GGM
GLOBAL GEARED MOTOR

www.ggm.co.kr

OPERATION MANUAL

GUD SERIES
SPEED CONTROL UNIT

DIGITAL

■ Headquarters / 1st Factory : 22, Gyeongin-ro 3beon-gil, Bucheon-si, Gyeonggi-do, Republic of Korea
Tel:(032)664-7790 Fax:(032)611-7791
■ Attached research institute / No. 2 factory : 180, Oksan-ro, Bucheon-si, Gyeonggi-do, Republic of Korea
Tel:(032)684-7791 Fax:(032)683-5059

GGM Co., Ltd.

Thank you for purchasing this GGM product.
Please do not use this product until you have read this user's guide thoroughly and familiarized yourself with the knowledge, safety information and precautions related to the product that it contains. After reading this user's guide, keep it at hand to use as a reference whenever it is needed.

1. Safety precautions

Please observe the following safety precautions in your use and operation of the product. Failure to observe the precautions may result in electric shock, injury or fire. The following precautions are very important and need to be observed at all times.

⚠ **Warning**	Ignoring the following warnings and instructions on the handling of the product may result in death or serious injury.

- Do not use the product near explosive materials, flammable gases, corrosive materials, combustible materials, or in places where it may be splashed by water. This may cause fire, electric shock or injury.
- Do not forcibly bend, pull or insert the motor lead wire. This may cause fire or electric shock.
- Do not move, install, connect or check the product while it is connected to an electric current. Carry out the work only after cutting off the power supply. Failure to do so may cause an electric shock.
- Have a qualified person with relevant knowledge install, connect, operate, control and check the product for failure. Failure to do so may cause fire, electric shock or injury.
- Within 1 minute after cutting off the power supply, do not touch the output terminal. This may cause an electric shock.
- Cut off the power supply when the power failure protection device or overheating protection device (THERMAL PROTECTOR) operates. Failure to do so may cause injury due to sudden re-operation of the product.
- Install the speed controller in the housing. Ground the protection ground terminal when it is installed. Failure to do so may cause electric shock or injury.
- Observe the rated voltage for the AC power supply to the speed controller. Failure to do so may cause a fire or damage to the product.
- Do not disassemble or modify the motor or the speed controller. This may cause an electric shock or injury.

⚠ Caution	Ignoring the following warnings and instructions on the handling of the product may result in injury or property damage.

• Do not use the motor or the speed controller beyond its specifications. Doing so may cause injury or damage to the product.

• Do not operate the product with wet hands. Doing so may cause an electric shock.

• Do not hold or carry the motor's lead wire. Doing so may cause disconnection and injury.

• Do not use the product for up and down operation. Doing so may cause injury or damage to the product.

• Use the motor only when the surface temperature of the motor is 90℃ or below.

• Disconnect the power supply if you do not intend to use the product for an extended period of time.

• Do not touch the product with your hand or any other body part while operating the product or immediately after stopping its operation. As the surface of the motor is very hot, there is a risk of burn.

• If an abnormality occurs, cut off the power supply immediately to stop the operation.

• The controller has no protection device. Install an over-current protection device, earth leakage circuit breaker or overheating protection device for safety.

• If the product is operated in parallel with a device controlled in a thyristor for a high-capacity electric furnace or welding machine, the product may malfunction. Wire separately using a separate power supply circuit.

• The product can be used at ambient temperatures between -10℃ and 40℃ and humidity less than 85%. Avoid exposure to direct sunlight, moisture or grease, and when using the product in such places, use the cover.

• Do not use the product in a place where static electricity occurs frequently.

• Dispose of this product as industrial waste.

• If you need to repair the product, contact us or the place where you purchased the product.

• Do not modify the product arbitrarily. Arbitrary product modification by the customer will void the warranty.

2. Confirmation when the product is handed over

- Confirm that the delivered product is the product you ordered.
- If a different product is installed, there is a risk of injury or fire.
- Contact a nearby retail store if there is a shortage compared to the number of the products you ordered or if a damaged product is delivered.

