

SPEED CONTROLLER

## SR series

SRA01 SRA02  
SRB01 SRB02  
SRC01 SRC02  
SRD01 SRD02  
SRX01 SRX02

MOTOR

- Thank you for purchasing SPG MOTOR products.

Please read this user manual thoroughly before installing and operating the motor, and always keep the manual Where it is readily accessible.

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## 1. PRECAUTIONS

### Warning

- If this warning is ignored, death or serious injury may be caused by fire or electric shock.

### Caution

- If this Caution is ignored, injury or physical damage may be caused by electric shock or other accidents.

Please make sure to use the controller after reading this manual carefully.

### Warning

- Do not use the product in an explosive or flammable atmosphere. Otherwise, fire may occur.
- Only qualified installers should be assigned to the work of installation, connection, running, operation and inspection. This is intend to prevent fire, electric shock and injury.
- Before starting the work, turn off the control pack power. Otherwise, electric shock may occur.
- The motor and control pack must be properly grounded. Otherwise, electric shock may occur.
- Be sure to keep power input voltage of the control pack within the rated range.
- Electrical connections must be made in strict accordance with the connection example. Otherwise, fire and electric shock may occur.
- After connection, mount the covers of the power connection terminal and input/output signal connection terminal. Otherwise, fire or electric shock may occur.

### Caution

- Do not use the motor and control pack in excess of ratings. Otherwise, electric shock, injury of the operator and damage of the equipment may occur.
- Do not grip the motor output shaft or lead wires. Otherwise, injury may occur.
- Do not place combustibles around the motor and control pack. Otherwise, fire may occur.
- Do not put any object into the openings of the control pack. Otherwise, fire, electric shock or damage of the equipment may occur.
- The rotating part(output shaft) of the motor should be provided with a cover. Otherwise, injury of the operator may occur.

- Start test running after making sure that emergency stop can be used whenever required.  
Otherwise, injury of the operator may occur.
- Immediately when trouble has occurred, stop running and turn off the control pack power.  
Otherwise, fire, electric shock and injury of the operator may occur.
- During running and for some time after stopping the equipment, do not touch the motor and control pack with a bare hand.  
You may be burnt by high temperature on the surface of the motor.
- Immediately after the protection function has been activated, turn off the power. After removing the cause, turn on power again. If the motor operation is continued without removing the cause, the motor and control pack may operate incorrectly to cause injury of the operator and damage of the equipment.
- When testing the insulation resistance or dielectric strength, do not touch the terminal. Otherwise, electric shock may occur.
- When scrapping the motor and control pack, scrap them as industrial waste.

## 2. Checking the products



- Use the motor and control unit in its specified combination.  
This is to prevent fire, electric shock and damage of the equipment.

### 2. 1 Checking the contents

Make sure that you have received all of the items listed below.

If an accessory is missing or damaged, contact the nearest SPG MOTOR office.

- CONTROLLER ..... 1EA
- Locker ..... 1SET
- Socket ..... 1EA
- User manual ..... 1EA

### 3. CHARACTERISTICS

#### ⚠ Warning

- 1) You should confirm that model, output and voltage is as same as you have ordered.
- 2) Please, confirm whether speed controller apply to motor correctly.

#### 3. 1 Applicable Motor

INDUCTION	AC110V	AC220V	AC100V	AC200V	AC220/240V
S6I06□-S12	SRA01	SRB01	SRC01	SRD01	SRX01
S7I15□-S12	SRA02	SRB02	SRC02	SRD02	SRX02
S8I15□-S12					
S8I25□-S12					
S9I40□(-)S12					
S9I60□(-)S12					
S9I90□(-)S12					

REVERSIBLE E-S	AC110V	AC220V	AC100V	AC200V	AC220/240V
S6R06□-(E)S12	SRA01	SRB01	SRC01	SRD01	SRX01
S7R15□-(E)S12	SRA02	SRB02	SRC02	SRD02	SRX02
S8R15□-(E)S12					
S8R25□-(E)S12					
S9R40□(-)S12					
S9R60□(-)ES12					
S9R90□(-)ES12					

#### ⚠ Warning

1. Refer to motor catalogue for capacitor's ratings.
2. Attention

- 1) □ indication shaft type and voltage.
- 2) ( ) indicates Heavy Impact(H)/Light Impact(L).
- 3) (E) indicates a motor with a built-in electromagnetic brake.
- 4) SRA□,SRB□ are for only 60Hz.  
SRC□,SRD□ are for 50Hz and 60Hz.  
SRX□ are for only 50Hz.

