GGM GGM GEARED MOTOR

## 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	GSA-U	GNA-U	GSA-C	GNA-C
Characteristics		GSA-J	GNA-J	GSA-L	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.
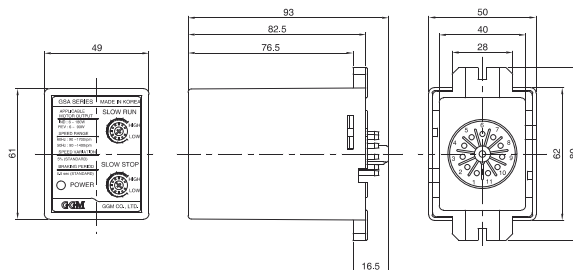
Main Body Wiring Diagram
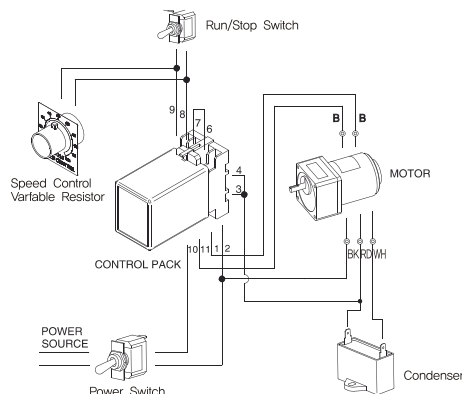
1. If turn power switch(SW1) ON, CONTROL PACK of the [POWER LAMP] is lit.
2. Motor speed is able to control by external speed setter without steos.
3. Operation current of motor is passing through the thick solid line. Use around 0.75 ㎟ of thick solid wires, thin solid wires around the 0.5 ㎟.
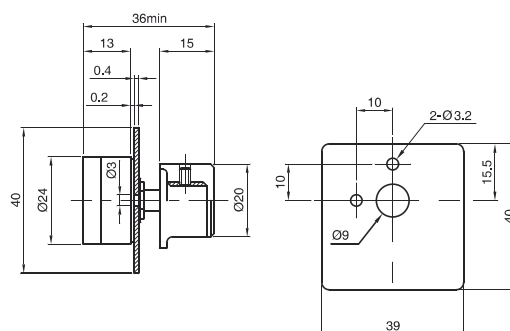
Product OUTLINE

■ CONTROL PACK

■ 11 PIN SOCKET

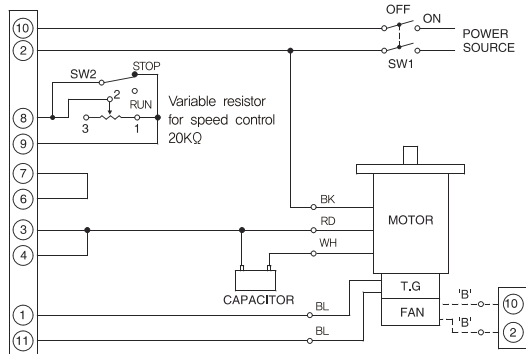■ External Speed Setter
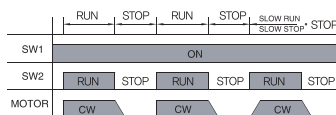
GGM GGM GEARED MOTOR
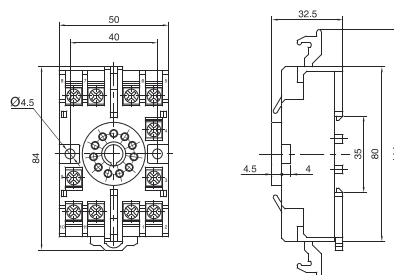
SPEED CONTROL UNIT

Basic Electrical Wiring(INDUCTION MOTOR)

