

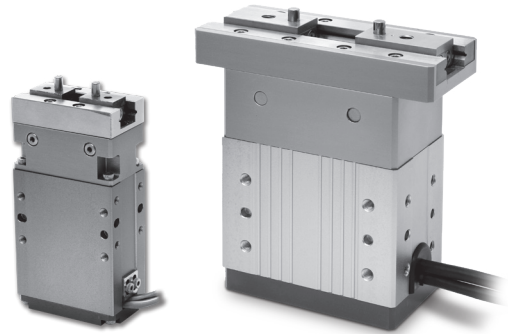
EDG series 2-Finger Electric Gripper

Product features/ Code of order

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Feature

- Worm Gear Drive
- Signal and Feedback
- High Precision



EDG

EDF

EDM

EDQ

EDX

EQX

EDK

ETB

P-SERVO

Operation manual

Specification

Item	Model	EDG 20	EDG 25	EDG 35	EDG 42
Use occasion		General environment			
Gripping force	N	14	80	140	220
Gripper stroke	mm	8	14	22	30
Max speed	mm/s	62.8	78.5	125	157
Actuation type		Worm, Double-helical, Helical rack gears			
Ambient and fluid temperature	°C	5~40			
Operating humidity range	%	35~85			
Motor size		20□	25□	35□	42□
Position repeatability	mm	±0.02			
Finger backlash(one side)	mm	0.2	0.3	0.4	
Idling stroke(one side)	mm	0.05	0.15		

Note 1: Idling stroke:Reference value when correcting the error caused by reciprocating motion.

Note 2: The speed and thrust will change base on the length of the wire, load weight and mounting conditions...etc. If the length of the wire over 5m, the speed and thrust will reduce 10% per 5m.

Note 3: If the load weight over the recommended value, the lifetime will shorter.

Code of order **EDG - 20 - 03 - P**

1 2 3

1

Mark	Motor size □
20	20
25	25
35	35
42	42

2

Mark	Wire length(m)
01	1
03	3
05	5
10	10

● Standard: 3M

3

Mark	Actuator
P	P-servo

● Standard component Refer to P6-1.89

EDG series 2-Finger Electric Gripper

Model selection

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- Seq 1 Confirm the gripping force → Seq 2 Confirm the gripping point and outward extension → Seq 3 Confirm the external force implied on the gripper

Seq 1 Confirm the gripping force

Conditions Confirmed → The gripping force is therefore calculated by → Choose the model through the gripping force chart → Selection of Touch Speed

Example

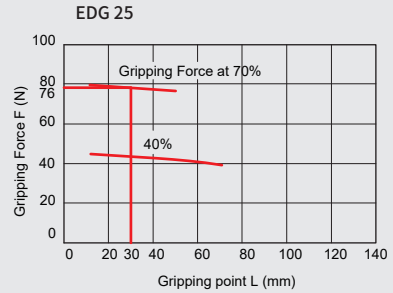
- Mass of Workpiece: 0.2kg
- Model should be selected based on 10 to 20 times of the weight of the workpiece according to the diverse COFs and shapes of the annexes and workpieces.
 - ※ For further details, please refer to the calculation of gripping force.
 - Additionally, considering the acceleration and impact force when transporting workpiece, a SF must be established.
- Ex. The required gripping force = $0.3\text{kg} \times 20 \times 9.8\text{m/s}^2 \approx 58.8\text{N}$ if the gripping force is set for at least 20 times the weight of the workpiece

Gripping Force: 40%

Thrust force is an input value of the controller steposition information.

Distance of Gripping Point: 30mm

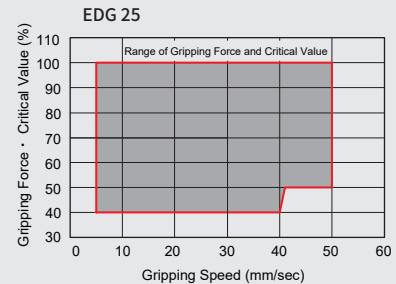
Gripping Speed: 30mm/sec



When choosing EDG 25 Series

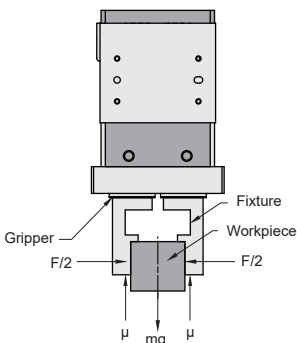
- From the distance of the gripping point $L=30\text{mm}$, and the intersection point positioned at 70% of the thrust force, we can learn that the gripping force is 27N.

- The gripping force is 27.6 times of the weight of the workpiece, which satisfies the required setup of gripping force for 20 times above.



- According to the intersection of 70% of the gripping force and 30mm/sec of the gripping speed, the latter is thereby judged to meet the requirement.
- Confirm the range of gripping speed based on the specified gripping force (%).

The gripping force is therefore calculated by



Gripping a workpiece, as shown in the left figure

- F : Gripping Force (N)
- μ : COF between Annex and Workpiece
- m : Mass of Workpiece (kg)
- g : Acceleration of Gravity ($=9.8\text{m/s}^2$)
- mg : Weight of Workpiece (N)

The condition of that the workpiece does not fall is $F\mu > mg$;

$$\text{Hence } F > \frac{mg}{\mu}$$

Provided SF is a, then F is

$$F = \frac{mg}{\mu} \times a$$

About "10 to 20 Times above the Weight of Workpiece"

The data "10 to 20 Times above the Weight of Workpiece" recommended by the Company is calculated through the impact force during transport when $SF=4$.

