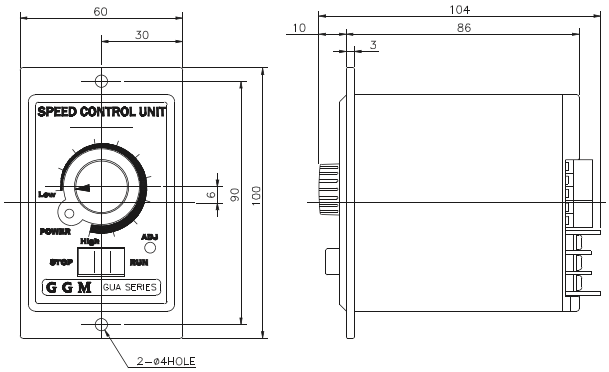
SPEED CONTROL UNIT

SPEED CONTROL UNIT ●GUA

Diagram and general contents

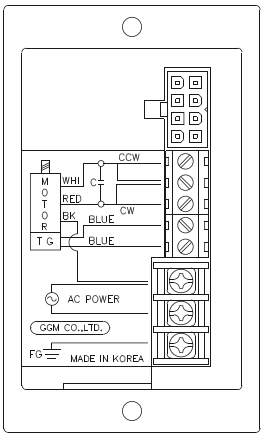
Appearance of Products



Specification

Model / Characteristics	GUA-U	GUA-J	GUA-C	GUA-L
Rated voltage and power Frequency	Single Phase AC110V 60Hz Single Phase AC115V 60Hz	Single Phase AC110V 50/60Hz	Single Phase AC220V 50/60Hz Single Phase AC230V 50/60Hz Single Phase AC240V 50Hz	Single Phase AC200V 50/60Hz
Operating Voltage Range	± 10% (compared to the lightning voltage)			
Application MOTOR output	INDUCTION : 6~180W REVERSIBLE : 6~ 90W			
Speed control range	60Hz : 90~1700rpm, 50Hz : 90~1400rpm			
Speed regulation	5% (standard)			
Speed setter	Setting by VOLUME			
Operating temperature range	-10~40℃			
Storage temperature range	-20~60℃			
Operating humidity range	Below 85% (where is no condensation)			

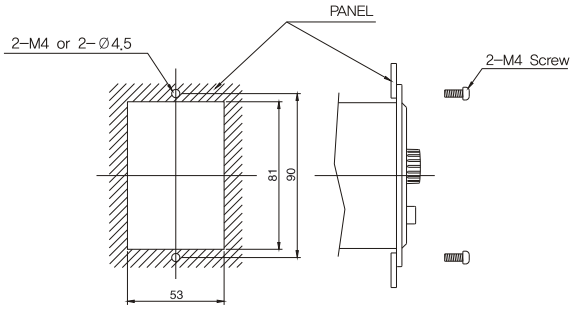
Wiring Diagram



Product Features

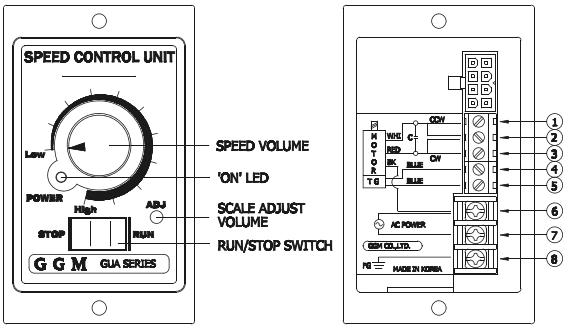
1. It is an UNIT product of detachable CONTROL MOTOR and CONTROL MOTOR.
   CONNECTOR is connected with the ONE TOUCH. It is most suitable in usage that remote control need.(There is not Moment stop function.)
2. There are assembled all needed devices of Speed control circuit, MOTOR CONDENSER, speed setter etc. in CONTROL UNIT.
   (There is also an external mounting type CONDENSER.)
   Connect together MOTOR and CONTROL UNIT by exclusive use CONNECTOR and can control the speed of MOTOR simply by connection AC terminals to POWER SOURCE.
3. If use an extension cord for the CONNECTOR OPTION, can be controlled speed by apart MOTOR and MOTOR CONTROL UNIT part maximum up to 2.0m.
4. Variable speed range is widely available by 50Hz: 90~1400rpm, 60Hz: 90~1700rpm speed widely available.

Panel Processing

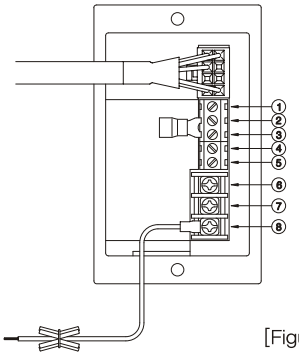


SPEED CONTROL UNIT

How to Use

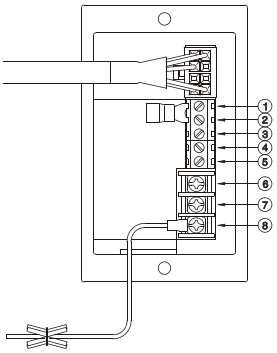


▶ When driving forward



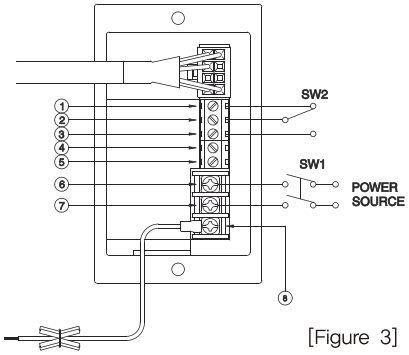
[Figure 1]

▶ When driving backward



[Figure 2]

▶ When driving two-way



[Figure 3]

SWITCH Specification

SWITCH Number	SWITCH contact capacity
SW1	AC125V or AC250V More than 5A
SW2	AC125V or AC250V More than 5A

■ Operation

Connects LEAD line CONNECTOR of CONTROLLER UNIT and MOTOR, and connect AC terminal to AC power.

If set RUN/STOP SWITCH of CONTROL UNIT by RUN side, MOTOR rotates clockwise direction when view at output side.

(It is SET to rotate clockwise when shipping.)

■ Transmission

If turn handle of SPEED VOLUME of CONTROLLER UNIT to clockwise

number of MOTOR rotation becomes rapid and the speed is delayed if turn in contrary. It is possible to control and set the MOTOR SPEED.

■ Stop

This is not ON/OFF SWITCH that please equip separate power SWITCH in case of stop MOTOR long hours.

■ Switching the direction of rotation

1. Case of continuous operation

In case of set inverse the rotaional direction of motor in transmission device such as GEAR HEAD, please exchange position of terminals to be connected terminal position of ② COMand ③ CW attached to CONTROL UNIT backside to position of ② COM and ① CCW.

Please connect always power cord terminal to ⑥ AC, ⑦ AC. This time, please exchange and access after turning OFF the power.

2. In case of control Normal/Reverse rotation

As like [Figure3] in left, please exchange the direction of rotation by install SWITCH(SW1) for power and Normal/Reverse exchange SWITCH(SW2). It is impossible moment Normal/Reverse rotation. Exchange SWITCH(SW2) after stop motor completely after turn off power SWITCH(SW1) firstly.

■ SPEED OUT

④,⑤ is terminal which is used connecting revolution-indicator by SPEED OUT.

* Can see number of rotation by connecting DIGITAL indication type revolution-indicator.

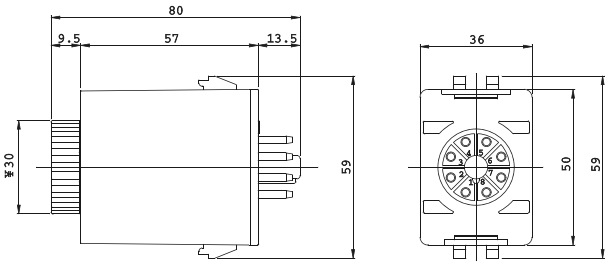
GGM GGM GEARED MOTOR

SPEED CONTROL UNIT ●GPA

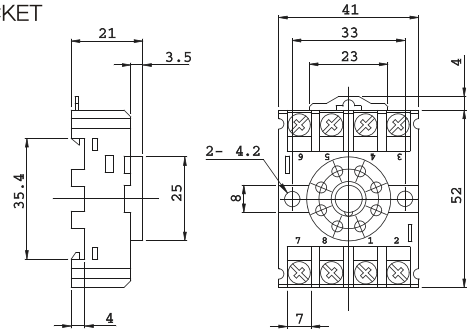
Diagram and general contents

Appearance of Products

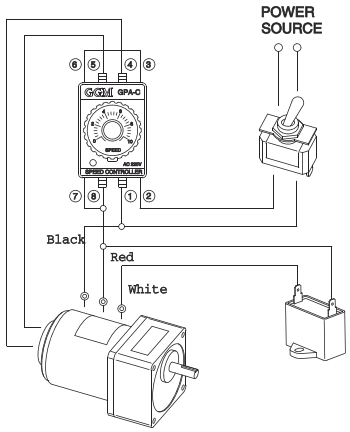
■ Main Body



■ SOCKET



Main Body Wiring Diagram



1. Motor rotation speed of motor is available to change by speed setter on top of main body..
2. In case of wire of Speed Signal Generator (TG) is long (More than 1m), connect to ④,⑤ terminals using TWIST SHIELD WIRE with 2-cored. (Do not ground SHIELD part.)
3. The thick solid line shows the power circuit. please use about 0.75 ㎟ wires.

Specification

* 1. Application MOTOR is SPEED CONTROL MOTOR (SP TYPE) and SPEED CONTROL & BRAKE MOTOR (D TYPE).
* 2. There is no preservation power in electricity BRAKE.
* 3. Buy our company products 'GSA' SERIES CONTROLLER in case of need SLOW RUN, SLOW STOP function.

