# GGM  GGM GEARED MOTOR

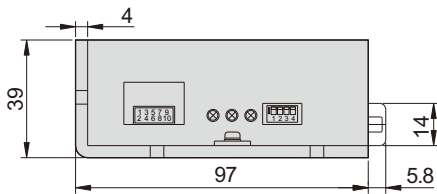# BLDC SPEED CONTROL UNIT

## GUX
### GUX-2-400
### GUX-9-750

### X Series motor applied product

→ **Product appearance**

■ Driver main part outside view



**[ ENCODER ]**
1: OUT A-   8: GND
2: OUT A+   7: ENC_U
3: OUT B-   6: ENC_V
4: OUT B+   5: ENC_W
7: OUT Z-   4: ENC_A
8: OUT Z+   3: ENC_A
9: POS_IN   2: ENC_A
10: DIR_IN  1: +5VDC

**BLDC Motor Driver**

**REGENERATIVE RESISTOR**

**[ VOLUME ]**
VR1: SLOW START
VR2: SLOW STOP
VR3: LOAD (INT. SPEED)

**[ I/O ]**
1: SPEED (+5VDC)
2: SPEED (SIGNAL)
3: SPEED (GND)
4: CW/CCW
5: DRIVER ON/OFF
6: MOTOR STOP
7: INT. SPEED
8: GND
9: INPOS OUT
10: GND
11: ALARM RESET
12: SPEED OUT
13: ALARM OUT
14: READY OUT

**GGM**
**GUX-9-750**
Input Voltage : DC24V(400W) / DC48V(750W)
www.ggm.co.kr
Made In Korea

**[ ALARM STATUS ]**
HALL SENSOR : 1 flash
LOW-VOLTAGE : 2 flash
OVER-LOAD : 3 flash
PARAMETER : 4 flash
OVER-HEAT : 5 flash
OVER-VOLTAGE : 6 flash
OVER-SPEED : 7 flash
OVER-CURRENT : 8 flash
MOTOR STALL : 9 flash

**[ DIP SWITCH ]**
1: ON 400W  OFF 750W
2: ON SINE   OFF SQUARE
3: ON OPEN  OFF CLOSED
4: ON POS   OFF SPEED

**[ SERIAL COMM ]**
4-7: OP-S00(Loader)
8: GND
9: RS-485 (A+)
9: RS-485 (B-)

**[ Hall SENSOR ]**
1: +5VDC
2: NC
3: GND
4: Hall U
5: Hall V
6: Hall W

**[ EMB ]**
1 E_P
2 E_B

**[ MOTOR ]**
U  V  W

**[ POWER ]**
(+)  (-)

**LED**

Dimensions: 190, 171, 180.5, 4.5, 97, 53, 17, 10, 4.75, 39, 4.5, 20, 4, 39, 14, 97, 5.8

## [ Accessory ]
■ Driver In / Out put IO wire

MOLEX 5557-14R        LEAD UL Style 1007, AWG 22



**Variable resistor 10KΩ**

300mm
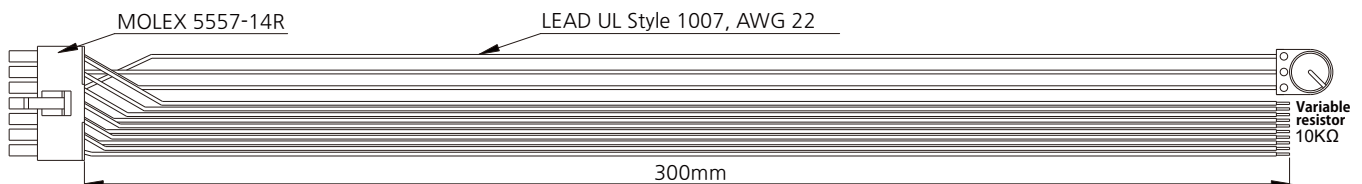
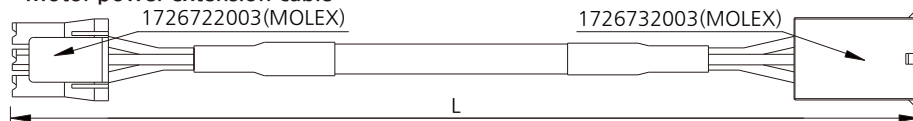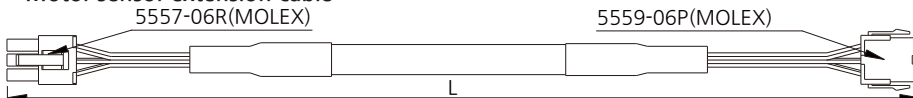## [ Optional Parts ]

