

EDF series 2-Finger Electric Gripper/ Long Stroke

Product features/ Code of order

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Feature

- Timing belt movement
- Feedback signal
- High precision



Specification

Item	Model		EDF 20	EDF 32
Gripper stroke	Basic	mm	24	32
	Long stroke	mm	48	64
Lead		mm	1	1.25
Gripping force		N	46	142
Open/close speed		mm/s	0~50	
Repeatability		mm	±0.05	
Actuation type			Worm wheel, Belt drive	
Ambient and fluid temperature		°C	5~40	
Operating humidity range		%	35~85	
Motor size			25 □	42 □
Finger backlash(one side)		mm	0.5 or less	
Idling stroke(one side)		mm	0.3 or less	

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.

Code of order **EDF - 20 - 24 - 03 - P**



1

Mark	Motor size □
20	25
32	42

2

Mark	Stroke (mm)
24	24
48	48
32	32
64	64

3

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

4

Mark	Actuator
P	P-servo

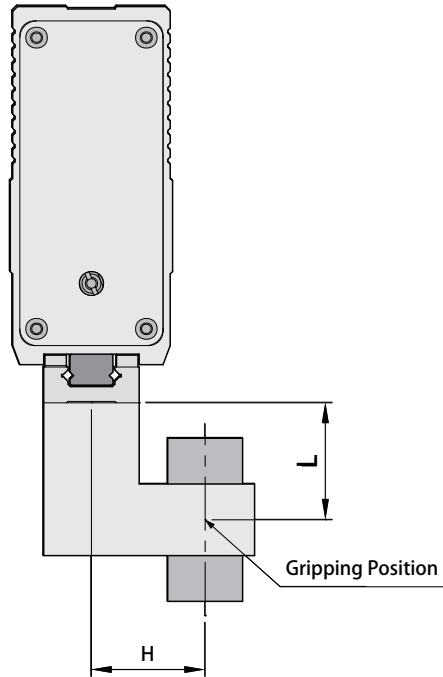
● Standard component Refer to P6-1.89

● Standard: 3m

EDF series 2-Finger Electric Gripper/ Long Stroke

夾持規範

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EDG

EDF

EDM

EDQ

EDX

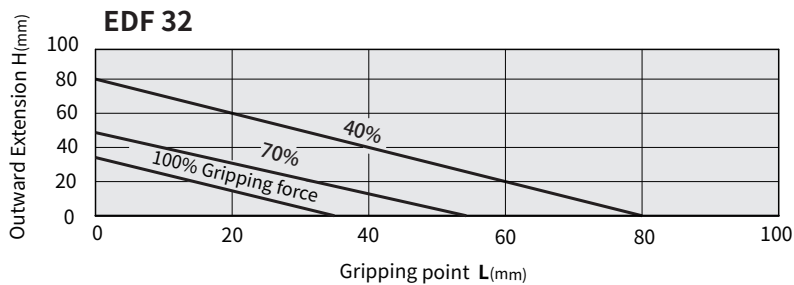
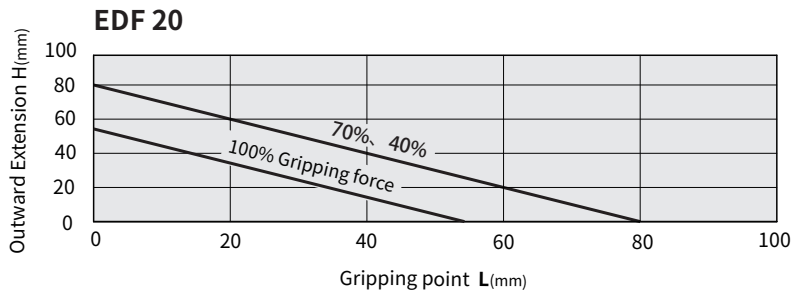
EQX

EDK

ETB

P-SERVO

Operation manual



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

EDF series 2-Finger Electric Gripper/ Long Stroke

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: 0.1kg

• 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 description chart of model selection.

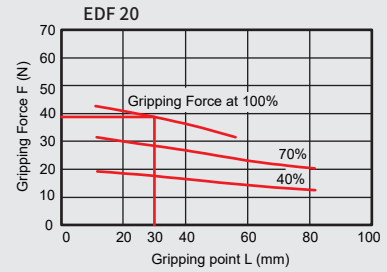
• Additionally, considering the acceleration and impact force when transporting the workpiece, an SF must be established.

