motor is stop.
- ※ It activates when there is no pulse input of motor operation for over 200ms.

## ◎RUN current setting



Switch No.	0	1	2	3	4	5	6	7	8	9	A	B	C	D	E	F
Current (A/Phase)	0.4	0.5	0.57	0.63	0.71	0.77	0.84	0.9	0.96	1.02	1.09	1.15	1.22	1.27	1.33	1.4

- ※ RUN current is a phase current provided to 5-phase stepping motor.
  - ※ Be sure to set RUN current at the rated current or below. If not, it may cause heat generation, loss of torque or step-out.
  - ※ Adjust the RUN current in case severe heat generation occurs. Be sure that torque decreasing may occur when adjusting the current.
  - ※ RUN current setting value may have some deviation depending on motor's running frequency.
- Note) Be sure to adjust RUN current while motor is running.

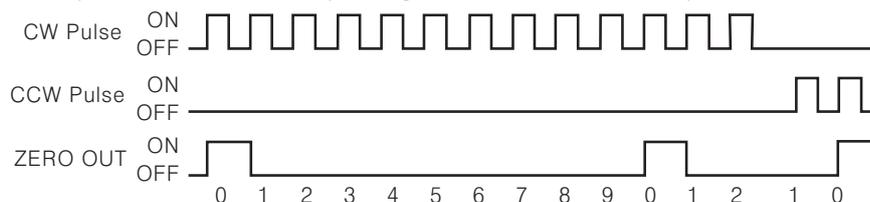
## ◎STOP current setting



Switch No.	0	1	2	3	4	5	6	7	8	9	A	B	C	D	E	F
%	27	31	36	40	45	50	54	58	62	66	70	74	78	82	86	90

- ※ STOP current is a phase current provided to 5-phase stepping motor at standstill.
  - ※ It will be activated when C/D (Auto current down) is set to ON. By setting STOP current, it is possible to suppress the heat generation at motor standstill.
  - ※ STOP current setting value is the ratio of RUN current setting value (%).
- Ex) In case RUN current setting value is set to 1.4A and STOP current setting value is set to 50%, auto current down current is set to 0.7A.
- ※ STOP current setting value may have some deviation depending on resistance impedance of motor.
  - ※ Auto current down function will be activated when HOLD OFF signal is [L]. When HOLD OFF signal is [H], the function is not activated since the current provided to each phase is cut off.
- Note) Be sure to adjust STOP current while motor is at standstill.

## ◎Zero point excitation output signal (ZERO OUT) [※Option]



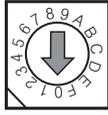
- ※ The signal is output to indicate when the motor excitation status is in the initial stage. / Used to check the rotation position of motor's axis
  - ※ In case of full step, the signal is output every 7.2°. (50 times / rotation)
- EX) Full step (0.72°/Step): Signal is output every 10 pulses.  
20 divisions (0.036°/Step): Signal is output every 200 pulses.

# Multi-Axis 5-Phase Stepping Motor Driver

## ◎HOLD OFF function

- ※ When HOLD OFF input signal is [H], motor excitation is released.
- When HOLD OFF input signal is [L], motor excitation is in a normal status.
- ※ A function used to rotate motor's axis using external force or used for manual positioning.
- ※ HOLD OFF Input signal [H] and [L] represent Photocoupler ON/OFF in a circuit.
- ※ Please do not use for stopping motor.

## ◎Setting microstep(Microstep : Resolution)



Switch No.	0	1	2	3	4	5	6	7	8	9	A	B	C	D	E	F
Resolution	1	2	4	5	8	10	16	20	25	40	50	80	100	125	200	250
Step angle	0.72°	0.36°	0.18°	0.144°	0.09°	0.072°	0.045°	0.036°	0.0288°	0.018°	0.0144°	0.009°	0.0072°	0.00576°	0.0036°	0.00288°

### ●Resolution setting(Same as MS1, MS2)

- ※ Microstepping is to make basic step angle of 5-phase motors (0.72°) divided into smaller angle according to setting values.
- ※ The formula for microstep angle is :

$$\text{Motor revolution angle (5-phase motors)} = \frac{\text{Basic step angle}(0.72^\circ)}{\text{Resolution}}$$