$\mu = 0.2$	$\mu = 0.1$
$F = \frac{mg}{2 \times 0.2} \times 4 = 10 \times mg$	$F = \frac{mg}{2 \times 0.1} \times 4 = 20 \times mg$

10 Times of the Weight of Workpiece

20 Times of the Weight of Workpiece

<Reference>COF μ (variable depending on different usage environments or surface pressure)

COF μ	Material Quality of Annex and Workpiece (standard)
0.1	Metal (surface roughness Rz is under 3.2)
0.2	Metal
Above 0.2	Rubber, Resin, etc.

- When the COF μ is higher than 0.2, please select the model of which the weight is 10 times to 20 times of the workpiece for safety concern.
- Considering the larger acceleration and impact force when transporting the workpiece, it is necessary to increase the SF.

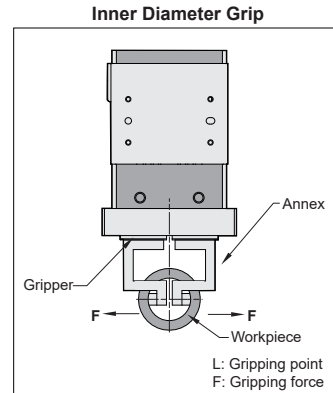
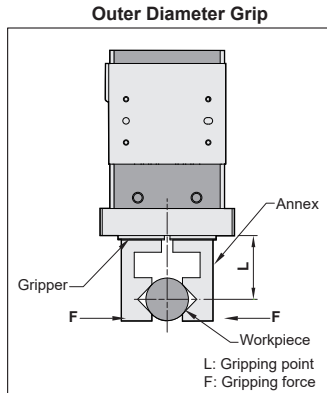
EDG series 2-Finger Electric Gripper

Model selection

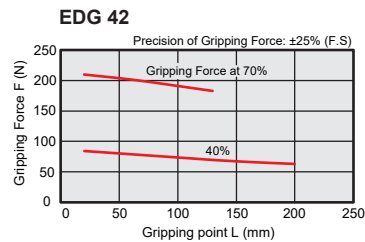
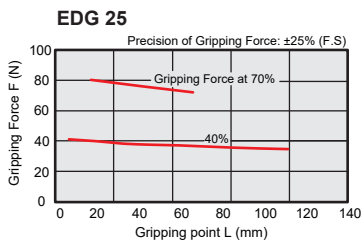
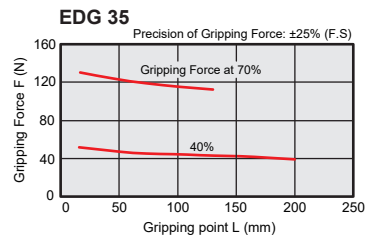
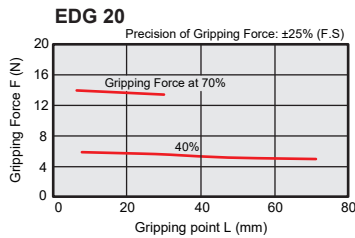
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Demonstration of gripping force

- The figure below shows the gripping force is applied by the complete touch by the two grippers, annex and workpiece, which is represented by F .
- Working position of grip: L please perform it within the range designated in the figure below.



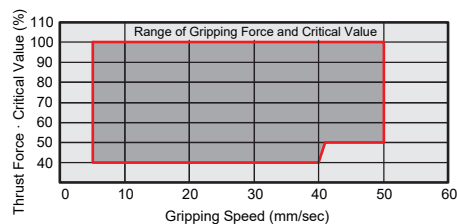
Curve Graph of gripping force and gripping point



Gripping force is an input vale of the drive information

Setup of Gripping Speed

- Please use the fundamental model within the range designated in the figure below when setting the gripping force and critical value.



EDG

EDF

EDM

EDQ

EDX

EQX

EDK

ETB

P-SERVO

Operation manual

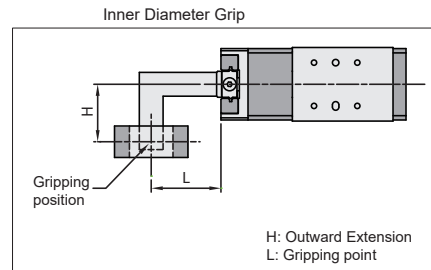
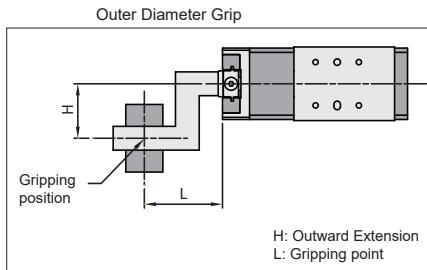
EDG series 2-Finger Electric Gripper