Ex. The required gripping force = $0.1\text{kg} \times 20 \times 9.8\text{m/s}^2 \doteq 19.2\text{N}$ at least, if the gripping force is set for above 20 times the weight of the workpiece.

Thrust Force: 100%

Distance of Gripping Point: 30mm

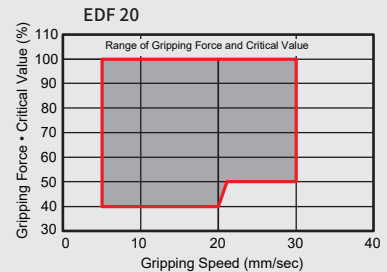
Gripping Speed: 20mm/sec



When choosing EDG 20 Series

• From the distance of the gripping point $L=30\text{mm}$, and the intersection point positioned at 100% of the thrust force we can learn that the gripping force is 38.7N.

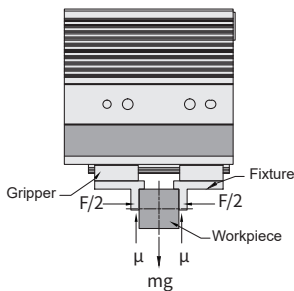
• The gripping force is 38.7 times the weight of the workpiece, which satisfies the required setup of gripping force for 20 times above.



• According to the intersection of 100% of the gripping force and 20mm/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 $SF=4$.

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

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.

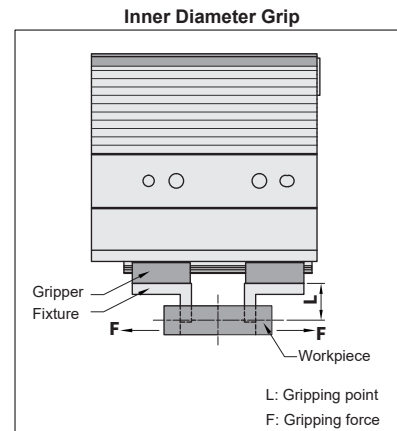
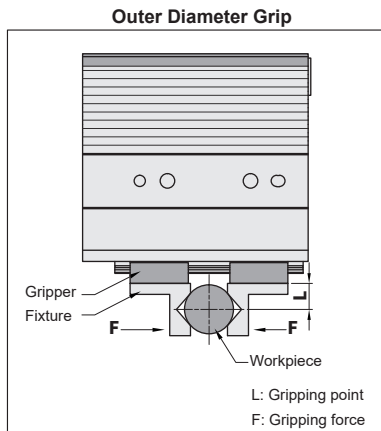
EDF series 2-Finger Electric Gripper/ Long Stroke

Model selection

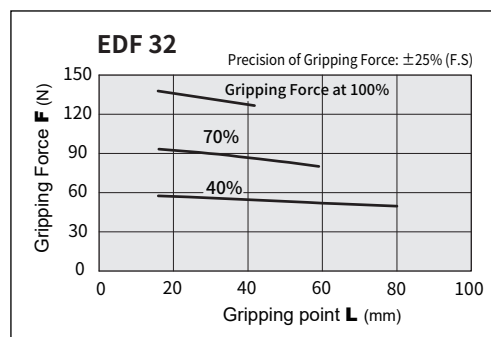
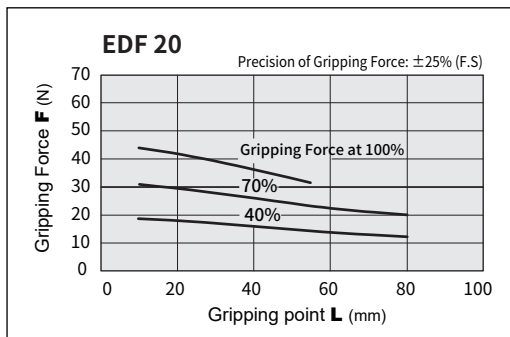
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Demonstration of gripping force

- 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.



