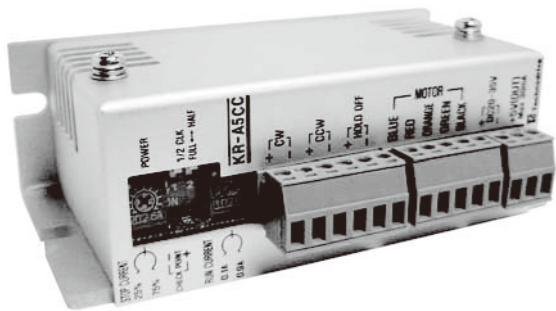


# 5 相步进电机驱动器 KR-A5CC

## 使用说明书



感谢您购买高技术驱动器产品。  
使用前请务必参阅《安全注意事项》，并按照警告、注意事项正确使用本产品。

※出于产品改良的目的，有可能在没有事先预告的情况下变更本使用手册中记载的规格、外形尺寸等参数，敬请谅解。

### 安全注意事项

※为了安全和正确使用本产品，并预防对顾客和他人造成危害及财产受损，请遵守使用说明书上的注意事项。  
※注意事项分为“警告”和“注意”。

- 警告** 表示若违反了指示事项，有可能造成人员伤亡或重伤。
- 注意** 表示若违反了指示事项，有可能造成轻伤或产品受损。

※产品和用手册中的符号所表示的含义如下。  
此符号表示由于在特定条件下有可能发生危险，因此务必加以注意（含警告）。

### 警告

- 用于危及生命和财产安全的机器（核能控制、医疗机器、车辆、铁路、航空、燃烧装置、娱乐机器、安全装置等）时，请务必采取双重的安全措施。否则有可能引起火灾、人身事故、财产受损。
- 应由具备专业知识的人员来实施设置、连接、运行、操作、检查、故障诊断作业。否则有可能引起火灾、触电、受伤。
- 对于直流电源输入规格的产品请使用 1 次侧和 2 次侧的强化绝缘的直流电源。否则有可能引起触电。
- 设置产品时应采取停电措施。  
Holding torque 的降低有可能引起受伤、装置受损。
- 禁止在有爆炸的危险、腐蚀的危险、有水的场所、易燃气体、可燃物附近、振动较多的场所及室外使用。否则有可能引起火灾、触电、受伤。
- 禁止分解和改造产品。检查或修理时敬请咨询。否则有可能引起火灾、触电、产品受损。

### 注意

- 请务必遵守电源输入电压的额定范围，并使用超过 AWGNo.18(0.75mm<sup>2</sup>) 的线材。否则有可能引起火灾、触电。
- 应按照连接图进行连接，投入电源之前请务必确认是否正确连接。否则有可能引起火灾、触电、产品受损。
- 停电时应立即切断电源。  
从停电状态恢复时产品会突然启动，从而有可能引起装置受损、受伤。
- 运行中或停止后的一段时间内接触产品时应多加注意。  
产品表面温度较高，有可能造成烫伤。
- 运行中应时常处于能够紧急停止的状态。否则有可能引起装置受损、受伤。
- 投入电源时，应先确认产品的控制输入信号后再去投入。  
电源投入的同时输入信号会启动工作，因此有可能造成受伤、装置受损。
- 保持垂直方向的位置时，禁止将 HOLD OFF 信号输入为 ON。  
由于降低保持力度，而发生落下现象，因此有可能引起受伤、装置受损。
- 电源输入为 OFF 后需要维持垂直方向的位置时，请另行设置安全装置。  
由于降低保持力度，而发生落下现象，因此有可能引起受伤、装置受损。
- 用手启动电机的转动轴时（手动位置设定等），请先确认 HOLD OFF 信号输入后实施。  
因产品的突然工作有可能引起受伤。
- 发生异常时应立即紧急停止。否则有可能引起火灾、受伤。
- 测定绝缘电阻或实施绝缘耐压测试时，禁止接触端子。否则有可能引起触电。
- 使用时禁止超出产品的规格 / 额定范围。否则有可能引起触电、受伤、装置受损。
- 维护保养时禁止使用水或溶剂，而使用干燥的毛巾。否则有可能引起触电、火灾。
- 产品废弃时应作为工业废弃物处理。

