



# Product Brochure

**The most affordable or nothing.**

Main category: Industrial robot arm / Collaborative robot arm /  
Electric gripper/Intelligent actuator/Automation solutions



# Z-EFG-R

## Electric 2-Fingers Parallel Gripper



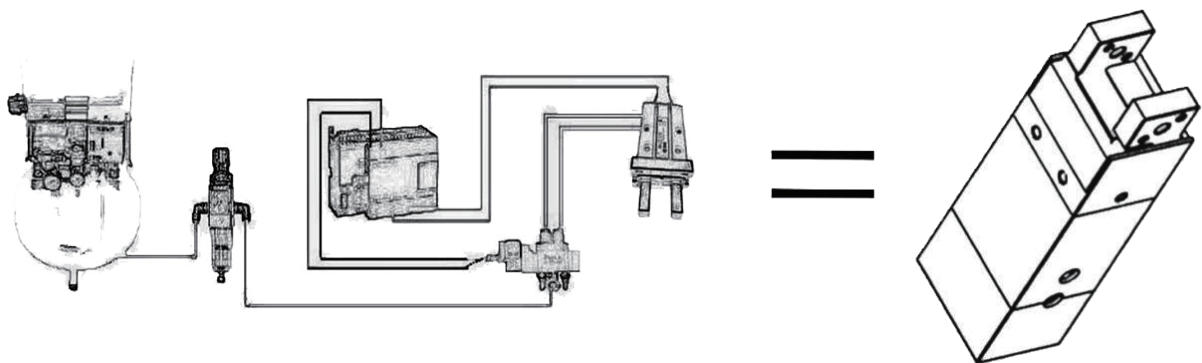
### Product Features

- Built-in controller
- Adjustable stroke and gripping force
- Use servo motor
- The end can be replaced to adapt to various needs
- Pick up fragile and deformable objects such as eggs, test tubes, rings, etc.
- Apply for scenes without air source (e.g. laboratory, hospital)

Promoting a revolution in the replacement of pneumatic grippers by electric grippers

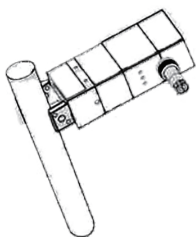
First electric gripper with integrated servo system in China

### Highly Integrated

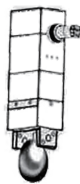


- Perfect replacement for air compressor + filter + solenoid valve + throttle valve + pneumatic gripper
- Multiple cycles service life, consistent with the traditional Japanese cylinder

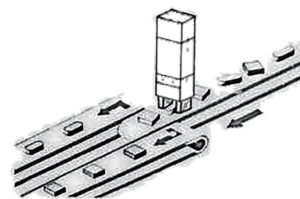
## Application Scenes



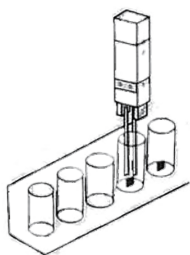
Fragile scene (e.g. test tube)



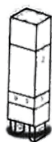
Fragile scene (e.g. eggs)



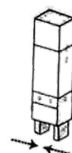
Sorting out things that are arranged in a mess



Gripping in narrow scene



Deformable scene (e.g. rings)



