Integrated Electric Gripper

User Manual
### INDUSTRIE 4.0 Best Partner

**Multi Axis Robot**
- Pick-and-place / Assembly
- Array and packaging / Semiconductor
- Electro-Optical industry
- Automotive industry / Food industry
- Articulated Robot
- Delta Robot
- SCARA Robot
- Wafer Robot
- Electric Gripper
- Integrated Electric Gripper
- Rotary Joint

**Single Axis Robot**
- Precision / Semiconductor
- Medical / FPD
  - KK, SK
  - KS, KA
  - KU, KE, KC

**Ball Screw**
- Precision Ground / Relaxed
  - Super S series
  - Super T series
  - Mini Roller
  - Ecological & Economical
  - Lubrication Module E2
  - Rotating Nut (R1)
  - Energy-Saving & Thermal-Controlizing (C1)
  - Heavy Load Series (RD)
  - Ball Spline

**AC Servo Motor & Drive**
- Semiconductor / Packaging machine / SMT / Food industry / LCD
  - Drives-D1, D2-N, D2
  - Motors-50W~2000W

**Linear Motor**
- Automated transport / AOI application / Precision / Semiconductor
  - Iron-core Linear Motor
  - Coreless Linear Motor
  - Linear Turbo Motor LMT
  - Planar Servo Motor
  - Air Bearing Platform
  - X-Y Stage
  - Gantry Systems

**Direct Drive Rotary Table**
- Aerospace / Medical / Automotive industry
- Machine tools / Machinery industry
  - RAB Series
  - RAS Series
  - RCV Series
  - RCH Series

**Linear Guide Way**
- Automation / Semiconductor / Medical
  - Ball Type—HO, EO, WE, MO, CG
  - Quiet Type—DH, DE, GW, GR
  - Other—RG, E2, PG, SE, RC

**Bearings**
- Machine tools / Robot
  - Crossed Roller Bearings
  - Ball Screw Bearings
  - Linear Bearing
  - Support Unit
## Contents

1. Precautions (be sure to read before use) ................................................................. 1
   1.1 Safety regulations .................................................................................................. 1
   1.2 Warning label location and description ............................................................. 3
   1.3 Warranty coverage ............................................................................................... 4
2. Product characteristics .............................................................................................. 5
   2.1 Integrated electric gripper features ..................................................................... 5
   2.2 Application examples ........................................................................................... 6
   2.3 Specification table ............................................................................................... 6
   2.4 System architecture diagram .............................................................................. 7
   2.5 Specification illustration ..................................................................................... 8
   2.6 Electric grippers mounting methods .................................................................... 9
3. Control method ......................................................................................................... 11
   3.1 Input/output definitions and functional descriptions ........................................... 11
   3.2 Indicator functions .............................................................................................. 11
   3.3 External wiring instructions ............................................................................... 12
   3.4 Operation timing diagram .................................................................................. 13
   3.5 Error status descriptions .................................................................................... 13
   3.6 Function descriptions ......................................................................................... 14
4. Dimension drawing .................................................................................................. 16
   4.1 SEG-04 outline drawing ...................................................................................... 16
   4.2 SEG-24 outline drawing ...................................................................................... 16
   4.3 STG-16 outline drawing ..................................................................................... 17
5. Appendix ................................................................................................................... 18
   5.1 EC Declaration of Conformity ............................................................................ 18
   5.2 Certificate of Conformity for Directive 2011/65/EU (RoHS) .............................. 19
   5.3 Shipping items ..................................................................................................... 20
   5.4 Robot arm language examples ............................................................................ 20
   5.5 Accessories installation methods ......................................................................... 22
   5.6 Finger design guide ........................................................................................... 28
   5.7 Electric gripper option selection requirements table ......................................... 29
1. Precautions (be sure to read before use)

1.1 Safety regulations

<table>
<thead>
<tr>
<th>Icon</th>
<th>Description</th>
</tr>
</thead>
<tbody>
<tr>
<td>!</td>
<td>Indicates an imminently hazardous situation which, if not avoided, will result in death or serious injury.</td>
</tr>
<tr>
<td>!</td>
<td>Indicates a potentially hazardous situation which could result in death or serious injury, if the equipment is operated incorrectly.</td>
</tr>
<tr>
<td>!</td>
<td>Indicates a potentially hazardous situation which may result in injury and machine damage, if the equipment is operated incorrectly.</td>
</tr>
</tbody>
</table>

These safety instructions are intended to prevent hazardous situations and/or equipment damage. These instructions indicate the level of potential hazard with the labels of “Danger,” “Warning”, or “Caution.” They are all important notes for safety and must be followed in addition to International Standards [ISO/IEC][Note 1], Japanese Industrial Standards [JIS][Note 2] and other safety regulations[Note 3].

[Note 1] ISO 10218: Robots and robotics devices - Safety requirement for industrial robots
        IEC 60204-1: Safety of machinery – Electrical equipment of machine (Part1: General requirement)

        JIS B 8433 : Manipulating industrial robots - Safety

[Note 3] Labor Safety and Health Act ......etc.

◎ This product is designed and manufactured as a component for using in general industrial machinery.

◎ Please make sure to acquire the product specifications from the system designer or someone who has sufficient knowledge and experience. In addition, please read the details of the “Technical Manual” and “Software Operating Manual” carefully and take the educational training for related safety prior to operating this product.

