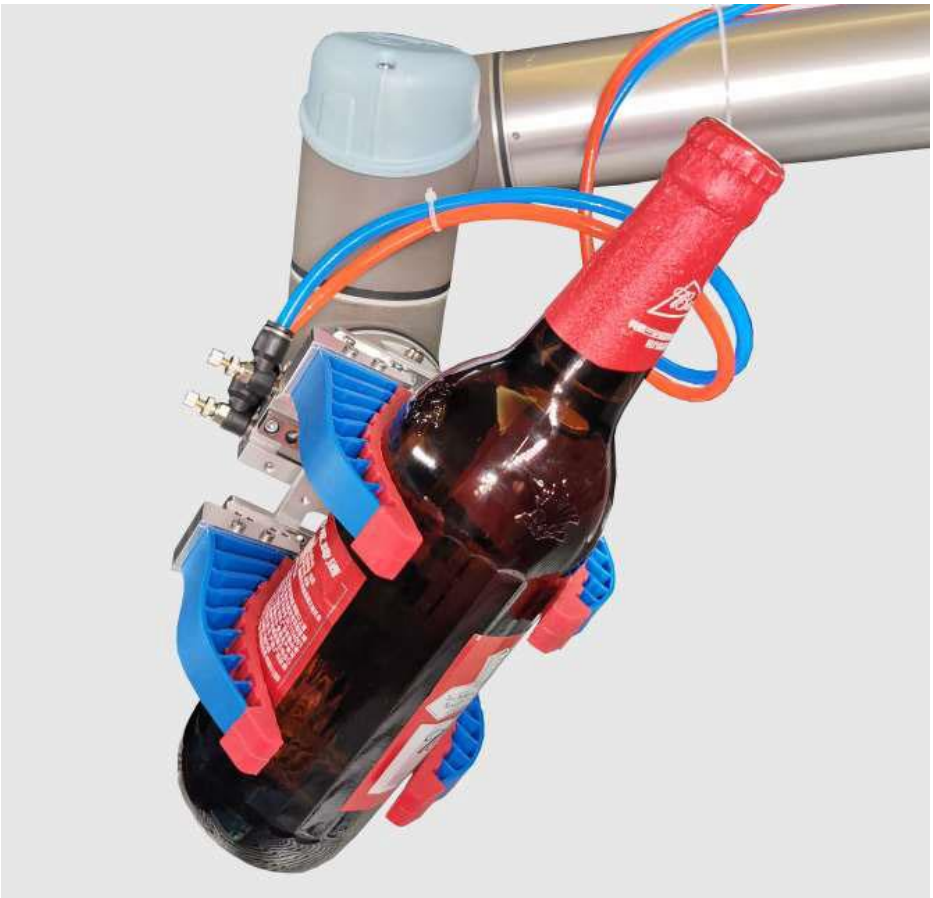
FA Flexible adaptive gripper



1. Overview of Flexible Adaptive Mechanical Grippers

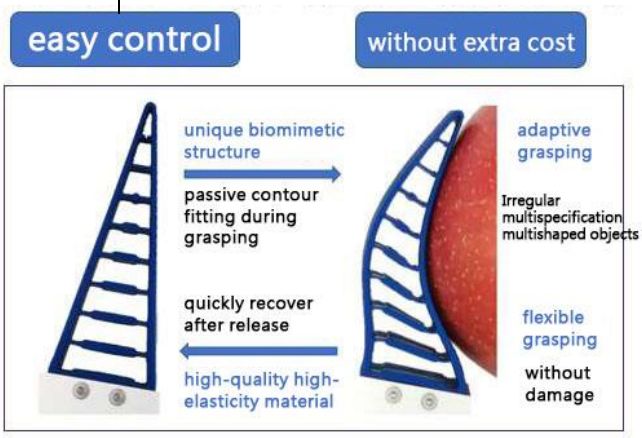
The Flexible Adaptive Gripper (FA), also known as a flexible adaptive end effector, is a new type of end-of-arm tool characterized by the use of flexible materials in the gripping end that comes into contact with the workpiece. It offers safety in interaction with humans and the environment, ensuring secure and damage-free gripping while demonstrating exceptional adaptability. With the same gripper, it is capable of handling workpieces of varying shapes, sizes, and weights.