Model selection

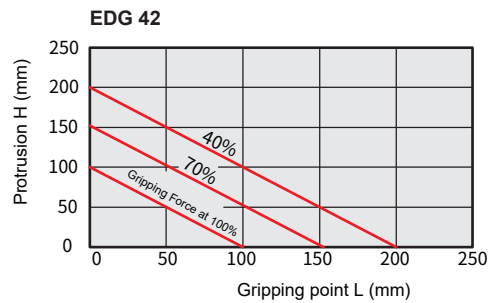
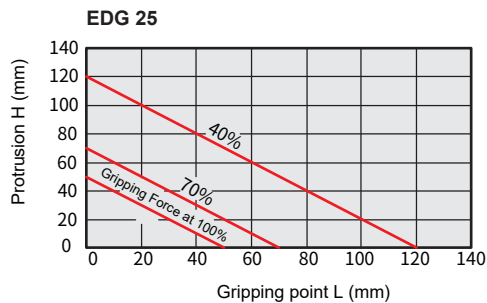
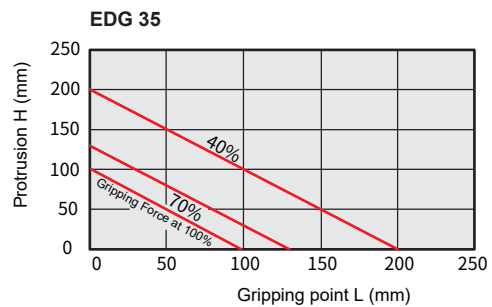
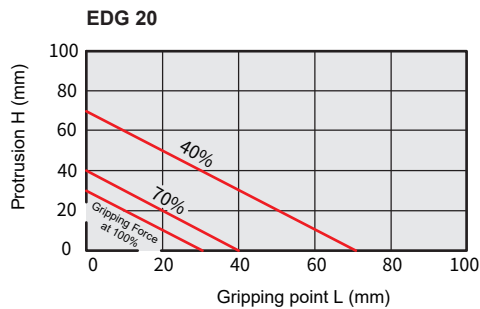
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Seq 2 Confirmation of Gripping Point and Outward Extension

- Gripping Position and Outward Extension of Workpiece: H - please perform it within the range designated in the figure below.
- If the gripping position exceeds the range of limitation, the service life of the electric gripper will be impacted.



Thrust force is an input value of the controller step position information.

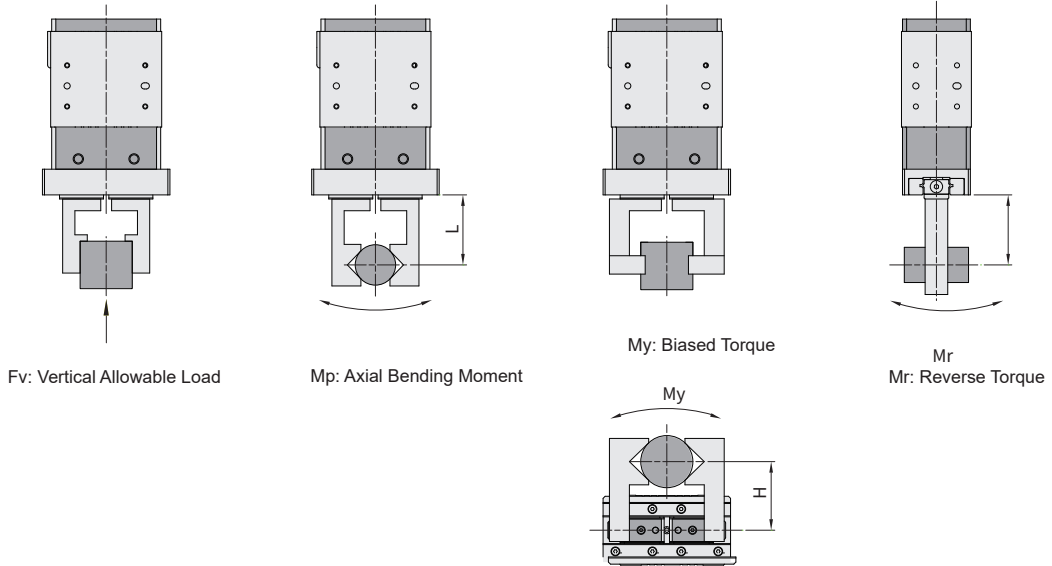


EDG series 2-Finger Electric Gripper

Model selection

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Seq 3 Confirm the utmost external force used in the fingers



Calculation of Allowable External Force (when bearing load torque)	Example
$\text{Allowable Load } F \text{ (N)} = \frac{M \text{ (Allowable Static Torque) (N}\cdot\text{m)}}{L \times 10^{-3}}$ <p style="text-align: center;">*Definite Number of Conversion of Units</p>	<p>The axial bending moment generated by the static load at $f=10\text{N}$ when the guide rail of EDG20 is reaching $L=30\text{mm}$ can be used.</p> $\text{Allowable Load } F = \frac{0.68}{30 \times 10^{-3}} = 22.7\text{(N)}$ <p>Load $f = 10\text{(N)} < 22.7\text{(N)}$</p>

夾持力為驅動器的訊號輸出值

Model	Vertical Load Fv (N)	Allowable Static Torque		
		Axial Bending Moment: Mp (N·m)	Biased Torque: My (N·m)	Reverse Torque: Mr (N·m)
EDG 20	60	0.5	0.5	1.5
EDG 25	356	1.9	2.7	4.6
EDG 35	558	3.8	5.5	9.5
EDG 42	651	5.1	7.2	12.4

EDG

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EDG series 2-Finger Electric Gripper

Gripping force specifications

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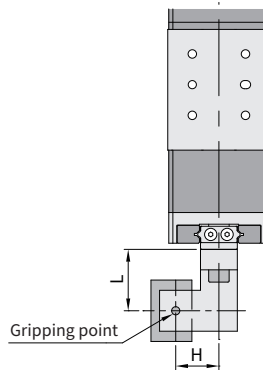
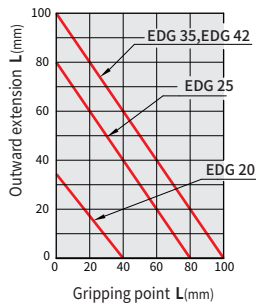
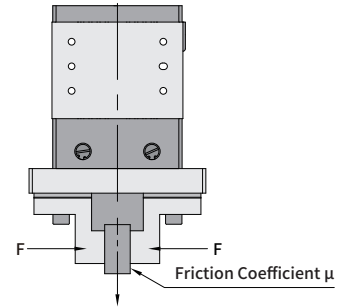
■ Gripper (EDG, EDF) is used in combination with jig for opening object.

