

Autonics

**MOTOR DRIVER(5 PHASE MICRO STEP DRIVER)
KR-55MC**

M A N U A L



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.
 - Warning** Injury or danger may occur under special conditions.

- Warning**
 - In case of using this unit with machineries(Nuclear power control, medical equipment, vehicle, train, airplane, combustion apparatus, entertainment or safety device etc.), it requires installing fail-safe device, or contact us for information on type required. It may result in serious damage, fire or human injury.
 - Installation, connection, operation, control, maintenance should be carried out by person who has been qualified. It may cause a fire or human injury, give electronic shock.
 - Please use reinforcement insulated DC power for DC type input product. It may give electronic shock.
 - Please install this unit after considering count plan against power failure. It may cause human injury or damage to product by releasing holding torque of motor.
 - 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 electronic shock.
 - Do not disassemble and modify this unit, when it requires, please contact us. It may cause a fire or give electronic shock, damage to product.
 - Please install board type product with protection equipment. It may cause a fire.

- Caution**
 - Power input voltage must be used within rating specification and power line should be over than AWG NO. 18(0.75mm²). It may cause a fire or give electronic shock.
 - Please check the connection before power. It may cause a fire or give electronic shock, damage to product.
 - Please turn power off when power failure occurred. It may cause human injury or damage to product due to sudden movement when recover power failure.
 - Do not touch this unit during it is operating or after stopping. (Within few second) It may cause a burn due to high temperature in surface.
 - The emergency stop needed during operating. It may cause human injury or damage to product.
 - Please supply power after checking control input signal. It may cause human injury or damage to product by releasing holding torque of motor.
 - 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.
 - Please install a safety device when need to remain the vertical position after turn off the power. It may cause human injury or damage to product by releasing holding torque of motor.
 - Please check if HOLD OFF signal input is ON when need to set the output manually. It may cause human injury by sudden movement.
 - Please stop this unit when mechanical trouble occurred. It may cause a fire or human injury.
 - Do not touch the terminal when test check pressure or insulation resistance. It may give electronic shock.
 - Please observe rating specification. It may cause human injury or give electronic shock, damage to product.
 - In cleaning the unit, do not use water or an oil-based detergent. It may cause a fire or give electronic shock.
 - Please separate as industrial scrapped material when disuse this unit.
- ※ The above specifications are changeable without notice anytime.

Features

- Able to drive micro step for low vibration and noise.
- Use step angle with conversion signal.
- Maximum 80 divisions, step angle of 0.72°, controlling as accurate as down to 0.009°. It needs 40,000 pulses for 1 revolution of motor.
- Various functions built-in, including an automatic current-down or self-diagnosis function.
- Realization of small, light and high speed/torque.
- Photo coupler input insulation method to minimize the effects from external noise.

Characteristics of input pulse

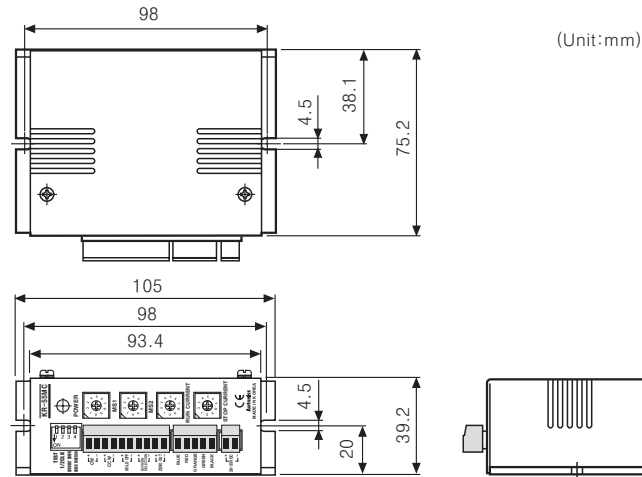
- Pulse width : Min. 0.5μs
- Pulse interval : Min. 0.5μs
- Rising • Falling time : Max. 1μs
- Max. input pulse frequency : 500k pps
- Pulse input voltage : [H]4V-8V, [L]0-0.5V
- Input resistor : 300Ω(CW, CCW), 390Ω(HOLD OFF, DIVISION SELECTION)