◎ If the gripper is integrated in a system (machine, robot, etc.), the system needs to meet the regulations and standards for safety measures. Check if the system satisfies the regulations and standards first. If so, properly handle the product in accordance with the regulations and standards.

◎ All situations are not covered by the “Danger”, “Warning”, and “Caution” safety signs. For more details, be sure to read the instruction manuals thoroughly before operation.

**Danger**

◎ Do not use the product outside specifications. It may cause the product to fail, stop functioning or sustain damage. It may also significantly reduce the service life of the product.

◎ If the machine will stop in the event of system problem such as emergency stop or power failure, design a safety circuit or other device to prevent equipment damage or injury.

◎ Do not use this product in a place exposed to ignitable, inflammable or explosive substances. It may explode or ignite, resulting in product damage or injury. Hot swapping is forbidden.

◎ Please follow the instruction manual when wiring the product. For plug in/plug out of the wire, connect to the terminal quickly and reliably.

◎ Please do not use the product with water and oil to avoid electric shock or fire.

◎ Before supplying power and operating the product, always check the operation area of the...
equipment to ensure safety. When operating or adjusting the gripper, be sure to observe safety measures for the system.

⚠️ Warning

- Do not expose the product to radiant heat generated from a heat source, and use the product within the ambient temperature range of +5°C to +45°C.
- Please use product under ambient humidity < 85% without condensation.
- Do not use product under corrosive gas or corrosive chemical solution locations, to avoid rust and other deterioration situation occurring.
- Do not use product in dust or iron powder environments.
- Do not use products where violent collision and vibration is possible.
- Do not use products near strong electromagnetic interference to avoid abnormal product movements.
- Install products and fixtures with appropriate screw locking torque.
- Do touch product when product in motion, to avoid hand injury.
- When a person is accidentally caught, please immediately turn off power or implement external safety circuit emergency stop button, and to ensure Check power state, and manually adjust gripper switch or remove fixture afterwards.
- When power failure occurs during operation, turn off power immediately to avoid sudden movement after the resumption of power, which may cause resulting in mechanical damage or personal injury.
- If abnormal heat, smoke, odor or persistent noise occurs, please immediately turn off power to avoid product damage or fire.
- When product is holding workpiece and cannot be activated, please immediately turn off power. Manually adjust gripper switch or remove fixture to remove workpiece. Wait for abnormal state to be resolved before turning on power supply.
- Do not use product grip live or dangerous objects.
- When gripping workpiece, avoid load on a single gripper.
- When product moves, avoid external force to the gripper.

⚠️ Caution

- When installing product, please do not handle action parts or wires, so as to avoid product damage.
- Do not put fingers or foreign matter into openings of the product, to avoid electric shock, personal injury, fire and other undesirable circumstances.
- The motor in operation will heat up, increasing surface temperature of product. Please avoid adversely affecting surrounding workpieces.
- The bending radius of the wire in the actuator cable is within specified range. (Rb ≥ 38 mm)
- Cables of product cannot be damaged and should be checked regularly. Damage to cable, excessive bending, pulling, curling can lead to abnormal function, cause fire or other undesirable circumstances.
- When product is discarded, it should be disposed in accordance to local waste disposal regulations.
- When using the product, please wear safety shoes and other appropriate protective equipment.
- Product body and gripper end are provided with positioning holes.
1.2 Warning label location and description

The product will be labeled as shown below to ensure correct and safe operation.

- Fixture should be designed to be light and short.
- Fixture material, shape, clamping area and other design characteristics will affect the maximum workpiece weight.
1.3 Warranty Coverage

Warranty period of this product is 12 months. The warranty does not cover any of following causes of failure:

◎ Operating mode, operating environment and storage beyond product manual definition.

◎ If after installation by professional staff, the product is damaged due to installation or delivery to another location, or a change is made to the use environment.

◎ Product damage caused by human operation or improper installation.

Following conditions are not covered by warranty:

◎ Product number or production date [month and year] of product cannot be verified.

◎ Gripper body and controller components are not HIWIN original products.

◎ Any element that is added or removed from gripper or controller.

◎ Any modification of wiring or cable between gripper body and controller.

◎ Any modification of gripper and controller appearance and any removal of gripper and controller components, such as: dismantling shell, drilling or cutting on product.

◎ Any damage caused by natural disasters, such as fire, earthquakes, tsunamis, lightning, winds and floods. In the event of product damage, HIWIN does not provide warranty or compensation unless user’s analysis confirms that product is defective. For more information on warranty terms, please contact dealer or technician.
2. Product characteristics

2.1 Integrated electric gripper features

- **Integrated control**
  - Controller is embedded inside gripper eliminating the need for additional mounting and can be used directly with I/O control.
  - Parameters can be set without computer, eliminating the need to edit program.
  - LED lights for Power and Ready, clearly show gripper status.
  - Compact design; small size, light weight.

- **Easy operation**
  - Only need one set of I/O signals to control gripper on/off.
  - Built-in Busy signal for immediate feedback gripper status.

- **Function**
  - SEG-24 has function buttons that allow user to quickly adjust gripper travel and store clamping point.

- **High speed clamping**
  - SEG-04 open/close cycle time is 0.26 seconds, suitable for 3C industry high-speed pick and place operations.
  - SEG-24 Clamp has smart pick and place function, set to function keys that store clamping point. It can move to clamping point at high-speed and automatically convert to slow clamping, effectively reduce cycle time and increase efficiency.
  - STG-16 is suitable for round object pick and place operations.
2.2 Application examples

- Gripper can be used for workpiece parts that are easily deformed, broken, or susceptible to surface damage.