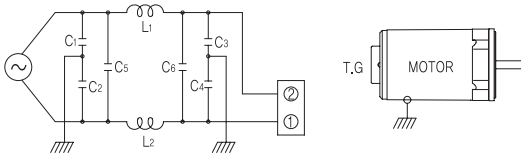
## 4. CAUTION BEFORE USING

### 4.1 Cautions for setting up

1. Use the motors under the condition of ambient temperature from  $-10^{\circ}\text{C}$  to  $+50^{\circ}\text{C}$  and humidity below 85%.  
Also keep out of the sun and install a cover.
2. Please, avoid shock, dust, corrosive gas and inflammable gas.
3. Please, avoid using under the condition of organic compounds like methyl alcohol, benzol, caustic soda and strong alkaline, since the cover and knob is made out of resin.

### 4.2 Cautions for Wiring

1. Use terminal board and socket, Don't solder to pins of speed controller directly since it may cause trouble.
2. Please turn off the electric power and confirm terminal number while you connect terminal board with socket, as well as while inserting speed controller in to the socket.
3. When used as a parallel circuit with Thyristor like welding machine, it can cause trouble. Use a seperate power source.
4. Install motor with speed controller as close as possible.
5. In case of assembling noise filter, constitute citcuit as follows.



C1~C4: 1000PF(2000VDC)

C5~C6:  $0.1\mu\text{F}\sim 0.2\mu\text{F}$ (AC 250WV or AC 500WV)

L1~L2:  $100\mu\text{H}$

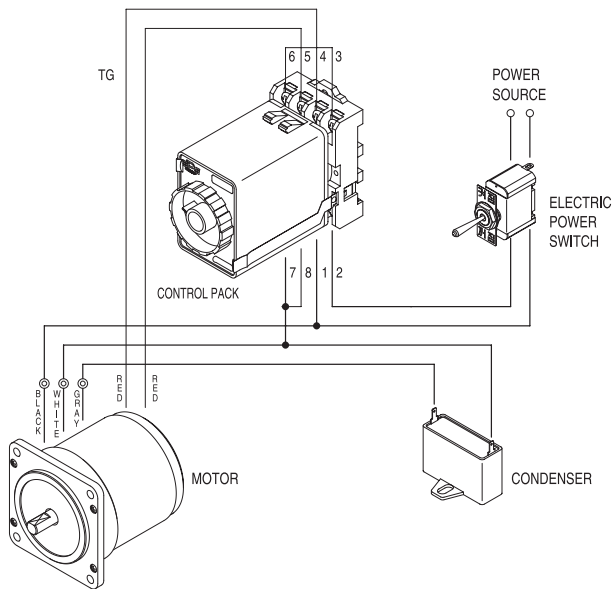
- P.S) 1. L1-L2 use not to be saturated through motor currency.  
 2. Earth the motor in the same place to earth condenser.  
 3. Connect wire shortly and earth by thick wire.

#### 4. 3 Caution while working

1. Turn off the electric power when it is stopped for a long period.
2. Keep surface temperature of motor below  $90^{\circ}\text{C}$ .

## 5. WIRING DIAGRAM

### 5.1 Wiring Diagram



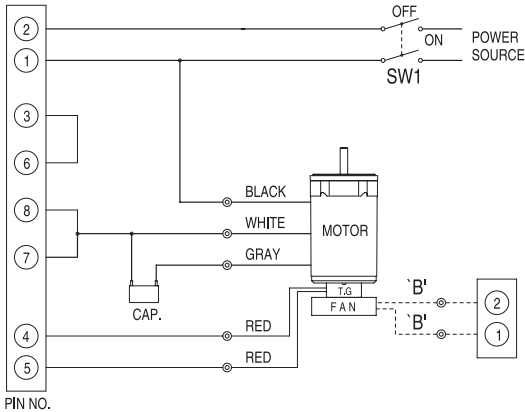
- The rotation speed of motor can be changed by controller.
- The solid lines indicate main circuit.  
Please use about 0.75mm<sup>2</sup>wire.
- In case that the TG's wire is long (over 1m), please connect double twist sealed  
(Please, Don't connect double twist shield wire to earth)



## 6. BASIC ELECTRIC WIRING

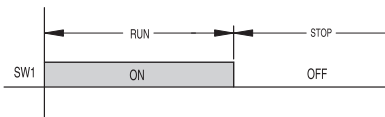
### 6. 1 Single Direction + Variable Speed

- INDUCTION MOTOR(6W~90W)
- REVERSIBLE MOTOR(6W~40W)