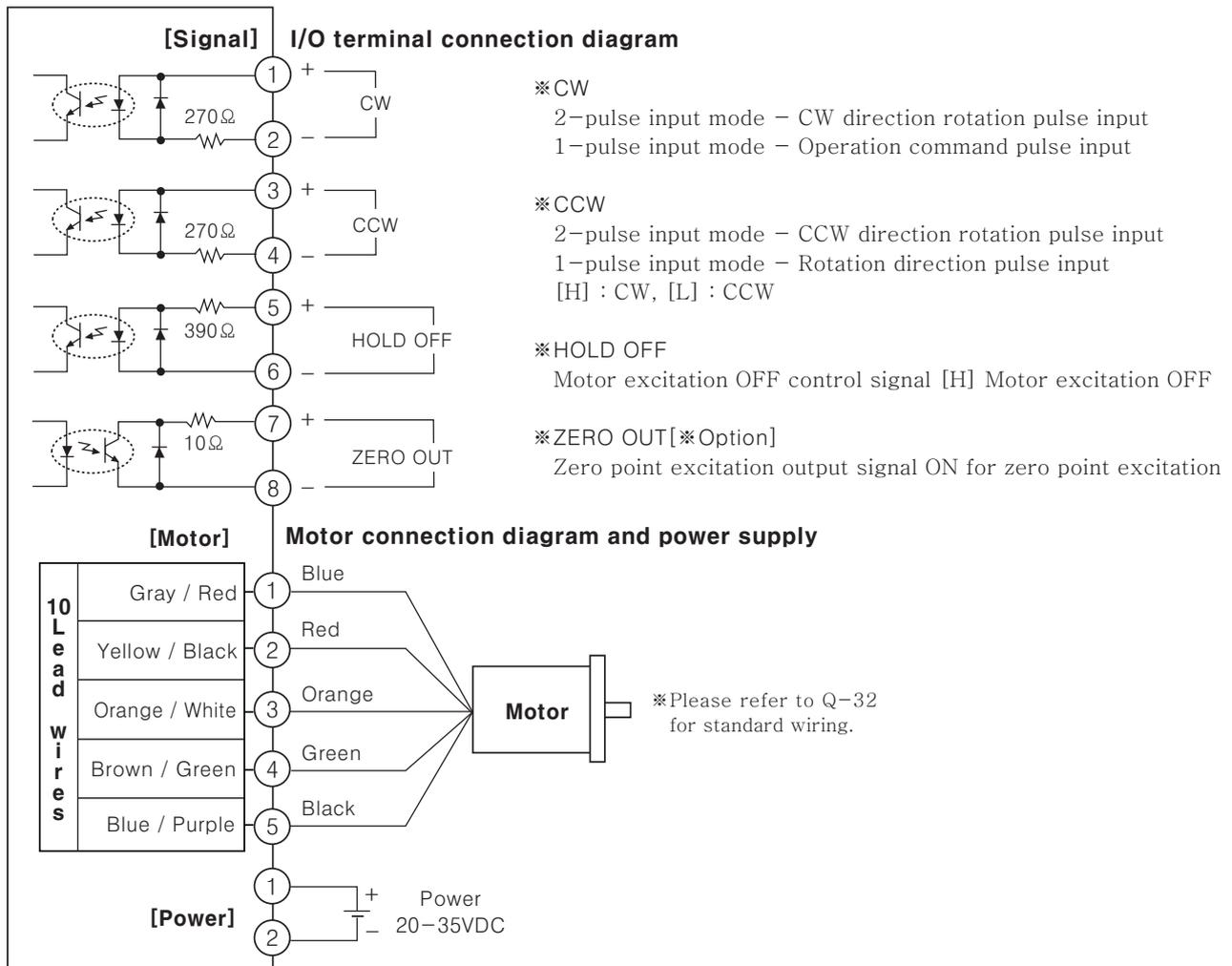
- ※ In case of geared motors, step angle shall be determined by dividing step angle by gear ratio.

EX)  $0.72^\circ / 10 (1:10) = 0.072^\circ$

- ※ It may cause step-out if resolution is changed while motor is running.

## ■Input - Output diagram

<Inner circuit of MD5-HD14-2X/3X>



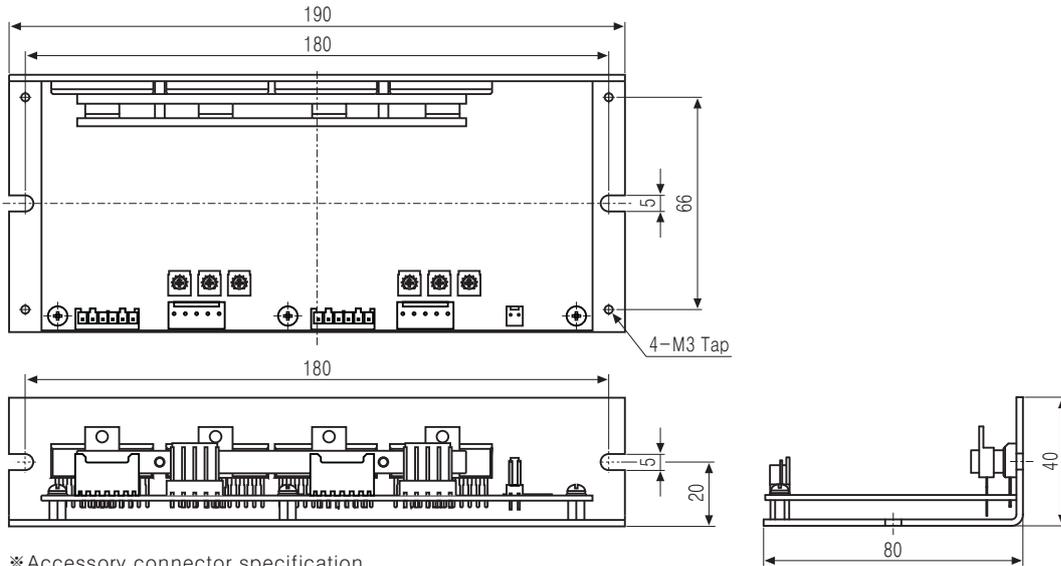
- Note)** Add external resistance when power for pulse from the external of the unit exceeds +5V. (Input current:10 to 20mA)
- Note)** 2/3-axis use power supply in common and input/output terminals are proportional to the number of axes of model.