Characteristics \ Model	GPA-U	GPA-J	GPA-C	GPA-L
Rated voltage and power Frequency	Single Phase AC110V 60Hz Single Phase AC115V 60Hz	Single Phase AC100V 50/60Hz	Single Phase AC220V 50/60Hz Single Phase AC230V 50/60Hz Single Phase AC240V 50Hz	Single Phase AC200V 50/60Hz
Operating Voltage Range	±10%(Compared with Rated voltage)			
Applied MOTOR output *1	INDUCTION : 6~180W REVERSIBLE : 6~90W SPEED & BRAKE : 6~180W			
Speed control range	60Hz : 90~1700 rpm 50Hz : 90~1400 rpm			
Speed regulation	5%(Standard value)			
Speed setter	Built-in (can be installed outside setter : special order)			
Braking *2	Electric motor brake for a period of time Braking through Current			
ELECTRICAL BRAKE hours	0.5 seconds Standard values			
SLOW RUN*3 SLOW STOP	No function			
Ambient temperature	-10℃ ~ 40℃			
Storage temperature	-20℃ ~ 60℃			

Application Motor

REVERSIBLE SPEED CONTROL & BRAKE MOTOR	AC110V 60Hz	AC220V 50/60Hz	AC230V 50/60Hz	AC240V 50Hz
K6R□6N□-SP, D	GPA-U	GPA-C	GPA-C	GPA-C
K7R□15N□-SP, D				
K8R□25N□-SP, D				
K9R□40N□-SP, D				
K9R□60F□-SP, D				
K9R□90F□-SP, D				
K9R□120F□-D				
K9R□180F□-D				

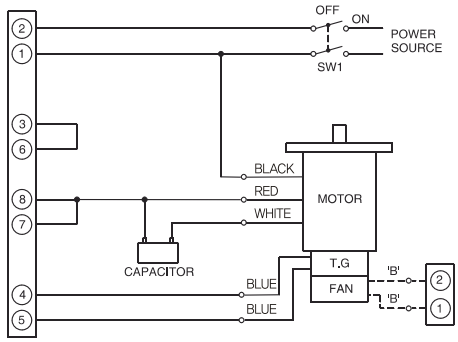
INDUCTION	AC110V 60Hz	AC220V 50/60Hz	AC230V 50/60Hz	AC240V 50Hz
K6I□6N□-SP	GPA-U	GPA-C	GPA-C	GPA-C
K7I□15N□-SP				
K8I□25N□-SP				
K9I□40N□-SP				
K9I□60F□-SP				
K9I□90F□-SP				
K9I□120F□-SP				
K9I□180F□-SP				

1. □ marks SHAFT TYPE and voltage specification.
2. -SP which is SPEED CONTROL MOTOR PLUG-IN TYPE, and -D is a SPEED CONTROL & BRAKE MOTOR.

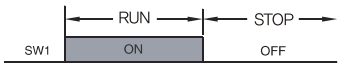
SPEED CONTROL UNIT

Main Body Electrical Wiring

1. One-way operation + change of speed



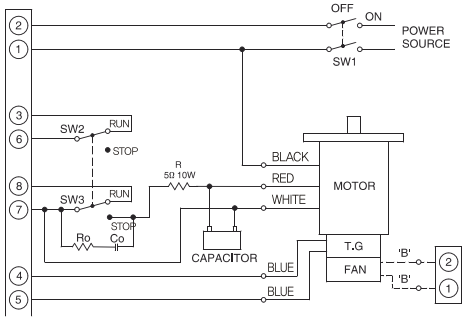
SW1	AC125V or more than AC250V 5A



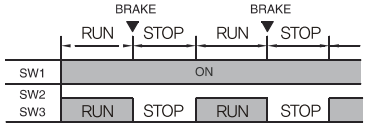
■ Cautions

1. MOTOR direction of rotation is clockwise (CW) seeing from axis side. When set Counter-clockwise (CCW), connect exchanging red line and white lines in the MOTOR.
2. When wiring more than 60W, connect and use FAN MOTOR MOTOR leader (yellow line) to ②, ① ('B' part)

2. One-way operation + change of speed + Braking



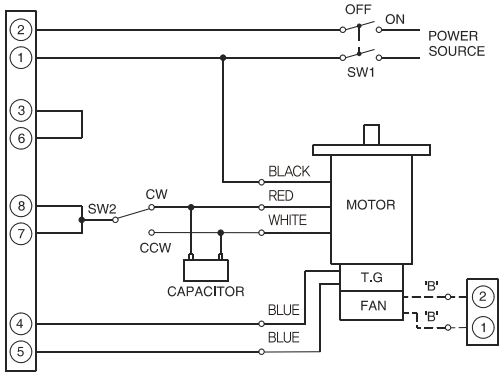
SW1, SW3	AC125V or more than AC250V 5A
SW2	DC20V 10mA
R0, C0	R0=10~200Ω (more than 1/4W) C0=0.1~0.33μF (200 or 400WVAC)
R	More than 4.7Ω ~6.8Ω 10W



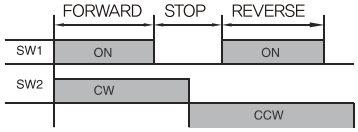
■ Caution

1. MOTOR direction of rotation is clockwise(CW) viewed from output shaft. In case of set Counter-clockwise (CCW), connect the red wire and white wire changing each other.
2. When set SW3 from operation to stop, braking(electric brake) operates about 0.5 seconds and stop momently. (There is no retention.)
3. When connect wiring motor more than 60W, use FAN MOTOR MOTOR leader wire(yellow line) connecting to ②, ①.('B' part)

3. Normal/Reverse Operation + change of speed



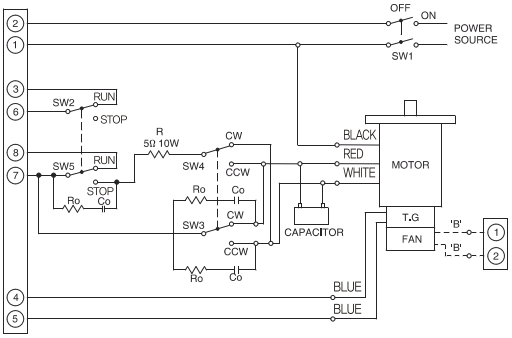
SW1, SW2	AC125V or more than AC250V 5A



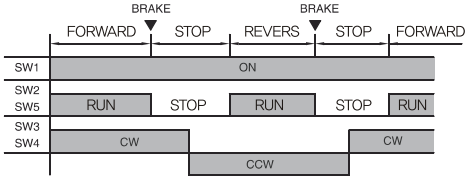
■ Cautions

1. For INDUCTION MOTOR, changeover SW2 after stop rotation by setting stop period. (set counterclockwise rotation after stop the run certainly)
2. REVERSIBLE MOTOR does not require the rest period. It is safe to handle SW2 even in state ON of SW1.
3. When wiring more than 60W FAN MOTOR, connect FAN MOTOR leader (Yellow line) to ②, ① and use. ('B' part) Ω

4. Normal/Reverse operation + change of speed + braking



SW1, SW3, SW4, SW5	AC125V or more than AC250V 5A
SW2	DC20V 10mA
R0, C0	R0=10~200Ω (more than 1/4W) C0=0.1~0.33μF (200 or 400WVAC)
R	more than 4.7Ω ~6.8Ω 10W



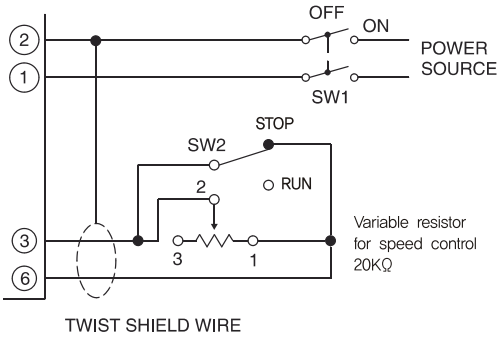
■ Cautions

1. If set SW5 from operation to stop, braking (electric brake) acts about 0.5 seconds and stops in moment.
2. This time, do not operate SW3, SW4 for about 0.5 seconds.
3. Set switching of SW3, SW4 quickly more than switching from stop to operation of SW2, SW5.

SPEED CONTROL UNIT

Application Electrical Wiring

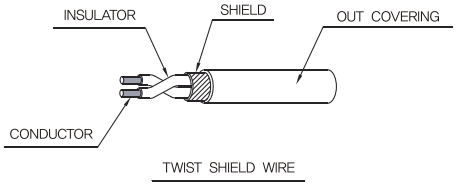
1. External speed setter usage



* Do not use #3 terminal of VR.
VR : External speed setter (20KΩ 1/4W B (20KΩ 1/4W B attribute value)

■ Caution

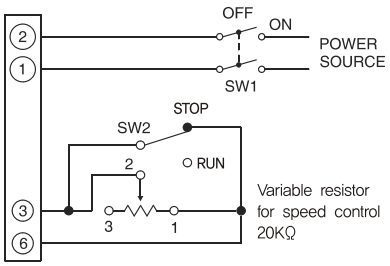
1. Set scale of the speed setter of main body by lowest (0).
2. Do wiring as short as possible. There is occasion of malfunction. Use TWIST SHIELD wire in case of malfunction.



2. How to make starting faster

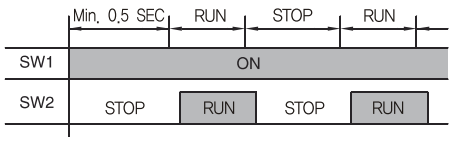
When approved the starting signal in power SWITCH SW1 in case of MOTOR starting was late, operate Run/Stop in SW2 using external speed setter VR.