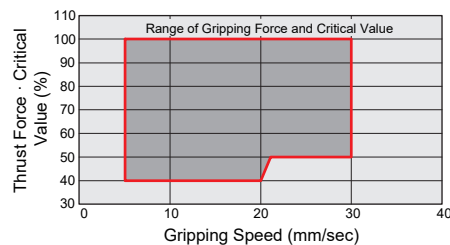
Curve Graph of gripping force and gripping point



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

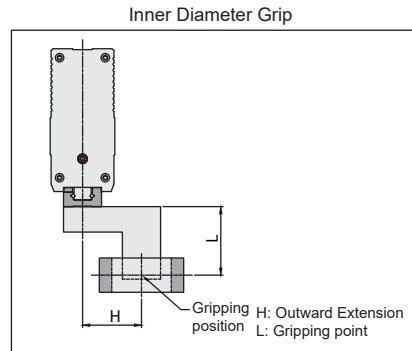
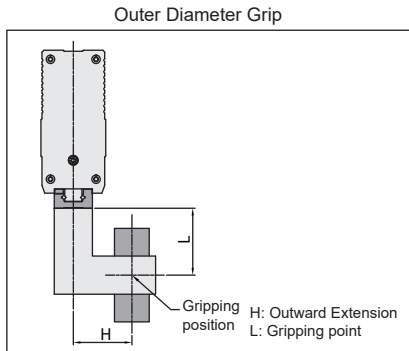
EDF series 2-Finger Electric Gripper/ Long Stroke

Model selection

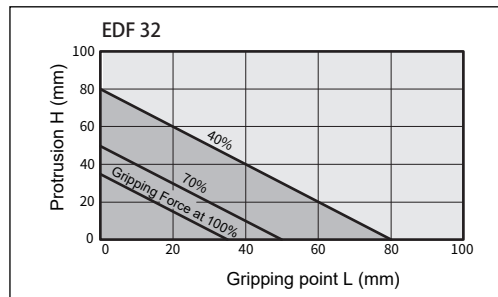
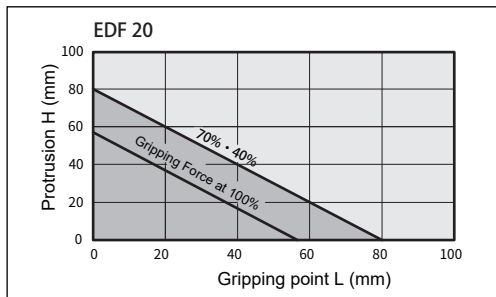
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Seq 2 Confirmation of Gripping Point and Outward Extension

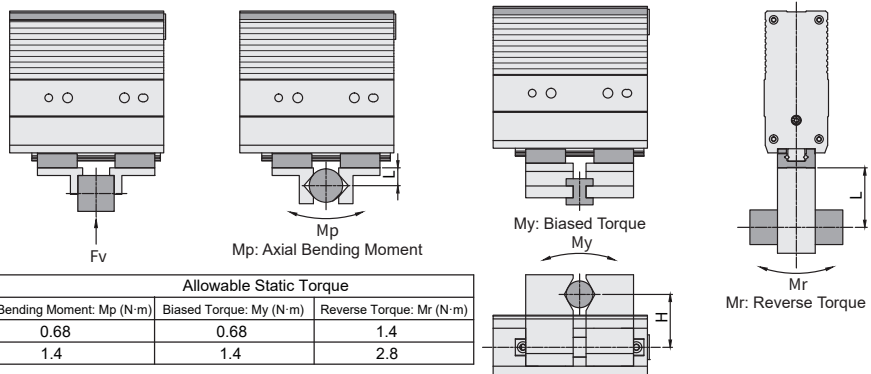
- Gripping Position and Outward Extension of Workpiece: H - please perform it within the range designated in the figure below.
- If the gripping position exceeds the range of limitation, the service life of the electric gripper will be impacted.



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



Seq 3 Confirm the external force applied on the slider



Model	Vertical Load F_v (N)	Allowable Static Torque		
		Axial Bending Moment: M_p (N·m)	Biased Torque: M_y (N·m)	Reverse Torque: M_r (N·m)
EDF 20□	98	0.68	0.68	1.4
EDF 32□	176	1.4	1.4	2.8

