

Thank you for choosing our Technodrive products.  
Please read the following safety considerations before use.

**■ Safety Considerations**

- ※Please observe all safety considerations for safe and proper product operation to avoid hazards.
- ※Safety considerations are categorized as follows.
- Warning** Failure to follow these instructions may result in serious injury or death.
- Caution** Failure to follow these instructions may result in personal injury or product damage.
- ※The symbols used on the product and instruction manual represent the following
- ▲ symbol represents caution due to special circumstances in which hazards may occur.

**▲ Warning**

- 1. Fail-safe device must be installed when using the unit with machinery that may cause serious injury or substantial economic loss.** (e.g. nuclear power control, medical equipment, ships, vehicles, railways, aircraft, combustion apparatus, safety equipment, crime/disaster prevention devices, etc.)  
Failure to follow this instruction may result in personal injury, fire, or economic loss.
- 2. Installation, connection, operation, maintenance, and inspection should be handled by qualified individuals.**  
Failure to follow this instruction may result in fire, electric shock, or personal injury.
- 3. Use reinforced insulation DC power at primary and secondary part for DC type input product.**  
Failure to follow this instruction may result in electric shock.
- 4. Install the unit after considering counter plan against power failure.**  
Failure to follow this instruction may result in personal injury, or product damage by releasing holding torque of motor.
- 5. Do not use the unit where is outside or flammable or explosive gas, corrosive material, water, vibration, or combustible material may be present.**  
Failure to follow this instruction may result in fire, electric shock, or personal injury.
- 6. Do not disassemble or modify the unit. Please contact us if maintenance necessary.**  
Failure to follow this instruction may result in fire, electric shock, or product damage.
- 7. In case of board type, install protection equipment for foreign substances.**  
Failure to follow this instruction may result in fire.

**▲ Caution**

- 1. Use the unit within the rated specifications.**  
Failure to follow this instruction may result in product damage, degradation, shortening the life cycle of the unit, personal injury, or peripheral devices damage.
  - 2. When connecting the power input cables, use the unit within the rated power supply and over AWG18 (0.75mm<sup>2</sup>) cables.**  
Failure to follow this instruction may result in fire or electric shock.
  - 3. Refer to the connection diagrams and check the connection correctly before supplying the power.**  
Failure to follow this instruction may result in fire, electric shock, or product damage.
  - 4. Turn OFF the power when power is failed.**  
Failure to follow this instruction may result in personal injury or product damage due to sudden movement when recover power failure.
  - 5. Do not touch the unit during or after operation for a while.**  
Failure to follow this instruction may result in burn due to high temperature of the surface.
  - 6. Emergency stop should be available during operation.**  
Failure to follow this instruction may result in personal injury or product damage.
  - 7. Check the control input signal of the unit before supplying the power.**  
Failure to follow this instruction may result in personal injury or product damage by unexpected signal input.
  - 8. Do not turn ON the HOLD OFF signal input while it is maintaining vertical position.**  
Failure to follow this instruction may result in personal injury or product damage by releasing holding torque of motor.
  - 9. Install safety device when it is required to remain the vertical position after turning off the power.**  
Failure to follow this instruction may result in personal injury or product damage by releasing holding torque of motor.
  - 10. Check HOLD OFF signal input is ON when moving the output axis (manual positioning etc.) manually.**  
Failure to follow this instruction may result in personal injury by unexpected operation.
  - 11. Stop instantly the unit when mechanical problem occurs.**  
Failure to follow this instruction may result in fire, or personal injury.
  - 12. Do not touch terminals when testing insulation resistance or dielectric strength.**  
Failure to follow this instruction may result in electric shock.
  - 13. Do not use water or oil-based detergent when cleaning the unit. Use dry cloth to clean the unit.**  
Failure to follow this instruction may result in fire or electric shock.
  - 14. When disposing the unit, please categorize it as industrial waste.**  
Failure to follow this instruction may result in fire or electric shock.
- ※The above specifications are subject to change without notice.