1) CONTROLLER ---------- 1EA
2) Extension cable (0.5m) ---------- 1EA
3) User's Guide (this book) ---------- 1EA
4) Option (extension cable)

Item name	Extension cable Length
KE-05	0.5m
KE-10	1m
KE-15	1.5m
KE-20	2m

If the controller is far away from the motor, refer to the optional specifications detailed in the table above. Extension up to 2 m is possible using one extension cable.
Do not extend more than 2.5m, as degradation of the motor's properties may occur.

3. Specifications

Characteristics \ Model name	GUD-U-□	GUD-C-□
Rated voltage and power frequency	Single-phase 100V~115V 50/60Hz	Single-phase 220V~240V 50/60Hz
Range of service voltage	±10% (in comparison to the rated voltage)	
Applied motor output	6 ~ 180W	
Speed control range	50Hz : 90~1430rpm 60Hz : 90~1730rpm	
Speed setting	Increase or decrease by 10 due to input setting	
Service temperature range	-10~40℃	
Preservation temperature range	-20~60℃	
Service humidity range	Less than 85% (place with no dew condensation)	
Protection level	IP20	

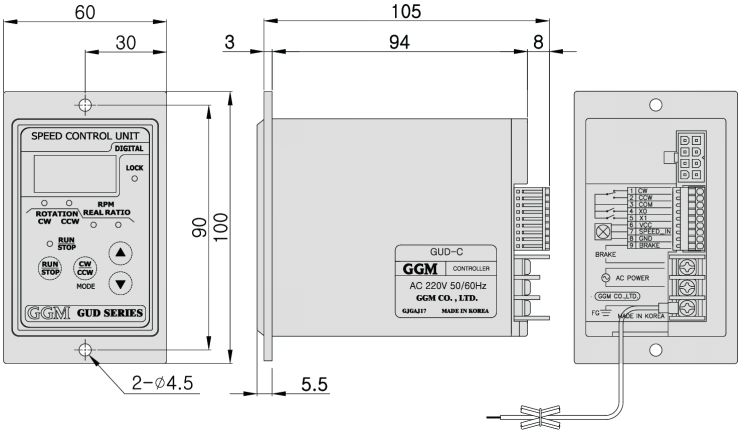
A number indicating the output of the motor is displayed where the □ is placed in the model name.

4. CONTROLLER CODING SYSTEM

G	U	D	-	C	-	60

- G : GGM Co.,LTD.
- U : Unit Type
- D : Digital Type
- C : Single Phase
  - 220V 50/60Hz
  - 230V 50/60Hz
  - 240V 50/60Hz
- U : Single Phase
  - 110V 50/60Hz
  - 115V 50/60Hz
- 6 : 6W
- 15 : 15W
- 25 : 25W
- 40 : 40W
- 60 : 60W
- 90 : 90W
- 120:120W
- 180:180W