1. Verify actual gripping force
2. Verify gripping point
3. Verify external force exerted on the Gripper

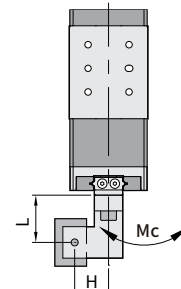
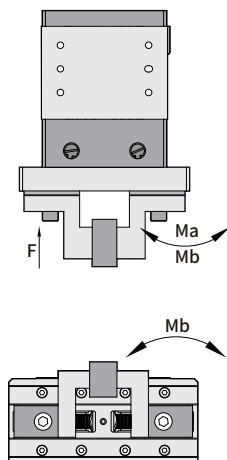
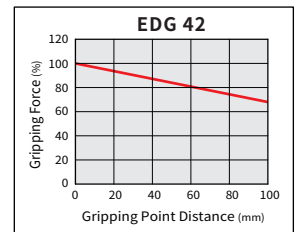
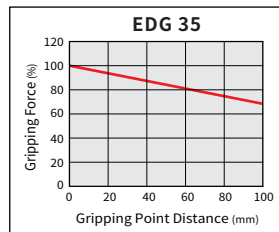
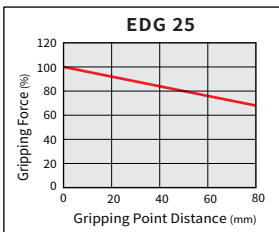
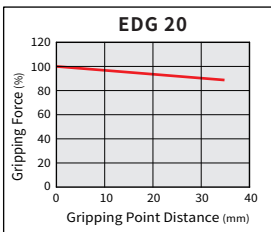
If safety factor is a , then F is:

$$F > \frac{mg}{\mu} \times 2 \text{ (safety value)}$$

- F : Gripping force (N)
- μ : Friction coefficient between accessory and workpiece
- m : Mass of workpiece
- g : Acceleration of gravity (=9.8m/s²)
- mg : Weight of workpiece



■ Gripping point distance and change of gripping force



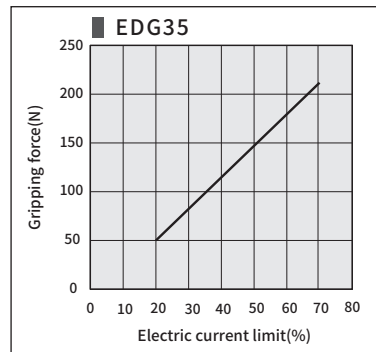
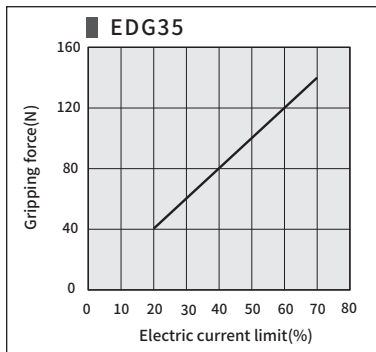
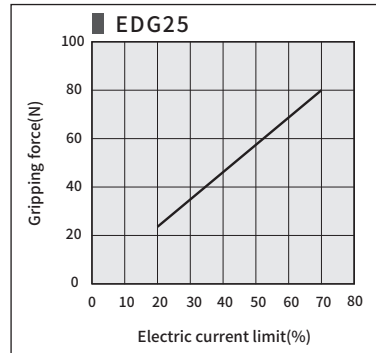
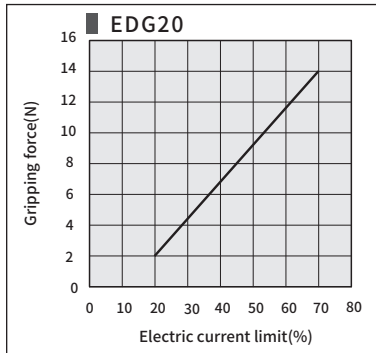
Spec	Allowable Vertical Load F (N)	Max. Allowable Loading Moment (Nm)		
		Ma	Mb	Mc
EDG 20	60	0.5	0.5	1.5
EDG 25	356	1.9	2.7	4.6
EDG 35	558	3.8	5.5	9.5
EDG 42	651	5.1	7.2	12.4

EDG series 2-Finger Electric Gripper

Characteristics graph, Mounting type

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Gripping force-current value graph