### 特征

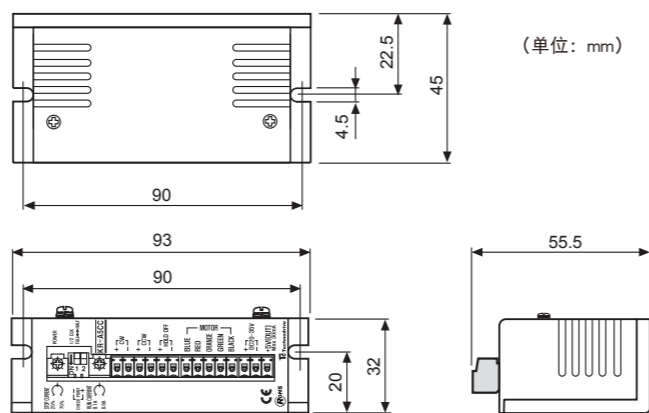
- FULL / HALF 步进切换功能
- 五角形结线双极定电流驱动方式
- 可以选择驱动电流和调节停止电流的自动降低电流功能
- 采用了最低限度的抑制光电耦合器的外部噪音的电路方式
- 输入电源电压范围 DC20-35V

### 规格

品名	KR-A5CC
输入电源	20-35VDC (3A MAX.)
驱动电流	0.1 ~ 0.9A/phase
驱动方式	五角形结线双极定电流驱动方式
分解能	×1(0.72°) ×2(0.36°)
CW/CCW 脉冲输入	脉冲幅度 高于 0.5μs 脉冲间隔 高于 0.5μs 上升下降时间 低于 1μs 频率 低于 50kpps
电压	High: 4 ~ 8VDC Low: 0 ~ 0.5VDC
使用周围温度	0 ~ 40°C (但不能有冻结)
使用周围湿度	35 ~ 85%RH (但不能有结露)
本体质量	约 120g

※不含包装箱的重量  
※根据输入的电源电压出现扭矩差。

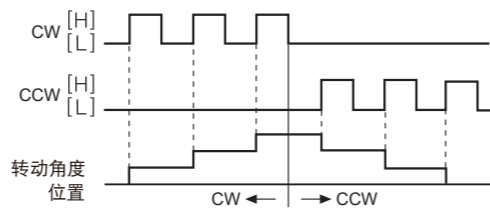
### 外形尺寸图



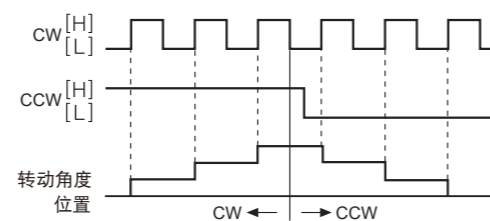
### 时间图 (Time Chart)

●CW 及 CCW 输入 (CW: 从正面看电机轴时顺时针方向)