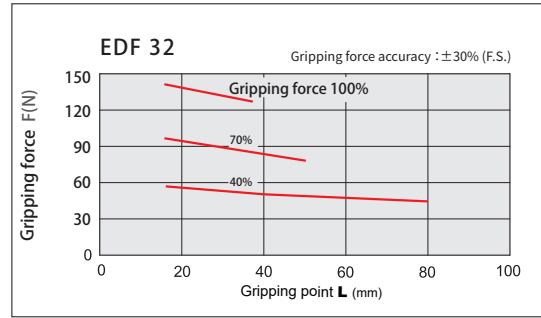
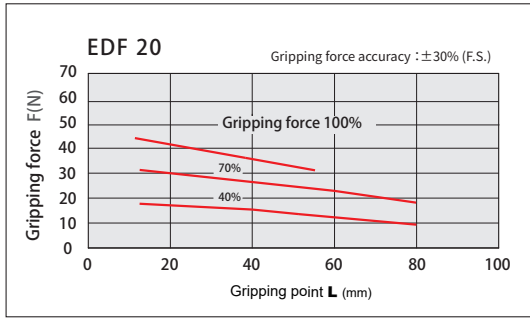
Calculation of Allowable External Force (when bearing load torque)		Example
Allowable Load F (N) =	$\frac{M \text{ (Allowable Static Torque) (N·m)}}{L \times 10^{-3}}$ <p style="text-align: center;">Definite Number of Conversion of Units</p>	<p>The axial bending moment generated by the static load at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

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Characteristics graph, Mounting type

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Gripping force-current value graph



Side mounting

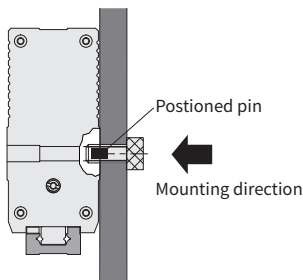
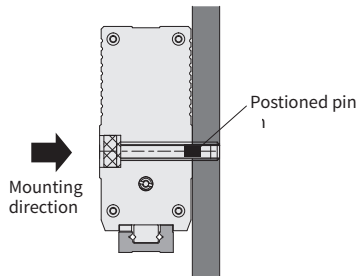
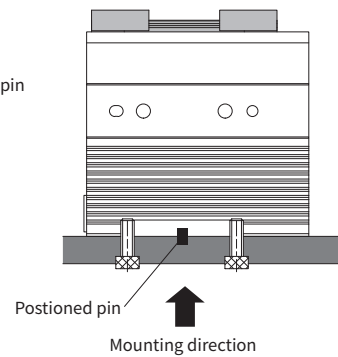


Plate mounting



Bottom mounting



Product weight

Item	Model	EDF 20		EDF 25	
Weight (kg)		0.6(Basic)	0.8 (Long stroke)	1.6(Basic)	2.0 (Long stroke)