Please Buy extension cable additionally for extending between motor and control(optional)
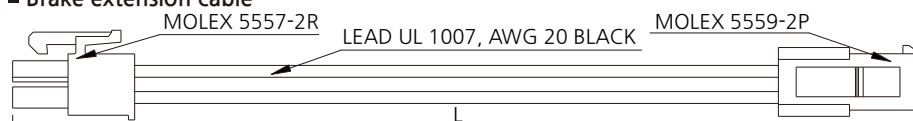
■ **Motor power extension cable**
1726722003(MOLEX)        1726732003(MOLEX)

L

■ **Motor sensor extension cable**
5557-06R(MOLEX)        5559-06P(MOLEX)

L

■ **Encoder extension cable**
SMH200-08(YEONHO)        SMH200-08PL(YEONHO)

L

■ **Brake extension cable**
MOLEX 5557-2R    LEAD UL 1007, AWG 20 BLACK    MOLEX 5559-2P

L

| MODEL | L (extension cable length) |
|---|---|
| K10XEW-1 | 1m |
| K10XEW-1.5 | 1.5m |
| K10XEW-2 | 2m |

| MODEL | L |
|---|---|
| K10XEW(h)-1 | 1m |
| K10XEW(h)-1.5 | 1.5m |
| K10XEW(h)-2 | 2m |

| MODEL | L |
|---|---|
| KEEW-1 | 1m |
| KEEW-1.5 | 1.5m |
| KEEW-2 | 2m |

| MODEL | L |
|---|---|
| KXEW(B)-1 | 1m |
| KXEW(B)-1.5 | 1.5m |
| KXEW(B)-2 | 2m |

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→ **Name and functions of each part**



| ① | LED | ④ | Electronic brake | ⑧ | DIP switch |
|---|---|---|---|---|---|
| ② | Power DC 48V/24V | ⑤ | Motor& Hallsensor | ⑨ | Internalvolume |
| | | ⑥ | In/OutputIO | ⑩ | Encoder(option) |
| ③ | Motor Power | ⑦ | Serial communication - OP-500 - RS485(option) | ⑪ | Regenerative resistor |

## 1. Specifications

| Item | | GUX-2-400 | GUX-9-750 | 비 고 |
|---|---|---|---|---|
| Rated output[W] | | 400W | 750W | |
| Input power[V] | | DC 24V | DC 48V | |
| Rated current[A] | | 24 | 21 | |
| Max current[A] | | 30 | 30 | |
| External size (mm) | | 190 X 97 X 39 | | |
| Communication | | RS485 Communication board (option) | | |
| Encoder | | Encoder Board (option) 1,000 ppr | | |
| Speed control | Speed control | 100~3,000r/min (Velocity variation±1% or under) | | |
| | Position control | 1~3,000r/min (Velocity variation±1% or under) | | Encoder type (When controlling pulse input) |
| Operating Environment | Termperature | Use : 0 ~ 40℃,  Storage : -20 ~ 70℃ | | Non-freezing |
| | Humidity | Use : 85% below, Storage : 85% below | | Non-condensing |
| | Environment | No corrosive gas and dust | | |
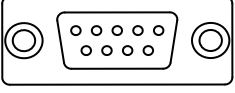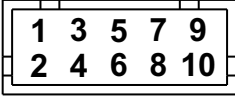
## 2. DIP switch & internal volume specifications