VOLTAGE	LEAD WIRE COLOR 'B'	SW1	AC 125V or AC 250V	MIN.5A
AC 100~110V	BROWN			
AC 200~240V	YELLOW			

▲ Please change the gray wire to brown for the single phase 220~240V, 50Hz motor's connections



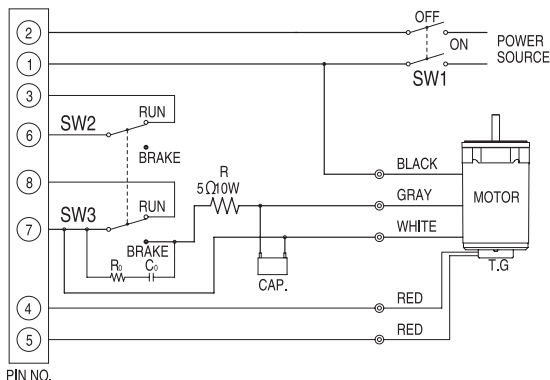
From shaft side view	
CW	Clock wise
CCW	Counter clock wise

### ⚠ Caution

- The motor rotating direction is CW when viewed from shaft side if connected like the solid line of above diagram. When adjusting to CCW direction, change and connect white and gray wire of motor.
- The wiring of fan motor is applicable for motors 60W and over.

## 6. 2 Single Direction + Variable Speed + Electric Brake

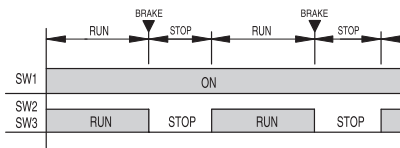
- INDUCTION MOTOR(6W~25W)
- REVERSIBLE MOTOR(6W~25W)



▲ Please change the gray wire to brown for the single phase 220~240V, 50Hz motor's connections

SW1, SW3	AC 125V or AC 250V MIN. 5A
SW2	DC 20V 10mA
R0, C0	R0=10~200Ω (MIN. 1/4W) C0 =0.1~0.2μF (AC 125 or 250VV)
R	4.7Ω~6.8Ω MIN. 10W

From shaft side view	
CW	Clock wise
CCW	Counter clock wise

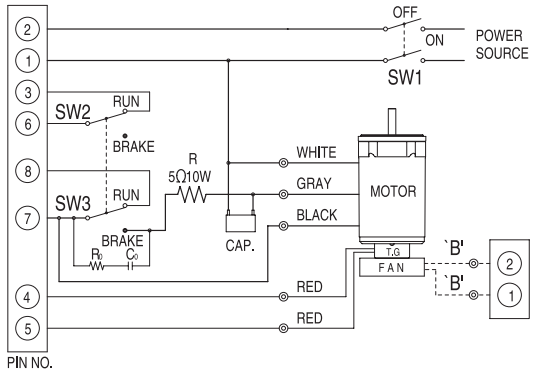


### ⚠ Caution

1. The motor rotating direction is CW when viewed from shaft side if connected like the solid line of above diagram. When adjusting to CCW direction, change and connect white and gray wire of motor.
2. When Changing from RUN to STOP, the control brake will function for 0.5sec and the motor stops immediately.

### 6. 3 Single Direction + Variable Speed + Electric Brake

- INDUCTION MOTOR(40W~90W)
- REVERSIBLE MOTOR(40W)

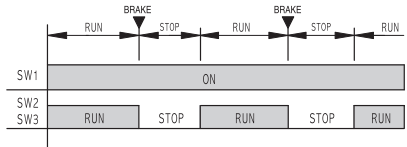


VOLTAGE	LEAD WIRE COLOR 'B'
AC 100~110V	BROWN
AC 200~240V	YELLOW

▲ Please change the gray wire to brown for the single phase 220~240V, 50Hz motor's connections

From shaft side view	
CW	Clock wise
CCW	Counter clock wise

SW1, SW3	AC 125V or AC 250V	MIN. 5A
SW2	DC 20V	10mA
R0, C0	R0=10~200Ω (MIN. 1/4W) C0=0.1~0.2μF (AC 125 or 250WV)	
R	4.7Ω~6.8Ω	MIN. 10W

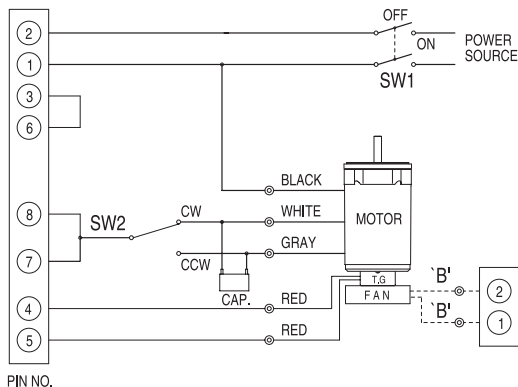


#### ⚠ Caution

- The motor rotating direction is CW when viewed from shaft side if connected like the solid line of above diagram. When adjusting to CCW direction, change and connect white and gray wire of motor.
- When Changing from RUN to STOP, the control brake will function for 0.5sec and the motor stops immediately.