2.3 Specification

<table>
<thead>
<tr>
<th>Category</th>
<th>Item</th>
<th>SEG-04</th>
<th>SEG-24</th>
<th>STG-16</th>
</tr>
</thead>
<tbody>
<tr>
<td>Stroke per side</td>
<td>mm</td>
<td>2</td>
<td>12</td>
<td>8</td>
</tr>
<tr>
<td>Gripping force</td>
<td>N</td>
<td>8 [Note1]</td>
<td>35 [Note2]</td>
<td>30 [Note1]</td>
</tr>
<tr>
<td>Gripping speed</td>
<td>mm/s</td>
<td>45</td>
<td>15[60] [Note3]</td>
<td>30</td>
</tr>
<tr>
<td>Repeatability</td>
<td>mm</td>
<td>±0.1</td>
<td>±0.1</td>
<td>±0.1</td>
</tr>
<tr>
<td>Operation voltage</td>
<td>V</td>
<td>24±10%</td>
<td>24±10%</td>
<td>24±10%</td>
</tr>
<tr>
<td>Load torque Mr</td>
<td>N·m</td>
<td>2.6</td>
<td>11.76</td>
<td>7</td>
</tr>
<tr>
<td>Load torque Mp</td>
<td>N·m</td>
<td>2.3</td>
<td>7.35</td>
<td>4.5</td>
</tr>
<tr>
<td>Load torque My</td>
<td>N·m</td>
<td>2.3</td>
<td>7.35</td>
<td>4.5</td>
</tr>
<tr>
<td>Load strength F</td>
<td>N</td>
<td>108.9</td>
<td>254.8</td>
<td>194</td>
</tr>
<tr>
<td>Weight</td>
<td>kg</td>
<td>0.2</td>
<td>0.7</td>
<td>0.7</td>
</tr>
<tr>
<td>IP class</td>
<td></td>
<td>IP40</td>
<td>IP20</td>
<td>IP20</td>
</tr>
<tr>
<td>Operation temperature</td>
<td>°C</td>
<td>5-45</td>
<td>5-45</td>
<td>5-45</td>
</tr>
<tr>
<td>Operation humidity</td>
<td>%RH</td>
<td>&lt; 85</td>
<td>&lt; 85</td>
<td>&lt; 85</td>
</tr>
<tr>
<td>Storage temperature</td>
<td>°C</td>
<td>0-60</td>
<td>0-60</td>
<td>0-60</td>
</tr>
<tr>
<td>Total length</td>
<td>mm</td>
<td>49</td>
<td>105.5</td>
<td>72.3</td>
</tr>
<tr>
<td>Total height</td>
<td>mm</td>
<td>25</td>
<td>88</td>
<td>100</td>
</tr>
<tr>
<td>Total thickness</td>
<td>mm</td>
<td>81</td>
<td>38</td>
<td>100</td>
</tr>
</tbody>
</table>
[Note 1] Gripping force tolerance is $\pm 25\%$.
[Note 2] Gripping force tolerance is $\pm 30\%$.
[Note 3] Moving velocity is 60mm/s.
[Description 1] Gripping force is recommended to be 10 to 20 times the weight of gripped object.
[Description 2] High-speed movement or rotation after gripping requires the weight of object to be reduced.
[Description 3] Material, shape, grip area, etc. of gripping workpiece will affect the maximum weight of gripped object.
[Description 4] SEG-04 is light gripping force model, it is recommended to use elastic material for gripping part, such as rubber, gifted glue, etc., to increase gripping friction, and avoid gripping objects from falling.
[Description 5] SEG-04 can only inside grip inside and the backlash is 0.5mm per side. Don’t grip at the backlash area.

2.4 System architecture diagram

Upper controller
For example:
programmable logic controller PLC
robot controller RC

24V DC power supply

• Plug and play
- Connect Integrated electric gripperdrive wires to power supply and host controller, to begin using.
2.5 Specification illustration

The model number of integrated electricripper series contains the type, size, other kinds of cable length or special order, etc..

<table>
<thead>
<tr>
<th>Code</th>
<th>Item</th>
<th>Description</th>
</tr>
</thead>
</table>
| A    | Type | SEG-04: total stroke is 4mm and two grippers type  
SEG-24: total stroke is 24mm and two grippers type  
STG-16: total stroke is 16mm and three grippers type |
| B    | Actuator cable length and connector type | 10: 1 M - straight connector (standard)  
1L: 1 M - L type connector  
30: 3 M - straight connector  
3L: 3 M - L type connector  
50: 5 M - straight connector  
5L: 5 M - L type connector |
| C    | Sensor | None: none  
O: 2M-Normal Open (Note 1)  
C: 2M-Normal Close (Note 1) |
| D    | Note | None: NPN Type (standard)  
P: PNP Type (Note 2)  
S: specified  
TM: TM Plug & Play Version (Note 3) |

[Note 1] The sensor is an optional equipment. It doesn’t affect the function of gripper if the sensor is not installed. According to the output mode (NPN, PNP type) of the gripper, the sensor with corresponding output mode is provided.

[Note 2] For SEG-24 and STG-16.