EX1) Occasion that do not braking



SW2	DC 20V 10mA

* Do not use #3 terminal of VR.
VR : External speed setter (20KΩ 1/4W B (20KΩ 1/4W B attribute value)

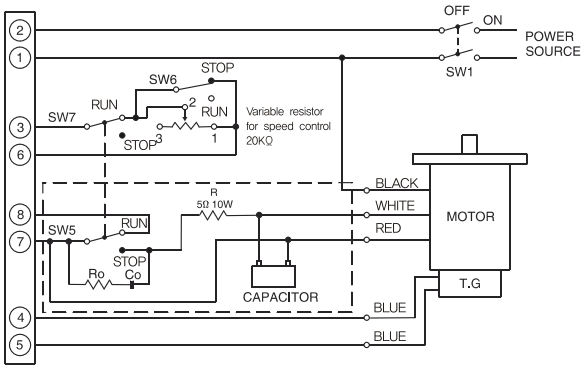


■ Caution

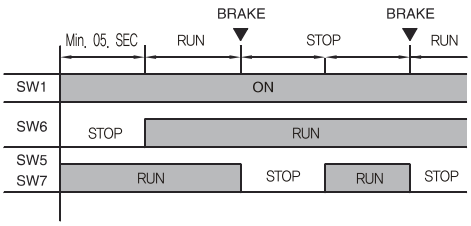
1. Make approve time of SWITCH SW1 faster 0.5 seconds than operation starting signal of SW2.
2. Set speed setter scale of main body by lowest (0), and control speed in external speed setter VR.
3. In case of do operation/stop, operate SW1 in ON state SW2. MOTOR can be controlled even a small signal.
4. Turn SW1 OFF in case of stop long hours.

3. How to make faster starting time

EX2) Occasion that do braking



SW1, SW5	AC125V or more than AC250V 5A
SW6, SW7	DC20V 10mA
R0, C0	R0=10~200Ω (more than 1/4W) C0=0.1~0.33μF (200 or 400WVAC)
R	more than 4.7Ω ~6.8Ω 10W



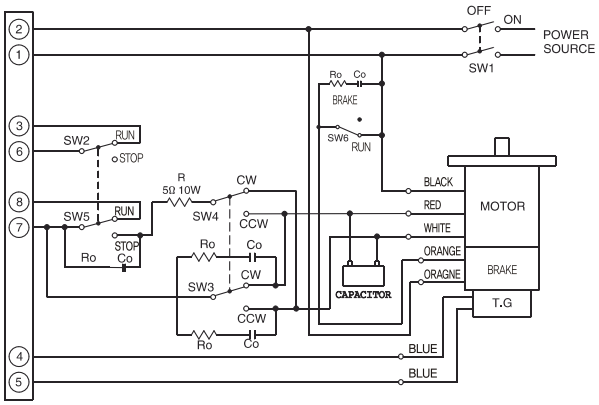
■ Caution

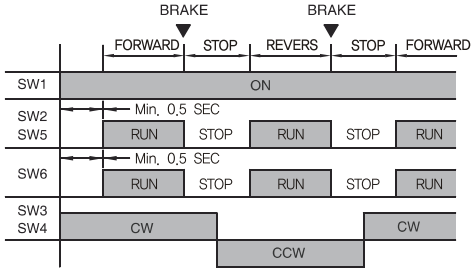
1. Electrical wiring above is "one-way operation + change of speed + braking.
2. Operate power SWITCH SW1 faster more 0.5 seconds than SW6.
3. Set speed setter scale of main body by lowest (0), and control speed in external speed setter VR.
4. Turn SW1 OFF in case of stop long hours.

SPEED CONTROL UNIT

Electron BRAKE Attachment MOTOR Wiring

1. Occasion use jointly electricity BRAKE of CONTROLLER.



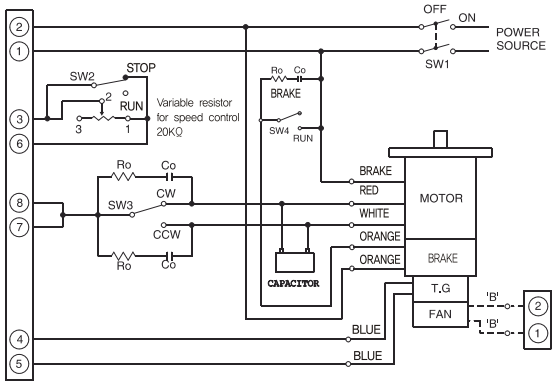


SW1, SW3, SW4, Sw5, SW6	AC125V or more than AC250V 5A
SW2	DC20V 10mA
R0, C0	R0=10~200Ω (more than 1/4W) C0=0.1~0.33μF (200 or 400WVAC)
R	more than 4.7Ω ~6.8Ω 10W

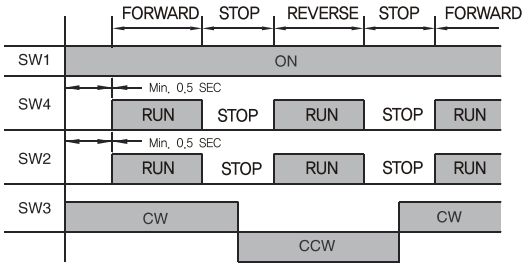
■ Caution

1. If brake while operation, Motor stops in moment by action of Electronic Brake.
2. Operate SW3, SW4 after motor stops.
3. Do switching of SW3, SW4 faster than switching from stop to operation of SW2, SW5, SW6.
4. Do power approve time of SWITCH SW1 faster more 0.5 seconds than operation starting sign by SW2, SW5, SW6.
5. In case of operation/braking, operate in SW2, SW5, SW6 by ON state of SW1.

2. Occasion do not use jointly electricity BRAKE of CONTROLLER.



SW1, SW3, SW4	AC125V or more than AC250V 5A
SW2	DC20V 10mA
R0, C0	R0=10~200Ω (more than 1/4W) C0=0.1~0.33μF (200 or 400WVAC)



■ Caution

1. Make SW3 switching after rotation has stopped.
2. Set approval time of power switch SW1 faster more 0.5 seconds than signal of operation starting by SW2, SW4.
3. In case of set operation/stop, operate in SW2, SW4 in state of SW1 by ON. MOTOR can be controlled even a small signal.
4. Set speed setter scale of main body by lowest (0), and control speed in external speed setter VR.
5. Turn SW1 OFF in case of stop long hours.

SPEED CONTROL UNIT ●GSA ●GNA

Specification

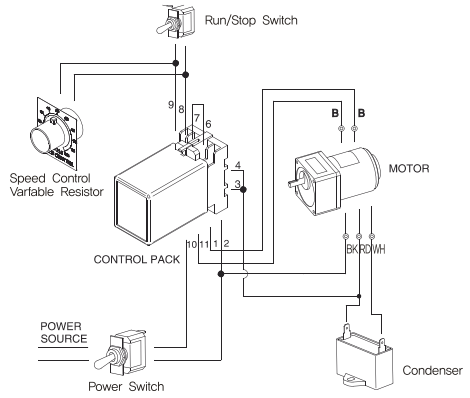
It is used to INDUCTION SPEED CONTROL MOTOR of 6W~180W and REVERSIBLE SPEED CONTROL MOTOR of 6W~90W and SPEED CONTROL & BRAKE MOTOR of 6 W~180 W.

Can control and set MOTOR speed of revolution by external speed setter. Moment stop function is possible by electricity BRAKE. It is COMPACT PLUG-IN (11 PINs) TYPE that hadling and install are easy. There is SLOW RUN, SLOW STOP function that starting and stop ares not attained rapidly and operate slowly. Time setting functions of SLOW RUN, SLOW STOP is built-in that control is simple. Parallel operation is possible. (Parallel operation means that can set and operate multi MOTOR CONTROL PACKs at the at the same time same speed by a external speed setters.)

Model / Characteristics		GSA-U / GSA-J	GNA-U / GNA-J	GSA-C / GSA-L	GNA-C / GNA-L
Rated voltage and Power Frequency		Single Phase AC110V 60Hz Single Phase AC115V 60Hz		Single Phase AC220V 50/60Hz Single Phase AC230V 50/60Hz Single Phase AC240V 50Hz	
		Single Phase AC100V 50/60Hz		Single Phase AC200V 50/60Hz	
Operating Voltage Range		±10% (Rated Voltage Contrast)			
Rated Current		3A			
Apply Motor Output	INDUCTION	6 ~ 180W			
	REVERSIBLE	6 ~ 90W			
	SPEED&BRAKE	6 ~ 180W			
Speed control range		60Hz : 90~1700RPM, 50Hz : 90~1400RPM			
Speed regulation		5%(standard)			
Speed setter		Speed can be adjusted by external speed setter			
Braking		Moment stop is available by electrical BRAKE,			
ELECTRICAL BRAKE Time		0.5 Seconds(standard)			
Parallel operation		has function	no function	has function	no function
SLOW RUN		Possible to rotate motor slowly acceleration, deceleration			
SLOW STOP					
Operating temperature range		-10℃~40℃			
Operating humidity range		86% or less (no condensation)			
Storage temperature		-20℃~60℃			
Insulation resistance		It is more than 100M Ω measured between CASE and PIN by DC 500V MEGGER in normal temperature and humidity.			
Isolation voltage		There is no singularity even if approved 1500V 50/60Hz for 1 minute in normal temperature and humidity betwee CASE and PIN.			

※ Application MOTOR is our SOCKET TYPE SPEED CONTROL MOTOR.(Use TG voltage MOTOR for 24V.) Electrical BRAKE has no retention.