(A)	Photo electric sensor
(B)	Fiber optic sensor
(C)	Door/Area sensor
(D)	Proximity sensor
(E)	Pressure sensor
(F)	Rotary encoder
(G)	Connector/Socket
(H)	Temp. controller
(I)	SSR/Power controller
(J)	Counter
(K)	Timer
(L)	Panel meter
(M)	Tacho/Speed/Pulse meter
(N)	Display unit
(O)	Sensor controller
(P)	Switching power supply
(Q)	Stepping motor & Driver & Controller
(R)	Graphic/Logic panel
(S)	Field network device
(T)	Production stoppage models & replacement

# MD5-HD14-2X, 3X

## Dimensions

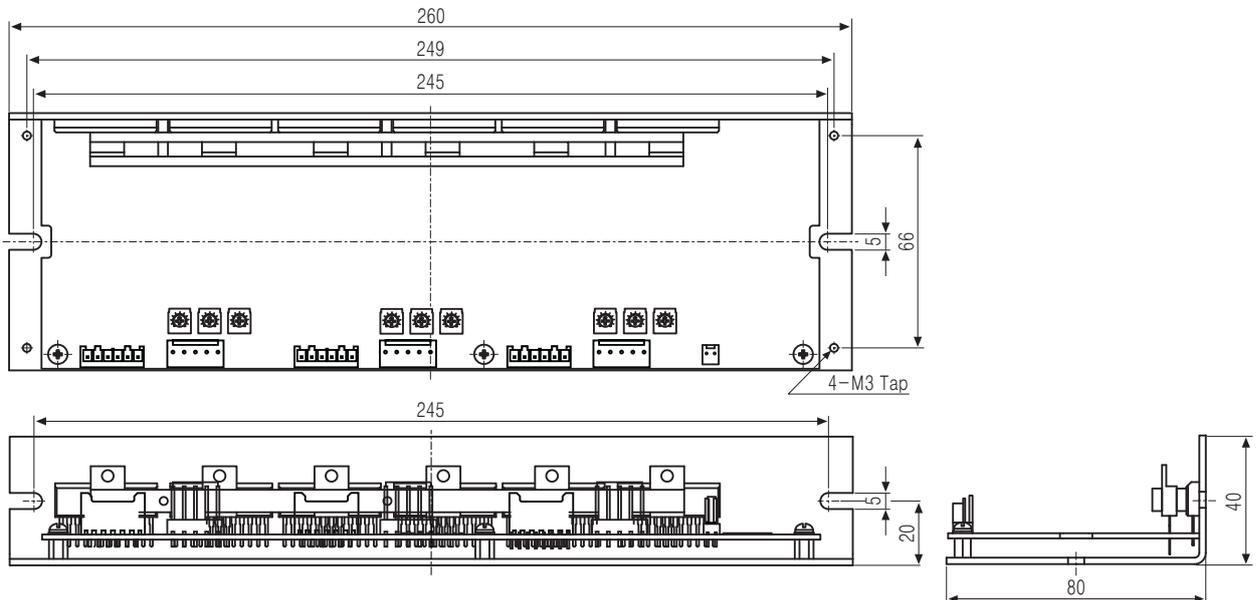
### MD5-HD14-2X



\*Accessory connector specification

	Connector		Qty
	Manufacturer	Model No.	
Power 2P Housing	Yeonho electronics	YH396-02V	1
Motor 5P Housing	Yeonho electronics	YH396-05V	2
Signal 6P Housing	JST	XAP-06V-1	2
Power/Motor Terminal Pin	Yeonho electronics	YT396	12
Signal Terminal Pin	JST	SXA-001T-P0.6	12

### MD5-HD14-3X



\*Accessory connector specification

	Connector		Qty
	Manufacturer	Model No.	
Power 2P Housing	Yeonho electronics	YH396-02V	1
Motor 5P Housing	Yeonho electronics	YH396-05V	3
Signal 6P Housing	JST	XAP-06V-1	3
Power/Motor Terminal Pin	Yeonho electronics	YT396	17
Signal Terminal Pin	JST	SXA-001T-P0.6	18

(Unit:mm)