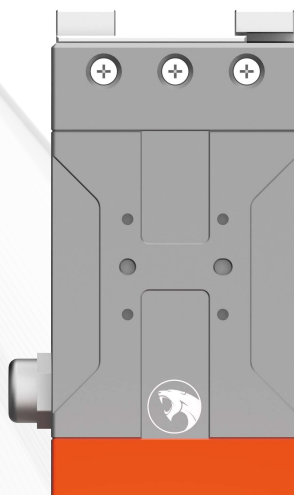


Z-EFG-20F

Product Manual

Main category: Industrial robot arm / Collaborative robot arm /
Electric Gripper/ Intelligent Actuator / Automation Upgrading



Z-EFG-20F

Electric 2-Fingers Parallel Gripper

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

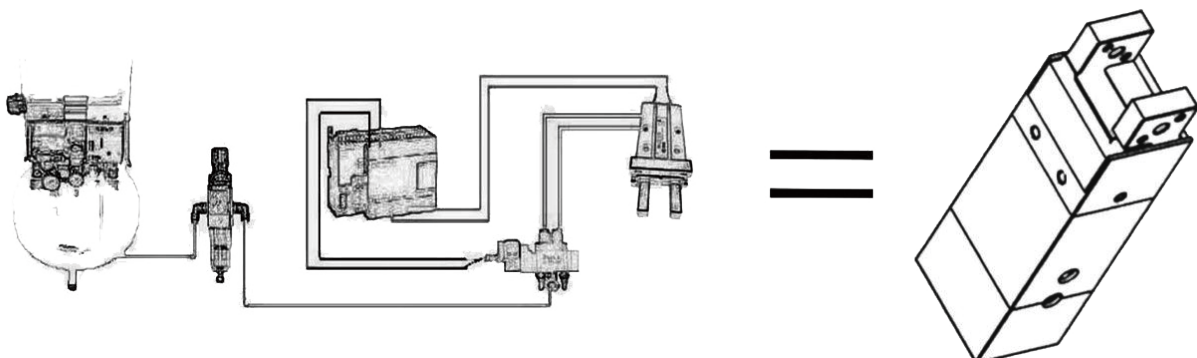
First electric gripper with integrated servo system in China



Product Features

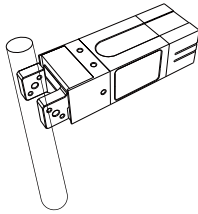
- Use servo motor
- The end can be replaced to adapt to various needs
- Pick up fragile and deformable objects such as eggs, test tubes, rings, etc.
- Apply for scenes without air source (e.g. laboratory, hospital)

Highly Integrated

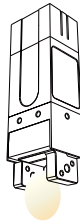


- Perfect replacement for air compressor + filter + solenoid valve + throttle valve + pneumatic gripper
- Multiple cycles service life, consistent with the traditional Japanese cylinder

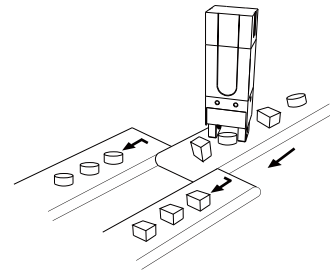
Application Scenes



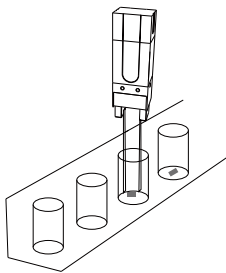
Fragile scene (e.g.test tube)



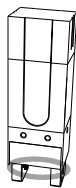
Fragile scene (e.g.eggs)



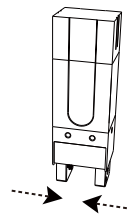
Sorting out things that are arranged in a mess



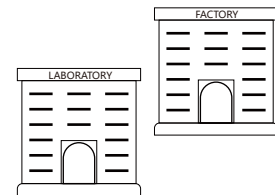
Gripping in narrow scene



Deformable scene (e.g.rings)



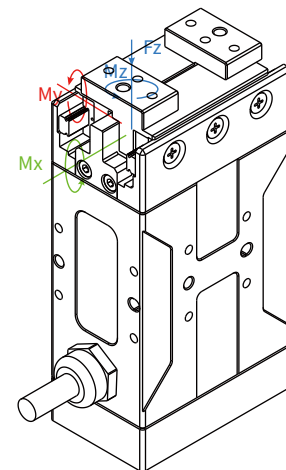
Gripping fragile items at high frequency



Medical, new retail, 3C industry, etc.