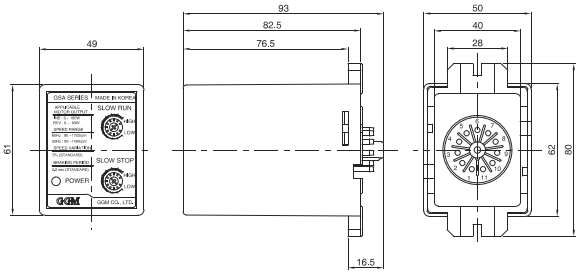
Main Body Wiring Diagram



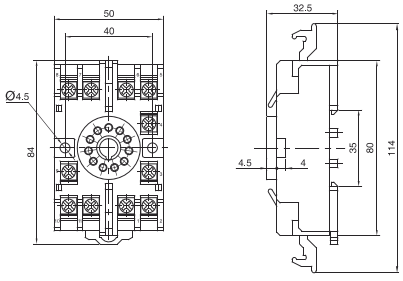
1. If turn power switch(SW1) ON, CONTROL PACK of the [POWER LAMP] is lit.
2. Motor speed is able to control by external speed setter without steos.
3. Operation current of motor is passing through the thick solid line. Use around 0.75 ㎟ of thick solid wires, thin solid wires around the 0.5 ㎟.

Product OUTLINE

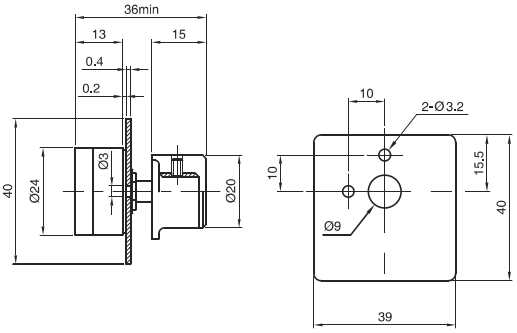
■ CONTROL PACK



■ 11 PIN SOCKET



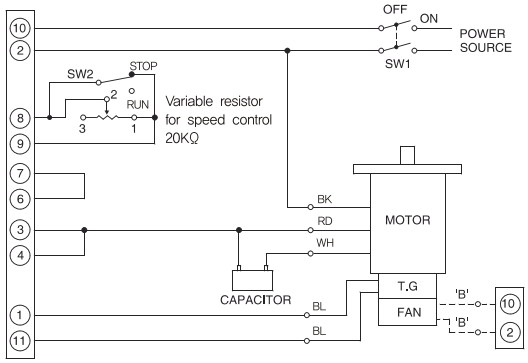
■ External Speed Setter



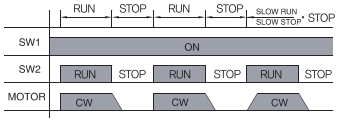
SPEED CONTROL UNIT

Basic Electrical Wiring(INDUCTION MOTOR)

1. When set 「one-way operation + change of speed 」 operation in INDUCTION MOTOR (6W~180W)



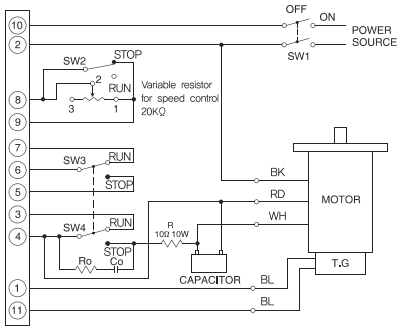
SW1	AC125V or more than AC250V 5A
SW2	DC20V 10mA



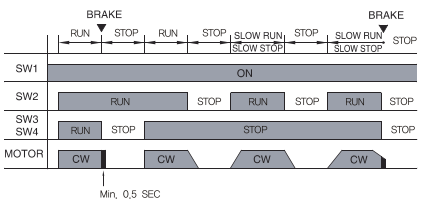
■ Caution

1. Rotating direction of MOTOR is clockwise(CW) seeing from output shaft side. When set Counter-clockwise (CCW) please exchange the red and white among MOTOR LEADs.
2. When wiring more than 60W FAN, please use connecting MOTOR MOTOR lead (yellow line) to ⑩, ②. ('B' part)

2. When set 「one-way operation + change of speed + braking 」 operation in INDUCTION MOTOR (6 W~25 W)



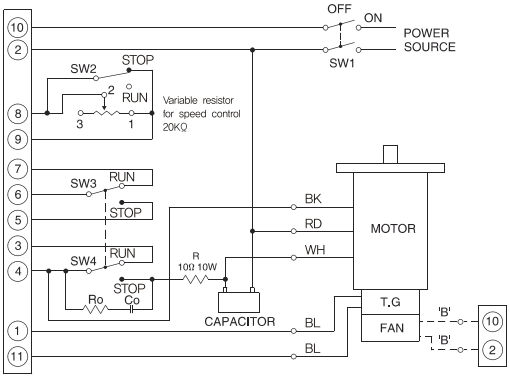
SW1, SW4	AC125V or more than AC250V 5A
SW2, SW3	DC20V 10mA
Ro, Co	Ro=10~200Ω (more than 1/4W) Co=0,1~0,2μF (AC125WV or AC250WV)
R : External resistance for braking	more than 10Ω 10W



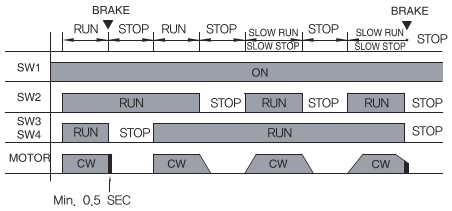
■ Caution

1. MOTOR direction of rotation is clockwise (CW) seeing from axis. Exchange redand white color among MOTOR LEAD lines in case of set to counterclockwise (CCW).

3. When set 「 one-way driving + change of speed + braking 」 operation in INDUCTION MOTOR (40 W~180 W)



SW1, SW4	AC125V or more than AC250V 5A
SW2, SW3	DC20V 10mA
Ro, Co	Ro=10~200Ω (more than 1/4W) Co=0,1~0,2μF (AC125WV or AC250WV)
R : External resistance for braking	more than 10Ω 10W



■ Caution

1. MOTOR direction of rotation is clockwise (CW) seeing from output shaft side. Exchange red and white color among MOTOR LEAD lines in case of set to counterclockwise (CCW).
2. When wiring MOTOR more than 60 W FAN, use connecting MOTOR leader (Yellow line) to ⑩,② ('B' part)

4. How to Use(INDUCTION MOTOR)

RUN/STOP Function

6-1, If set SW2 by operation side at basis electrical wiring of 2,3 clauses, MOTOR rotates at the speed set by external speed setter, and if set to STOP side, stops naturally by inertia.

RUN/BRAKING Function

6-2, At basis electrical wiring of 3 clauses, if set SW3, SW4 from OPERATION to braking side, MOTOR는 BRAKE acts about 0.5 seconds and stops in moment.

SLOW RUN, SLOW STOP

Can set MOTOR rotation to accelerate and decelerate slowly through SLOW RUN, SLOW STOP control volume of CONTROL PACK. Setting time increases as well as volume increment, it is set by SLOW RUN : about 30±5 seconds, SLOW STOP : about 35±5 seconds at Volume on MAX. (maximum 60Hz : 1700 rpm, 50Hz : 1400 rpm standard) MOTOR natural SLOW STOP is impossible by the time less than nature stop of MOTOR.

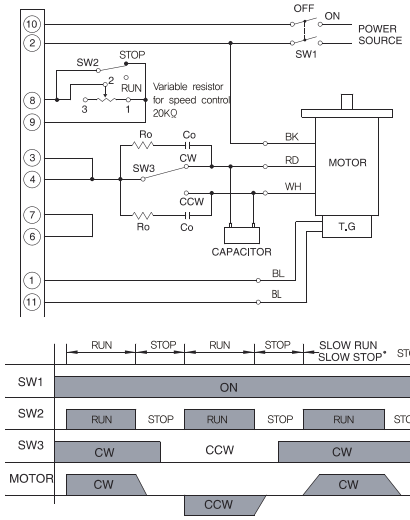
■ Caution

1. Do not change direction of rotation for about 3 seconds after MOTOR stop when approve power and stop moment.
2. When do not use long hours, set SW1 by OFF to prevent heating of CONTROL PACK.

SPEED CONTROL UNIT

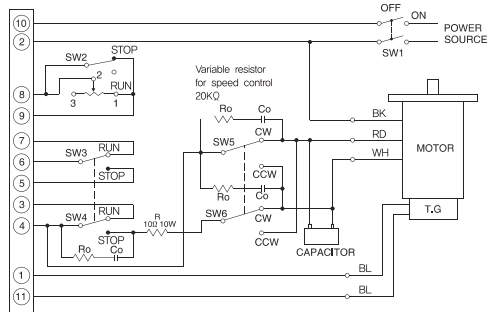
Basic Electrical Wiring(REVERSIBLE MOTOR)

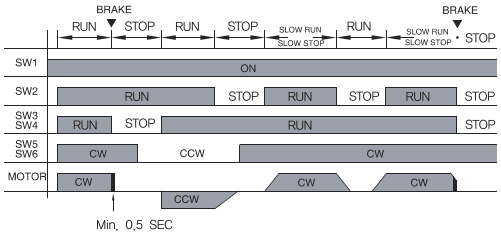
1. When operate 「normal/reversed operation + change of speed」 in REVERSIBLE MOTOR.(6W ~ 90W)



SW1, SW3	AC125V or more than AC250V 5A
SW2	DC20V 10mA
Ro, Co	Ro=10~200Ω (more than 1/4W) Co=0.1~0.2μF (AC125WV or AC250WV)
R : External resistance for braking	more than 10Ω 10W