EDG

EDF

EDM

EDQ

EDX

EQX

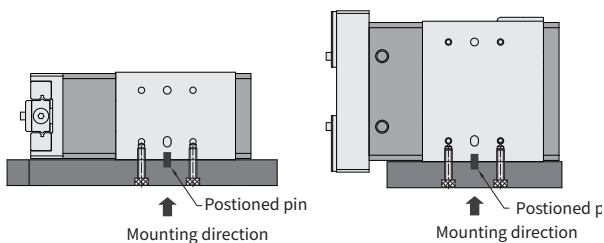
EDK

ETB

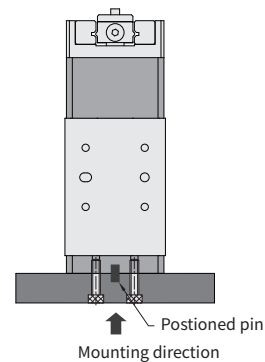
P-SERVO

Operation manual

Side mounting



Bottom mounting



Product weight

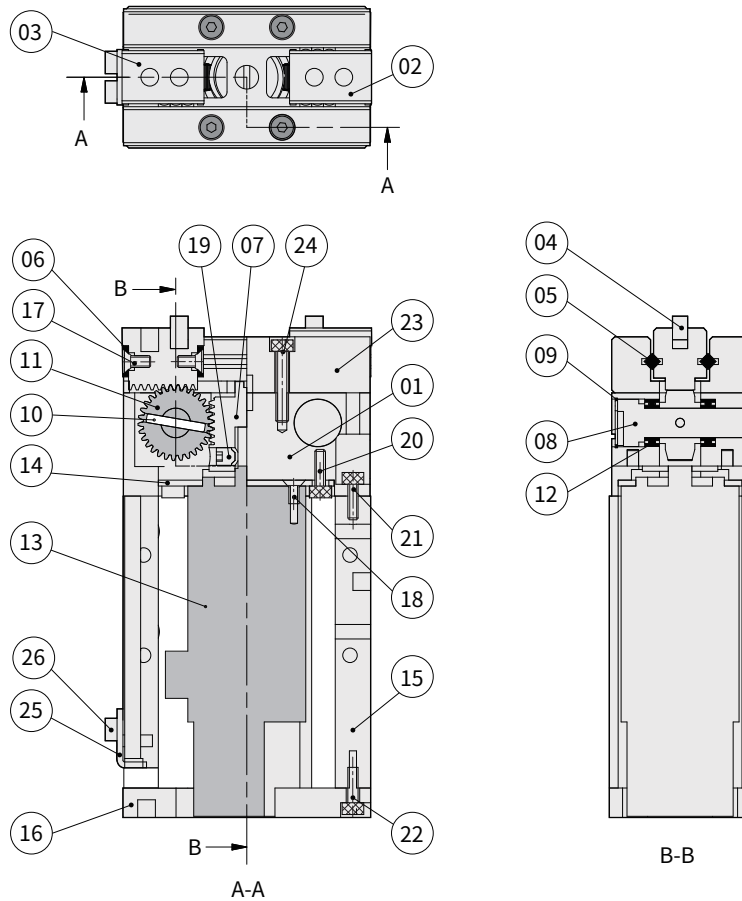
Item	Model	20	25	35	42
	Weight (kg)	0.3	0.5	1.0	1.4

EDG series 2-Finger Electric Gripper

Product features

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EDG20



Components and material list

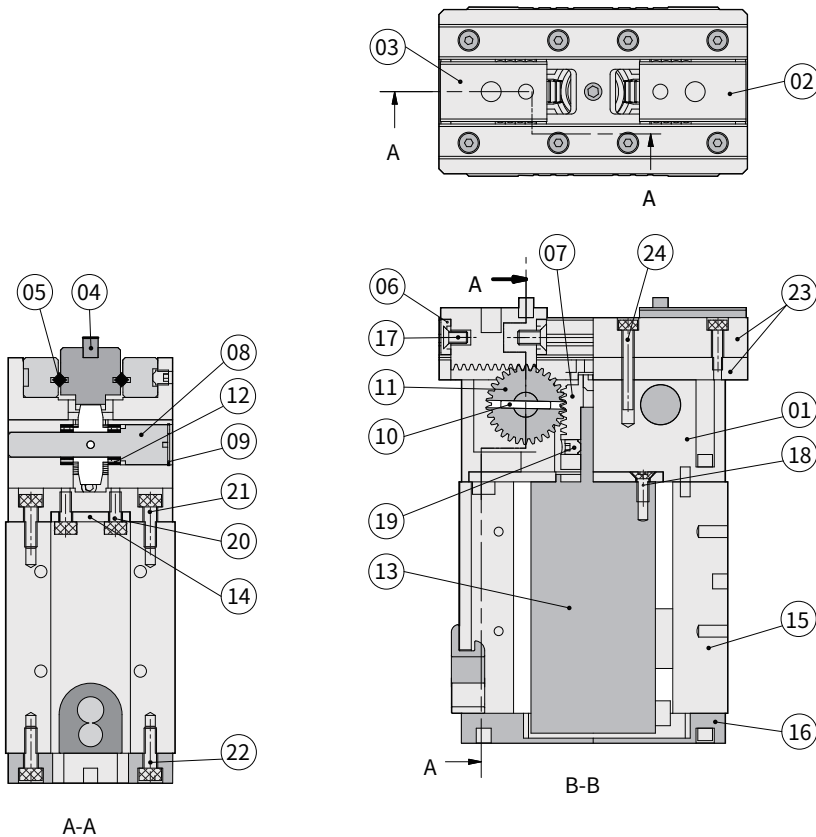
No.	Item	Material	No.	Item	Material
01	Body	Aluminum alloy	14	Motor Adapter Plate	Aluminum alloy
02	Finger	Stainless steel	15	Shell	Aluminum alloy
03	Finger	Stainless steel	16	Base	Aluminum alloy
04	Finger Plate Fixing Pin	Carbon steel	17	Ball Stop Fixing Screw	Alloy steel
05	Finger Plate Roller	Bearing steel	18	Motor Fixing Screw	Alloy steel
06	Roller block	Stainless steel	19	Motor Set Screw	Alloy steel
07	Worm gear	Stainless steel	20	Adapter Plate Fixing Screw	Alloy steel
08	Shaft	Stainless steel	21	Body Fixing Screw	Alloy steel
09	Shaft Clip Ring	Alloy steel	22	Bottom Plate Fixing Screw	Alloy steel
10	Shaft Spring Pin	Spring steel	23	Finger Plate Holder	Stainless steel
11	Gear shaft	Customized	24	Finger Plate Holder Fixing Screw	Alloy steel
12	Axial Bearing	Bearing steel	25	Wire Cover Plate	Stainless steel
13	Close-loop Motor	POM	26	Wire Cover Plate Fixing Screw	Alloy steel