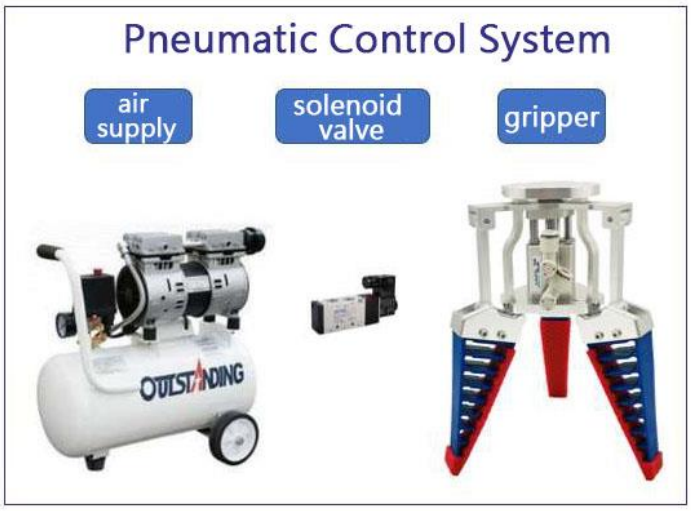
The Flexible Adaptive Gripper (FA) passively adapts to the curvature of the object when in contact, eliminating the need for custom machining based on precise product dimensions and shapes. It's a versatile solution compatible with multiple object specifications, without the need for expensive quick-change systems.

Flexible mechanical grippers offer gentle and adaptable handling, making them particularly suitable for grasping delicate, easily breakable, multi-specification, and irregularly shaped products.

■ Flexible Mechanical Gripper Control System

Pneumatic Version: Controlled by a two-position five-way solenoid valve. As a preferred option, a precision pressure regulating valve can be added at the air inlet.





■ Features and Application Areas

safety：

Composed of flexible materials, it does not cause pain even if someone's hand is accidentally caught. Its inherent safety makes it suitable for interaction with humans, making it ideal for use in research and service fields.

without damage：

The material is soft, and its elastic structure can compensate for excessive external forces, ensuring damage-free gripping of objects. It is particularly suitable for damage-free gripping of items such as fruits, glass, ceramics, powder injection molded objects, and objects with high surface requirements.

single gripper compatible：

It can adapt to the contour of objects, allowing a single gripper to grasp different shapes, sizes, and irregular workpieces. It is highly suitable for gripping irregular objects and flexible production of various specifications on a production line.

saving money and time：

There is no need for quick changes when grasping objects of different specifications, making it efficient and cost-effective. Custom machining of gripper shapes based on the workpiece's shape is unnecessary; it's ready to use, saving time and labor.

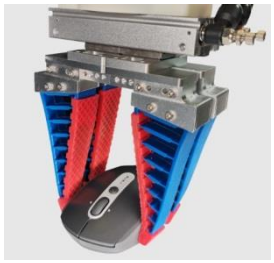
The flexible self-adaptive gripper can gently envelop and grasp various objects without causing physical damage to the grabbed items. It is suitable for a wide range of applications, including food, automotive, personal care, medical, 3C electronics, and more. It can be integrated into smart assembly, automated sorting, logistics warehousing, and food processing production lines. It can also serve as a functional accessory for research experiments, smart entertainment devices, or service robots. It is the ideal choice for customers who require intelligent, damage-free, high-safety, and highly adaptable gripping.

powder metallurgy production

irregular lampshade injection molding

service robot

daily chemical

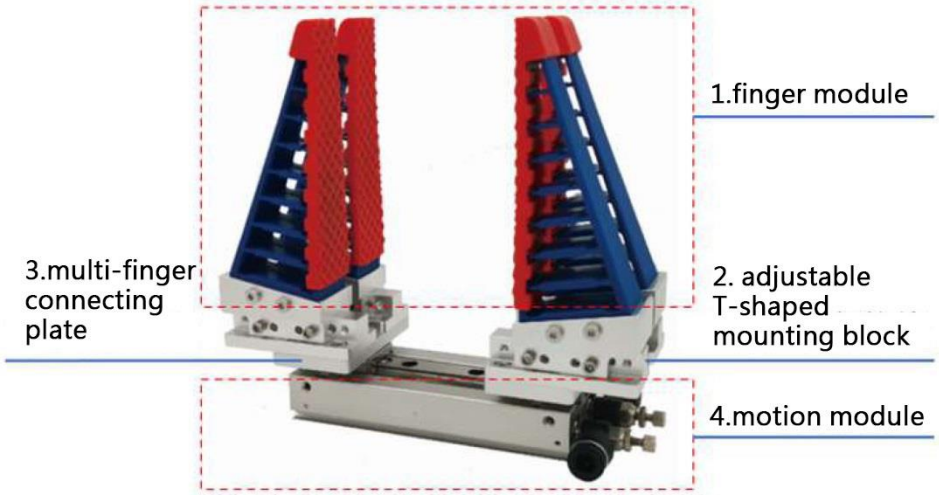


3C

fresh fruits

2. Product Introduction of Flexible Adaptive Mechanical Grippers

■ composition



1、 Finger Modules: There are three types - FAM(R)66, 86, and 100, which can be modularly combined.