Specifications

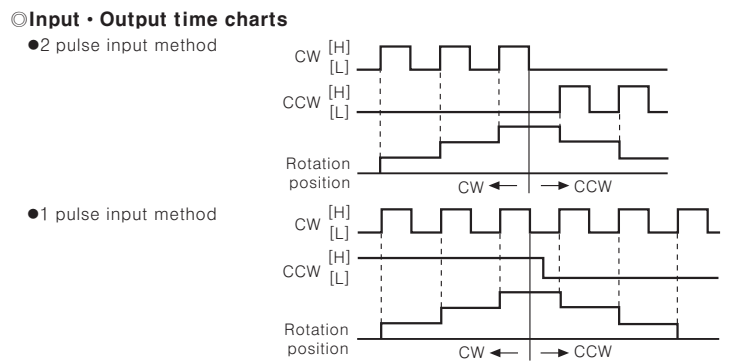
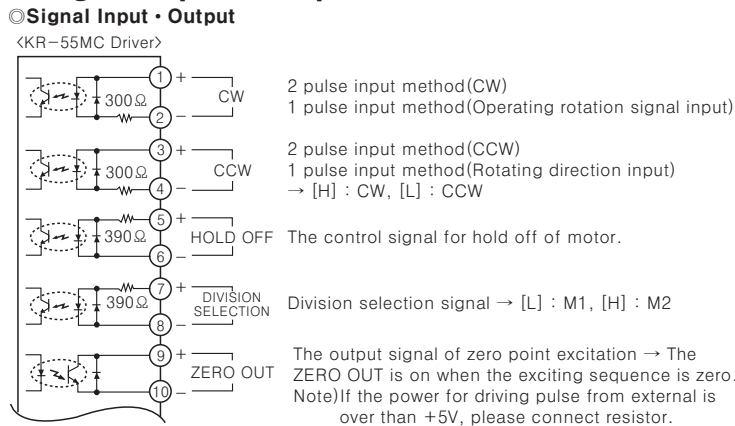
Model	KR-55MC
Input power	20-35VDC(Max. rating) 3A
RUN current	1.4A/phase max.
Drive method	Micro step(1, 2, 4, 5, 8, 10, 16, 20, 40, 80 Division)
Ambient temperature	0 to 40°C
Ambient humidity	35 to 85%RH
Weight	Approx. 240g

※ There is torque difference by input power.