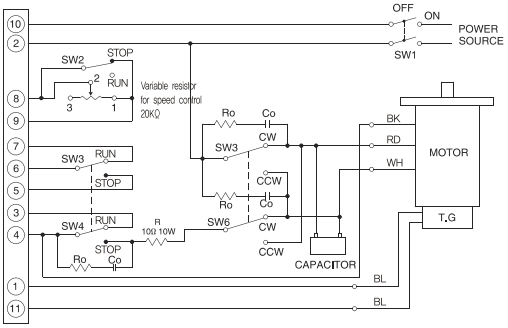
2. When operate 「normal/reversed operation + change of speed + Braking」 in REVERSIBLE MOTOR.(6W~25W)



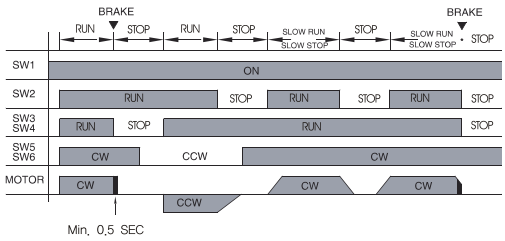


SW1, SW4 SW5, SW6	AC125V or more than AC250V 5A
SW2, SW3	DC 20V 10mA
Ro, Co	Ro=10~200Ω (more than 1/4W) Co=0.1~0.2μF (AC125WV or AC250WV)
R : External resistance for braking	more than 10Ω 10W

3. When operate 「normal/reversed operation + change of speed + Braking」 in REVERSIBLE MOTOR. (40W ~90W)



SW1, SW4, SW5, SW6	AC125V or more than AC250V 5A
SW2, SW3	DC 20V 10mA
Ro, Co	Ro=10~200Ω (more than 1/4W) Co=0.1~0.2μF (AC125WV or AC250WV)
R : External resistance for braking	more than 10Ω 10W



■ Caution

1. When wiring MOTOR more than 60 W FAN, use connecting MOTOR leader (Yellow line) to ⑩,② ('B' part)

4. How to Use(REVERSIBLE MOTOR)

RUN/STOP Function

7-1. If set SW2 by operation side at basis electrical wiring of 2,3 clauses, MOTOR rotates at the speed set by external speed setter, and if set to STOP side, stops naturally by inertia.

RUN/BRAKING Function

7-2. At basis electrical wiring of 3 clauses, if set SW3, SW4 from OPERATION to braking side, MOTOR는 BRAKE acts about 0.5 seconds and stops in moment.

SLOW RUN / SLOW STOP

Can set MOTOR rotation to accelerate and decelerate slowly through SLOW RUN, SLOW STOP control volume of CONTROL PACK. Setting time increases as well as volume increment, it is set by SLOW RUN : about 30±5 seconds, SLOW STOP : about 35±5 seconds at Volume on MAX.
(maximum 60Hz : 1700 rpm, 50Hz : 1400 rpm standard)
MOTOR natural SLOW STOP is impossible by the time less than nature stop of MOTOR.

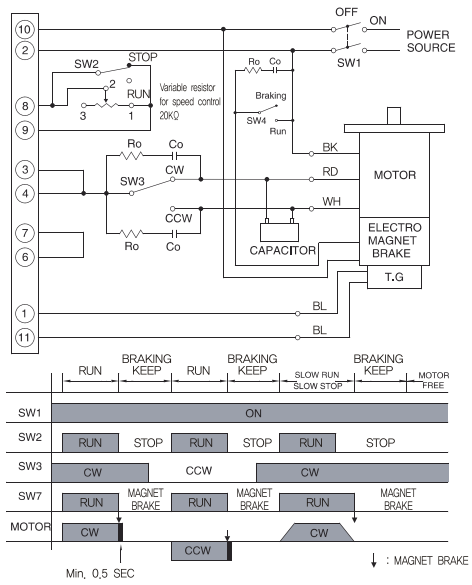
■ Caution

1. Do not change direction of rotation for about 3 seconds after MOTOR stop when approve power and stop moment.
2. When do not use long hours, set SW1 by OFF to prevent heating of CONTROL PACK.

SPEED CONTROL UNIT

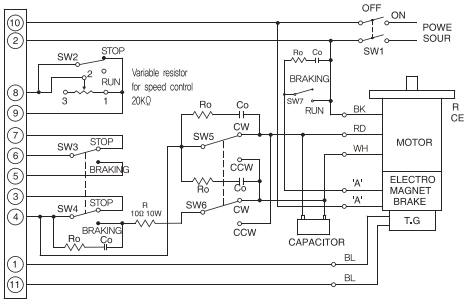
Basic Electrical Wiring(SPEED CONTROL BRAKE MOTOR)

1. In case of set 「normal/reversed operation + change of speed + position retention operation」 in SPEED CONTROL BRAKE MOTOR(6 W~180 W)

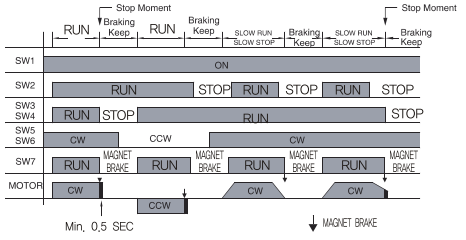


SW1, SW3, SW4	AC125V or more than AC250V 5A
SW2	DC 20V 10mA
Ro, Co	Ro=10~200Ω (more than 1/4W) Co=0.1~0.2μF (AC125WV or AC250WV)

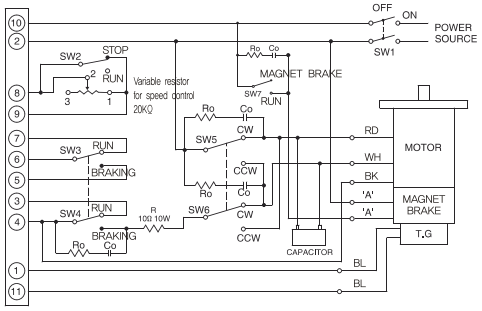
2. In case of set 「normal/reversed operation + change of speed + braking」 in SPEED CONTROL BRAKE MOTOR(6W~25W)



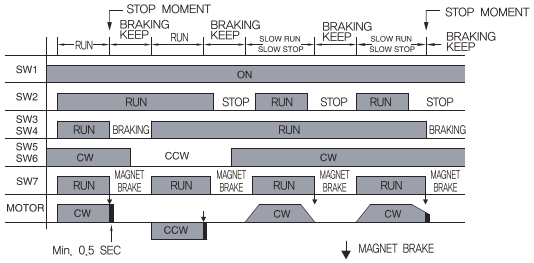
SW1, SW4, SW5, SW6, SW7	AC125V or more than AC250V 5A
SW2, SW3	DC 20V 10mA
Ro, Co	Ro=10~200Ω (more than 1/4W) Co=0.1~0.2μF (AC125WV or AC250WV)
R : External resistance for braking	more than 10Ω 10W



3. In case of set 「normal/reversed operation + change of speed + braking」 in SPEED CONTROL BRAKE MOTOR(40W ~180W)



SW1, SW4 SW5, SW6, SW7	IAC125V or more than AC250V 5A
SW2, SW3	DC 20V 10mA
Ro, Co	Ro=10~200Ω (more than 1/4W) Co=0.1~0.2μF (AC125WV or AC250WV)
R : External resistance for braking	more than 10Ω 10W



4. HOW to USE(INDUCTION MOTOR)

RUN/STOP Function

8-1. If set SW2 by RUN side in basis electricity wiring of 2,3 clauses, MOTOR rotates at the speed set by external speed setter, and if set STOP side it stops naturally by inertia.

RUN/Braking Function

8-2. In basis electrical wiring of 3 clause, when set SW3, SW4 from RUN to BRAKE side in state of SW2 by RUN side, MOTOR BRAKE acts about 0.5 seconds and stops in a moment.

SLOW RUN, SLOW STOP Function

MOTOR rotation can be set to accelerate and decelerate slow through control volume of SLOW RUN, SLOW STOP of CONTROL PACK. Setup time increases as raising volume and can be set SLOW RUN : about 30±5 seconds, SLOW STOP : about 35±5 seconds in volume MAX. (Up to 60Hz : 1700 rpm, 50Hz : 1400 rpm standard)

Time of SLOW STOP is impossible to be shorter than natural stop of MOTOR.

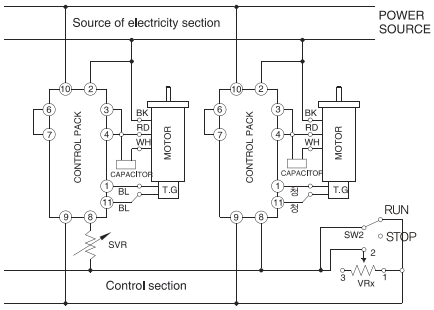
■ Caution

1. Do not change direction of rotation for about 3 seconds after motor stopping when approve power and stops in moment.
2. Turn SW1 OFF to prevent heating of CONTROL PACK when not in use for a long time.

SPEED CONTROL UNIT

Basic Electrical Wiring(Parallel Operation)

As like below wiring diagram, GSA high power TYPE is possible to operate parallel operation that can be controlled speed by set multi motors at same speed at same time by one variable resistor for speed control.



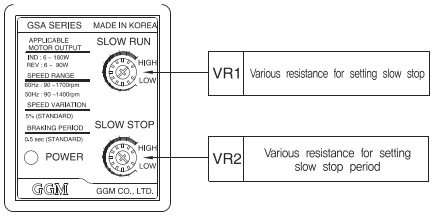
As like above wiring diagrams, connect power supply (terminal number ②, ⑩) and controls (terminal number ⑧, ⑨) to each wire the by same lines. Even in case of combunation other motor with CONTROL PACK, parallel operation is possible making same power part and control part.