2、 Adjustable T-shaped Mounting Block: Can be used to adjust the fixed distance between the two side fingers, with two options - A (long) and B (short).

3、 Multi-Finger Connecting Plate: Customizable, with standard options of A (long) and B (short). This includes increasing the number of fingers, increasing the spacing between fingers on the same side, and enlarging the installation distance between the two side fingers.

4、 Motion Module: Standard options include L12/24/48mm. It can also be reselected based on requirements, including motion style and stroke.

■ Order Code

FA - 4 - MR - 100 – W30 – L48 - TA
① ② ③ ④ ⑤ ⑥ ⑦

①Model

FA	Flexible adaptive gripper

②number of fingers

empty	finger modules only
2	2 fingers
4	4 fingers

③Finger modules with or without silicone layer

MR	Fingers with silicone reinforcement layer
M	Fingers without silicone reinforcement layer

④finger length

66	66mm finger length
86	86mm finger length
100	100mm finger length

⑤center-to-center distance between fingers on the same side

W30	30mm center-to-center distance between fingers on the same side/ i.e., multi-finger connecting plate with B (short)
W80	Center-to-center distance between fingers on the same side is 80mm, and it can also be adjusted to 50mm./i.e., multi-finger connecting plate with A (long)

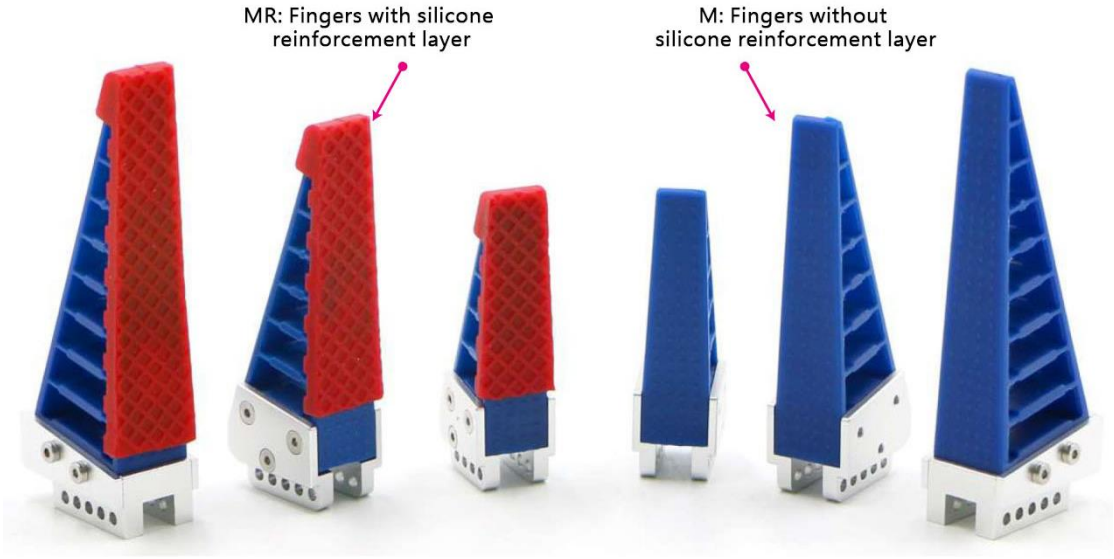
⑥Motion module travel distance

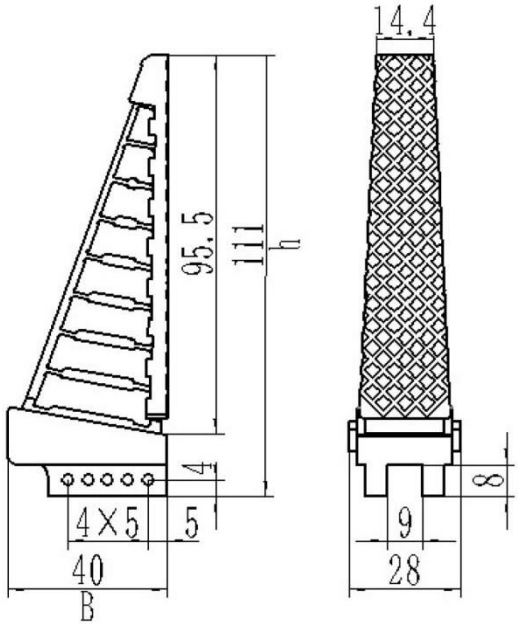
L12	The difference in opening and closing travel is 12mm
L24	he difference in opening and closing travel is 24mm
L48	he difference in opening and closing travel is 48mm