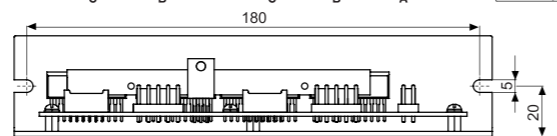
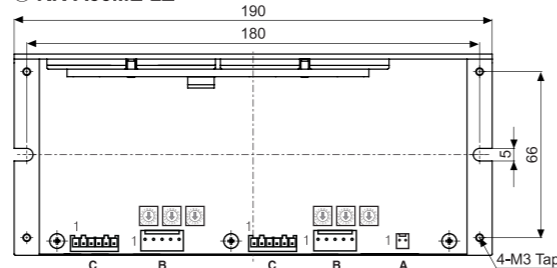
**■ Specifications**

Model	KR-A55ME-2Z	KR-A55ME-3Z
Power supply <sup>※1</sup>	20-35VDC	
Allowable voltage fluctuation range	90 to 110% of the rated voltage	
Max. current consumption <sup>※2</sup>	5A	7A
RUN current <sup>※3</sup>	0.4-1.4A/Phase	
STOP current	27 to 90% of RUN current (set by STOP current switch)	
Drive method	Bipolar constant current pentagon drive	
Basic step angle	0.72°/Step	
Resolution	1, 2, 4, 5, 8, 10, 16, 20, 25, 40, 50, 80, 100, 125, 200, 250-division (0.72° to 0.00288°/Step)	
Input pulse characteristics	Pulse width	Min. 1μs (CW, CCW), Min. 1ms (HOLD OFF)
	Duty Rate	50% (CW, CCW)
	Rising/Falling time	Below 130ns (CW, CCW)
	Pulse input voltage	[H]: 4-8VDC, [L]: 0-0.5VDC
	Pulse input current	7.5-14mA(CW, CCW), 10-16mA(HOLD OFF, ZERO OUT)
Max. input pulse frequency <sup>※4</sup>	Max. 500kHz (CW, CCW)	
Input resistance	270Ω(CW, CCW), 390Ω(HOLD OFF), 10Ω(ZERO OUT)	
Insulation resistance	Over 100MΩ (at 500VDC megger, between all terminals and base)	
Dielectric strength	1,000VAC 50/60Hz for 1min.(between all terminals and base)	
Noise resistance	±500V the square wave noise (pulse width: 1μs) by the noise simulator	
Vibration	Mechanical	1.5mm amplitude at frequency of 5 to 60Hz(for 1 min.) in each X, Y, Z direction for 2 hours
	Malfunction	1.5mm amplitude at frequency of 5 to 60Hz(for 1 min.) in each X, Y, Z direction for 10 min.
Environment	Ambient temp.	0 to 40°C, Storage: -10 to 60°C
	Ambient humi.	35 to 85%RH, Storage: 35 to 85%RH
Approval	CE	
Weight <sup>※5</sup>	Approx. 446g (approx. 292g)	Approx. 597g (approx. 411g)

- ※1: When using over 30VDC power supply, torque characteristics are improved but the driver temperature raise. The unit should be installed at the well ventilation environment.
- ※2: Based on ambient temperature 25°C, ambient humidity 55%RH.
- ※3: RUN current varies depending on the input RUN frequency and max. RUN current at the moment varies also varies depending on the load.
- ※4: Max. input pulse frequency is max. frequency to be input and is not same as max. pull-out frequency or max. slewing frequency.
- ※5: The weight includes packaging. The weight in parentheses is for unit only.
- ※Environment resistance is rated at no freezing or condensation.

**■ Dimensions**

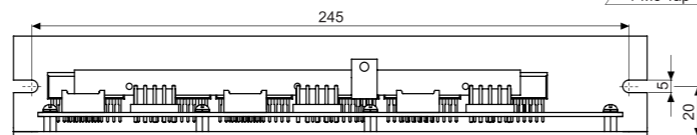
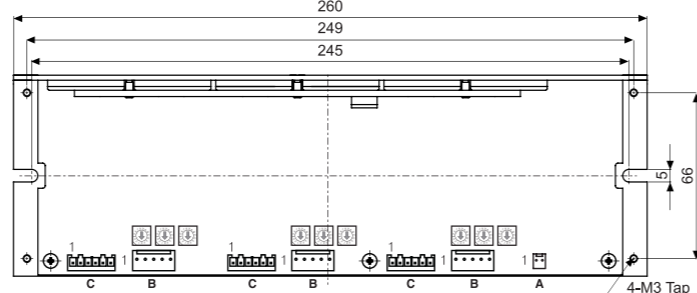
○ KR-A55ME-2Z (unit: mm)