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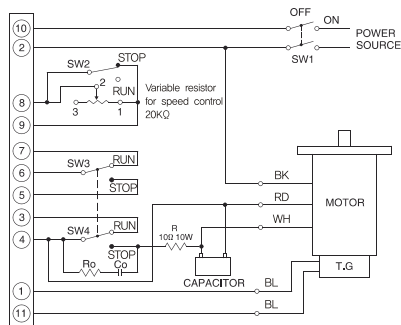

SW1	AC125V or more than AC250V 5A
SW2	DC20V 10mA

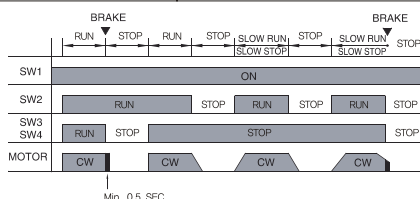■ Caution
1. Rotating direction of MOTOR is clockwise(CW) seeing from output shaft side.
   When set Counter-clockwise (CCW) please exchange the red and white among MOTOR LEADs.
2. When wiring more than 60W FAN, please use connecting MOTOR MOTOR lead (yellow line) to ⑩, ②. ('B' part)

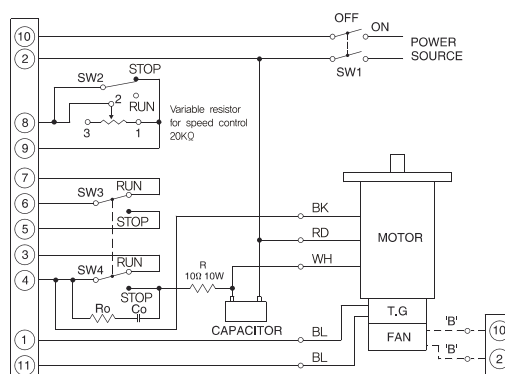### 2. When set 「one-way operation + change of speed + braking」 operation in INDUCTION MOTOR (6 W~25 W)

| 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

Min. 0.5 SEC
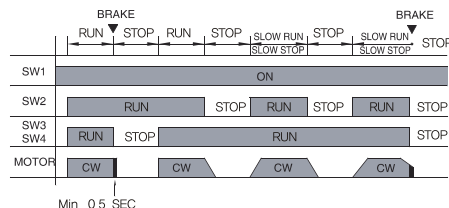
■ Caution
1. MOTOR direction of rotation is clockwise (CW) seeing from output shaft side. Exchange red and white color among MOTOR LEAD lines in case of set to counterclockwise (CCW).
2. When wiring MOTOR more than 60 W FAN, use connecting MOTOR leader (Yellow line) to ⑩,② ('B' part)

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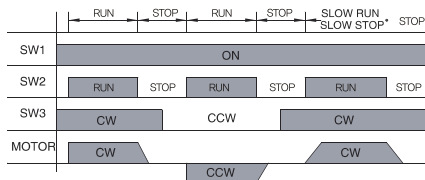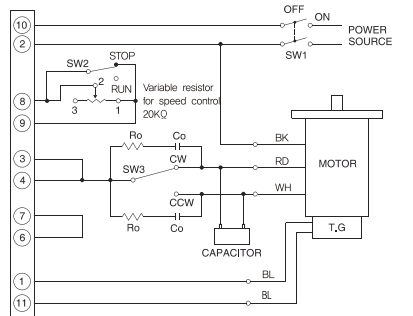
■ Caution
1. Do not change direction of rotation for about 3 seconds after MOTOR stop when approve power and stop moment.
2. When do not use long hours, set SW1 by OFF to prevent heating of CONTROL PACK.

