Autonics

MOTOR DRIVER
(5 PHASE STEPPING MOTOR DRIVER)
KR-5MC

M A N U A L

CE

Thank you very much for selecting Autonics products.
For your safety, please read the following before using.

▣ Caution for your safety

※Please keep these instructions and review them before using this unit.

※Please observe the cautions that follow;
⚠ **Warning** Serious injury may result if instructions are not followed.
⚠ **Caution** Product may be damaged, or injury may result if instructions are not followed.

※The following is an explanation of the symbols used in the operation manual.
⚠ Caution:Injury or danger may occur under special conditions.

⚠ Warning

1. **In case of using this unit with machinery(Nuclear power control, medical equipment, vehicle, train, airplane, combustion apparatus, entertainment or safety device etc), is require to instal fail-safe device, or contact us for information on type required.**
   It may result serious damage, fire or human injury.
2. **Installation, connection, operation, control, maintenance should be executed by person who has been qualified.**
   It may cause a fire or human injury, give an electric shock.
3. **Please use reinforced insulation DC power for DC type input product.**
   It may give an electric shock.
4. **Please install this unit after considering counterplan against power failure.**
   It may cause human injury or damage to product by releasing holding torque of motor.
5. **Do not use this unit outdoors or place where there are flammable, corrosive gas, water, big vibration etc.**
   It may cause a fire or give an electric shock.
6. **Do not disassemble and modify this unit, when it is required, please contact us.**
   It may cause a fire or give an electric shock,damage to product.
7. **Please install board type product with protection equipment.**
   It may cause a fire.

⚠ Caution

1. **Power input voltage must be used within the rated specification and power line should be over than AWG NO. 18(0.75mm²).**
   It may cause a fire or give an electric shock.
2. **Please check the connection before inserting the power.**
   It may cause a fire or give an electric shock, damage to product.
3. **Please turn off power when power is failed.**
   It may cause human injury or damage to product due to sudden movement when recovering power failure.
4. **Do not touch this unit during it is operating or after stopping.**
   It may cause a burn due to high temperature in surface.
5. **The emergency stop should be available during operating.**
   It may cause human injury or damage to product.
6. **Please supply power after checking control input signal.**
   It may cause human injury or damage to product by sudden movement.
7. **Do not turn on the HOLD OFF signal input while it is maintaining vertical position.**
   It may cause human injury or damage to product by releasing holding torque of motor.
8. **Please install a safety device when requiring to maintain the vertical position after turn off the power.**
   It may cause human injury or damage to product by releasing holding torque of motor.
9. **Please check if HOLD OFF signal input is ON when setting the output manually.**
   It may cause human injury by sudden movement.
10. **Please stop this unit when mechanical trouble occurred.**
    It may cause a fire or human injury.
11. **Do not touch the terminal when testing insulation dielectric strength or measuring insulation rresistance.**
    It may give an electric shock.
12. **Please observe rating specification.**
    It may cause human injury give an electric shock or damage to product.
13. **In cleaning the unit, do not use water or an oil-based detergent.**
    It may cause a fire or give an electric shock.
14. **Please separate as industrial scrapped material when disuse this unit.**

※**The above specification are changeable without notice anytime.**

▣ Features

- **It is upgraded in Oct. 2006.**
- Self-diagnosis, micro step function(Resolution:×1, ×2, ×10, ×20).
- Bipolar constant current pentagon drive method.
- Built-in stop/run current adjustment function.
- Photo coupler input insulation method to minimize the effects from external noise.
- Available 20-35VDC of power supply range.

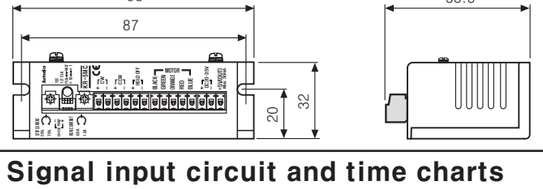
▣ Specifications

Model	KR-5MC
Power supply	20-35VDC(3A Max.)
Drive current	1.4A/Phase(Max.)
Drive method	Bipolar constant current pentagon drive
Resolution(Rotating angle)	×1(0.72°), ×2(0.36°), ×10(0.072°), ×20(0.036°)
Pulse width	Min. 0.5㎲
Pulse interval	Min. 0.5㎲
Rising/Falling time	Max. 1㎲
Max. input pulse frequency	280kpps
Pulse input voltage	High:4-8VDC, Low:0-0.5VDC
Input resistor	390Ω(CW, CCW, HOLD OFF)
Ambient temperature	0 ~ 40℃(at non-freezing status)※
Ambient humidity	35~85%RH
Unit weight	Approx. 120g

※Please mount the product in ventilative place due to too much heat of driver when using over 30VDC.