●2 脉冲输入方式

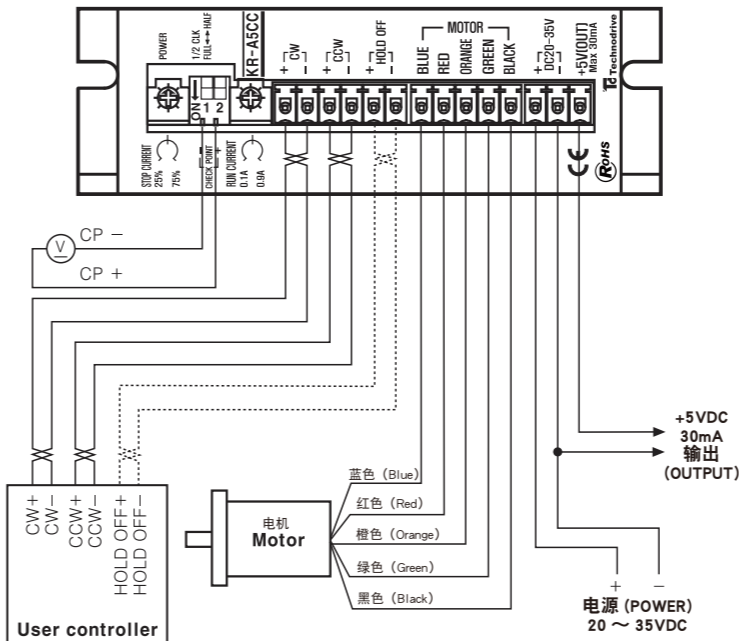


●1 脉冲输入方式



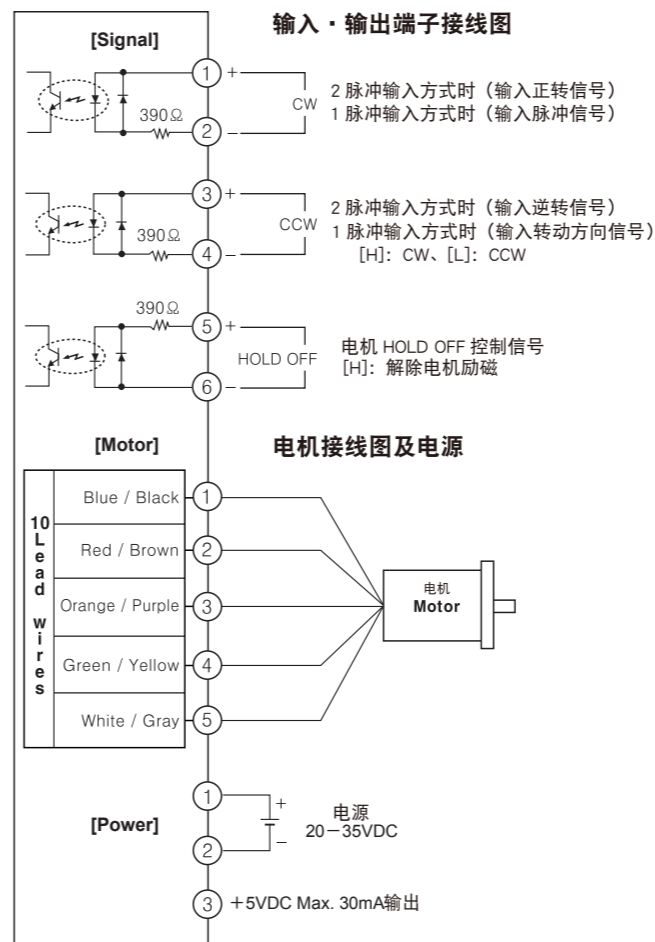
注) 禁止在 2 脉冲输入方式中同时输入 CW、CCW 信号。  
任意一方为 ON 时，若输入其他方向信号有可能无法正常工作。

### 接线图



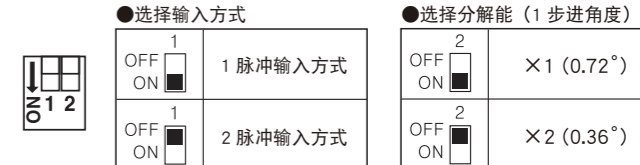
### 信号输入输出电路及接线图

KR-A5CC 内部电路



注) 若输入信号电压大于 +5VDC，请在外部安装电流控制电阻后使用。

### 开关功能



### 驱动电流设定方法

- 驱动电流是电机驱动的情况下可向电机供应的相电流。
- 驱动电流设定是在不超过相连的电机的相电流的范围内对准负载进行设定。(如果过高设定驱动电流，或将导致产品发热及激烈振动。如果过低设定驱动电流，或将导致驱动扭矩下降。)
- 连接 CP+ 和 CP- 电压针，转动 RUN 旋钮设定通过以下公式决定的电压。(出厂设定: 0.35A / phase) ⇒ 魔博 (MoBo) 要设定: 0.75A / 相
- 请按照以下公式变更相电流。

$$\text{设定电流值 (A)} = \frac{\text{CP 电压 (V)}}{4}$$

(注) 请务必在电机驱动的状态下设定电流。

### 停止电流设定方法

- 停止电流是电机停止的情况下可向电机供应的相电流。
- 停止电流旋钮的设定值是针对已经设定的驱动电流的比率 (%)。(如果过高设定停止电流，或将导致产品发热及激烈振动。如果过低设定停止电流，或将导致停止扭矩下降。)
- 例) 驱动电流设定为 0.5A，STOP 旋钮设定为 50% 时，停止电流为 0.25A/Phase。

(注) 请务必在电机停止的状态下设定停止电流。

### 拖延 (HOLD OFF)

- HOLD OFF 输入为 [H] 时，供应给各相的电流被切断，因此电机的励磁被解除。
- HOLD OFF 输入为 [L] 时，处于正常的电机励磁状态。
- 通过手动方式修正电机轴位置时使用。
- [H] / [L] 把本体电路内的光电耦合器切换为 ON/OFF。