EDG

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P-SERVO

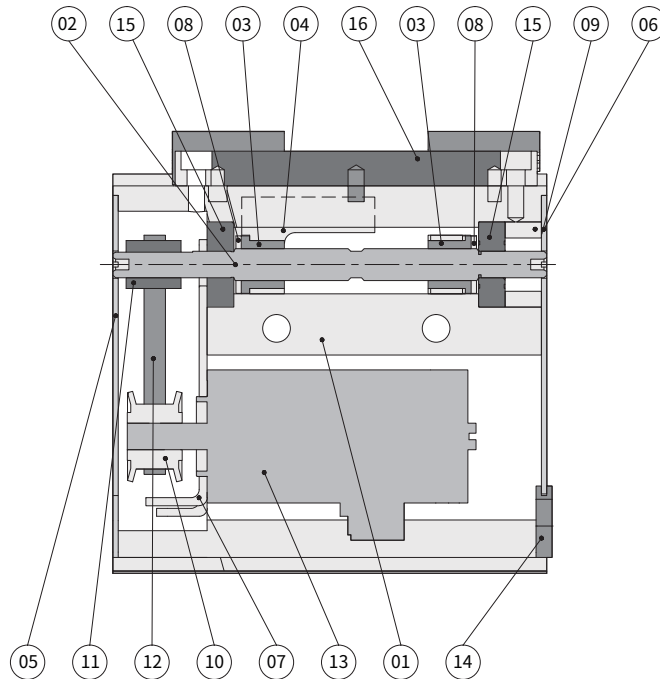
Operation manual

EDF series 2-Finger Electric Gripper/ Long Stroke

Product features

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EDF20, EDF32



Components and Material list

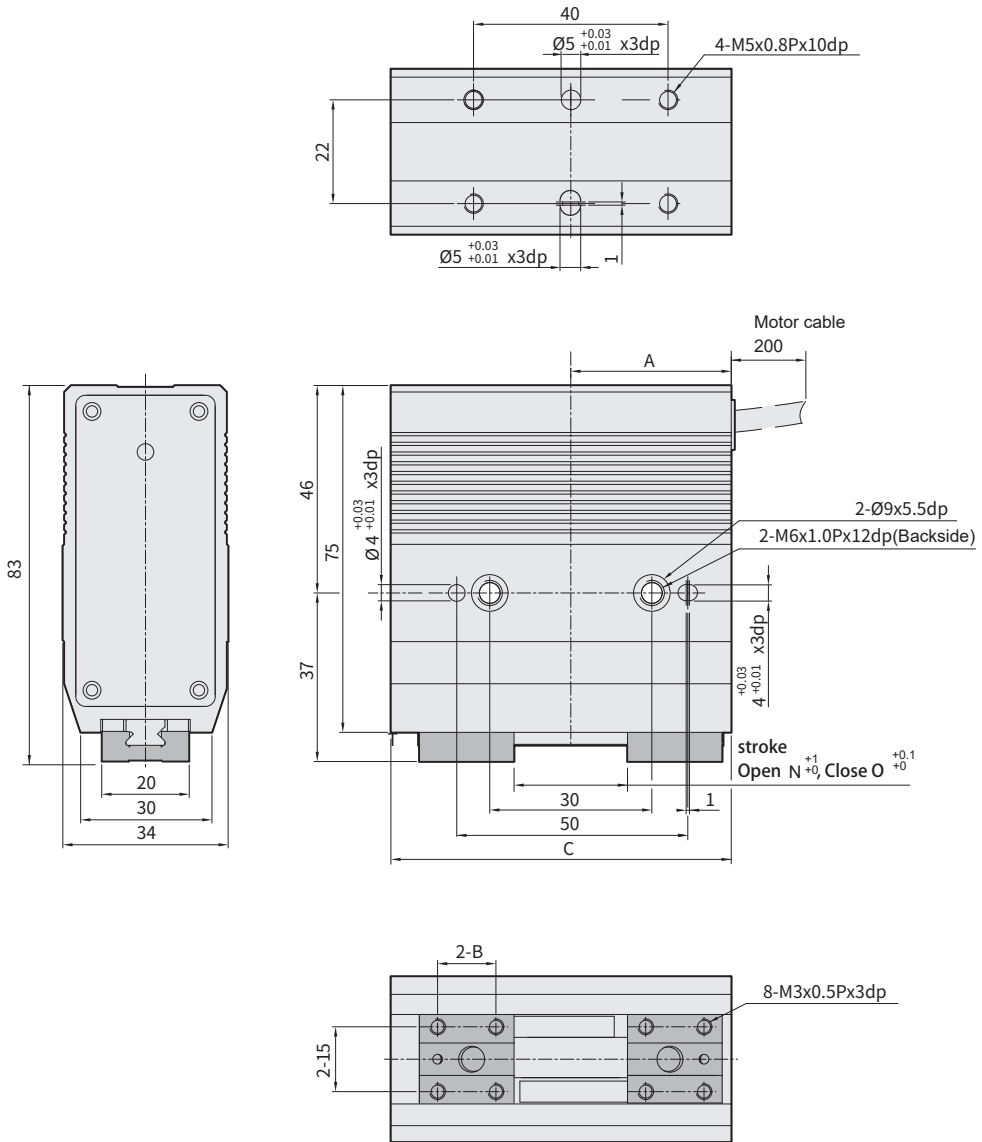
No.	Name	Material	No.	Name	Material
01	Body	Aluminum alloy	09	Cushion	POM
02	Ball screw	Alloy steel	10	Timing belt pulley/5AF	Customized
03	Internal thread sleeve	Alloy steel	11	Timing belt pulley/5A	Customized
04	Action fixing block	Stainless	12	Timing belt	Customized
05	Stopper	Stainless	13	Closed loop motor	Customized
06	Cabel stopper	Stainless	14	Outlet rubber	Rubber
07	Motor fixing plate	Stainless	15	Bearing	Customized
08	Sleeve fixing piece	Stainless	16	Slider wirh slide base	Stainless