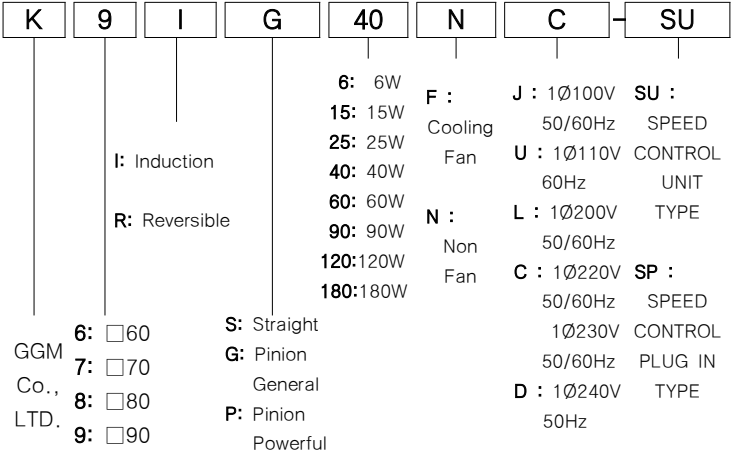
5. Outside view of the product



6. Characteristics of the product

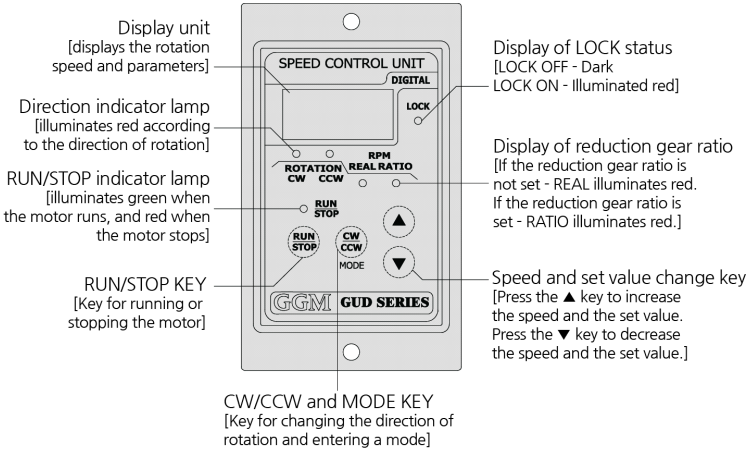
① Indicates the current rotation speed (r/min).
② The motor speed can be controlled simply by connecting the motor and the control unit using the dedicated connector, and connecting the AC terminal to the power source.
③ You can use the CW/CCW key at the front side and the external input port at the rear side to change the direction between forward and backward.
④ Multi-level speed control can be achieved using the input port. (4 levels)
⑤ You can control the speed simply by using the front switch.
- Range of variable speed -
50Hz : 90 ~ 1430 r/min, 60Hz : 90~1730 r/min
⑥ Various operation modes are available through the parameter setting.
- Reduction gear ratio, acceleration/deceleration time, Lock, brake function, speed change unit
⑦ The external volume can be used.

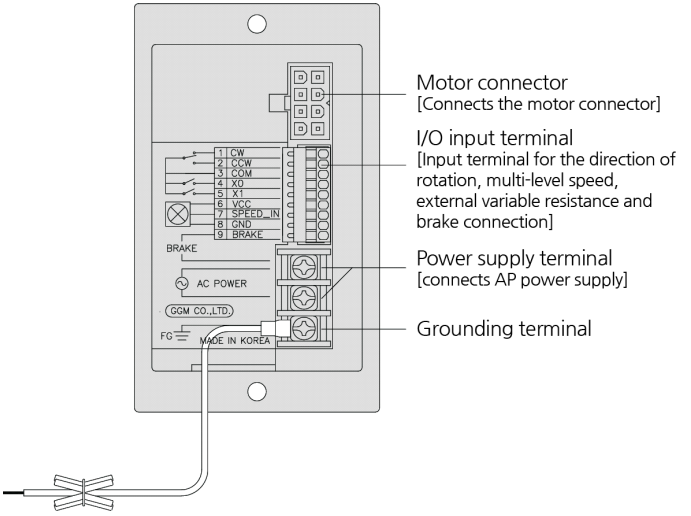
7. Applied motor



- The motor and the speed controller are packaged separately, so confirm that the speed controller can be used for the applicable motor.