### 使用时的注意事项

- 信号输入时的注意事项
    - 2 脉冲输入方式时禁止同时输入 CW、CCW。有可能出现运行错误。  
CW、CCW 任意信号处于 [H] 时，若输入其他方向信号，也有可能无法正常运行。
    - 当信号输入电压大于规定使用的电压时，必须从外部连接追加电阻后使用。
  - 驱动电源的注意事项
    - 请使用能够充分供应电机驱动电流的输入电源。
    - 电源输入的电流值是驱动的最大消耗电流值。
    - 驱动电机之前，请确认电源的极性。
  - 结线上的注意事项
    - 信号线应使用 2 米以内的双绞线 (超过 0.2 mm<sup>2</sup>)。
    - 延长电机线时，请使用比电机引线粗的线材。
  - 安装时的注意事项
    - 为了提高散热板的散热效率，最好把散热板贴近金属面后安装在通风良好处。
    - 根据使用状况驱动的发热会很大。设置时散热板的温度不能超过 80°C。(超过 80°C 时，需要对散热板进行强制冷却。)
  - 本产品可在以下环境条件下使用。
    - 室内使用
    - 低于 2000m 高度下使用
    - 污染等级 2
    - 设置范畴 2
- ※若不遵守上述“使用时的注意事项”，有可能导致产品的故障。  
请务必遵守所记载的内容，并安全使用。

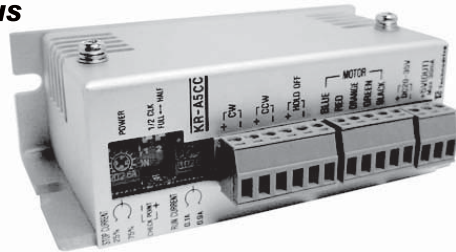
**KSS Co., Ltd.**  
Advanced Technology of "Miniature"  
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# Motor Driver(5-Phase stepping motor driver) KR-A5CC

**M A N U A L**



Thank you very much for selecting Technodrive 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), it is required to install fail-safe device, or contact us for information on type required. It may cause serious human injury or a fire, property.

2. Installation, connection, operation, control, maintenance should be carried out by person who has been qualified.

It may cause a fire, human injury or give an electric shock.

3. Please use DC power with reinforced insulating the primary and secondary part for the DC power product.

It may give an electric shock.

4. Please install this unit after consider countplan 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 explosiveness, flammable, corrosive gas, water and frequent vibration etc.

It may cause a fire or give an electric shock.

6. Do not disassemble or modify this unit. Please contact us if it required.

It may cause a fire, give an electric shock or damage to product.

### Caution

1. Power input voltage must be used within rating specification and power line should be over than AWG NO. 18(0.75mm<sup>2</sup>).

It may cause a fire or give an electric shock.

2. Please check the connection before power.

It may cause a fire or give an electric shock.

3. Please turn off when power failure occurred.

It may cause human injury or damage to product due to sudden movement by recovering from power failure.

4. Do not touch during the operation or after a while of operation.

It may cause a burn due to high temperature in surface.

5. The emergency stop should be enabled during the operation.

It may cause human injury or damage to product.

6. Please apply 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 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.

9. Please check if HOLD OFF signal input is ON when need to set the output manually.

It may cause human injury by sudden movement.

10. Please stop this unit when mechanical problem is occurred.

It may cause a fire or human injury.

11. Do not touch the terminal when during the insulation dielectric strength test or insulation resistance measurement.

It may give an electric shock.

12. Please observe rating specification.

It may cause a fire, 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 waste when disuse this unit.

※ The above specifications are changeable at anytime without notice.

### Features

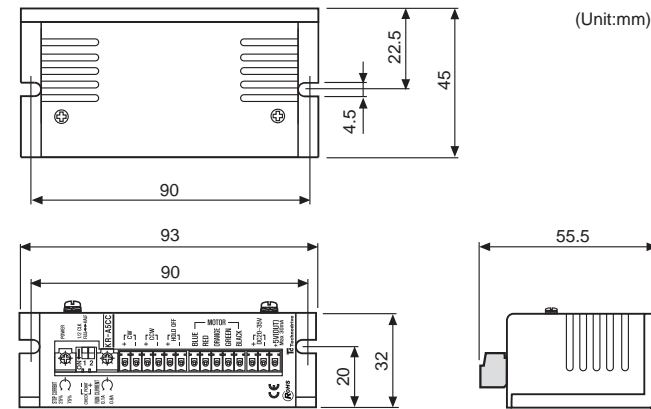
- Full/Half step
- Bipolar constant current pentagon drive method.
- STOP/RUN current adjustable
- Photocoupler input insulation method to minimize the effects from external noise.
- Power supply : 20-35VDC