⑦Adjustable T-shaped mounting block

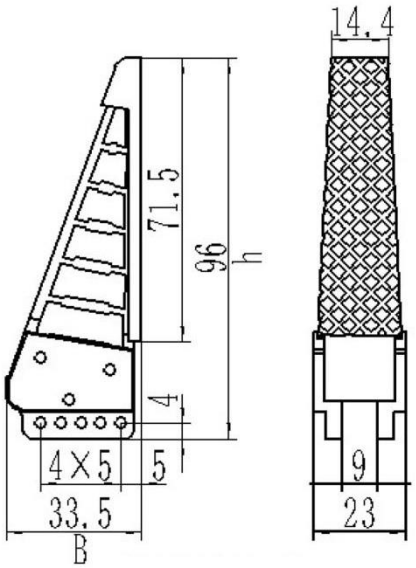
TA	Equipped with the long adjustable T-shaped mounting block
TB	Equipped with the short adjustable T-shaped mounting block
remarks	Total length of A is 50mm, and total length of B is 3mm

finger modules

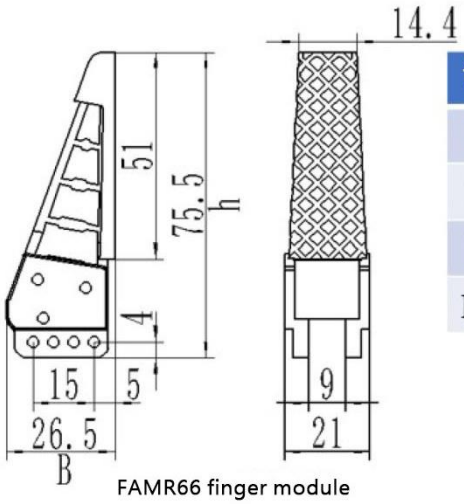




FAMR100 finger module



FAMR86 finger module

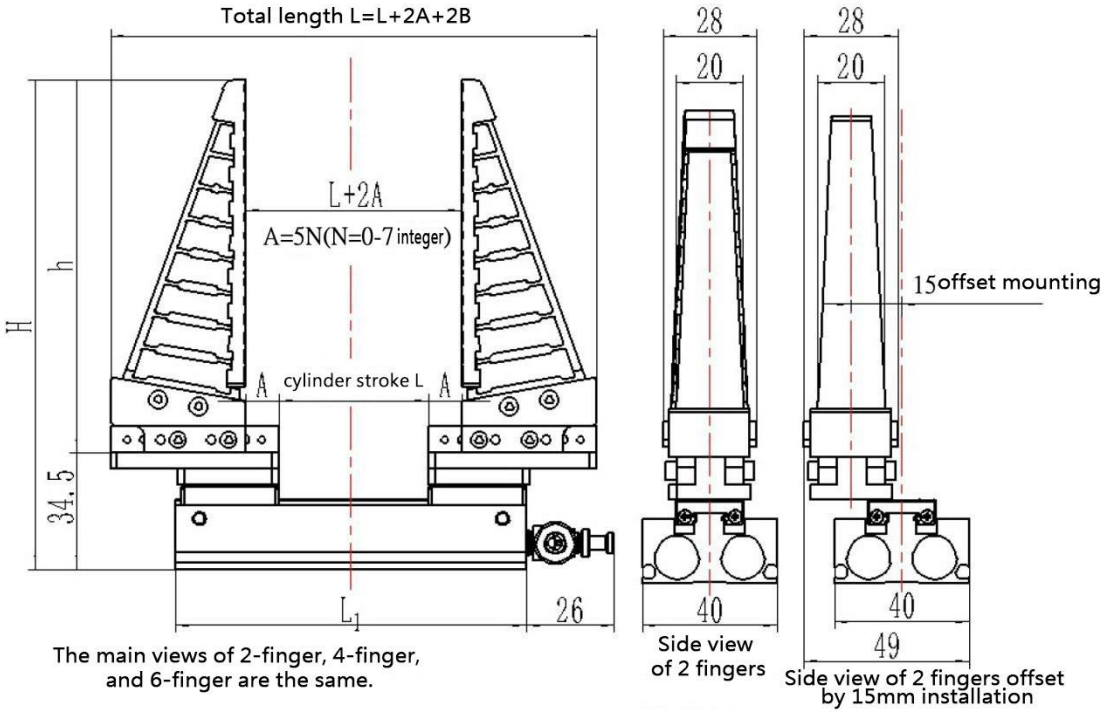


FAMR66 finger module

finger module		
Model	weight	load per finger
FAMR66	25g	250g
FAMR86	36g	300g
FAMR100	50g	350g