▣ Dimensions

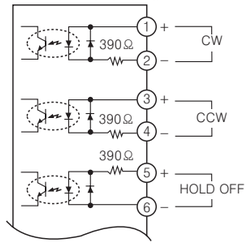
(Unit:mm)



▣ Signal input circuit and time charts

◎**Signal input device**

<KR-5MC inner circuit>



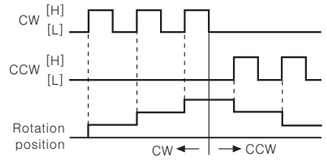
2 pulse input method(CW)
1 pulse input method(Operating rotation signal input)
Note)If the power for driving pulse from external is over than +5V, please connect resistor.

2 pulse input method(CCW)
1 pulse input method(Rotating direction input)
[H] : CW, [L] : CCW

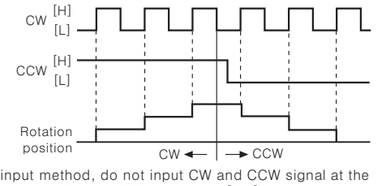
The control signal for hold off of Motor
[H] : Motor Hold OFF

◎**Time chart**

●2 pulse input method

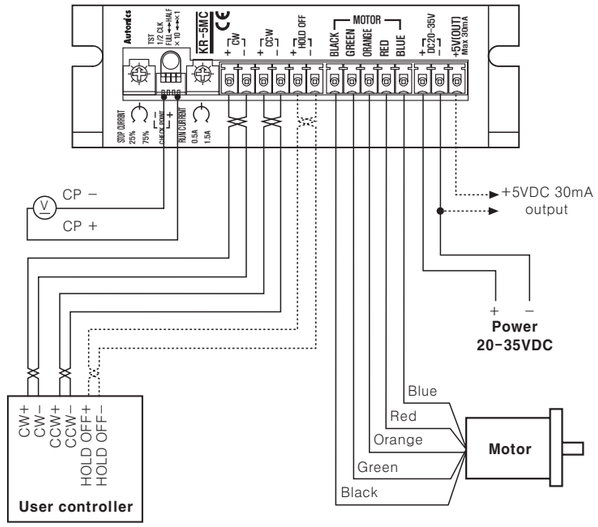


●1 pulse input method



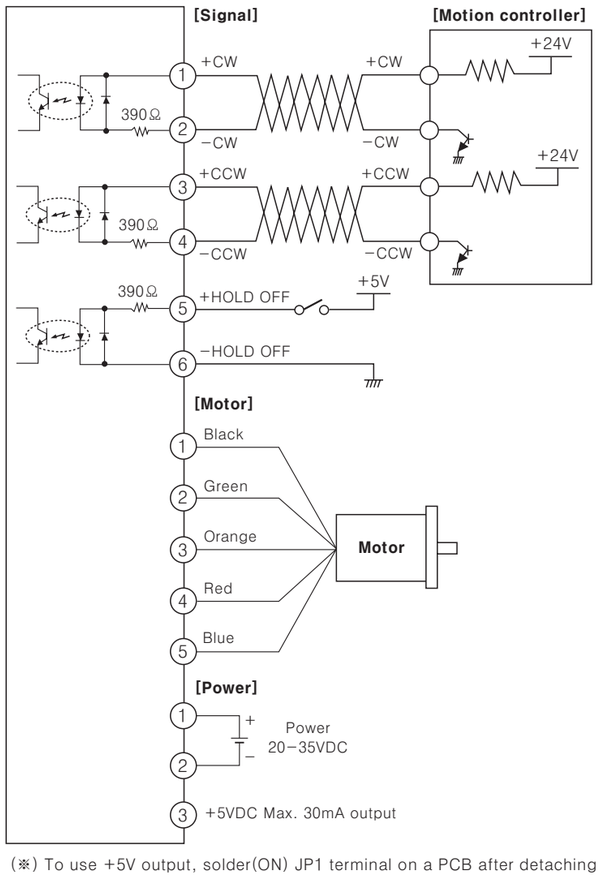
Note)When using 2 pulse input method, do not input CW and CCW signal at the same time. When one of the CW and CCW signals is [ON], it may not be worked normally.