### Specifications

Model	KR-A5CC	
Power supply	20-35VDC(3A Max.)	
RUN current	0.1-0.9A/Phase	
Drive method	Bipolar constant current pentagon drive	
Resolution(Rotating angle)	× 1(0.72°), × 2(0.36°)	
CW/CCW Input pulse	Pulse width	Min. 0.5μs
	Pulse interval	Min. 0.5μs
	Rising/Falling time	Max. 1μs
	Frequency	Max.50kpps
	Voltage	High:4-8VDC, Low:0-0.5VDC
Ambient temperature	0-40°C(at non-freezing status)	
Ambient humidity	35-85%RH(at non-dew status)	
Unit weight	Approx. 120g	

※ There is torque difference by input power.

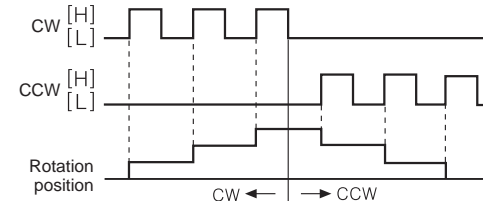
### Dimensions



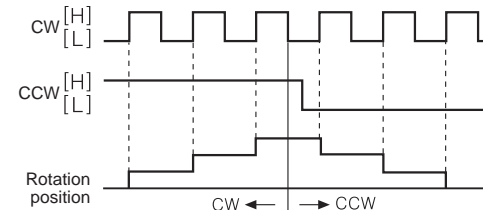
### Time charts

◎ CW / CCW Input(CW : Clockwise direction from the front view of shaft)