■ Caution

1. Make wiring same each PIN number for Power supply and control unit respectively.
2. Get capacity of variable resistor for speed control as following.
   VRx = 20/N KΩ, N/4 W(N:Number of MOTOR)
   EX) In case of two MOTORs, it is 10KΩ 1/2W.
3. Each MOTOR rotates almost the same rate but will cause some errors by differences of load, variation of the product. To prevent such a phenomenon, prepare variable resistor for fine adjustment
   to be about 5~10% of variable resistor value for speed control(VRx) and 1/4W of capacity to terminals No. ⑧

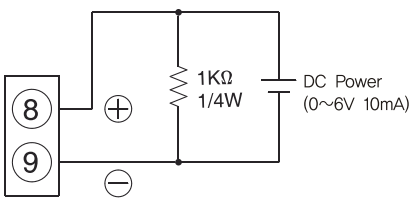
Application of electrical wiring

– Operation Panel



– In case of control number of rotation by external DC voltage

In case of set MOTOR speed by external DC power instead of variable resistor for external speed setting that is accessory, connect DC power and CONTROL PACK as follows; (However, use the DC power output isolated from the AC input, and note for changing polarity.)

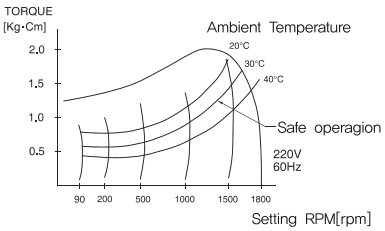


(Connection wiring diagram of control speed by esternal DC voltage)

Temperature rise of MOTOR

AC SPEED CONTROL MOTOR is increased pressure according to amount of load so that the more rising load the more temperature of motor increases. Curved line that got MOTOR temperature rise, limit TORQUE and number of RPM is called use limit curve, and use motor in the range of TORQUE RPM of curve bottom. In following occasion, can use more TORQUEs moving use limit curve upside.

– Occasion heat effect is good
– in case of cooling by FAN
– Occasion that ambient temperature is low

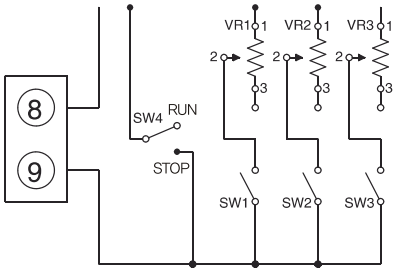


■ Caution

Should be used in less than 90 ℃ of surface temperature of the MOTOR case.

– Multistage switching of number of rotation

1. When needed multi–speed control, set VR1, VR2, VR3 respectively, and speed can be switched by SW1, SW2, SW3.
   Set SWITCH changeover period by RELAY contact point switching time.



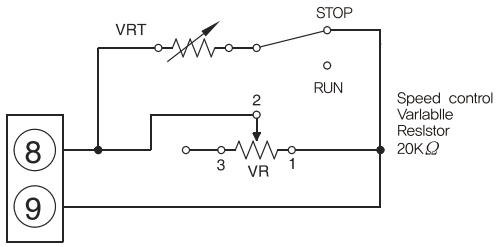
VR1, VR2, VR3	20KΩ 1/4W B Characteristic
SW1, SW2, SW3, SW4	DC 20V 10mA

2. There is built–in one set of VOLUME for external external setting in packing box of CONTROL PACK.
   When needed more, please purchase our products separately.

–How to set operating time quickly

Setting speed of motor becomes into slow speed, turn Run/Stop switch to Run side, and then time upto start of motor rotation will be longer. In case of operating time is issued when set Low Run, connect variable resistance VRT for controlling operation time, refer following circuit system.

SPEED CONTROL UNIT

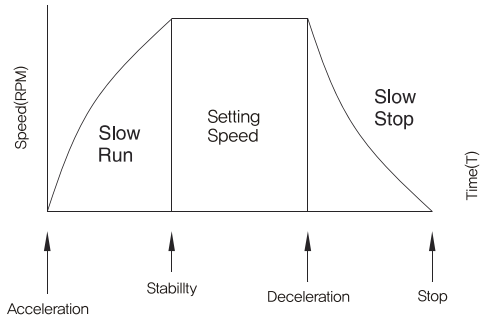


VRT	2KΩ 1/4W B Characteristics
SW2	DC 20V 10mA

* In case of make stop in moment, use RUN/Braking switch linking with RUN/Stop switch of above circuit.
* Adjust VRT just before motor starting, in state of set RUN/Stop switch to STOP side.

Use of SLOW RUN, SLOW STOP

Functions of GSA TYPE are SLOW RUN that is accelerated the speed gradually until set speed and SLOW STOP that is decelerated the speed gradually until set speed.
Use this function when want soft acceleration, deceleration by easing against impact at starting and stop.
Time setting of SLOW RUN and SLOW STOP is possible in the range of SLOW RUN about 30± 5 second, SLOW STOP : about 35± 5 second/1700 rpm (60Hz), 1400 rpm (50Hz) by variable resistor inside CONTROL PACK.
It is impossible to stop in less time than nature stop of MOTOR.
In case of do not need SLOW operation, turn VOLUME untill to end of left side (Counterclockwise).



13. Moment stop characteristics
There is electric brake function in CONTROL PACK that MOTOR can be stopped moment in a short time of 0.1 seconds while operation.
Braking current will work about 0.5 seconds and thereafter will automatically turn off.
There is no retention power to catch MOTOR that can be adjusted to the desired location after stop. In case of need retention to stop object moving up and down, selected and use the CONTROL MOTOR mounted e-brake of our company.

■ Cautions
1. It takes about 0.5 seconds until MOTOR rotatation after turning braking switch to operation side after operation for momentary stop in CONTROL PACK.
2. In CONTROL PACK, when operate variable resistor for speed setting 0Ω or operate momentary stop in state of turning RUN/STOP switch to stop side, then motor may run about one rotation when turn to operation side, so please do not do operation like this.
Also, in case of do RUN/STOP switch repeatedly within 0.5 seconds at AC power, MOTOR can rotate instantaneously that avoid RUN/STOP in AC Power Terminal. Necessary stop time takes longer than 3 seconds for stabile restart after moment stop.

GGM GGM GEARED MOTOR

SPEED CONTROL UNIT ●GUD

We thank you very much for your purchase our GGM products.
Before you start to use this product, we strongly recommend you to read this manual carefully for you to acquire knowledge, safety information and cautions, etc., about this product in order to use it properly.

1. Check the product upon its arrival

1. Check the product upon its arrival

- Please check the delivered product whether it is the same one as ordered.
- If different product from that of order is installed, then it may result in a risk of injury, fire.
- The product is well packed in paper box in order to protect from shock, and it contains following items.

Please check if it contains following items.

1) Controller.....1 piece
2) Extension wire(0.5m).....1 piece
3) User manual(This manual).....1 copy
4) Options(Extension lines)

Items	Lengths
KE – 10	1.0 m
KE – 15	1.5 m
KE – 20	2.0 m
KE – 40	4.0 m
KE – 50	5.0 m

2. Specification

Model Name	GUD–U	GUD–J	GUD–C	GUD–L
Input voltage	single phase AC110V/115V 50/60Hz ±10%	single phase AC100V 50/60Hz ±10%	single phase AC220V/AC230V AC240V 50/60Hz ±10%	single phase AC200V 50/60Hz ±10%
Output power and current of motor	6W–180W, AC SPEED CONTROL MOTOR / 3.0A			
REAL RPM	After green color LED ON of RUN/STOP, red color 7 SEGMENT 4 DIGIT			
RATIO RPM	After RATIO red color LED ON, Red color 7 SEGMENT 4 digit			
LED condition table	Input electric power (Stop)	RUN/STOP LED red color & REAL LED red color		
	Operation(RUN)	RUN/STOP LED green color & REAL LED red color		
	Error occurs	RUN/STOP LED red color is flickering		
	SLOW ON operation	Slow start LED red color		
	SLOW OFF operation	Slow stop LED red color		
	DATA LOCK	Lock LED red color		
Control method	AC Phase control method by MICOM			
Kind of controls	Speed control in proportion to measured value(automatic control by MICOM)			
Pulse input	Selectable from 1 to 99 pulses, GGM rated specification: 12 pulses			
Speed setting method	Increase or decrease by 5 by input setting			
Scope of control	50Hz = 90 ~ 1400rpm, 60Hz = 90 ~ 1700rpm			
Information function	MICOM self diagnosis function			
Power consumption	About 5W(10VA), excluding power consumption of motor			
Control error	Average +/–5%			
Setting key 4	1) RUN/STOP 2) MODE 3) UP 4) DOWN			
Measuring method	Pulse timing calculation measuring method by MICOM			
Remote RUN/STOP	Selected use of remote S/W			
Vibration resistance durability	2 hours for the direction to 0.7mm X, Y, Z, 10 ~ 55Hz			
Shock resistance durability	250m/s 6 directions for 3 times			
Noise resistance	1500V/ms for power lines, 500V/ms for TG lines			
Dielectric strength	It must stand for more than 1 minute at AC 1500V, 50/60Hz between power line terminals and earth.			
Life of controller	Semi–permanent at optimized condition to use			
Insulation resistance	Above than 100Mhom between TG terminal and earth measured with DC500V megger			
DIMENSION	60(W)x100(H)x100(D)			
Operation temperature	–10℃ + 40℃			
Operation humidity	Below 85% RH(No dew)			