[Note 3] The actuator cable length is recommended for three meters or more.
2.6 Electric gripper mounting methods

A. When using the screw holes on underside of gripper body

<table>
<thead>
<tr>
<th>Type</th>
<th>Screw M</th>
<th>Recommended locking torque [N*m]</th>
<th>Maximum locking depth SL [mm]</th>
</tr>
</thead>
<tbody>
<tr>
<td>SEG-04</td>
<td>M3x0.5P</td>
<td>0.6~0.8</td>
<td>3</td>
</tr>
<tr>
<td>SEG-24</td>
<td>M3x0.5P</td>
<td>0.6~0.8</td>
<td>8</td>
</tr>
<tr>
<td>STG-16</td>
<td>M6x1P</td>
<td>4.6~5.2</td>
<td>6</td>
</tr>
</tbody>
</table>

B. When using front through holes of gripper body
**C. When using screw holes on the back of gripper body**

<table>
<thead>
<tr>
<th>Type</th>
<th>Screw M</th>
<th>Recommended locking torque T (N*m)</th>
<th>Maximum locking depth SL (mm)</th>
</tr>
</thead>
<tbody>
<tr>
<td>SEG-04</td>
<td>M3x0.5P</td>
<td>0.6~0.8</td>
<td>6</td>
</tr>
<tr>
<td>STG-16</td>
<td>M5x0.8P</td>
<td>2.8~3.4</td>
<td>5</td>
</tr>
</tbody>
</table>
3. Control method

3.1 Input/output definitions and functional descriptions

- SEG-04, STG-16 I/O control: 2IN/1OUT

<table>
<thead>
<tr>
<th>Signal input</th>
<th>IN1</th>
<th>IN2</th>
<th>Function</th>
</tr>
</thead>
<tbody>
<tr>
<td>OFF</td>
<td>OFF</td>
<td>None</td>
<td></td>
</tr>
<tr>
<td>ON</td>
<td>OFF</td>
<td>Open</td>
<td></td>
</tr>
<tr>
<td>ON</td>
<td>ON</td>
<td>Close</td>
<td></td>
</tr>
</tbody>
</table>

- SEG-24 I/O control: 2IN/2OUT

<table>
<thead>
<tr>
<th>Signal input</th>
<th>IN1</th>
<th>IN2</th>
<th>Function</th>
</tr>
</thead>
<tbody>
<tr>
<td>OFF</td>
<td>OFF</td>
<td>None</td>
<td></td>
</tr>
<tr>
<td>ON</td>
<td>OFF</td>
<td>Open</td>
<td></td>
</tr>
<tr>
<td>ON</td>
<td>ON</td>
<td>Close</td>
<td></td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th>Signal output</th>
<th>Pin</th>
<th>Function</th>
</tr>
</thead>
<tbody>
<tr>
<td>OUT1</td>
<td>Busy</td>
<td></td>
</tr>
</tbody>
</table>

[Description 1] when IN1(Ready)=ON of SEG-24, electric gripper will perform a reset action to confirm origin and then open to outside.

[Description 2] The OUT1(busy) signal is ON when electric gripper action is executed. The OUT1(busy) signal is OFF after the action is completed.

3.2 Indicator functions

<table>
<thead>
<tr>
<th>Color</th>
<th>Function</th>
<th>Description</th>
</tr>
</thead>
<tbody>
<tr>
<td>Green</td>
<td>Power indicator</td>
<td>On when power is connected</td>
</tr>
<tr>
<td>Blue</td>
<td>Status indicator</td>
<td>On when IN1(Ready)=ON</td>
</tr>
</tbody>
</table>

![Power indicator](image1)
![Status indicator](image2)
![Power indicator](image3)

SEG-04  SEG-24  STG-16
### Pin definition

<table>
<thead>
<tr>
<th>Pin</th>
<th>Color</th>
<th>I/O</th>
<th>Function</th>
</tr>
</thead>
<tbody>
<tr>
<td>1</td>
<td>White</td>
<td>IN1</td>
<td>Ready</td>
</tr>
<tr>
<td>2</td>
<td>Brown</td>
<td>IN2</td>
<td>DIR [O/C]</td>
</tr>
<tr>
<td>3</td>
<td>Green</td>
<td>OUT1</td>
<td>Busy</td>
</tr>
<tr>
<td>4</td>
<td>Yellow</td>
<td>VCC</td>
<td>24V/1A</td>
</tr>
<tr>
<td>5</td>
<td>Blue</td>
<td>GND</td>
<td>0V</td>
</tr>
<tr>
<td>6</td>
<td>Red</td>
<td>OUT2</td>
<td>Alarm [Note 1]</td>
</tr>
<tr>
<td>7</td>
<td>Black</td>
<td></td>
<td>Shielding</td>
</tr>
</tbody>
</table>

[Note 1] For SEG-24 and STG-16.

---

### 3.3 External wiring instructions

#### SEG-04

**NPN Type**

- IN1: Ready
- IN2: DIR
- OUT1: Busy
- VCC: 24V
- GND: 0V

#### SEG-24

**NPN Type**

- IN1: Ready
- IN2: DIR
- OUT1: Busy
- VCC: 24V
- GND: 0V

**PNP Type**

- IN1: Ready
- IN2: DIR
- OUT1: Busy
- VCC: 24V
- GND: 0V

#### STG-16

**NPN Type**

- IN1: Ready
- IN2: DIR
- OUT1: Busy
- VCC: 24V
- GND: 0V

**PNP Type**

- IN1: Ready
- IN2: DIR
- OUT1: Busy
- VCC: 24V
- GND: 0V
3.4 Operation timing diagram

- SEG-04, STG-16

3.5 Error status descriptions (SEG-24 only)

After the GRIP point and the FREE point are set completely and Ready=ON, please refer to the table below:

<table>
<thead>
<tr>
<th>Mode</th>
<th>Situation</th>
<th>Alarm</th>
</tr>
</thead>
<tbody>
<tr>
<td>Move</td>
<td>Not stop at the FREE point</td>
<td>●</td>
</tr>
<tr>
<td>Grip</td>
<td>Not stop in the tolerance band ( n )</td>
<td>●</td>
</tr>
<tr>
<td></td>
<td>Stop at second tolerance point ( \bar{M} )</td>
<td>●</td>
</tr>
</tbody>
</table>
### 3.6 Function button descriptions (SEG-24 only)

<table>
<thead>
<tr>
<th>Panel</th>
<th>Press button</th>
<th>Mode</th>
<th>Short press</th>
<th>Long press</th>
</tr>
</thead>
<tbody>
<tr>
<td>POWER READY TRAVEL</td>
<td>Jog button (inward)</td>
<td>Move inward 1 mm</td>
<td>Move inward continuously</td>
<td></td>
</tr>
<tr>
<td>SAVE GRIP FREE</td>
<td>Jog button (outward)</td>
<td>Move outward 1 mm</td>
<td>Move outward continuously</td>
<td></td>
</tr>
<tr>
<td></td>
<td>Memory button</td>
<td>Gripping center point (G)</td>
<td>Tolerance (G+n or G-n)</td>
<td></td>
</tr>
<tr>
<td></td>
<td>Memory button</td>
<td>Release point (F)</td>
<td>Clear all storage points</td>
<td></td>
</tr>
</tbody>
</table>

[Description 1] This function button can be used only when gripper Ready = OFF.

[Description 2] After re-connected to power, reset must be executed first (press GRIP and FREE at the same time). Then, the function button can be used to move the gripper. Or the Ready light would sparkle 5 times rapidly to warn the user.

[Description 3] The distance between gripping center point and release point shall not be less than 1mm.

[Description 4] To set tolerance point (M), user simply sets one of the points, system will automatically produce the center point(G) as mirror point and find the second tolerance point(R).

[Description 5] The distance between tolerance point and second tolerance point is called "tolerance band (n)".

[Description 6] If user does not set tolerance point, the system default tolerance point is G ± 0.5mm.

[Description 7] Taking grip gripper inward, fast outward movement as an example, the timing chart is as follows:

![Timing Chart](chart.png)
Setup process

1. Press and at the same time to execute Reset.
2. Press for 3 sec. to clear all stored points (depends on user’s requirements to setup).
3. Use jog buttons or to move gripper to gripping center point and press to save button. Ready indicator blinks 1 times when saved successfully.
4. Use jog buttons or to adjust gripping travel range, press 3 sec. to save tolerance point. Ready indicator blinks 3 times when saved successfully (depends on user’s requirements to setup).
5. Use jog buttons or to move gripper to release point and press to save. Ready indicator blinks 1 times when saved successfully.

[Explanation 1] Be sure to perform Reset during the period of setting and power restarting.
[Explanation 2] When gripping center point and release point are not set or setting is not complete, full travel is gripped.
4. Dimensions

4.1 SEG-04 outline drawing

Connector Cable:

- Straight Type:

- Right angle Type:

<table>
<thead>
<tr>
<th>No.</th>
<th>Dimensioning</th>
</tr>
</thead>
<tbody>
<tr>
<td>1</td>
<td>Ø3(^*)0.02 X2DP</td>
</tr>
<tr>
<td>2</td>
<td>M3X0.5X3DP</td>
</tr>
<tr>
<td>3</td>
<td>M4X0.7X6DP, Ø3.3 THRU</td>
</tr>
</tbody>
</table>

4.2 SEG-24 outline drawing

Connector Cable:

- Straight Type:

- Right angle Type:

<table>
<thead>
<tr>
<th>No.</th>
<th>Dimensioning</th>
</tr>
</thead>
<tbody>
<tr>
<td>1</td>
<td>Ø3(^*)0.02 X2DP</td>
</tr>
<tr>
<td>2</td>
<td>M3X0.5X3DP</td>
</tr>
<tr>
<td>3</td>
<td>M3X0.5X8DP</td>
</tr>
<tr>
<td>4</td>
<td>Ø5(^*)0.02 X2DP</td>
</tr>
</tbody>
</table>
4.3 STG-16 outline drawing

Connector Cable:

- Straight Type: 
- Right angle Type:

Detail A

- 3-M6x1P THRU B.C.D Ø56

Detail B

- 2-M3x0.5x3DP

A

- 6-Ø6h7
- 6-Ø4.5
5. Appendix

5.1 CE Declaration of Conformity

DECLARATION OF INCORPORATION OF PARTLY COMPLETED MACHINERY

According to European directive 2006/42/EC annex II 1.B.

Manufacturer: HIWIN TECHNOLOGIES CORP.

No. 7, Jingke Rd., Taichung Precision Machinery Park, Taichung 40852, Taiwan

Description and identification of the partly completed machinery:

Equipment: Electric Gripper

Model Name/Serial No.: SEG-04, SEG-24, STG-16

Year of affixing CE Marking: From 2017

It is hereby declared that the following essential requirements of the Machinery Directive 2006/42/EC have been fulfilled:

1.1,1.3,1.5,1.6,1.7

Moreover, it is declared that the relevant technical documentation specified under Annex VII Part B has been compiled. It is hereby explicitly declared that the partly completed machine complies with all of the pertinent conditions in the following EC Directives.