## 6. 4 Reverse + Variable Speed

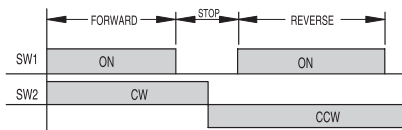
- INDUCTION MOTOR(6W~90W)
- REVERSIBLE MOTOR(6W~40W)



SW1	AC 125V or AC 250V	MIN.5A
-----	-----------------------	--------

VOLTAGE	LEAD WIRE COLOR 'B'
AC 100~110V	BROWN
AC 200~240V	YELLOW

From shaft side view	
CW	Clock wise
CCW	Counter clock wise



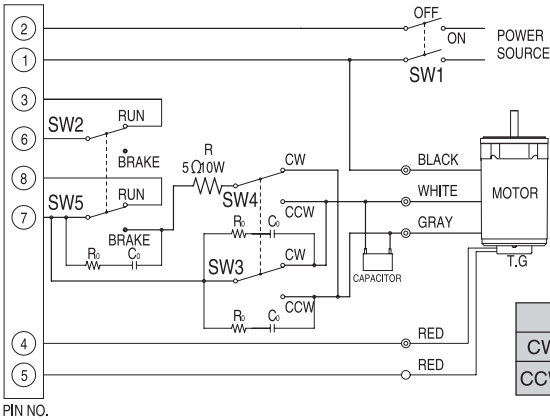
▲ Please change the gray wire to brown for the single phase 220~240V, 50Hz motor's connections

### ⚠ Caution

1. Change to SW2 after a certain period of STOP for induction motor.
2. Reversible motor don't necessarily need this stopping period.  
Please operate the SW2 while SW1 is 'ON'.
3. The wiring of fan motor is applicable for motors 60W and over.

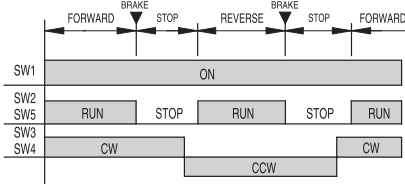
## 6. 5 Reverse + Variable Speed + Electric Brake

- INDUCTION MOTOR(6W~25W)
- REVERSIBLE MOTOR(6W~25W)



From shaft side view	
CW	Clock wise
CCW	Counter clock wise

▲ Please change the gray wire to brown for the single phase 220~240V, 50Hz motor's connections



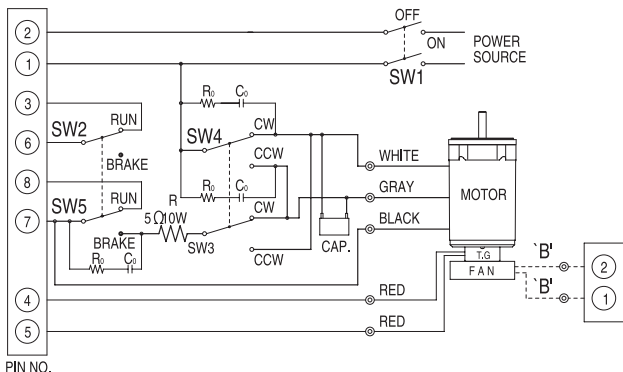
SW1, SW3 SW4, SW5	AC 125V or AC 250V	MIN. 5A
SW2	DC 20V	10mA
R0, C0	R0=10~200Ω (MIN. 1/4W) C0=0.1~0.2μF (AC 125 or 250VVV)	
R	4.7Ω ~6.8Ω MIN. 10W	

### ⚠ Caution

1. The motor rotating direction is CW when viewed from shaft side if connected like the solid line of above diagram. When adjusting to CCW direction, connect like the broken line of above diagram.
2. During this 0.5sec, do not operate SW3 or SW4.
3. Before SW2 and SW5 is switched to run, stop SW2 and SW5 and then convert SW3 and SW4.