| Item | | Pin no. | Contents | | | | Note |
|---|---|---|---|---|---|---|---|
| DIP switch  | | 1 | ON | 400W (24V) | OFF | 750W (48V) | |
| | | 2 | ON | Sine wave | OFF | Square wave | |
| | | 3 | ON | Open (No control speed feedback) | OFF | Closed (Control speed feedback) | Applicable for Encoder option |
| | | 4 | ON | Position control mode | OFF | Speed control mode | |
| Internal volume  | | VR1 | SLOW START | VR2 | SLOW STOP | VR3 | Load ratio cantrol / Speed in - speed control |

## 3. LED specifications

| Item | | LED sign | Note |
|---|---|---|---|
| LED [Operation] | | Power ON :  Orange light on, Power OFF : Orange light off | |
| | | Control ON : Green light on, Control OFF : Green light off | |
| LED [Alarm] | Hall sensor alarm | Flickering once at intervals of 6 seconds (Red) | Motor stop |
| | Low voltage alarm | Flickering twice at intervals of 6 seconds (Red) | |
| | Over load alarm | Flickering 3 times at intervals of 6 seconds (Red) | |
| | Parameter alarm | Flickering 4 times at intervals of 6 seconds (Red) | |
| | Over heat alarm | Flickering 5 times at intervals of 6 seconds (Red) | |
| | Over voltage alarm | Flickering 6 times at intervals of 6 seconds (Red) | |
| | Over speed alarm | Flickering 7 times at intervals of 6 seconds (Red) | |
| | Over current alarm | Flickering 8 times at intervals of 6 seconds (Red) | |

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## 4. Communication or Encoder output & Position pulse input (option)

| Item | Pin no. | Contents | | | Note |
|---|---|---|---|---|---|
| **D-SUB(9P)-Female** | 1,2,3 | N.C | | | |
| | 4 | OP-500(+5VDC) | | | Separate purchse of OP-500 |
| | 5 | GND | | | OP-500 Function<br>- Speed display<br>- Setting the parameter<br>(communication ID, Highest speed, etc) |
| | 6 | OP-500(RX) | | | |
| | 7 | OP-500(TX) | | | |
| | 8 | RS-485(A+) | | | Communication option<br>(Separate purchse of communication board) |
| | 9 | RS-485(A-) | | | |
| **Encoder output & Position pulse input**<br>**1 3 5 7 9**<br>**2 4 6 8 10**<br>(YEONHO, YDAW 200-10) | 1 | ENC_A- | 2 | ENC_A+ | A phase output |
| | 3 | ENC_B- | 4 | ENC_B+ | B phase output |
| | 5 | OUT_Z- | 6 | OUT_Z+ | Z phase output |
| | 7 | POS_IN- | 8 | POS_IN+ | Position pulse |
| | 9 | DIR_IN- | 10 | DIR_IN+ | Direction pulse |

The right-most column for the encoder rows reads "Separate purchase of encoder board".