2006/42/EC Machinery Directive (MD)

Harmonized directives and standards

2014/30/EU Electromagnetic Compatibility Directive (EMC)
2011/65/EU Restriction of the use of certain hazardous substances (RoHS)
EN ISO 10218-1:2011
EN ISO 12100:2010
EN 61000-6-2:2005
EN 61000-6-4:2007

The following essential requirements of EN ISO 10218-1:2011 have been fulfilled:

Clause: 5.12, 5.14, 5.15

The person authorized to compile the relevant technical documentation:

Name, Surname: Werner Mäurer

Address: HIWIN GmbH, Brückelsbünd 2, D-77654 Offenburg

Note:

The partly completed machinery must not be put into service until the final machinery into which it is to be incorporated has been declared in conformity with the provisions of the machinery directive.

This declaration becomes invalid. If technical or operational modifications are introduced without the manufacturers consent.

Taichung, November 15, 2017  Wen-Chia Wu, Senior General Manager
(Place, Date)  (First Name and Surname, and function of signatory)

Wu Wen Chia
(Signature)
5.2 Certificate of Conformity for Directive 2011/65/EU (RoHS)

**SEG-04**

**SGS Test Report**

Report No: CX21917/20236
Date: 29/07/2021

NO. 7, JINHSE RD, TAIWAN PRECISION MACHINERY PARK, TAIWAN 40852, TAIWAN

The following sample(s) were submitted and identified by/along behalf of the applicant as:

- **Sample Submitted By**: HWIN TECHNOLOGIES CORP.
- **Sample Description**: INTEGRATED ELECTRIC GRIPPER
- **Sample No.**: SEG-04
- **Sample Receiving Date**: 2017/03/20 and 2017/03/18
- **Testing Period**: 2017/03/20 to 2017/03/08 and 2017/03/08 to 2017/03/21

**Test Result(s)**

- **Conclusion**: Based upon the performed tests on submitted samples, the test results comply with the limits of RoHS Directive 2011/65/EU with the exempted materials below according to the declaration from applicant:
  1. SILVER METALLIC NUT (No.1.16) in Table 1: Lead (Pb)
  2. GOLDEN METALLIC PIN (No.1.25) in Table 1: Lead (Pb)
  3. SILVER METALLIC TUBE (No.3.26) in Table 1: Lead (Pb)
  4. ELECTRONIC COMPONENT (No.0.4) in Table 1: Lead (Pb)

**Seg-04**

**SGS Test Report**

Report No: CX21917/20237
Date: 29/07/2021

NO. 7, JINHSE RD, TAIWAN PRECISION MACHINERY PARK, TAIWAN 40852, TAIWAN

The following sample(s) were submitted and identified by/along behalf of the applicant as:

- **Sample Submitted By**: HWIN TECHNOLOGIES CORP.
- **Sample Description**: INTEGRATED ELECTRIC GRIPPER
- **Sample No.**: SEG-34
- **Sample Receiving Date**: 2017/03/20
- **Testing Period**: 2017/03/20 to 2017/03/08

**Test Result(s)**

- **Conclusion**: Based upon the performed tests on submitted samples, the test results comply with the limits of RoHS Directive 2011/65/EU with the exempted materials below according to the declaration from applicant:
  1. SILVER METALLIC NUT (No.1.12) in Table 1: Lead (Pb)
  2. GOLDEN METALLIC TUBE (No.2.2) in Table 1: Lead (Pb)

**Seg-04**
5.3 Shipping items

- **Standard shipping items:**
  1. Electric gripper
  2. Actuator cable
  3. Accessory kit
     - Pin
     - Centering Sleeve [SEG-24、STG-16]

- **Product label:**

5.4 Robot arm language example

Most end effectors are assembled with robot arm. This section provides the basic functions of a robot language example for reference.

Robot Arm Model: HIWIN RA605
Robot arm control program: HRSS 2.1
Gripper type: SEG-24 corresponds to Robot I/O as shown below

- **Robot Output (RO):**
  - RO [ 1 ] : IN1(READY);
  - RO [ 2 ] : IN2(DIR);
- **Robot Input (RI):**
  - RI [ 1 ] : OUT1(BUSY);
  - RI[2]:OUT2(Alarm);
- **Digital Output (DO):**
  - DO[1]:External alarm indicator(suggested);
- **Digital Input (DI):**
  - DI[1]:External alarm clear button(suggested);
If gripper wants to execute following actions

▼ Gripper “RESET”
▼ Robot arm “Move to point P1”
▼ Gripper “Grip” [Grip item]
▼ Robot arm “Move to P2”
▼ Gripper “Release” [release item]