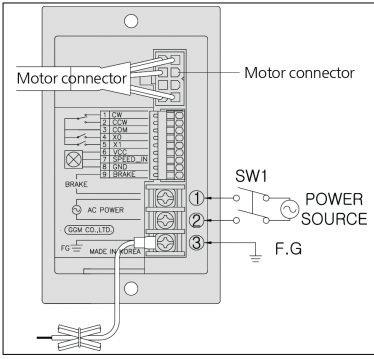
8. Names and functions of each part





9. Wiring method

9-1 Power and motor wiring

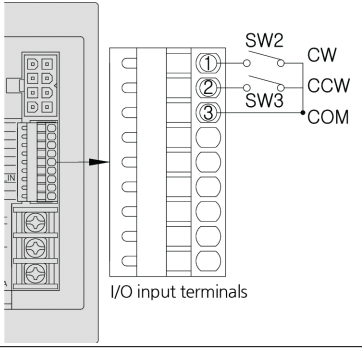


▶ Connect the motor connector to the motor connector terminal at the back of the controller.
▶ Connect the AC power to power supply terminals No. ① and No. ②.

SW1 contact capacity
AC 125V or 250V 5A or higher

▶ Connects grounding to No. ③.

9-2 Forward and backward signal wiring

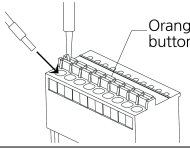


▶You can operate forward and backward motor rotation by connecting to I/O input terminals No. ①, No. ② and No. ③.

SW2	SW3	Motor shaft rotation
ON	OFF	Rotate in the CW direction
OFF	ON	Rotate in the CCW direction
OFF	OFF	Stop

※ I/O input takes precedence over the RUN/STOP key at the front.

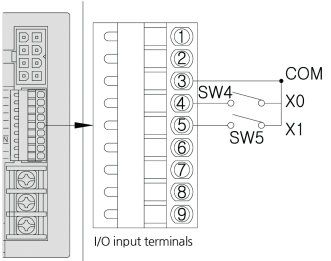
※ LEAD WIRE connection method



※ Lead wire specifications
- AWG 26~20 (0.14~0.5 ㎟)
- Length of the stripped sheath : 8mm

▶ Insert the lead wire while depressing the orange-colored button using a screwdriver.

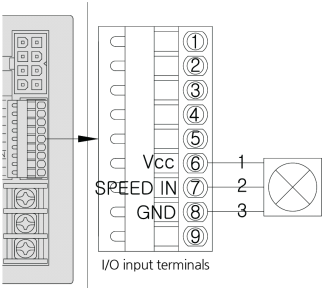
9-3 Multi-level speed wiring method



▶You can set the speed in 4 levels by connecting to I/O input terminals No. ③, No. ④ and No. ⑤.

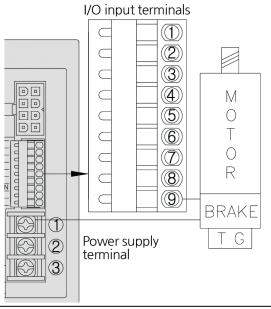
SW4	SW5	MOTOR rotation speed
OFF	OFF	Set speed at the front
ON	OFF	SPD 1 set speed
OFF	ON	SPD 2 set speed
ON	ON	SPD 3 set speed

9-4 External variable resistance (speed change) wiring method



▶ You can change the speed by connecting variable resistance to I/O input terminals No. ⑥, No. ⑦ and No. ⑧.
(20KΩ 1/4W characteristics)

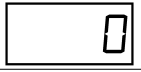
9-5 Brake wiring method (Speed control brake motor)



▶ Connect the electromagnetic brake line to I/O input terminal No. ⑨ and power supply terminal No. ①.
▶ Enable the use of the brake in the parameters.
[OFF => ON] (Refer to Page 14)
▶ In the event of a Motor RUN signal, the power will be supplied to the brake, and in the event of a Motor STOP signal, the power supplied to the brake will be cut off.