Specification Parameters

Model No. Z-EFG-20F	Parameter
Total stroke	20mm adjustable
Gripping force	1-8N adjustable
Repeatability	±0.02mm
Recommended gripping weight	≤0.1kg
Transmission mode	Gear rack + Linear guide
Grease replenishment of moving components	Every six months or 1 million movements / time
One-way stroke motion time	0.1s
Movement mode	Two fingers move horizontally
Weight	0.5kg
Dimensions (L*W*H)	52*32*103mm
Operating voltage	24V±10%
Rated current	0.4A
Peak current	1A
Power	10W
Protection class	IP40
Motor type	DC brushless
Operating temperature range	5-55°C
Operating humidity range	RH35-80 (No frost)



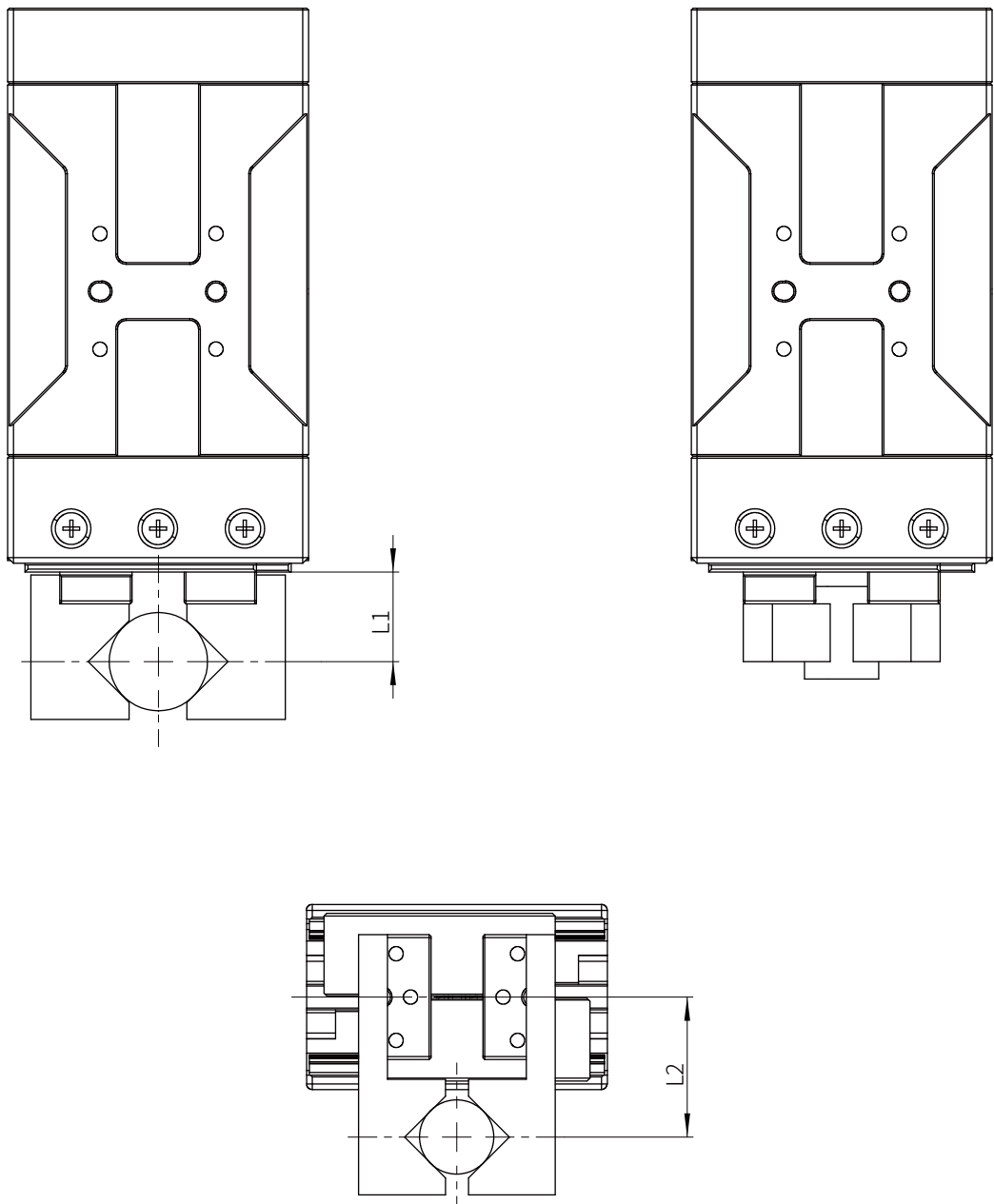
Permissible static load in vertical direction

Fz:	120 N
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Permissible load torque

Mx:	0.6 N.m
My:	1N.m
Mz:	1N.m

Offset of Load Gravity Center



L1 Range	0~50mm
L2 Range	0~30mm

Wire Sequence Description

Red	24V+
Black	GND
Yellow-white	485-
Yellow	485+
Blue	IN1
Blue-white	IN2
Purple	OUT1
Purple-white	OUT2

Notice:

1. Please make sure the positive and negative poles of the power cable is correct and the 485 communication line and I/O line is correct when wiring, as the burning due to incorrect wiring is not covered by the normal warranty.
2. 485 and 24V gripper are not isolated internally, if isolation is needed, customers will need to use other equipment for isolation.

RS485 Communication

The RS485 communication of Z-ERG-30 uses Modbus RTU protocol and the supports function codes including: 0x03, 0x06 0x10, the default communication parameters are as follows.