EDG series 2-Finger Electric Gripper

Product features

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EDG25, EDG35, EDG42



EDG
EDF
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Components and material list

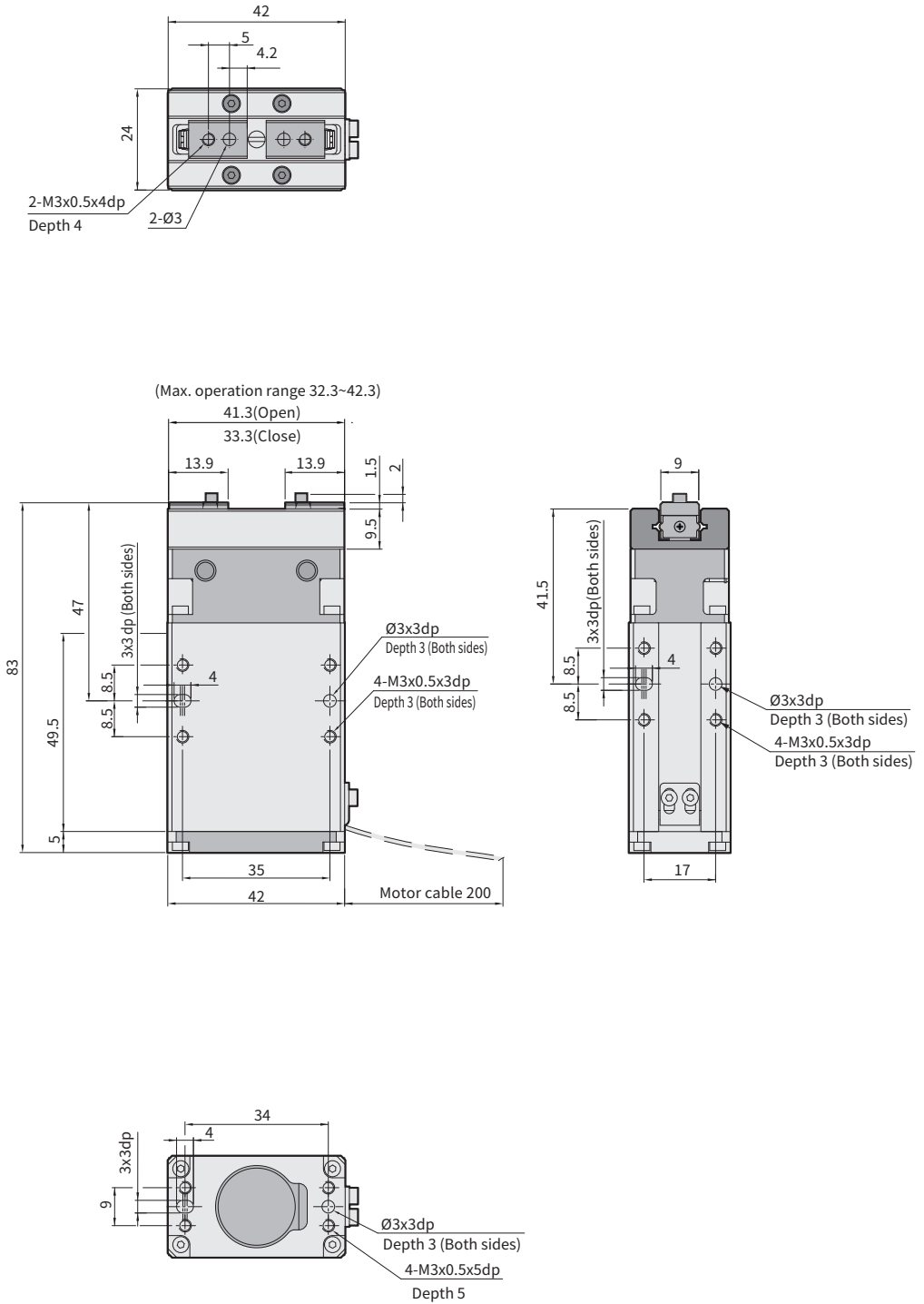
No.	Item	Material	No.	Item	Material
01	Body	Aluminum alloy	13	Close-loop Motor	Customized
02	Finger	Stainless steel	14	Motor Adapter Plate	Aluminum alloy
03	Finger	Stainless steel	15	Shell	Aluminum alloy
04	Finger Plate Fixing Pin	Carbon steel	16	Base	Aluminum alloy
05	Finger Plate Roller	Bearing steel	17	Ball Stop Fixing Screw	Alloy steel
06	Roller block	Stainless steel	18	Motor Fixing Screw	Alloy steel
07	Ball screw	Stainless steel	19	Motor Set Screw	Alloy steel
08	Shaft	Stainless steel	20	Adapter Plate Fixing Screw	Alloy steel
09	Shaft Clip Ring	Alloy steel	21	Body Fixing Screw	Alloy steel
10	Shaft Spring Pin	Spring steel	22	Bottom Plate Fixing Screw	Alloy steel
11	Gear shaft	POM	23	Finger Plate Holder	Stainless steel
12	Radial bearing	Bearing steel	24	Finger Plate Holder Fixing Screw	Alloy steel