User can refer to the bottom of the robot language

1. $RO[1] = FALSE ; Initial I/O
3. WAIT SEC 0.03 ; Wait for signal is received
4. $RO[1] = TRUE ; Select the ready and reset action
5. WAIT FOR $RI[1] == TRUE ; Wait for action is starting
6. WAIT FOR $RI[1] == FALSE ; Wait for action is completion
7. IF $RI[2] == TRUE ; Alarm occurs
8. $DO[1] = TRUE ; External alarm indicator
9. WAIT FOR $ DI[1] == TRUE ; Clear external alarm
10. ENDIF
11. PTP P1 CONT Vel=100% Acc=50% TOOL[0] BASE[0] ; Robot moving
12. $DO[2] = TRUE ; Send close signal
13. WAIT FOR $RI[1] == TRUE ; Wait for action is starting
14. WAIT FOR $RI[1] == FALSE ; Wait for action is completion
15. IF $RI[2] == TRUE ; Alarm occurs
16. $DO[1] = TRUE ; External alarm indicator
17. WAIT FOR $ DI[1] == TRUE ; Clear external alarm
18. ENDIF
19. PTP P2 CONT Vel=100% Acc=50% TOOL[0] BASE[0] ; Robot moving
20. $DO[2] = FALSE ; Send open signal
21. WAIT FOR $RI[1] == TRUE ; Wait for action is starting
22. WAIT FOR $RI[1] == FALSE ; Wait for action is completion
23. IF $RI[2] == TRUE ; Alarm occurs
24. $DO[1] = TRUE ; External alarm indicator
25. WAIT FOR $ DI[1] == TRUE ; Clear external alarm
26. ENDIF
5.5 Accessory installation methods

- SEG-04 sensor installation

SEG-04 sensor accessory kit

<table>
<thead>
<tr>
<th>Item</th>
<th>Name</th>
<th>Amount</th>
</tr>
</thead>
<tbody>
<tr>
<td>1</td>
<td>S4 sensor rack</td>
<td>1</td>
</tr>
<tr>
<td>2</td>
<td>Bolt (M4X0.7PX6L SUS)</td>
<td>2</td>
</tr>
<tr>
<td>3</td>
<td>S4 sensor plate</td>
<td>2</td>
</tr>
<tr>
<td>4</td>
<td>Bolt (M2X0.4PX6L SUS)</td>
<td>2</td>
</tr>
<tr>
<td>5</td>
<td>Proximity switch [Note 1]</td>
<td>2</td>
</tr>
</tbody>
</table>

[Note 1] Refer to table below for proximity switch specifications.

<table>
<thead>
<tr>
<th>Specifications</th>
<th>Output state</th>
<th>Output method</th>
<th>Sensing distance</th>
<th>Response frequency</th>
<th>Operating voltage</th>
</tr>
</thead>
<tbody>
<tr>
<td>PM05-02N</td>
<td>NO</td>
<td>NPN</td>
<td>1.5 mm</td>
<td>2.5 KHz</td>
<td>10~30 VDC</td>
</tr>
<tr>
<td>PM05-02NB</td>
<td>NC</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>XL-F05P1.2E1</td>
<td>NO</td>
<td>PNP</td>
<td>1.2 mm</td>
<td>2 KHz</td>
<td>10~30 VDC</td>
</tr>
<tr>
<td>XL-F05P1.2E2</td>
<td>NC</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
</tbody>
</table>
• SEG-04 with RA605 robot manipulator

<table>
<thead>
<tr>
<th>Item</th>
<th>Name</th>
<th>Amount</th>
</tr>
</thead>
<tbody>
<tr>
<td>1</td>
<td>Positioning pin (Ø5X8L)</td>
<td>1</td>
</tr>
<tr>
<td>2</td>
<td>S4-605 Robot manipulator adapter</td>
<td>1</td>
</tr>
<tr>
<td>3</td>
<td>Inner hexagon head screws (M5X0.8PX8L SUS)</td>
<td>4</td>
</tr>
<tr>
<td>4</td>
<td>Positioning pin (Ø3X10L)</td>
<td>2</td>
</tr>
<tr>
<td>5</td>
<td>S4-605 Gripper adapter</td>
<td>2</td>
</tr>
<tr>
<td>6</td>
<td>Bolt [M3X0.5PX8L SUS]</td>
<td>4</td>
</tr>
<tr>
<td>7</td>
<td>Bolt [M3X0.5PX8L SUS]</td>
<td>4</td>
</tr>
</tbody>
</table>
• SEG-24 sensor installation

<table>
<thead>
<tr>
<th>Item</th>
<th>Name</th>
<th>Amount</th>
</tr>
</thead>
<tbody>
<tr>
<td>1</td>
<td>S24 sensor rack</td>
<td>1</td>
</tr>
<tr>
<td>2</td>
<td>Bolt [M4X0.7PX6L SUS]</td>
<td>2</td>
</tr>
<tr>
<td>3</td>
<td>S24 sensor plate</td>
<td>2</td>
</tr>
<tr>
<td>4</td>
<td>Bolt [M2.5X0.45PX4L SUS]</td>
<td>2</td>
</tr>
<tr>
<td>5</td>
<td>Proximity switch [Note 1]</td>
<td>2</td>
</tr>
</tbody>
</table>

[Note 1] Refer to table below for proximity switch specifications.

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<th>Sensing distance</th>
<th>Response frequency</th>
<th>Operating voltage</th>
</tr>
</thead>
<tbody>
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<td>NO</td>
<td>NPN</td>
<td>1.5 mm</td>
<td>2.5 KHz</td>
<td>10–30 VDC</td>
</tr>
<tr>
<td>PM05-02NB</td>
<td>NC</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
</tbody>
</table>
• SEG-24 with RA605 robot manipulator

SEG-24-RA605 accessory kit

<table>
<thead>
<tr>
<th>Item</th>
<th>Name</th>
<th>Amount</th>
</tr>
</thead>
<tbody>
<tr>
<td>1</td>
<td>Positioning pin (Ø5X8L)</td>
<td>1</td>
</tr>
<tr>
<td>2</td>
<td>S24-605 Robot manipulator adapter</td>
<td>1</td>
</tr>
<tr>
<td>3</td>
<td>Bolt (M5X0.8PX8L SUS)</td>
<td>4</td>
</tr>
<tr>
<td>4</td>
<td>Gripper adapter</td>
<td>2</td>
</tr>
<tr>
<td>5</td>
<td>Bolt (M3X0.5PX10L SUS)</td>
<td>4</td>
</tr>
</tbody>
</table>
• STG-16 sensor installation