Dimensions



Signal Input • Output circuit and time charts

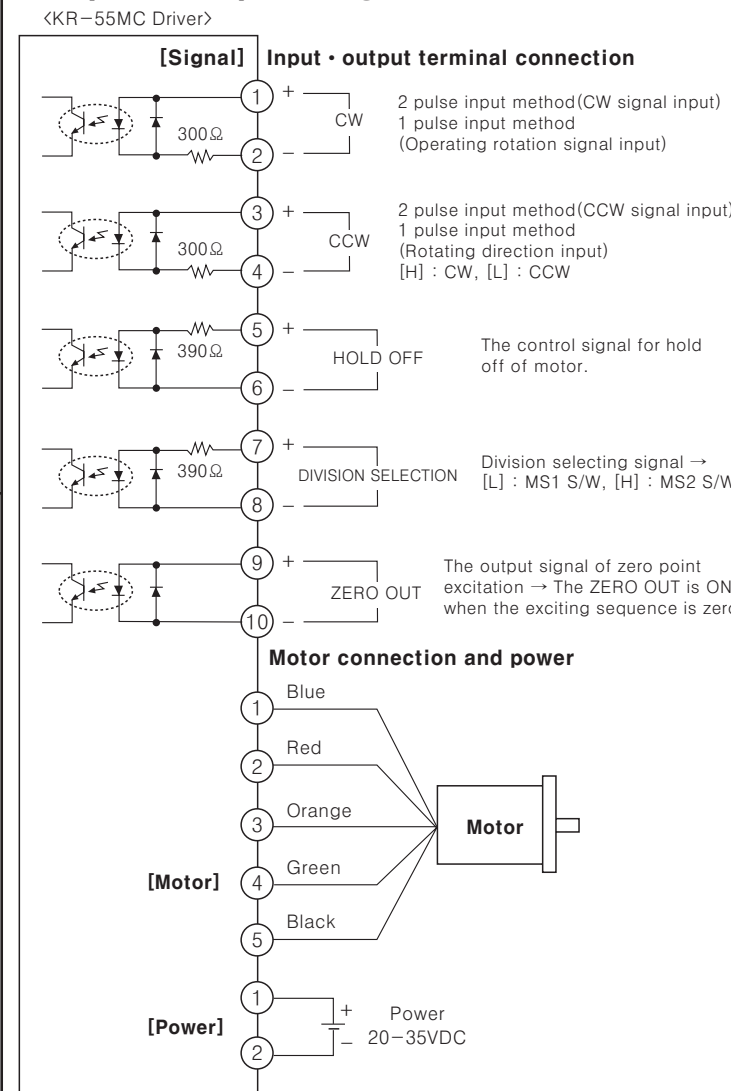


Note)When using the 2 pulse input method, do not input CW and CCW at the same time. When one of the CW and CCW signals is ON, a signal input in another directions may not work normally.

Connections



Input • Output diagram



Function S/W

No	Function	S/W position	
		ON	OFF
1	Self diagnosis function	100pps Rotation	Normal
2	Input signal method	1pulse input method	2pulse input method
3	Auto Current Down	Not use	Use
4	Check inner function	When it is used, OFF	

RUN and STOP Current setting

- The run current is phase current for 5 phase stepping motor.
- Use only for less than the rated current of motor, any modification may reduce the torque.
- When using the RUN CURRENT S/W in the range of "D to F", do not forget to first check the rated current to prevent motor heating.
- Increasing the run current of motor will make the torque, but motor heating may be severe. Therefore, please set run current of motor. Which is appropriate to the load.

S/W NO	0	1	2	3	4	5	6	7	8	9	A	B	C	D	E	F
Current(A)	0.5	0.58	0.66	0.75	0.81	0.88	0.96	1.03	1.1	1.15	1.25	1.3	1.4	1.47	1.53	1.6

- Using the STOP CURRENT S/W is allowed, and the set value is a percentage of the setting value of RUN CURRENT S/W.
- In the case of using run current as 1.4A/phase, set the S/W to "5", reduces 50% and sets the stop current as 0.7A/phase.
- This function is work at only HOLD OFF signal is [L].
- When it is [H], the current for phase will be cut off, so CURRENT DOWN will not work.

$$\text{Holding torque[kgf} \cdot \text{cm]} = \frac{\text{Holding torque[kgf} \cdot \text{cm]} \times \text{Stop current[A]}}{\text{Rated current of motor[A]}}$$

S/W 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

Division setting

S/W NO	0	1	2	3	4	5	6	7	8	9
Division	1	2	4	5	8	10	20	40	80	16

$$\text{5 Phase motor rotation angle} = \frac{\text{Step angle}(0.72^\circ)}{\text{Division}}$$

- Operates the selective division with MS1 S/W on the selection signal [L] and MS2 S/W on the selection signal [H] according to the division selecting signal.
- The adjustment of division during stepping motor operation may cause malfunction.
- The Zero point excitation signal is ON when the excitation sequence is 0. In the case of a 5 phase motor with 0.72° with an output every 7.2°, changing the step angle after turning on the power might not produce any output.

Caution for using

- Caution for signal input
 - When using the 2 pulse input method, do not input CW and CCW at the same time. When one of the CW and CCW signals is [H], a signal input in another directions may not work normally.
 - Current of input power maximum current.
 - Please use enough power enables to supply for motor driving.
- Caution for wiring
 - Use Twist pair(Over than 0.2mm²) for the signal wire should be shorter than 2m.
 - Please use over than AWG No.18(0.75mm²) wire for motor wiring(when it needs to extend) and power line.
- Please check the polarity of power before driving it.
- Caution for installation
 - Please mount a heating panel on metal surface closely.
 - Please mount this product at well-ventilated place in order to increase the heating efficiency of heating panel.
- Function S/W
 - The self-diagnosis is outputting a pulse of 100pps while the position of S/W is ON, which is setting to test the motor and driver.
 - Check the position of self-diagnosis S/W before turn on the power. If turn on the power at the state of ON, it could be dangerous due to abrupt motor starting.
 - The Auto Current Down reduces the run current at a constant rate to minimize heating when stop the motor.
- Installation environment
 - It shall be used indoor
 - Altitude Max. 2000m
 - Pollution Degreee 2
 - Installation 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
- GRAPHIC PANEL
- 5-PHASE STEPPING MOTOR & DRIVER & CONTROLLER
- LASER MARKING SYSTEM(CO₂, Nd:YAG)

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Satisfiable Partner For Factory Automation

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