EDG series 2-Finger Electric Gripper

Dimensions

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EDG-20

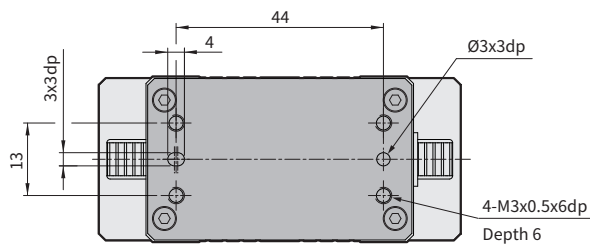
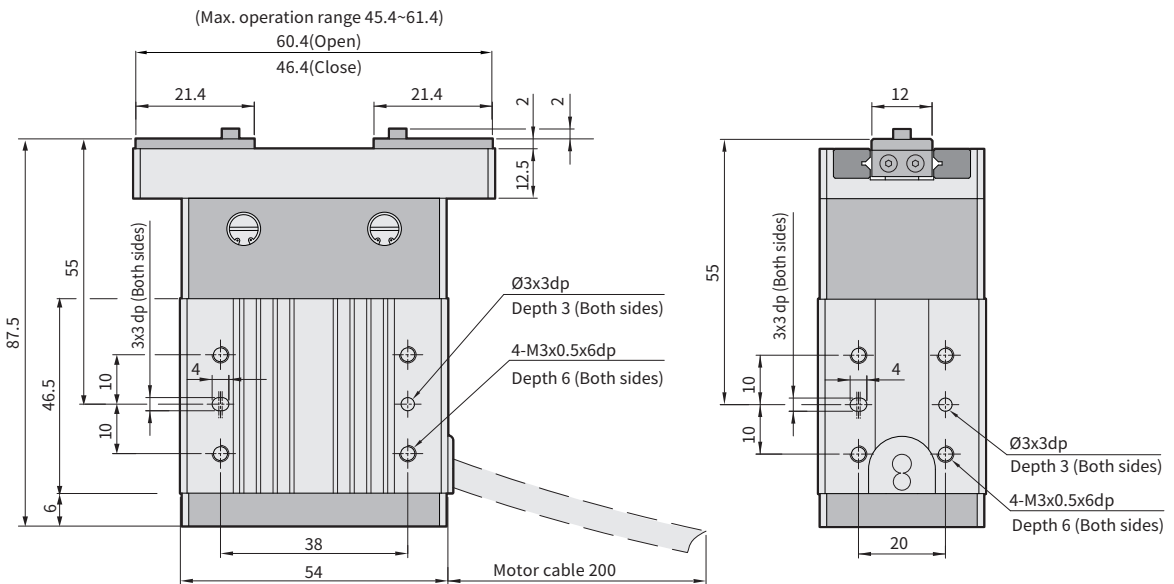
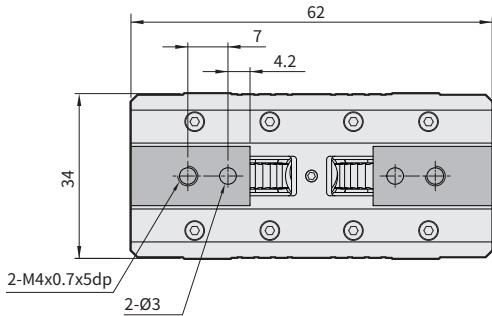