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Basic Electrical Wiring(REVERSIBLE MOTOR)

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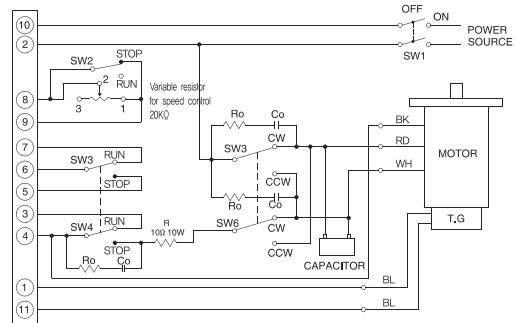

SW1, SW3	AC125V or more than AC250V 5A
SW2	DC20V 10mA
Ro, Co	Ro=10~200Ω(more than 1/4W) Co=0.1~0.2μF (AC125WV or AC250WV)
R : External resistance for braking	more than 10Ω 10W

2. When operate 「normal/reversed operation + change of speed + Braking」 in REVERSIBLE MOTOR.(6W~25W)
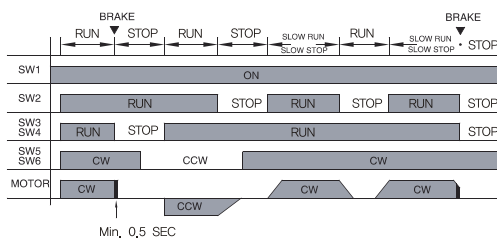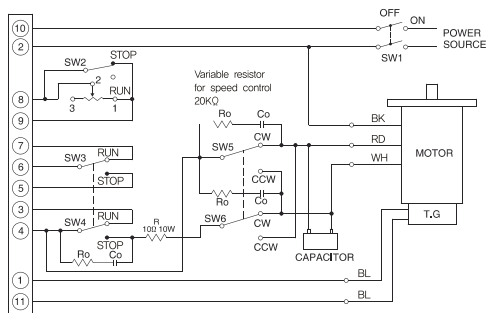
Min. 0.5 SEC

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

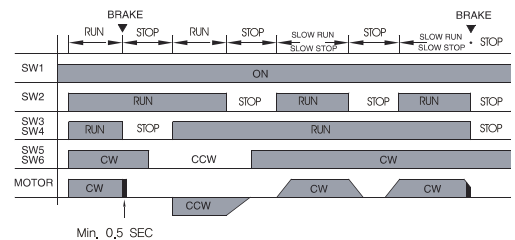### 3. When operate 「normal/reversed operation + change of speed + Braking」 in REVERSIBLE MOTOR. (40W ~90W)

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

Min. 0.5 SEC

■ 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.

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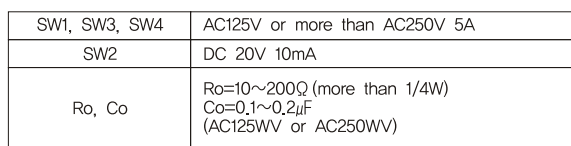
SW1, SW3, SW4	AC125V or more than AC250V 5A
SW2	DC 20V 10mA
Ro, Co	Ro=10~200Ω(more than 1/4W) Co=0.1~0.2μF (AC125WV or AC250WV)

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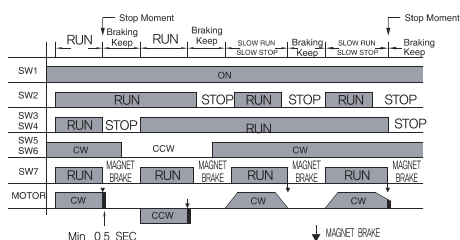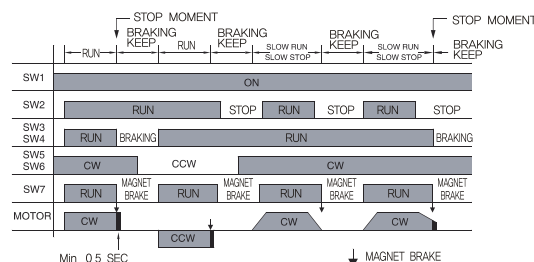
SLOW RUN, SLOW STOP Function
MOTOR rotation can be set to accelerate and decelerate slow through control volume of SLOW RUN, SLOW STOP of CONTROL PACK. Setup time increases as raising volume and can be set SLOW RUN : about 30±5 seconds, SLOW STOP : about 35±5 seconds in volume MAX. (Up to 60Hz : 1700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