▣ Connections

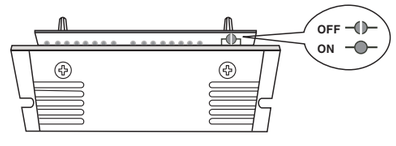


▣ Input • Output circuit an connection diagram

<KR-5MC inner circuit>



(※) To use +5V output, solder(ON) JP1 terminal on a PCB after detaching the case.



▣ Function S/W

●**Self-diagnosis function**

OFF ON (1)	Rotate as 150pps
OFF ON (1)	RUN mode

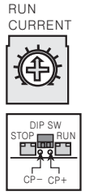
●**Select input method**

OFF ON (2)	1 Pulse input method
OFF ON (2)	2 Pulse input method

●**Select resolution(rotation angle)**

OFF ON (3,4)	×1(0.72°)
OFF ON (3,4)	×2(0.36°)
OFF ON (3,4)	×10(0.072°)
OFF ON (3,4)	×20(0.036°)

▣ RUN current setting

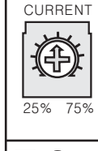


- In order to adjust run current for controlling temperature rise and vibration of motor and driver, change it using RUN CURRENT volume.
- To change the Run current, connect the CP− to the (−) terminal of the voltmeter and the CP+ to the (+) terminal of the voltmeter then adjust RUN CURRENT S/W.
  (Factory specification of Run current is 1.4A/Phase)
- Phase current change :

$$\text{Setting current(A)} = \frac{\text{CP measurement voltage(V)}}{2}$$

(Note)Run current should be changed during the operating of motor.

▣ Motor STOP current setting



- In order to reduce the heat adjusting the current, change it using STOP CURRENT volume.
- The setting value of STOP CURRENT volume is a percentage of the setting volume of RUN CURRENT.
  Ex)After setting 1.0A for Run current then put STOP CURRENT volume at 50%, the Stop current will be 0.5A.

(Note)Run current should be changed during the operating of motor.

▣ Caution for using

1. For signal input
   ①When using 2 pulse input method, do not input CW and CCW signal at the same time. When one of the CW and CCW signal it [ON], it may not be worked normally.
   ②When the power for pulse operation is exceeded +5V, please connect resistance and use from the external.
2. For supplying power
   ①Use the power enough to supply the run current when turn on the power.
   ②The current value indicated on power supply is the max. input of driver.
   ③**Please check the polarity of power before using.**
3. For cable connection
   ①Use Twist pair(Over 0.2mm²) for the signal cable should be shorter than 2m.
   ②Please use over than AWG No.18(0.75mm²) wire for motor and power connection(when it is required to be extended) and power line.
4. For installation
   ①Please mount a heating panel on metal surface closely.
   ②Please mount this product in ventilative place in order to increase the heating efficiency of heating panel.
5. Installation environment
   ①It shall be used indoor
   ②Altitude max. 2000m
   ③Pollution degree 2
   ④Installation category Ⅱ

※**It may cause malfunction if above instructions are not followed.**

▣ Major products

■ PROXIMITY SENSOR ■ PHOTOELECTRIC SENSOR ■ AREA SENSOR
■ FIBER OPTIC SENSOR ■ DOOR/DOOR SIDE SENSOR ■ PRESSURE SENSOR
■ ROTARY ENCODER ■ COUNTER ■ TIMER ■ TEMPERATURE CONTROLLER
■ TEMPERATURE/HUMIDITY TRANSDUCER
■ POWER CONTROLLER
■ PANEL METER
■ TACHO/LINE SPEED/PULSE METER
■ DISPLAY UNIT
■ SENSOR CONTROLLER
■ SWITCHING POWER SUPPLY
■ GRAPHIC PANEL
■ 5-PHASE STEPPING MOTOR & DRIVER & CONTROLLER
■ LASER MARKING SYSTEM (CO2, Nd:YAG)

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