EDG series 2-Finger Electric Gripper

Dimensions

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EDG-25



EDG

EDF

EDM

EDQ

EDX

EQX

EDK

ETB

P-SERVO

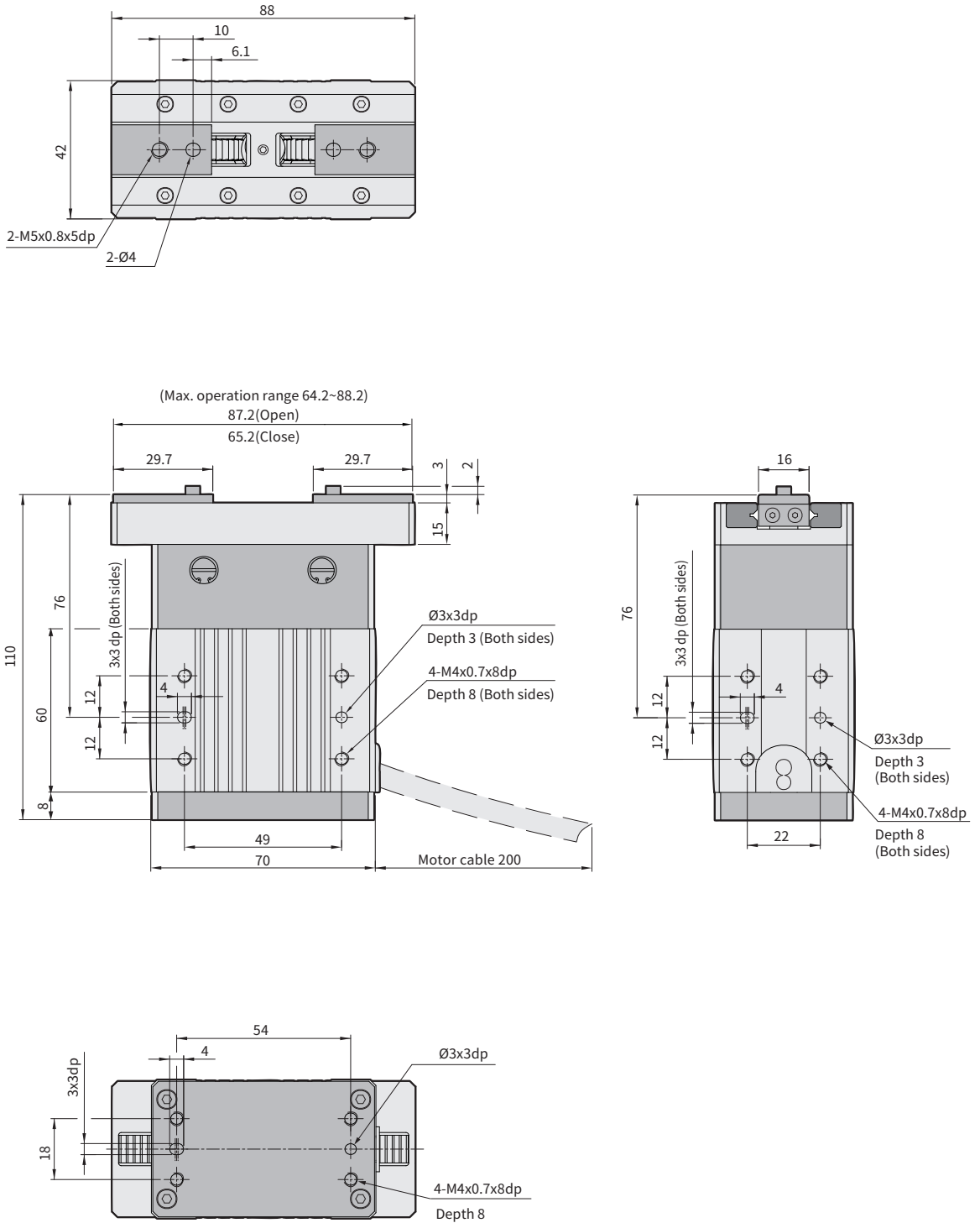
Operation manual

EDG series 2-Finger Electric Gripper

Dimensions

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EDG-35

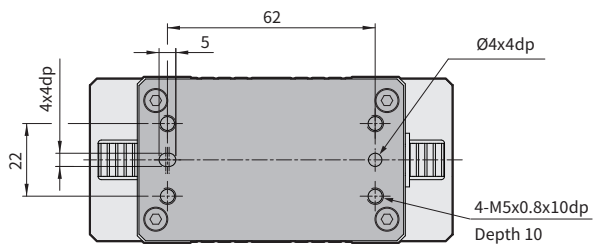
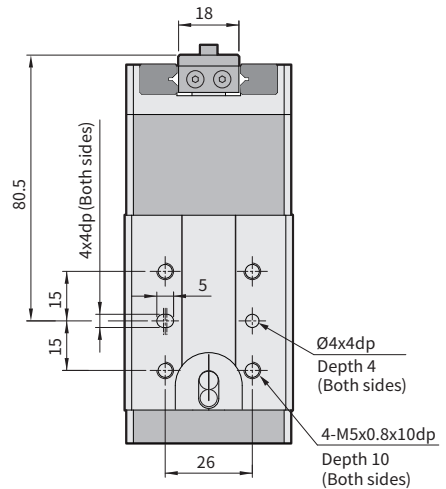
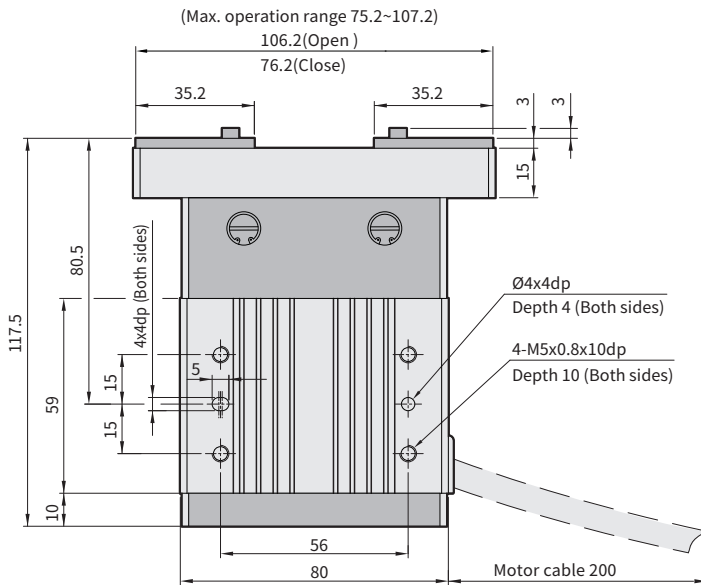
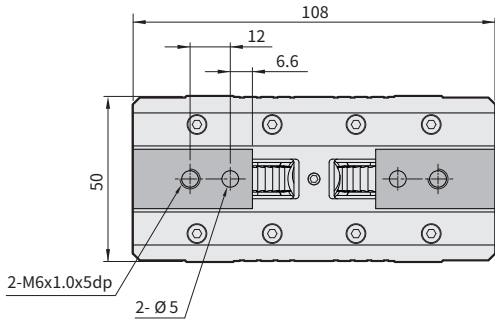


EDG series 2-Finger Electric Gripper

Dimensions

CHELIC

EDG-42



EDG

EDF

EDM

EDQ

EDX

EQX

EDK

ETB

P-SERVO

Operation manual