## 6. 6 Reverse + Variable Speed + Electric Brake

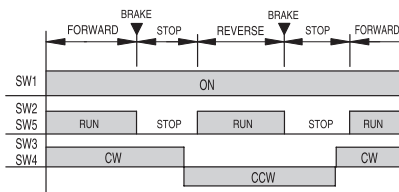
- INDUCTION MOTOR(40W~90W)
- REVERSIBLE MOTOR(40W)



From shaft side view	
CW	Clock wise
CCW	Counter clock wise

VOLTAGE	LEAD WIRE COLOR 'B'
AC 100~110V	BROWN
AC 200~240V	YELLOW

SW1, SW3 SW4, SW5	AC 125V or AC 250V MIN. 5A
SW2	DC 20V 10mA
R <sub>0</sub> , C <sub>0</sub>	R <sub>0</sub> =10~200Ω (MIN. 1/4W) C <sub>0</sub> =0.1~0.2μF (AC 125 or 250VV)
R	4.7Ω ~6.8Ω MIN. 10W



▲ Please change the gray wire to brown for the single phase 220~240V, 50Hz motor's connections

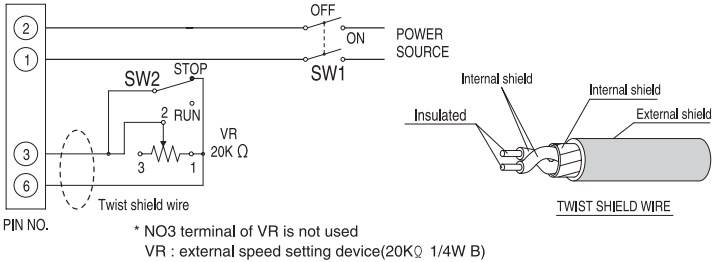
### ⚠ Caution

1. When stopped from running the electric brake will function for 0.5sec and the motor stops immediately.
2. During this 0.5sec, do not operate SW3 or SW4
3. Before SW2 and SW5 is switched to run, stop SW2 and SW5 and then convert SW3 and SW4.

## 7. WIDE APPLICATION OF ELECTRIC WIRING

7.1 The following is the explanations of external speed setting device

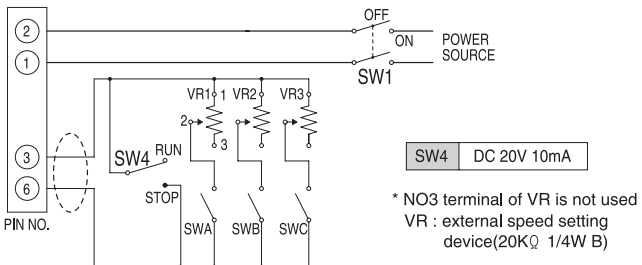
- When long distance control is needed



### ⚠ Caution

1. Set the controller scale to 「LOW」 .
2. Wire connection should be in short distance.  
 Otherwise may cause malfunction. Use twisted sealed wire.

- When multi-stage speed setting is needed



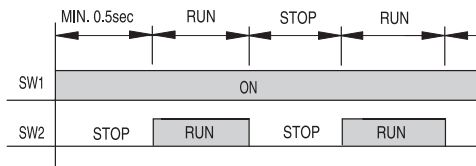
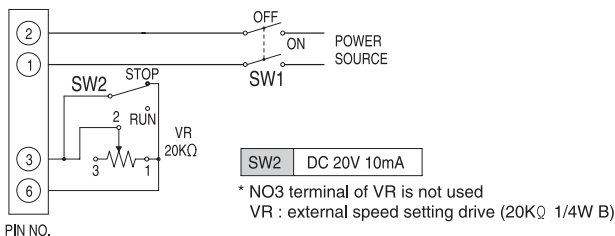
### ⚠ Caution

1. Set the controller scale to 「LOW」 .
2. Change the speed with external speed setting device VR1, VR2 and VR3 by using SWA, SWB, SWC.

## 7. 2 To shorten the starting time

If the starting of motor is slow when starting signal is inputted from SW1, RUN/STOP by operating SW2 using external speed setting device volume.

EX1) Case of electric brake not working.