※Accessory connector specification (manufacturer: JST)

Accessory	Model	Quantity
A 2-pin power connector	VHR-2N	1
B 5-pin motor connector	VHR-5N	2
C 6-pin signal connector	XAP-06V-1	2
- Power/Motor connector pin	SVH-21T-P1.1	12
- Signal connector pin	SXA-001T-P0.6	12

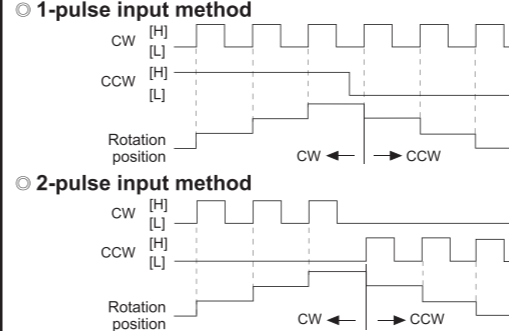
○ KR-A55ME-3Z



※Accessory connector specification (manufacturer: JST)

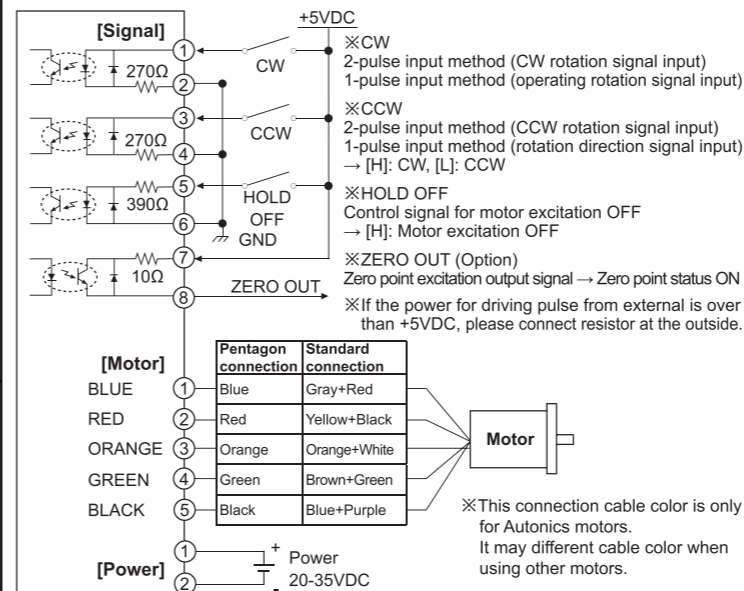
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C 6-pin signal connector	XAP-06V-1	3
- Power/Motor connector pin	SVH-21T-P1.1	17
- Signal connector pin	SXA-001T-P0.6	18

**■ Time Chart**



※Do not input CW, CCW signals at the same time in 2-pulse input method. It may not operate properly if another direction signal is inputted when one of CW or CCW is [H].

**■ I/O Circuit And Connections**



※Power input of 2/3-axis are used as same and I/O terminals are proportional to the number of axes.

**■ Functions**

○ Function selection DIP switch

No	Name	Function	Switch position
1	TEST	Self diagnosis function	ON (default) OFF (default)
2	1/2 CLK	Pulse input method	1-pulse input method 2-pulse input method
3	C/D	Auto Current Down	Not use Use

- **TEST**
- Self diagnosis function is for motor and driver test.
- This function makes the motor rotate with 30rpm in full step. Rotation speed varies with resolution settings.
- Rotation speed = 30rpm/resolution
- In 1-pulse input method, it rotates to CCW, and in 2-pulse input method, it rotates to CW.
- Be sure that the TEST switch is OFF before supplying the power.
- If the TEST switch is ON, the motor operates immediately and it may be dangerous.
- **1/2 CLK**
- 1/2 CLK switch is to select pulse input method.
- 1-pulse input method: CW → operating rotation signal input, CCW → rotation direction signal input ([H]: CW, [L]: CCW)
- 2-pulse input method: CW → CW rotation signal input, CCW → CCW rotation signal input.
- **C/D (auto current down)**
- This function is to reduce the current provided for motor automatically for preventing severe motor's heat when motor stops.
- If motor RUN pulse is not applied, the current provided for motor reduces as the set STOP current.
- Be sure that when motor RUN current is reduced, the stop torque of motor also reduced.
- Set the STOP current by the STOP current setting switch.