<table>
<thead>
<tr>
<th>Item</th>
<th>Name</th>
<th>Amount</th>
</tr>
</thead>
<tbody>
<tr>
<td>1</td>
<td>T16 sensor rack</td>
<td>1</td>
</tr>
<tr>
<td>2</td>
<td>Bolt [M3X0.5PX4L SUS]</td>
<td>2</td>
</tr>
<tr>
<td>3</td>
<td>T16 sensor plate</td>
<td>2</td>
</tr>
<tr>
<td>4</td>
<td>Bolt [M2X0.4PX4L SUS]</td>
<td>2</td>
</tr>
<tr>
<td>5</td>
<td>Proximity switch [Note 1]</td>
<td>2</td>
</tr>
</tbody>
</table>

[Note 1] Refer to table below for proximity switch specifications.

<table>
<thead>
<tr>
<th>Specifications</th>
<th>Output state</th>
<th>Output method</th>
<th>Sensing distance</th>
<th>Response frequency</th>
<th>Operating voltage</th>
</tr>
</thead>
<tbody>
<tr>
<td>PM05-02N</td>
<td>NO</td>
<td>NPN</td>
<td>1.5 mm</td>
<td>2.5 KHz</td>
<td>10~30 VDC</td>
</tr>
<tr>
<td>PM05-02NB</td>
<td>NC</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>XL-F05P1.2E1</td>
<td>NO</td>
<td>PNP</td>
<td>1.2 mm</td>
<td>2 KHz</td>
<td>10~30 VDC</td>
</tr>
<tr>
<td>XL-F05P1.2E2</td>
<td>NC</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
</tbody>
</table>
• STG-16 with RA605 robot manipulator

<table>
<thead>
<tr>
<th>Item</th>
<th>Name</th>
<th>Amount</th>
</tr>
</thead>
<tbody>
<tr>
<td>1</td>
<td>Positioning pin (Ø5X8L)</td>
<td>1</td>
</tr>
<tr>
<td>2</td>
<td>T16-605 Robot manipulator adapter</td>
<td>1</td>
</tr>
<tr>
<td>3</td>
<td>Bolt (M5X0.8PX10L SUS)</td>
<td>4</td>
</tr>
<tr>
<td>4</td>
<td>Positioning pin (Ø4X6L)</td>
<td>2</td>
</tr>
<tr>
<td>5</td>
<td>Bolt (M5X0.8PX10L SUS)</td>
<td>3</td>
</tr>
</tbody>
</table>
5.6 Finger design guide

SEG-04 is a light gripping force grepper. If the finger is made of metal material, such as steel and aluminum etc., the finger could be pasted with soft material to increase the friction, such as rubber and Polyurethane etc. Please refer to the following figure for pasting position.

- SEG-04

The user is suggested to design an oblong hole and a reference surface at the finger to locate the slide block on the oblong hole with positioning pin. Then align the reference surface of the finger and the slide block to make sure the finger is in position. Please refer to the following figure as an example.
### 5.7 Electric gripper option selection requirements table

<table>
<thead>
<tr>
<th>Company name</th>
<th>Contact person</th>
<th>Date</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th>Telephone</th>
<th>Address</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td></td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th>Fax.</th>
<th>E-Mail</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td></td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th>Pre-selected gripper spec.</th>
<th>Effective stroke (mm)</th>
</tr>
</thead>
<tbody>
<tr>
<td>Gripping force (N)</td>
<td>Repeatability (mm)</td>
</tr>
<tr>
<td>Gripping speed (mm/s)</td>
<td>Material</td>
</tr>
<tr>
<td>Weight (kg)</td>
<td>Size (mm)</td>
</tr>
<tr>
<td>Station type</td>
<td>Load (kg)</td>
</tr>
<tr>
<td>Stage speed (mm/s)</td>
<td>Duty cycle (s)</td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th>Special application environment</th>
</tr>
</thead>
<tbody>
<tr>
<td>□ Clean room □ Dust □ High temperature _____ °C</td>
</tr>
<tr>
<td>□ Low temperature _____ °C □ Vibration</td>
</tr>
<tr>
<td>□ Oil □ Water □ Wet □ Chemical corrosion □ Other ________</td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th>Cable length required</th>
</tr>
</thead>
<tbody>
<tr>
<td>Drive terminal cable length : □ 1M □ 3M □ 5M □ RA605 cable</td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th>Use method and gripping method</th>
</tr>
</thead>
<tbody>
<tr>
<td>□ Horizontal two grippers □ Horizontal three grippers</td>
</tr>
<tr>
<td>□ Open angle two grippers □ Open angle three grippers</td>
</tr>
<tr>
<td>□ Grip inward □ Grip outward □ Positioning □ Detection</td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th>Special application requirements</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th>Remarks</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
</tr>
</tbody>
</table>
1. HIWIN is the registered trademark of HIWIN Technologies Corp. For your protection; To avoid counterfeit products, be certain you are buying genuine HIWIN products before purchase.

2. Actual products may be different from the specifications and photos in this catalog. The differences in appearances or specifications may be caused by, among other things, product improvements.

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