EDF series 2-Finger Electric Gripper/ Long Stroke

Dimensions

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EDF-20



EDG

EDF

EDM

EDQ

EDX

EQX

EDK

ETB

P-SERVO

Operation manual

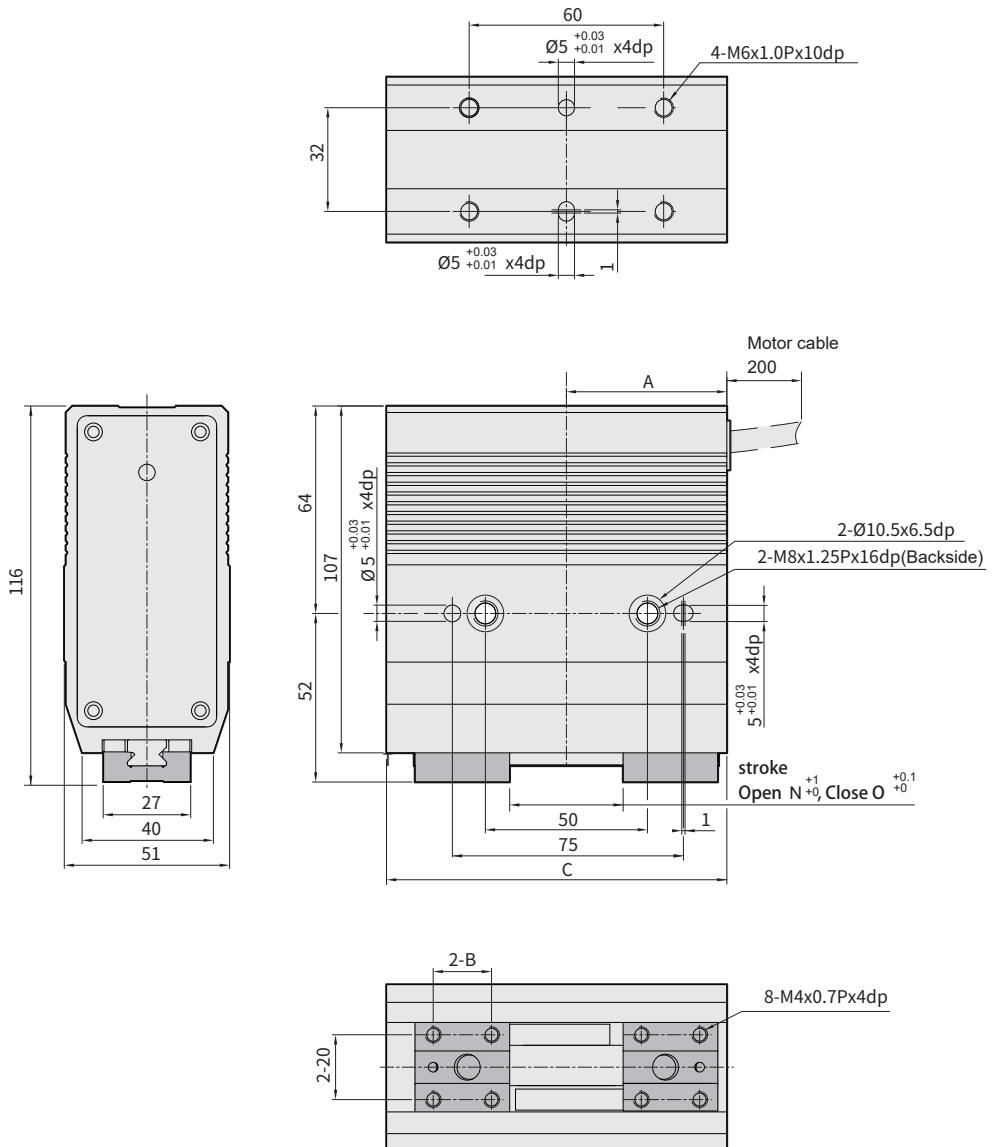
size(mm)	A	B	C	N
EDF 20x24	35.8	12	81.5	24
EDF 20x48	53.8	18	110	48

EDF series 2-Finger Electric Gripper/ Long Stroke

Dimensions

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EDF-32



size(mm)	A	B	C	N
EDF 32x32	49.5	18	105	32
EDF 32x64	72.5	26	145	64