### Caution

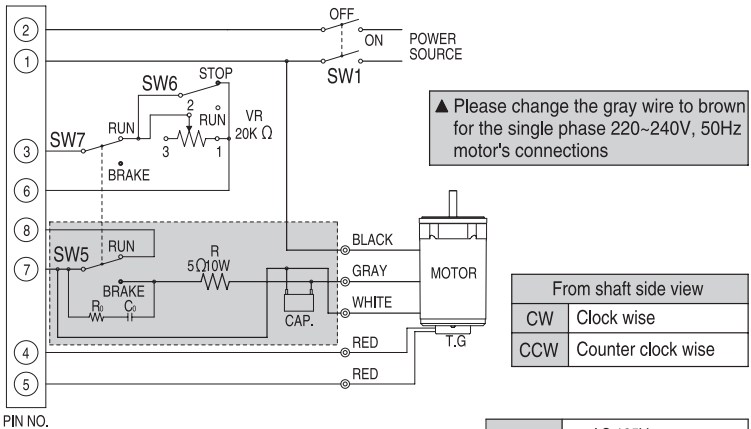
1. Input time by current switch SW1 should be 0.5sec faster than starting signal of SW2.
2. Set the controller scale to 「LOW」 and control the speed through external speed setting device VR.
3. Please operate SW2 while SW1 is 「LOW」 when RUN / STOP Motor can be controlled even by small signals.
4. When stopping for long period, please turn off the SW1.



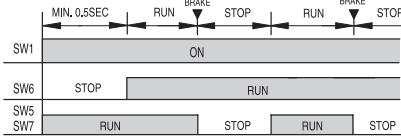
### 7.3 To shorten the starting time

- INDUCTION MOTOR(6W~25W)
- REVERSIBLE MOTOR(6W~25W)

EX2) Case of the electric brake working.



PIN NO.



SW1, SW5	AC 125V or AC 250V	MIN. 5A
SW6, SW7	DC 20V 10mA	
R0, C0	R0=10~200Ω (MIN. 1/4W) C0=0.1~0.2μF (AC 250 or 500VV)	
R	4.7Ω~6.8Ω MIN. 10W	

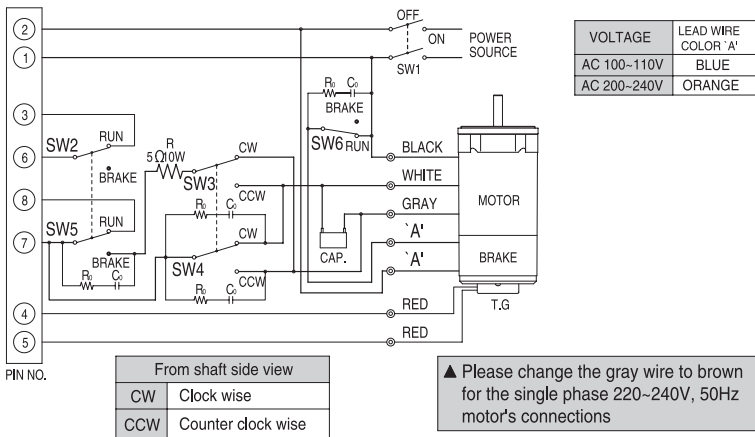
#### ⚠ Caution

- This wiring is for unidirection+variable speed+braking of and motors 25watt or less. For motor 40watt and over   part of wiring is different. please refer to each circuit picture.
- Please operate each switch SW1 0.5sec faster than SW6.
- Set the controller scale to 「LOW」 and control the speed through external speed setting device VR.
- When stopping for long period, please turn off the SW1.

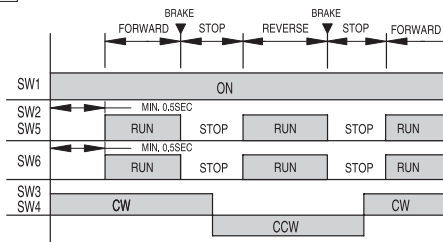
## 8. ELECTRO MAGNETIC BRAKE MOTOR WIRING

### 8.1 Wiring for electro magnetic brake motor

- When electric brake of controller is used simultaneously (6W~25W)



SW1, SW3 SW4, SW5 SW6	AC 125V or AC 250V	MIN. 5A
SW2	DC 20V	10mA
R0, C0	R0=10~200Ω (MIN. 1/4W) C0=0.1~0.2μF (AC 125 or 250VV)	
R	4.7Ω ~6.8Ω MIN. 10W	