10. Operation and parameter setting sequence

10-1 Operation sequence

① Supplying the AC power (Connect the AC power to the power supply terminals No. ① and No. ②)	
	The indicator lamp illuminates. (Rotation speed)
② Controlling the operation key (operation)	
	When you press the RUN/STOP key, the motor will start rotating at the set speed. [RUN/STOP indicator lamp illuminates green]
③ Rotation speed setting	
	Press the ▲ key to increase the speed Press the ▼ key to decrease the speed
	Display of rotation speed / When the power is supplied again, the motor will rotate at the new rotation speed.
④ Changing the direction of rotation	
	When you press the CW/CCW key while the motor is rotating in a CW direction, the rotational direction of the motor will change to CCW. When you press the CW/CCW key while the motor is rotating in a CCW direction, the rotational direction of the motor will change to CW. [If you change the direction while the motor is operating, the direction will not change immediately. The direction changes after the motor decelerates and stops.]
⑤ Controlling the operation key (stop)	
	When you press the RUN/STOP key while the motor is operating, the motor will stop. [RUN/STOP indicator lamp illuminates red]

10-2 Parameters

Display unit	Function	Range	Default value	Note
RATE rAtE	Reduction gear ratio	1~ 999	1.0	Reduction gear ratio setting REAL RPM = Motor rotation speed / Reduction gear ratio
S-ON S-On	Acceleration time	0~15	0.0	Mode set to accelerate the rotation of the motor slowly (increments of 0.1 second)
SOFF SOFF	Deceleration time	0~15	0.0	Mode set to decelerate the rotation of the motor slowly (increments of 0.1 second)
LOCK LOCK	Lock Function	YES NO	NO	Mode set to prevent the change of the set operation condition by locking setting keys other than RUN/STOP key YES: Lock, NO: Unlock
DGT dGt	Speed change unit	1,5, 10	10	When setting the acceleration/deceleration speed, set a speed change unit. (If set to 10, the speed increases by 10)
SPD1 SPd1	Set speed 1	90~ 1730	500	Multi-level operation speed SPD1 setting (Operates when the I/O inputs ③-④ are connected)
SPD2 SPd2	Set speed 2	90~ 1730	1000	Multi-level operation speed SPD2 setting (Operates when the I/O inputs ③-⑤ are connected)
SPD3 SPd3	Set speed 3	90~ 1730	1500	Multi-level operation speed SPD3 setting (Operates when the I/O inputs ③-④-⑤ are connected)
BRK brK	Brake function	YES NO	NO	Set whether or not to use the electromagnetic brake YES: Use the brake NO: Do not use the brake

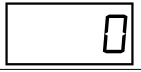
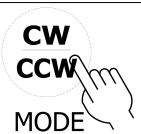
10-3 Parameter setting sequence

① Supplying AC power	
	The indicator lamp illuminates. (Rotation speed)
② Entering Parameter mode (**Press and hold**)	
	Press and hold the CW/CCW key **(for 3 seconds or longer)** to enter Parameter mode.
③ Selecting a parameter (9 parameters)	
	Press the Arrow keys to select the desired parameter. The mode changes in the order of RATE -> S-ON -> SOFF -> LOCK -> DGT -> SPD1 -> SPD2 -> SPD3 -> BRK
④ Entering parameter data (**press briefly**)	
	Press CW/CCW briefly to enter the selected parameter data. When you press CW/CCW briefly after entering data,the parameter selection mode will be displayed.
⑤ Changing parameter data	
	Press the arrow keys to change the data value. Set the desired data value.
⑥ Finishing parameter data change and entering Operation mode (**Press and hold**)	
	When you press and hold the CW/CCW key **(for 3 seconds or longer)**, the changed value will be set and saved, and the motor will enter Operation mode. Caution) If you press the CW/CCW key briefly, the changed value will not be saved.
※ To enter Operation mode after entering Parameter mode, press and hold the [CW/CCW] key.	