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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.
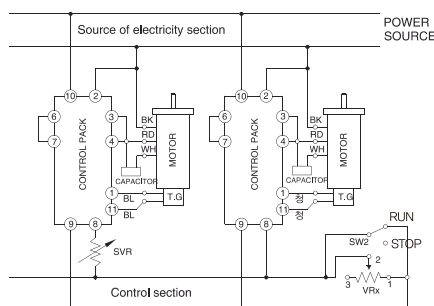

As like above wiring diagrams, connect power supply (terminal number ②, ⑩) and controls (terminal number ⑧, ⑨) to each wire the by same lines. Even in case of combunation other motor with CONTROL PACK, parallel operation is possible making same power part and control part.

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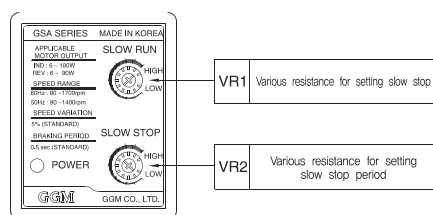
— In case of control number of rotation by external DC voltage
In case of set MOTOR speed by external DC power instead of variable resistor for external speed setting that is accessory, connect DC power and CONTROL PACK as follows; (However, use the DC power output isolated from the AC input, and note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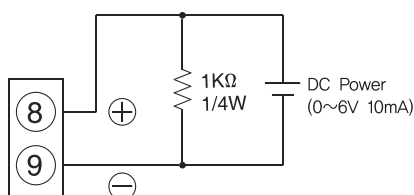

(Connection wiring diagram of control speed by esternal DC voltage)

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
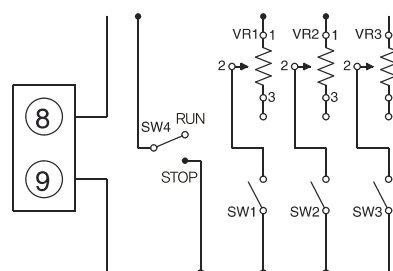— Occasion that ambient temperature is low
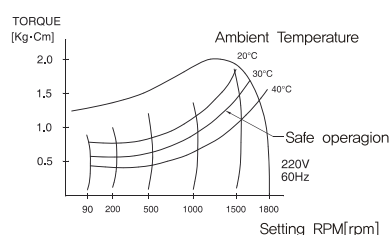
■ Caution
   Should be used in less than 90 ℃ of surface temperature of the MOTOR case.

— 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.

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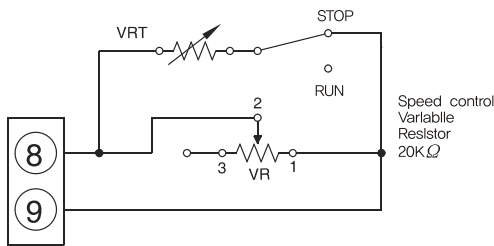
VRT	2KΩ 1/4W B Characteristics
SW2	DC 20V 10mA

* 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).
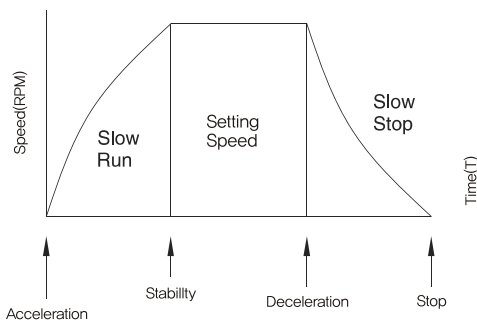
13. Moment stop characteristics
There is electric brake function in CONTROL PACK that MOTOR can be stopped moment in a short time of 0.1 seconds while operation.
Braking current will work about 0.5 seconds and thereafter will automatically turn off.
There is no retention power to catch MOTOR that can 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.