Baud Rate	115200
ID	1
Data bits	8
Stop bits	1
Checksum	No

Communication Protocols

Function category	Address	Function	Read-write property	Default value (Data type)	Description
Control	0x0000	Initialization	R/W	0 (int)	1. Single direction calibration (calibration direction can be set)
	0x0001	(Reserved)	R/W	0 (int)	
	0x0002	Gripping position	R/W	Maximum value (float)	Unit: mm, Value range: 0~20
	0x0004	Gripping speed	R/W	Maximum value (float)	Unit: mm/s, Value range: 3~300
	0x0006	Gripping current	R/W	0.4 (float)	Unit: A, Value range: 0.1~0.5
	0x0016	Enable motor	R/W	1 (int)	Write 0 to turn off the motor output, write 1 to enable the motor
	0x0017	Gripping point control point	R/W	0 (int)	Gripping point position mode control parameter, select the communication trigger point, the range of values: 1 ~ 8
State Feedback	0X0040	Initialization state feedback	R	0 (int)	0: Uninitialized, 5: Initialized , Others: Initializing
	0X0041	Gripping state feedback	R	0 (int)	00: in place, 1: operating 2: grip, 3: drop
	0X0042	Gripping position feedback	R	Maximum value (float)	Unit: mm
	0X0044	Gripping speed feedback	R	(float)	Unit: mm/s
	0X0046	Gripping current feedback	R	0 (float)	Unit: A
	0x0050	Error warning notification (reserved)	R	0 (int32)	
Parameter Configuration	0x0080	ID	R/W	1 (int)	Value range: 1~247 Valid for restart after saving parameters
	0x0081	Baud rate	R/W	4 (115200) (int)	0~8: baud9600, baud19200, baud38400, baud57600, baud115200, baud153600, baud256000, baud460800, baud921600
	0x0082	Initialization direction	R/W	0 (int)	Set position calibration direction. 0: open calibration, 1: Close calibration.
	0x0083	Automatic initialization setting	R/W	0 (int)	Set position calibration mode. 0: automatic calibration after power-on, 1: manual control calibration Valid for restart after saving parameters
	0x0084	Save parameters	R/W	0 (int)	Write 1 to save the parameters. Note: Do not use this command during real-time control. Use only for configuration parameters before actual use
	0x0085	Restore default parameters	R/W	0 (int)	Write 1 to restore default parameters
	0x0090	I/O mode switch	R/W	0 (int)	0: close I/O mode, 1: open I/O mode

Indicator Light Definition

The rotating gripper has two indicator lights, respectively indicating the state of gripping and rotation

Red light is always on	Uninitialized
Green light is always on	Initialized
Green light flashing	In motion
Blue light is always on	Object gripped
Blue light flashing	Object dropped

Working Process

1. When the gripper is powered on, it will be initialized automatically, and after the gripper is opened outward, initialization process is completed.

Manual initialization instructions:

Device address	Function code	Register start address	Register content	CRC check code
01	06 (HEX)	00 00	00 01 (Initialization)	48 0A

Reply: 01 06 00 00 00 01 48 0A

Note: When initializing, please make sure that there is no object blocking the finger to prevent the zero position from being recognized incorrectly, and you can set whether to automatically initialize through 0x0083 after power-on.

2. Now you can control the gripping and rotation of the gripper by command.

Close the gripper:

Device address	Function code	Register start address	Register length	Number of bytes	Register content	CRC check code
01	10 (HEX)	00 02	00 02	04	00 00 00 00 (0 (float))	72 76

Reply: 01 10 00 02 00 02 E0 08

Set the gripping speed to 200:

Device address	Function code	Register start address	Register length	Number of bytes	Register content	CRC check code
01	10 (HEX)	00 04	00 02	04	42 48 00 00 (200(float))	67 CE

Reply: 01 10 00 04 00 02 00 09

Set gripping current to 0.2:

Device address	Function code	Register start address	Register length	Number of bytes	Register content	CRC check code
01	10 (HEX)	00 06	00 02	04	3E 4C CC CD (0.2 (float))	2B 2F

Reply: 01 10 00 06 00 02 A1 C9

Read gripping state:

Device address	Function code	Register start address	Register content	CRC check code
01	03 (HEX)	00 41	00 01	D4 1E

Reply: 01 03 02 00 00 B8 44 (00 00 means in place, 0: in place, 1: in motion, 2: grip, 3: drop)

I/O Function

The input status and control points are shown in the table below:
NPN type is effectively 0V, PNP type is effectively 24V

IN1	IN2	Control clamping point
Invalid	Invalid	1
Efficient	Invalid	2
Invalid	Efficient	3
Efficient	Efficient	4

The state of the gripper indicated by the output state is shown in the table below:
NPN type is effectively 0V, PNP type is effectively 24V

OUT1	OUT2	Clamping state
Invalid	Invalid	In place
Efficient	Invalid	In motion
Invalid	Efficient	Holding
Efficient	Efficient	Drop



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