○ Setting RUN current

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

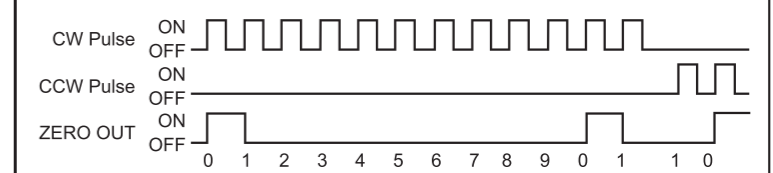
- RUN current setting is for the current provided for motor when the motor runs.
- When RUN current is increased, RUN torque of the motor is also increased.
- When RUN current is set too high, the heat is severe.
- Set RUN current within the range of motor's rated current according to its load.
- Change RUN current only when the motor stops.

○ Setting STOP current

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 setting is for the current provided for motor when the motor stops.
- This setting is applied when using C/D(Current down) function.
- Setting value of STOP current is percentage (%) ratio of the set RUN current.
- E.g.) Set RUN current as 1.4A and STOP current as 40%.  
STOP current is set as 1.4A×0.4=0.56A.
- When STOP current is decreased, STOP torque of the motor is also decreased.
- When STOP current is set too low, the heat is lower.
- Change STOP current only when the motor stops.

○ Zero point excitation output signal (ZERO OUT)



- This output indicates the initial step of excitation order of stepping motor and rotation position of motor axis.
- This signal outputs every 7.2° of rotation of the motor axis regardless of resolution. (50 outputs per 1 rotation of the motor.)  
E.g.) Full step: outputs one time by 10 pulses input.  
20-division: outputs one time by 200 pulses input.

○ HOLD OFF function

- This signal is for rotating motor's axis using external force or used for manual positioning.
- When hold off signal maintains over 1ms as [H], motor excitation is released.
- When hold off signal maintains over 1ms as [L], motor excitation is in a normal status.
- Must stop the motor for using this function.
- Refer to I/O Circuit And Connections.

○ 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°

● Setting resolution (MS1)

- The set step angle is dividing basic step angle(0.72°) of 5-phase stepping motor by setting value.
- The calculation formula of divided step angle is as below.  
Set step angle = Basic step angle(0.72°) / Resolution
- When using geared type motor, the angle is step angle divided by gear ratio.  
Step angle / gear ratio = Step angle applied gear  
E.g.) 0.72° / 10(1:10) = 0.072°
- Must stop the motor before changing the resolution.

**■ Cautions During Use**

- 1. For signal input**
  - Do not input CW, CCW signal at the same time in 2-pulse input method. Failure to follow this instruction may result in malfunction. It may not operate properly if another direction signal is inputted when one of CW or CCW is [H].
  - When the signal input voltage is exceeded the rated voltage, connect additional resistance at the outside.
- 2. For RUN current, STOP current setting**
  - Set RUN current within the range of motor's rated current. Failure to follow this instruction may result in severe heat of motor or motor damage.
  - If motor stops, switching for STOP current executed by the current down function. When hold off signal is [H] or current down function is OFF, the switching does not execute.
  - Use the power for supplying sufficient current to the motor.
- 3. For cable connection**
  - Use twisted pair (over 0.2mm<sup>2</sup>) for the signal cable which should be shorter than 2m.
  - The thickness of cable should be same or thicker than the motor cable's when extending the motor cable.
  - Must separate between the signal cable and the power cable over 10cm.
- 4. For installation**
  - In order to increase heat protection efficiency of the driver, must install the heat sink close to metal panel and keep it well-ventilated.
  - Excessive heat generation may occur on driver. Keep the heat sink under 80°C when installing the unit. (at over 80°C, forcible cooling shall be required.)
- 5. For using function selection DIP switches**
  - Be sure that the TEST switch is OFF before supplying the power. If the TEST switch is ON, the motor operates immediately and it may be dangerous.
  - Do not change the pulse input method during the operation. It may cause danger as the revolution way of the motor is changed conversely.
- 6. This product may be used in the following environments.**
  - Indoor
  - Altitude under 2000m
  - Pollution degree 2
  - Installation category II

※Failure to follow these instructions may result in product damage.



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