Gripping fragile items at high frequency

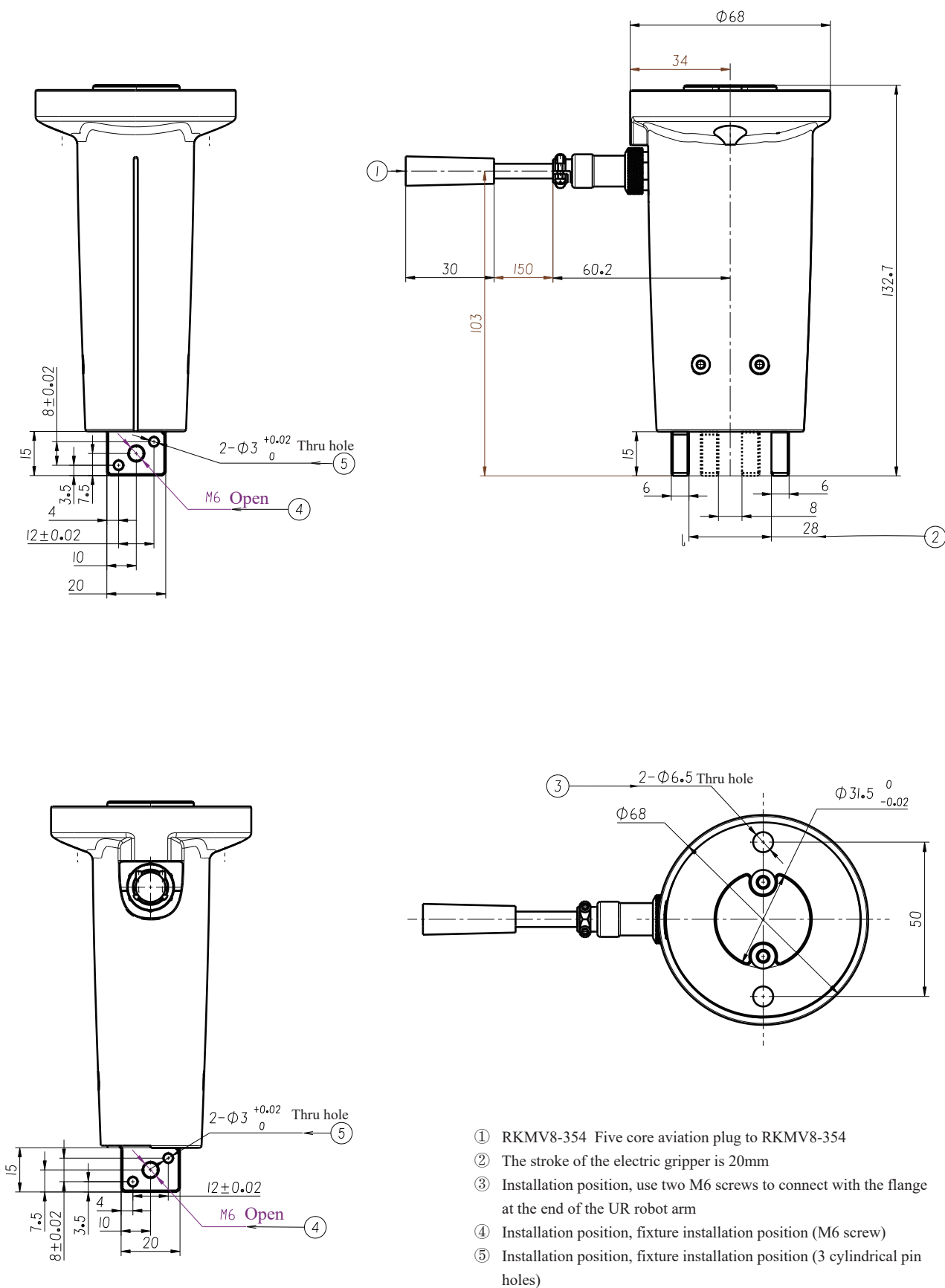


Apply for scenes without air source (e.g. laboratory, hospital)

## Specification Parameters

Model No. Z-EFG-R	Parameter
Total stroke	20mm
Gripping force	80N
Repeatability	±0.02mm
Recommended gripping weight	0.8kg
Transmission mode	Gear rack + Cross roller guide
Grease replenishment of moving components	Every six months or 1 million movements / time
One-way stroke motion time	0.45s
Operating temperature range	5-55°C
Operating humidity range	RH35-80 (No frost)
Movement mode	Two fingers move horizontally
Stroke control	Adjustable
Clamping force adjustment	Adjustable
Weight	0.5kg
Dimensions (L*W*H)	68*68*132.7mm
Controller placement	Built-in
Power	5W
Motor type	DC brushless
Rated voltage	24V
Peak Current	1A
Adaptable six-axis robot arm	UR, Aubo

# Dimension Installation Diagram



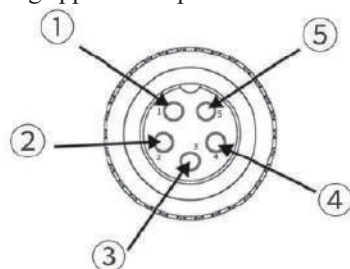
## Wire Sequence Description (RNM)