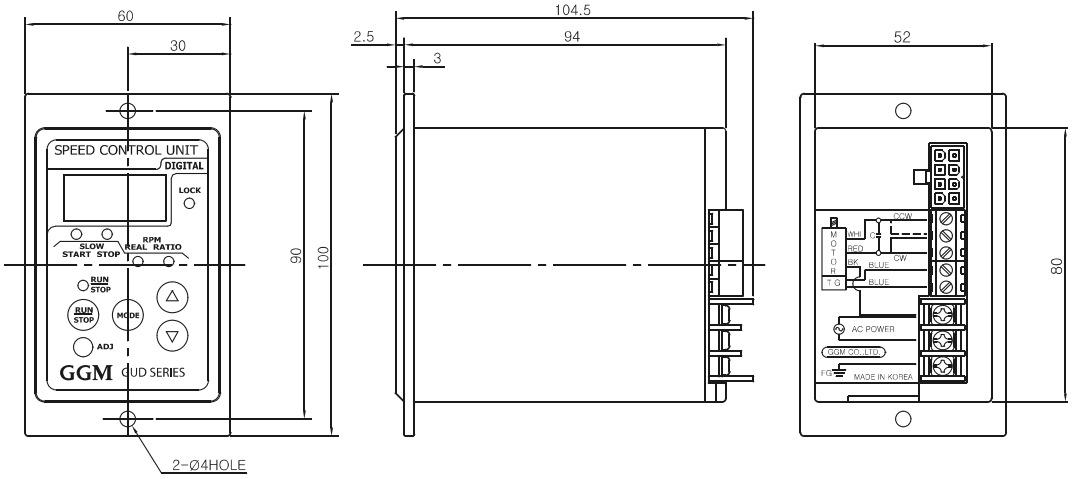
SPEED CONTROL UNIT

3. CODING SYSTEM

G	U	D	–	C	–	60	

- G: GGM Co., LTD.
- U: Unit Type
- D: Digital Type
- C:
  - C: Single Phase AC220V 50/60Hz AC230V 50/60Hz AC240V 50Hz
  - L : Single phase AC200V 50/60Hz
  - U : Single Phase AC110V 60Hz AC115V 60Hz
  - J : Single phase AC100V 50/60Hz
- 60:
  - 06 : 6W
  - 15 : 15W
  - 25 : 25W
  - 40 : 40W
  - 60 : 60W
  - 90 : 90W
  - 120 : 120W
  - 180 : 180W
- (blank): 50/60Hz C : common use

4. Outline of Product



SPEED CONTROL UNIT

5. Caution for Use

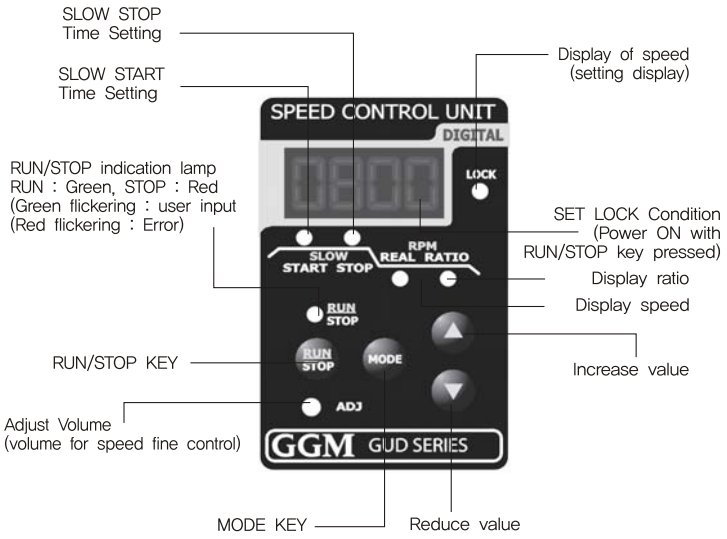
〈warning〉

- There are live electric parts at rear side of controller.
  Please install it in a box in order for 3rd person not to be easily contacted.
- Use it with 3P terminals covered. It may cause risk of electric shock. (It is basically equiped with this product)
- Do not contact it with wet hands. It may cause risk of electric shock. Switch it off during installation, transportation, wiring, checking. It may cause risk of electric shock.
- Be careful for water not to be splashed at a location of risk of water contact.
- Switch it off during interruption of electric power or when the thermal protector against overheat is operated. It may cause possible injury if it is restarted in a sudden.

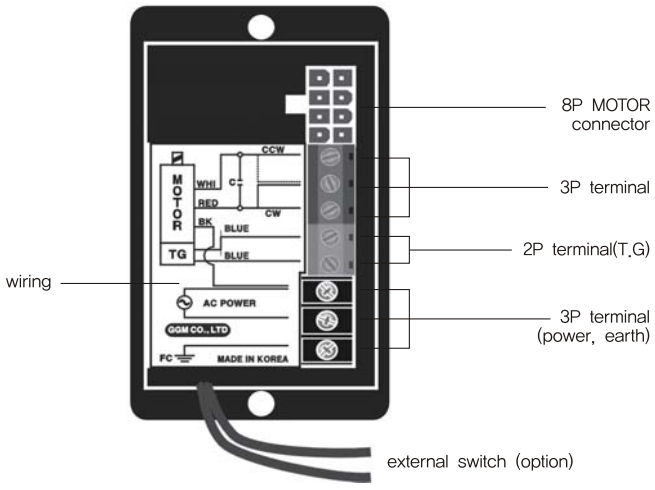
〈Cautions〉

- Please do not alter the product because it is outside our guarantee and it may cause risk of electric shock and/or fire.
- Please contact our company or our agent if repair is required.
- The controller does not have any protecting device. Therefore please install safety devices such as overcurrent protector, earth leakage breaker, thermal protector against overheated, etc.
- Do not use it at places of a lot of static electricity. It may cause risk of injury due to unexpected operation.
- Do not use damaged motor. It may cause risk of electric shock or injury.
- Please check the product upon delivery whether it is the same as you ordered. It may cause any risk of injury or fire.
- Do not place any inflammables around motor.
- Do not contact it with your hands or body during operation or immediately after stop of operation. It may cause risk of injury due to high temperature of motor surface.
- Do not use it at the place where inflammable gas and/or corrosive gas is generated. It may cause risk of fire.
- If you dispose of this product, then dispose of it as industrial waste.

6. Name and function of each part



〈picture1 – Front〉



〈Picture 2 – Rear Part〉

SPEED CONTROL UNIT

7. How to set operation mode

If mode key is pressed, then the mode is changed in following sequence

[RATIO MODE]

The rotating speed of motor is divided by magnification factor to display

Press mode key and then select "RATE" mode.
If figures are flickering on the display screen, set reduction ratio of speed by pressing △,▽ keys.

1) Setting values of reduction ratio of gear speed

Real RPM = rotating speed of motor − Ratio value
(adjustable by 0.1 unit between 1~999.9)

Nominal Reduction ratio	Actual reduction ratio				
	K6G□B(C)	K7G□B(C)	K8G□B(C)	K9G□B(C)	K9P□B(F) K9P□BU(F)
3	3	3	3	3	3
3.6	3.6	3.6	3.6	3.6	3.6
5	5	5	5	5	5
5	5	5	5	5	5
7.5	7.5	7.5	7.5	7.5	7.5
9	9	9	9	9	9
10	10	10	10	10	10
12.5	12.5	12.5	12.5	12.5	12.5
15	15	15	15	15	15
18	18	18	18	18	18
20	20	20	20	20	20
25	25	25	25	25	25
30	30	30	30	30	30
36	36	36	36	36	36
40	40	40	40	40	40
50	50	50	50	50	50
60	60	60	60	60	60
75	75	75	75	75	75
90	90	90	90	90	90
100	100	100	100	100	100
120	120	120	120	120	120
150	150	150	150	150	150
180	180	180	180	180	180
200	202.8	200	200	202.5	201.7
250	250.2	250	–	254.5	

ex) 1.0 1.1 1.2 ..... 2.0 ..... 999.9
If the rotating speed of motor is set at 1000rpm and its reduction ratio of speed is set at 2, 1000/2=500(REAL rpm)

2) Setting value of multiplying magnification factor

REAL rpm = Rotating speed of motor / ratio value
(Adjustable by 0.1 unit in the range of 0.2 ~ 0.9)

ex) 0.2 0.3 ..... 0.9
If motor rotating speed is set at 500rpm and multiplying magnification factor is set
500 ÷ 0.5 = 500 × 2 = 1000 (REAL RPM)

[TURN MODE]

This mode is to set rotating speed.

If mode key is pressed and "TURN" mode is selected, then RUN/STOP LED is flickering in green color and then you may set the rotation speed of motor by pressing △,▽ key.

In this case each time of △,▽ key is pressed it moves by 5rpm unit and if it is pressed continuously then it is increased or decreased by 10rpm unit.

ex) If the frequency of electric power is 50Hz: 90 100 110 ..... 1400 ~ 1500rpm.
If frequency of electric power is 60Hz: 90 100 110 ....1400 ~ 1800rpm

* Note : This product is for both 50/60 Hz.

- If this product is being used at 1500 ~ 1800rpm 60Hz and it is changed to 50 Hz then it automatically changed to 1500rpm. (On the basis of magnification factor 1.0).
- If this product is being used at maximum RPM 1500rpm 50Hz and it is changed to 60Hz then it runs at 1500rpm without any change of the speed, and in this case speed can be set in range of 1500 ~ 1800rpm by increasing the turn setting value. (On the bases of magnification factor 1.0).
- Change of power frequency 50Hz 〈–〉60Hz below 1500rpm then the speed is almost the same.

[SLOW ON MODE]

This mode is to set to slowly increase the speed of motor.

Press MODE KEY and select "S–ON" MODE During flickering of figures on the display panel you can set SLOW operating time by pressing △,▽ key.

You can set 0 ~ 30 seconds(In the unit of 0.1 second)

[SLOW OFF MODE]

This mode is to set to slowly decrease the speed of motor.

Press MODE KEY and select "S.OFF" Mode. While the figures on display panel is flickering, you can set SLOW stop time by pressing △,▽ key.