## 5. Input and output I/O specification (YEONHO, YDH200-14)

| Pin no. | Name of signal | Color | Contents |
|---|---|---|---|
| 1 | SPEED_+5V | Red | Direct current power for speed setting (+5V) / This is used as the power input of variable resistance for receiving this power supply from the external source and entering the speed, and it is prohibited to use it for any other purpose.<br>10KΩ (1/4W or higher) is used when the external variable resistance is used. |
| 2 | SPEED_IN | Orange | Direct current power input for speed setting/ Change the motor speed up to the maximum speed in proportion to (0~5VDC). |
| 3 | SPEED_GND | Black | GND |
| 4 | CW / CCW | Yellow | Decides the motor direction. CW direction if the input is "Low" (GND connection).<br>CCW direction if the input is "High" (GND not connected). |
| 5 | START | White | If the input is "Low" (GND connection), the motor control function is enabled(Motor rotation ready).<br>If the input is "High" (GND not connected) during motor rotation, the motor will stop automatically. |
| 6 | STOP | Blue | If the input is "Low" (GND connection) during motor rotation, the motor is stopped by the deceleration brake. |
| 7 | SPEED_IN | Brown | When the input is low (connect GND), the internal volume(VR3) is applied as the speed volume to set the speed.<br>- When the input is low (connect GND), internal Vol. VR3 can not be used as a load factor Vol.<br>When the input is high (GND not connected), use the external volume to set the speed. |
| 8 | GND | Black | GND |
| 9 | Inpos Out | Green | Position movement completion output (when encoder type control the position) "Low" (0V) changing. |
| 10 | GND | Black | GND |
| 11 | Alarm Reset | Gray | This eliminates the cause of an alarm and forcibly resets the alarm.<br>If the input is "Low" (GND connection), the alarm is reset. |
| 12 | SPEED_OUT | Pink | Motor speed pulse output (Open Collector) _ 12 pulse output a rotation. |
| 13 | Alarm Out | Purple | In the event of an alarm by alarm signal output (Open Collector), output changes to "Low" (0V). |
| 14 | N.C | | |

## 6. Features

### ■ Speed control

If I/O #7inputis"High" (GND not connected), motor speed changes up to the max speed in proportion to the external volume (I/O#2) input voltage (0~5VDC).
In the event of utilizing external adjustable resistance, use the value of 10KΩ (1/4W or over).
If I/O #7input is "Low" (GND connection), motor speed changes up to the max speed in proportion to the internal volume input voltage (0~3.3VDC)

### ■ Motor direction control

If I/O #4input is "Low" (GND connected), the motor rotates toward CW (to motor axis).
If I/O #4input is "High" (GND not connected), the motor rotates toward CCW (to motor axis).

### ■ Controller ON/OFF control

If I/O#5input is"Low" (GND connected), motor control function is activated. (green LED light on)
(ready for motor rotation)
Motor operation starts according to an external volume input value. If input is "High" (GND not connected) while motor rotation, the motor stops naturally.

### ■ Motor stop control

If I/O#6inputis "Low" (GND connected) while motor rotation, the motor stops. [deceleration - brake (no maintaining)]

### ■ Output signal

| Inpos Signal output | Motor speed pulse output | Alarm sign output |
|---|---|---|
| Driver internal — User Circuit — Max +24VDC — Pull-up Resistor — Resistance R (Current 10mA Less than) — input/output IO Pin#9 — Pin#8#10 | Driver internal — User Circuit — Max +24VDC — Pull-up Resistor — input/output IO Pin#12 — Pin#8#10 | Driver internal — User Circuit — Max +24VDC — Pull-up Resistor — input/output IO Pin#13 — Pin#8#10 |
| I/O signal output "Low" when position movement is completed (encoder type is position control mode) | I/O #12 outputs signal pulse while motor rotation. (outputs 12 pulses of signal per 1 motor rotation) | In the event of an alarm, I/O #13 output changes to "Low" (0V). |

### ■ Electric brake control / position & direction instruction signal

| Electric brake control | Position & Direction instruction signal input (Position control mode) |
|---|---|
| Driver internal, Brake input, Vin+ 24V DC, Pin#1, Pin#2 | Driver internal — Position pulse input port — User Circuit — POS_IN+ Pin#8 — +5VDC — POS_IN- Pin#7 — POS_IN- — DIR_IN+ Pin#10 — +5VDC — DIR_IN- Pin#9 — DIR_IN- CCW CW — +5VDC GND |
| Electric brake is released automatically when motor is run. Electric brake works automatically after the motor stop (Brake type motor) | - Counts Per Revolution (CPR) = 1000 pulse<br>- Pulse frequency(Hz) = (Control Speed rpm/60)*1000<br>(Signal permitted frequency 100KHz) |