Aviation Plug	Black Wire	Six-axis robot arm	Function	Usage	Remarks
1	White	OUT1	Control signal (control clamping or loosening)	<p>If the controller logic level is 3.3V or 5V, it can be connected directly to the I/O port</p> <ul style="list-style-type: none"> <li>When inputting 0V-0.7V (low level) , and input the pulse signal at the same time, the gripper opens outwards</li> <li>When inputting 2.7V-5V (high level) , and input the pulse signal at the same time, the gripper clamps inwards</li> </ul> <p>If the controller logic level is higher than 5V, the open drain output can be used</p> <ul style="list-style-type: none"> <li>When open drain output “Open Drain” (not valid), and input the pulse signal at the same time, the gripper clamps inwards</li> <li>When inputting 0V-0.7V (valid) , and input the pulse signal at the same time, the gripper opens outwards</li> </ul> <p>If the controller logic level is higher than 5V, and the second method cannot be used, a resistor can be connected in series. When the control voltage is 24V, the resistor in series is 8.2k</p> <ul style="list-style-type: none"> <li>When the input is higher than 2.7V (high level) , the gripper clamps inwards.</li> <li>When inputting 0-VLow* (low level) , the gripper opens outwards</li> </ul>	Connected required
2	Pink	+24V	+24V	Power supply	Connected required
3	Yellow	OUT2	Input Pulse	<ul style="list-style-type: none"> <li>Connection method and high / low level definition are the same as port 1 (control signal)</li> <li>Input 0~200 pulses, control the gripper to travel 0-20mm, each pulse travel 0.1mm</li> <li>Maximum input 200 pulses, 10mm on each side,the highest frequency is 5KHz</li> </ul>	Connected required
4	Orange	/	Feedback pulse	<ul style="list-style-type: none"> <li>Read-only output, selective connected</li> <li>The pulse is 0V, 3.3V pulse feedback, the effective level time is 100us, and it is related to the gripper stroke, each 0.1mm inward/outward travel, one pulse feedback</li> <li>The high and low level time is not less than 200us, 1KHz corresponds to the maximum speed, frequency more than 1KHz, less than 5KHz time, still perform 1KHz</li> </ul>	Selective connection
5	Grey	GND	GND	Power supply	Connected required

### \* Description

1.  $V_{Low} \leq 0.7 - 2.6 \cdot R_x / 50K$ ;

2. After power on, the gripper will open to the maximum position (initialization) .



- ① Control signal
- ② +24V
- ③ Input pulse
- ④ Feedback pulse
- ⑤ GND

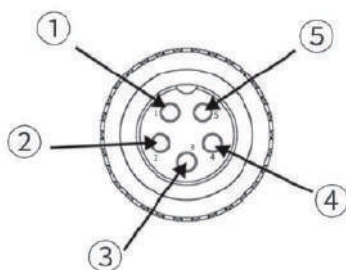
Diagram of aviation plug female port

## Wire Sequence Description (RNK)

Aviation Plug	Black Wire	Six-axis robot arm	Function	Usage	Remarks
1	White	OUT1	Control signal	<p>If the controller logic level is 3.3V or 5V, it can be connected directly to the I/O port  When 1 and 3 control signals are high or low at the same time, the gripper has no action  1 high level , 3 low level as gripper opens  3 high level , 1 low level as gripper closes</p> <p>· When inputting 0V~0.7V (low level)  · When inputting 2.7V~5V (high level)  If the controller logic level is higher than 5V, the open drain output can be used  · When open drain output “ Open Drain ” (invalid)  · When inputting 0V-0.7V (valid)</p> <p>If the controller logic level is higher than 5V, and the second method cannot be used, a resistor can be connected in series  When the control voltage is 24V, the resistor in series is 8.2k  · When the input is higher than 2.7V (high level)  · When inputting 0-VLow* (low level)</p>	Connected required
2	Pink	+24V	+24V	Power supply	Connected required
3	Yellow	OUT2	Control signal	Same control mode as port 1	Connected required
4	Orange	/	Feedback signal	<p>· Selective connection, read-only and display the status of LED  · Output 3.3V when in motion, output 0V when motion ends</p>	Selective connection
5	Grey	GND	GND	Power supply	Connected required

### \* Description

1.  $V_{Low} \leq 0.7 - 2.6 \cdot R_x / 50K$ ;
2. After power on, the gripper will open to the maximum position (initialization) .