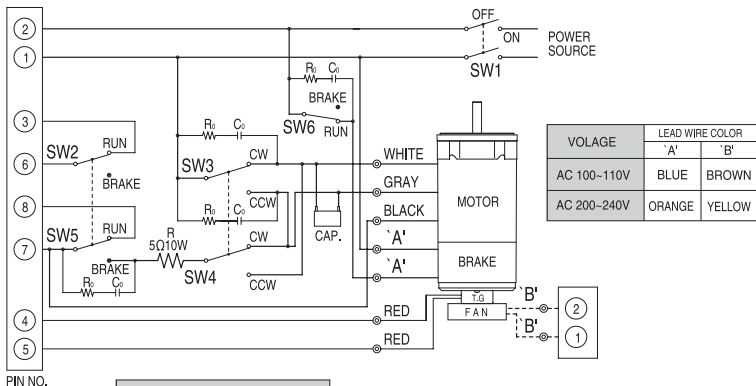


### ⚠ Caution

- When changing from RUN to BRAKE the electric brake operates and the motor stops immediately.
- Operate SW3 and SW4 after motor stops.
- Before switching SW2, SW5 and SW6 from BRAKE to RUN. Please convert SW3 and SW4 first.
- The power source SW1 should be switched 0.5 sec faster than the operation starting signal of SW2, SW5 and SW6.
- When operating RUN - BRAKE, leave the SW1 on, and operate with SW2, SW5 and SW6. When stopping for long period, please turn off the SW1.

## 8. 2 Wiring for electro magnetic brake motor

- When electric brake of controller is used simultaneously (40W~90W)

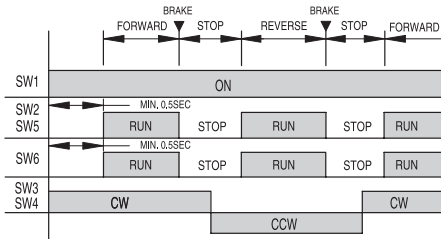


PIN NO.

From shaft side view	
CW	Clock wise
CCW	Counter clock wise

▲ Please change the gray wire to brown for the single phase 220~240V, 50Hz motor's connections

SW1, SW3 SW4, SW5 SW6	AC 125V or AC 250V	MIN. 5A
SW2	DC 20V	10mA
R0, C0	R0=10~200Ω (MIN. 1/4W) C0=0.1~0.2μF (AC 125 or 250WV)	
R	4.7Ω ~6.8Ω	MIN. 10W

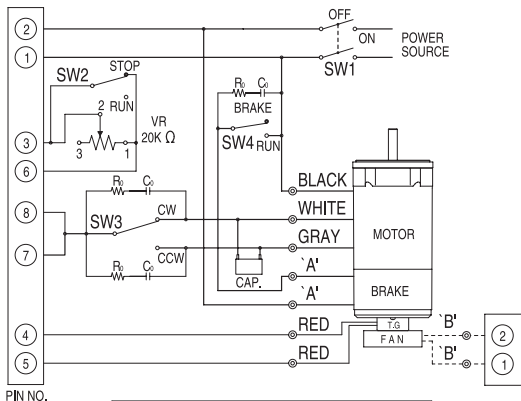


### ⚠ Caution

1. When changing from RUN to BRAKE the electric brake operates and the motor stops immediately.
2. Operate SW3 and SW4 after motor stops.
3. Before switching SW2, SW5 and SW6 from BRAKE to RUN . Please convert SW3 and SW4 first.
4. The power source SW1 should be switched 0.5 sec faster than the operation starting signal of SW2, SW5 and SW6.
5. When operating RUN - BRAKE, leave the SW1 on, and operate with SW2, SW5 and SW6. When stopping for long period, please turn off the SW1.

### 8.3 Wiring for electro magnetic brake motor

- When electric brake of controller is not used simultaneously (6W~90W)

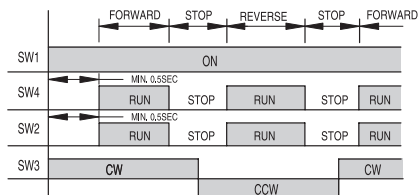


PIN NO.

From shaft side view	
CW	Clock wise
CCW	Counter clock wise

▲ Please change the gray wire to brown for the single phase 220~240V, 50Hz motor's connections

VOLTAGE	LEAD WIRE COLOR	
	'A'	'B'
AC 100~110V	BLUE	BROWN
AC 200~240V	ORANGE	YELLOW



SW1, SW3 SW6	AC 125V or AC 250V	MIN. 5A
SW2	DC 20V 10mA	
R0, C0	R0=10~200Ω (MIN. 1/4W) C0=0.1~0.2μF (AC 125 or 250VV)	

#### ⚠ Caution

1. Leave a certain period until the motor stops, than switch SW3
2. The power source SW1 should be switched 0.5sec faster than the operation start signal of SW2 and SW6.
3. When operating RUN - STOP, leave the SW1 'ON', and control with SW2 and SW6.  
When stopping for long period, please turn off the SW1.
4. Set the controller scale to 「LOW」 and control the speed through external speed setting device VR.