#### ● 2 Pulse type



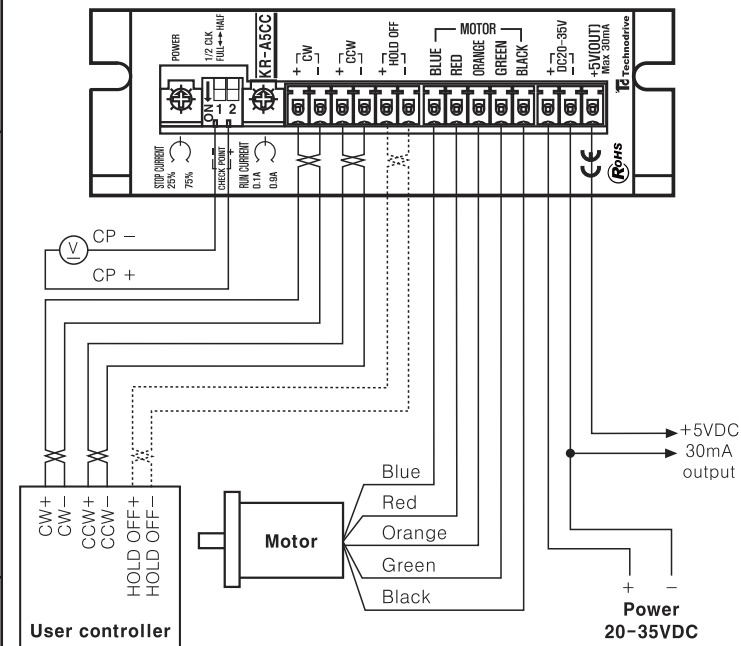
#### ● 1 Pulse type



#### Note)

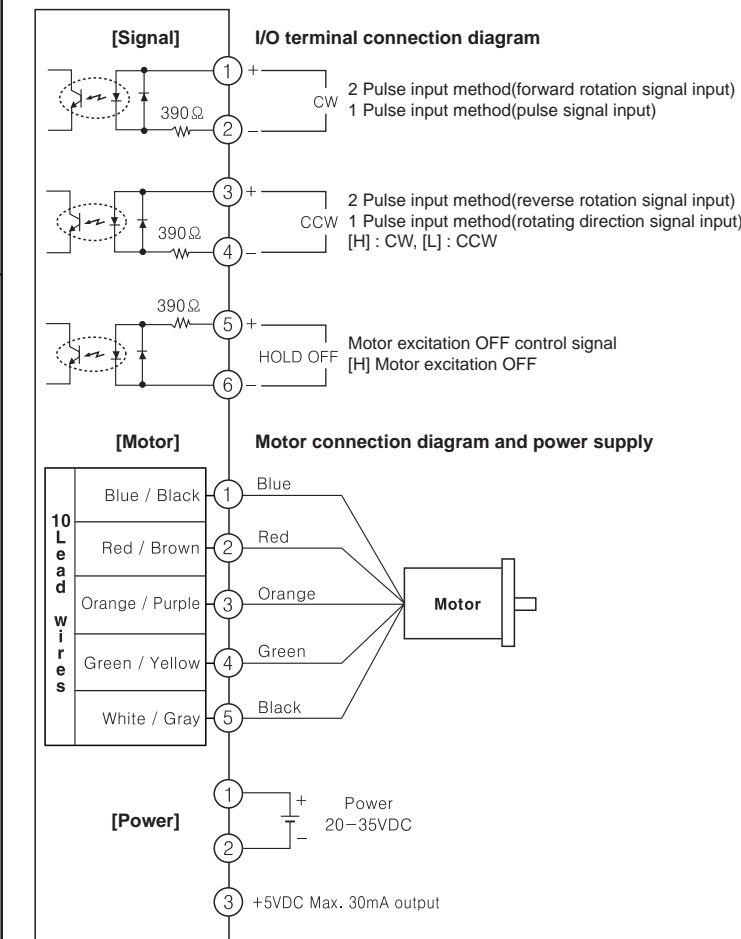
When using 2 pulse input method, do not input CW and CCW signal at the same time. When one of the CW and CCW signals is [ON], it may not be worked normally.

### Connections



### Input-Output diagram

<KR-A5CC Driver inner circuit>

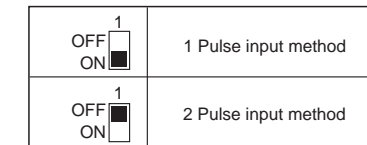


#### Note)

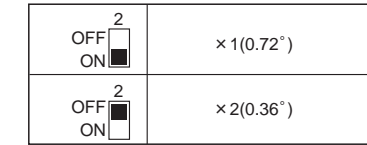
Add external resistor when power for pulse from the external of the unit exceeds +5VDC.

### Selectable function switch

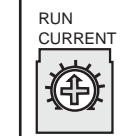
#### ● Select input method



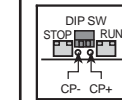
#### ● Select resolution(rotation angle)



### Setting RUN current



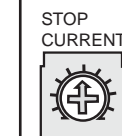
- RUN current is phase current provided for motor when the motor runs.
- Set the RUN current SV within the rated current of motor. (When RUN current SV is higher, it may cause heat stress on the unit. When RUN current SV is lower, it may decrease running torque.)
- To change the RUN current, connect the CP- to the(-) terminal of the voltmeter and the CP+ to the (+) terminal of the voltmeter then adjust RUN current switch.



● Phase current change :  
Setting current(A) =  $\frac{\text{CP measurement voltage(V)}}{4}$

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

### Setting STOP current



- STOP current is phase current provided for motor when the motor stops.
- STOP current VR SV is the percentage of RUN current SV.(When STOP current SV is higher, it may cause heat stress on the unit. When STOP current SV is lower, it may decrease stop torque.)
- Ex) After setting 0.5A for RUN current then put STOP current adjuster at 50%, STOP current will be 0.25A.

Note) STOP current should be changed during the motor stops.

### HOLD OFF function

- HOLD OFF is [H], the excitation is released, because current provided to each phase is cut off.
- HOLD OFF is [L], the excitation is in a normal status.
- It rotates motor axis by external force or is used for manual positioning.
- Input H/L means ON/OFF of photocoupler in a circuit.

### Caution for using

- Caution for signal input
  - Do not input CW, CCW signal at the same time in 2 Pulse input method. It may not work properly if another signal is supplied when one of them is ON.
  - In case, the signal input supply is higher than rated supply expressed on the specification, please connect the additional resistor to external part.
- Caution for supplying power
  - Use the power enough to supply the run current when turn on the power.
  - The current value indicated on power supply is the max. input of driver.
  - Please check the polarity of power before using.**
- Caution for wiring
  - Use Twist pair(Over 0.2mm<sup>2</sup>) for the signal wire should be shorter than 2m.
  - Please use an electric wire is thicker than the motor lead when product the motor wire connection.
- Caution for installation
  - In order to increase heat protection efficiency, keep the heat sink as close as possible 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.(In case it is over 80°C, forcible cooling shall be required.)
- Installation environment
 

① It shall be used indoor	③ Pollution Degree 2
② Altitude Max. 2000m	④ Installation Category II

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