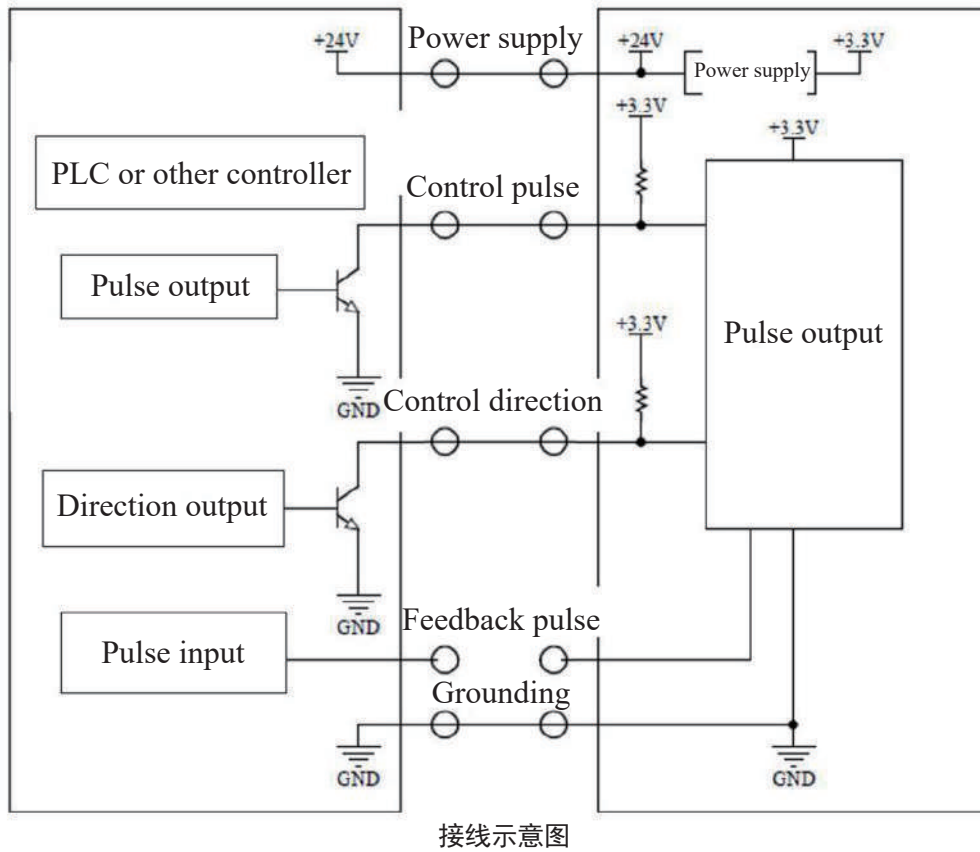


- ① Control signal
- ② +24V
- ③ Control signal
- ④ Feedback signal
- ⑤ GND

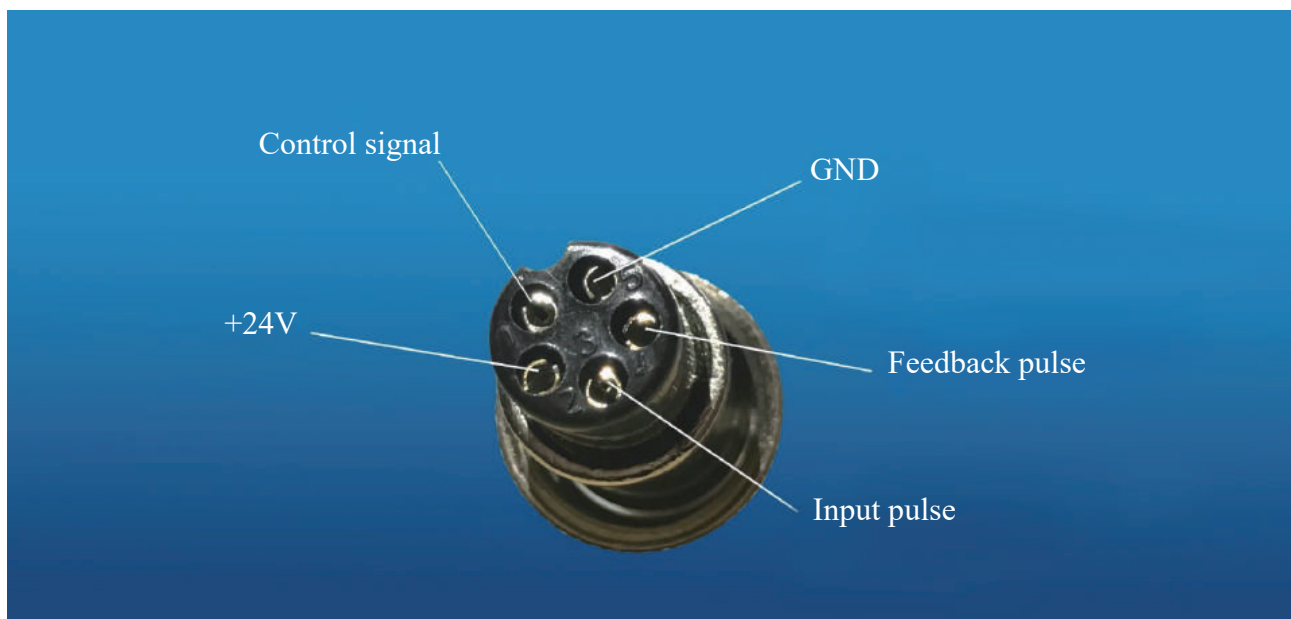
Diagram of aviation plug female port

## Electrical Parameters

- Rated voltage  $24 \pm 2V$
- Current 0.4A



## Physical Diagram





## FAQ

**1. There is a requirement for the concentricity of rotation, so when the two sides of the gripper are close, does it stop at the middle position each time?**

Answer: Yes, there is a symmetry error of  $<0.1\text{mm}$ , and the repeatability is  $\pm 0.02\text{mm}$ .

**2. Does the gripper include the fixture part?**

Answer: No. Users need to design their own fixture part according to the actual clamped items. In addition, Hitbot provides a few fixture libraries, please contact our staff for more details.

**3. Where is the drive controller and do I need to pay extra money for it?**

Answer: It is built-in, no extra charge, the amount of the gripper already includes the cost of controller.

**4. Is it possible to have a single finger movement?**

Answer: No, single finger movement grippers are still under development, please contact our staff for more details.

**5. What is the operating speed of Z-EFG-R?**

Answer: Z-EFG-R takes 0.45s for a full stroke in one direction and 0.9s for a round trip.

**6. What is the gripping force of Z-EFG-R and how to adjust it?**

Answer: The clamping force of Z-EFG-R can be obtained according to the corresponding curve of deformation and force due to the addition of controllable deformation material in front of the fixture.