It is adjustable in the range of 0 ~ 30 seconds(In 0.1 second unit)

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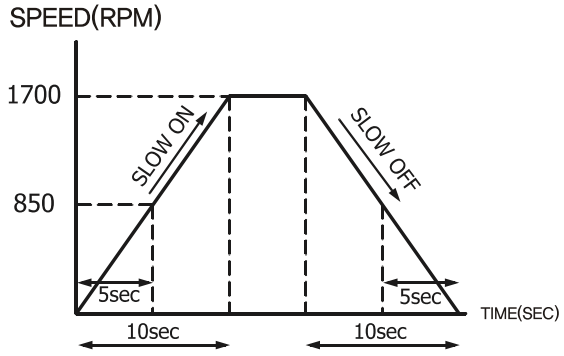


〈Figure 3〉 Graph showing motor speed changes according to SLOW ON/OFF item.

Example) After each time of SLOW ON/OFF set to 10 seconds, if the TURN setting is set to 1700rpm then it takes 10 seconds for it to reach from 0 to 1700rpm and likewise it takes 5 seconds for it to reach to 850rpm.(See figure 3)

** If inertia of load is large, then it may take longer time.

[TACHO MODE]

This mode is to adjust number of TACHO poles.
The default value of this product at the time of release is set to "12" to fit to our motor.
(It is adjustable 1~99, but it is usually used at 12 or 24)
If the value of TACHO is set to too low or too high comparing with motor, it may not reach to the operating speed of motor or it may

[LOCK MODE]

This mode is to prevent any change of the set operating condition by locking setting keys except RUN/STOP KEY

After setting the operating condition, press MODE key and then select "LOCK" MODE. While "LOCK" is flickering you may set it by pressing △,▽ key.(LOCK LED is lit).

Operations to be recognized in the LOCK MODE.
① RUN/STOP KEY
② ADJ VOLUME CONTROL
③ POWER ON/OFF

* How to release LOCK MODE
It is released if electric power is switched ON with the RUN/STOP KEY pressed.

[POWER ON CONDITION SETTING MODE]

This mode is to select operating condition of motor at the time of electric power being switched ON. There are 2 modes "YES", "NO" in the POWER ON CONDITION SETTING.

Press MODE KEY + △ or ▽ Key and then set to "YES" or "NO".

Set to YES		
Last condition before power switches OFF	If power is switched ON	☞ Last condition before power switch OFF is "RUN" then if the power switched on then it is always "RUN" condition. Likewise if the last condition before power switch off is "STOP" then if the power is switched on then it becomes always "STOP".
'RUN' condition	Start up	
'STOP' condition	Stop	
Set to NO		
Last condition before power switch OFF	If electric power is switched ON	☞ Whether the last condition before power switch off is 'RUN" or 'STOP". If power is switched on then it becomes always "STOP"
'RUN' condition	Stop	
'STOP' condition	Stop	

〈Table 1 – Description of POWER ON CONDITION MODE〉

*It is set to "NO" at the time of release of the product.
(The reason why it is used in usually at "NO" set condition is that it can prevent any risk of sudden operation at the time of recovery of electric power interruption.)

8. Basic operation method

1) Preparation of operation

Switch on the power and set [POWER ON CONDITION SETTING MODE] to "YES" or "NO". (Default value set at the time of release of the product is 'NO")
* [POWER ON CONDITION SETTING MODE]

2) Setting of rotation direction

After power switched off, if the terminals located at rear of controller is wired CW–COM then it rotates clockwise, and if terminals are wired CCW–COM then it rotates count clockwise.

Note) Rotation direction in the view from output side of motor

CW	Clockwise direction
CCW	Count clockwise direction

Caution)
** [Figure 2–description of rear part]*

3) Connection of motor

: Connect the connector for motor.

SPEED CONTROL UNIT

4) POWER ON
: Switch ON electric power.

5) Selection of magnification factor
: Set the decrease or increase ratio of gear. (The default value is set at 1.0 at the time of release of the product)

** [RATIO MODE]*

6) Setting SLOW ON/OFF time
The default value for both ON/OFF is set to 0 second at the time of release of the product.

** [SLOW ON], [SLOW OFF]*

7) Operation
Select OPERATION with RUN/STOP KEY. The start of operation is indicated by RUN/STOP LED changed into green color.
During operation, speed is adjustable by pressing △,▽ key in TURN MODE.
SLOW ON/OFF time is adjustable even during operation.

8) Change of rotating direction (CW〈–〉CCW)
After switched off the power, the rotating direction of motor can be changed by using direction change terminals located at rear part.

9) STOP
Select STOP with RUN/STOP KEY. STOP is indicated with RUN/STOP LED changed into red color.

10) Option (Use of external switch)
GUD is available with use of external switch.
External Switch "ON" causes temporary stop during running.
(External Switch "OFF" return to Running)
During stop when changing external switch ON to OFF, start running with setting value..

*Note :

External Switch OIN	External Switch Cable Connected
External Switch OFF	External Switch Cable Not Connected

RUN/STOP	External Switch	Running
RUN – LED Green	ON	Temporary Stop
	OFF	Run
STOP– LED Red	ON –〉 OFF	Run (run with last setting value)
	OFF –〉 ON	Stop

〈Table 1〉

※ Note : During External Switch ON, Mode & RUN/STOP button can't be worked.

9. Fine adjustment of rotating speed (Speed adjustment)

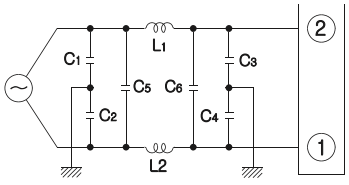
RPM value set in TURN MODE may be different from actual RPM according to the load condition . In this case it is adjustable with ADJ volume. You can do fine adjustment with small watch–driver.

Note – ADJ volume shall not be turned by force or strongly pressed. The watch–driver shall be maintained at right angle to the ADJ volume hole during adjustment.

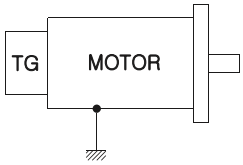
〈Figure 5〉 ADJ Volume

10. Count measure against noise

If it makes error during operation due to noise from external lines then use following noise filter.



C1∼C4 : 1000PF(2000VDC)
L1∼L2 : about 100uH

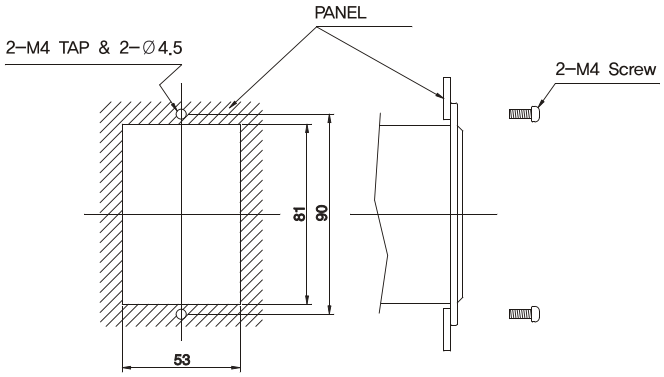


C5∼C6 : 0.1uF∼0.2uF
(AC 125WV or AC 250WV)

(Note) 1. L1 ∼ L2 shall not be self saturated by motor current.
2. The motor shall be grounded to the same position of the earth of condenser.
3. The wiring shall be short in length and the thick in diameter for earthing.

SPEED CONTROL UNIT

11. PANEL PROCESSING DIAGRAM



Method to fix by making holes at four faces.

12. Checking

Performance of parts may become bad and their life may make problems due to influence from operating environment(temperature, humidity, dust, vibration, etc), routine checking in advance is very important in order to prevent unexpected failure.

13. Causes and count measure of faults

If any abnormal condition occurs, "ERR.#(ERROR NUMBER)" is to be displayed.

〈List of error messages〉

Err.1	Frequency signal(50/60Hz signal pulse) are not inputted. Power connection is abnormal.
Err.2	T.G connection is abnormal or direction change terminals are not connected. Motor is not connected.
Err.3	Motor does not operate. Check the connection of starting condenser. T.G signal is abnormal

If electric power is switched on again then it may return to normal operation. (However, set value is the default value at the time of release of product.) If "Err.#" is still displayed even after power switch on again then fault may be considered in the internal circuit.
(Please contact A/S section of our company)

Q–1) Display panel goes out and motor does not rotate.
A–1) Check correct wiring.

Q–2) Speed of motor is not constant and unstable.
A–2) Check setting of number of motor poles in correct setting in TACHO MODE.

Q–3) Display panel is out and even though RUN/STOP LED is in green color motor does not rotate.
A–3) Check if it is overloaded. Reduce load or increase capacity of motor.

Q–4) The speed of motor is not adjustable
A–4) If rotation speed setting is not possible in turn mode then check if T.G is disconnected. In this case error message 2(Err.2) may be mostly displayed.
* After disconnect of motor connector, test conductivity of T.G1, 2 blue–blue wire at rear part of controller.

Q–5) Even though it generates voltage*of T.G, speed of motor is not adjustable. (If voltage of T.G is not generated, then it is fault in controller.)
* Measure the voltage between T.G 1, 2 blue wire–blue wire at the rear part of controller in the condition of seperation of motor connector.
A–5) Rotor is rotating without loaded. Check motor.

Q–6) Motor is abnormally heated during its rotation.
A–6) It is normal heat generated due to internal loss of motor therefore some heat shall be considered as normal. However if it is highly heated during operation then Its life may be decreased therefore surface temperature of motor is recommended to maintain at below 90℃.

** Note: If motor has T.P(Thermally protector) in it motor circuit is automatically opened if it is abnormally heated. (It is indicated in the motor name plate)*