## 9. TROUBLESHOOTING

### 9. 1 Check

The daily check as follows are important to improve efficiency and extending life cycle.

1. Does it work without hitching?
2. Is there any abnormal noise while operating?
3. Is there any abnormal temperature rise?

### 9. 2 Troubleshooting

Abnormal condition	Checking part	Point	Trouble spot & Decision	Counter plan
Motor does not rotate	Connect Wire	Wiring Problem	Wiring Confirm	Connect the Wiring
	Terminal ①~⑦	Check speed regulator variation	If the voltage doesn't change, speed controller is poor	
			If the voltage changes from 0V to output voltage	
			1) Inferior motor	
			2) Heavy loading	Lighten loading
3) Inferior capacitor				
Motor rotates but the speed doesn't change.	Connect Wire	Wiring Problem	Wiring Confirm	Connect the Wiring
	Speed Generator Terminal ④~⑤	Check if AC 8V is produced on 1700rpm condition	If AC 8V is not produced, the quality of speed regulator is poor. If AC 8V is produced the quality of speed controller is poor.	

## 10. SPECIFICATION

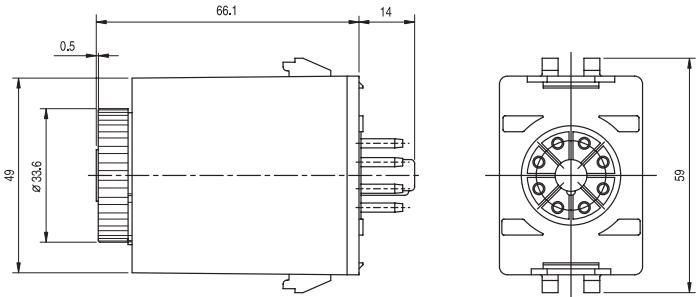
MODEL	SRA01	SRA02	SRB01	SRB02
	SRC01	SRC02	SRD01	SRD02
			SRX01	SRX02
Characteristics				
Rated Power Source	AC 110V		AC 220V	
	AC 100V		AC 200V	
			AC 220~240V	
Use Voltage	± 10% (Rated Output Comparison)			
Frequency	60Hz			
	50/60Hz			
			50Hz	
*1 Application Motor Output	6W	15~90W	6W	15~90W
Speed control range	60Hz : 90 ~ 1700r/min. 50Hz : 90 ~ 1400r/min.			
Speed fluctuation rate	5% (Average)			
Speed Regulation	Built in (With external speed setting device optional)			
*2 Brake	Run Electric brake for Certain Period to Motor			
Electric Brake Time	0.5sec (Average)			
*3 SLOW RUN, SLOW STOP	None			
Noise filter	None			
Ambient Temperature	-10 ~ 50°C			
Preserving Temperature	-20 ~ 60°C			

- \* 1. Applicated motor is variable speed control motor.  
For specification of motors, refer to our catalogue.
- \* 2. Electric brake can't endure load.
- \* 3. Use the control motor of `SS' type, SH' type and controller  
when the function, SLOW RUN, SLOW STOP is needed.

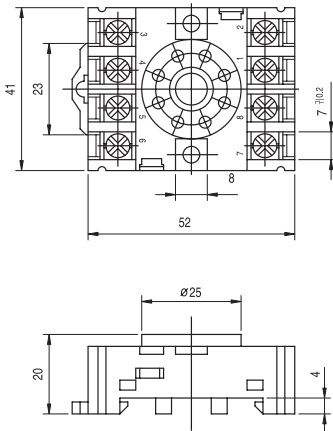
## 11. DIMENSION

### ▶ DIMENSION (SCALE: 1/2)

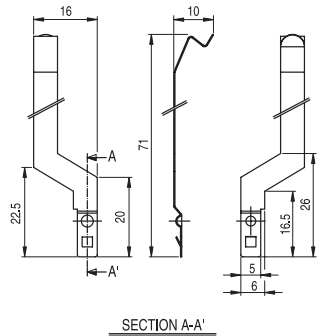
#### ■ CONTROL PACK



#### ■ SOCKET



#### ■ LOCKER



*21C, for world geared motor !*



**SPG Co., Ltd**

<http://www.spg.co.kr>

■ HEAD OFFICE

67B/L 12LOT 628-11, GOJAN-DONG NAMDONG-KU, INCHON, KOREA  
TEL : 82-32-820-8200 FAX : 82-32-821-0383

※ The product of specification or appearance can be changed without any announcement to customers caused by the reason, developing of the function.  
Futher details are required, please contact to R&D or sales dept of sales branch office.