**7. How to adjust the stroke of Z-EFG-R?**

Answer: 200 pulses correspond to a 20mm stroke, and 1 pulse corresponds to a 0.1mm stroke.

**8. The gripper of Z-EFG-R has a stroke of 20mm corresponding to 200 pulses. What will happen if 300 pulses are sent?**

Answer: The extra pulse will not be executed and has no effect.

**9. The gripper of Z-EFG-R has a stroke of 20mm corresponding to 200 pulses. If 200 pulses are sent, but the gripper clamp things after reaching 100 pulses, will it stop after clamping things and the remaining 100 pulses continue to be sent? Does it have any effect?**

Answer: The remaining pulses will not be executed and have no effect.

**10. How to judge whether the grippers is holding something or not?**

Answer: For Z-EFG-R, the number of feedback pulses reflects the current position of the gripper, so the user can judge whether the object is clamped by counting the feedback pulses.

**11. Is the electric gripper waterproof?**

Answer: IP protection class 20.

**12. What kind of motor is used in Z-EFG-R?**

Answer: Servo motor.



**13. Is it possible to use Z-EFG-R gripper for gripping items larger than 20mm?**

Answer: Yes, 20mm refer to the effective stroke, not the size of the object to be clamped. The Z-EFG-R can be used for clamping objects with the maximum to minimum size difference within 20mm.

**14.If it keeps working, will the motor of the electric gripper overheat?**

Answer: After professional testing, the surface temperature of Z-EFG-R will not exceed 60 degrees when clamping continuously at a temperature of about 30 degrees.

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