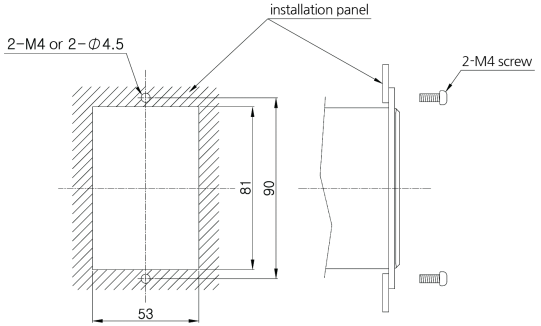
10-4 Setting method if using the reduction gear ratio (ex. 1/10 of the reduction gear ratio)

① Supplying AC power	
	The indicator lamp illuminates. (Rotation speed)
② Entering Parameter mode (**Press and hold**)	
	Press and hold the CW/CCW key **(for 3 seconds or longer)** to enter Parameter mode.
③ Selecting a parameter	
	Press the arrow keys to select the RATE parameter. 
④ Entering RATE DATA (**Press briefly**)	
	Press the [CW/CCW] key briefly to enter RATE parameter data (When you press CW/CCW briefly after entering RATE parameter data, the parameter selection mode will be displayed.)
⑤ Changing parameter data	
	Press the arrow keys to set the reduction gear ratio - Default value: 1 (Setting range: 1-999) - Change the set reduction gear ratio from 1 to 10.
⑥ Finishing parameter data change and entering Operation mode (**Press and hold**)	
	When you press and hold the CW/CCW key **(for 3 seconds or longer)**, the changed value will be set and saved, and the motor will enter Operation mode.
The displayed speed will change to the reducer output speed due to the setting of 1/10 of the reduction gear ratio. (90~1730 rpm => 9~173 rpm)	

10-5 Setting method if using the electromagnetic brake

① Supplying AC power	
	The indicator lamp illuminates. (Rotation speed)
② Entering Parameter mode (**Press and hold**))	
	Press and hold the CW/CCW key **(for 3 seconds or longer)** to enter Parameter mode.
③ Selecting a parameter	
	Press the arrow keys to select the BRK parameter. 
④ Entering BRK DATA (**Press briefly**)	
	Press the [CW/CCW] key briefly to enter BRK parameter data. (When you press CW/CCW briefly after entering BRK parameter data, the parameter selection mode will be displayed.)
⑤ Changing parameter data	
	Press the arrow keys to set whether or not to use the brake. - Default value : NO (Do not use brake) - To use the brake, change NO => YES
⑥ Finishing parameter data change and entering Operation mode (**Press and hold**)	
	When you press and hold the CW/CCW key **(for 3 seconds or longer)**, the changed value will be set and saved, and the motor will enter Operation mode.

11. Installation method (Panel process drawing)
- Drill a hole in the installation panel as shown in the figure below. Assemble the controller body and the front cover, and fix them using M4 screws and nuts.
(Use an installation panel with a thickness of 2mm or less)



12. Potential causes of failure, and countermeasures

Problem	Checkpoints
The value is not displayed on the display unit when power is supplied.	• Check the connection of AC power supply.
The motor does not rotate.	• Check whether the motor is connected correctly.
	• Check whether the RUN key illuminates green and I/O connection is established properly.
	• Check whether the motor is overloaded.
The motor rotates, but the speed cannot be changed.	• Check for abnormalities in the TG signal of the motor, or for incorrect wiring.
The motor does not run immediately.	• Check whether an excessively long acceleration time has been set.
The speed cannot be changed.	• Cancel the lock setting.
There is abnormality or excessive vibration during motor operation.	• Check whether the motor is affected by an external noise.
	• Confirm that the combination of the motor and the speed controller is the same.

※ Contact the retail store where you purchased the product or our Factory 2 if you have any product inquiries or customer service requests.

Leader of geared motor GGM CO.,LTD. http://www.ggm.co.kr

Headquarters / 1st Factory
22, Gyeongin-ro 3beon-gil, Bucheon-si,
Gyeonggi-do, Republic of Korea
TEL : 82-32-664-7790 FAX : 82-32-611-7791

Attached research institute / No. 2Factory
180, Oksan-ro, Bucheon-si,
Gyeonggi-do, Republic of Korea
TEL : 82-32-684-7791 FAX : 82-32-683-5059