Gripping short and small objects works better with shorter fingers. The load is for reference only and may vary depending on the shape and material. B represents the width of the finger modules, and all mounting holes are Ø3 through-holes. The fingers are available in two versions: with silicone and without silicone, with very minor differences in size.

■ 2 fingers FA mechanical gripper



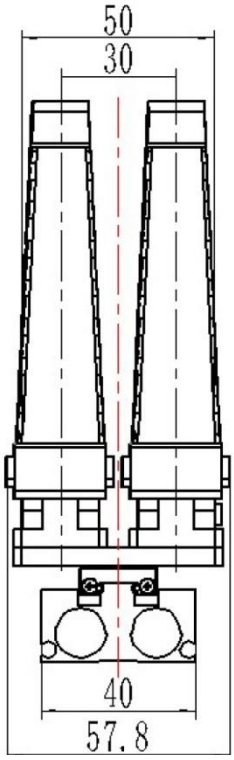
The main views of 2-finger, 4-finger, and 6-finger are the same.

Side view of 2 fingers

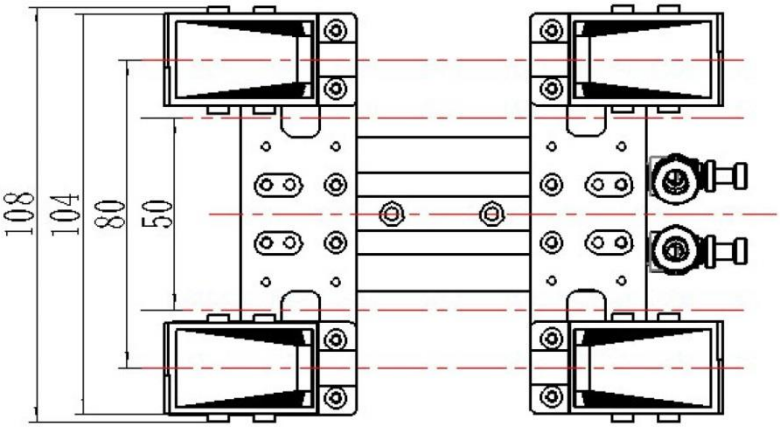
Side view of 2 fingers offset by 15mm installation

Model	Finger length	Size B	Integer N	Open and close travel distance L	Length L1	Height H	Self-weight	Load
FA2MR66L12TB	66mm	26.5mm	0-3	12mm	52mm	110mm	240g	300g
FA2MR66L24TB/A	66mm	26.5mm	0-3/7	24mm	68mm	110mm	285g	400g
FA2MR66L48TB/A	66mm	26.5mm	0-3/7	48mm	104mm	110mm	370g	500g
FA2MR86L24TB/A	86mm	33.5mm	0-3/7	24mm	68mm	130.5mm	310g	450g
FA2MR86L48TB/A	86mm	33.5mm	0-3/7	48mm	104mm	130.5mm	395g	600g
FA2MR100L24TB/A	100mm	40mm	0-3/7	24mm	68mm	145.5mm	335g	500g
FA2MR100L48TB/A	100mm	40mm	0-3/7	48mm	145.5mm	104mm	420g	700g

■ 4 fingers FA mechanical gripper



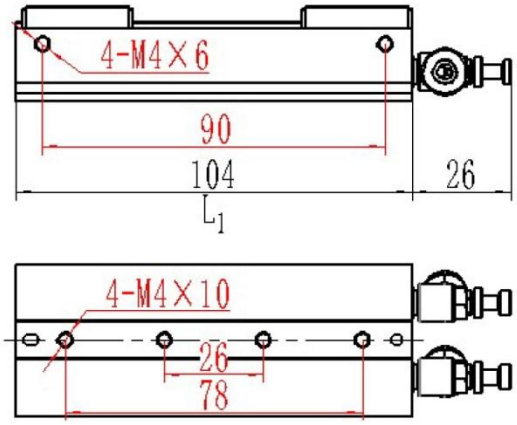
4 fingers, W30, side view



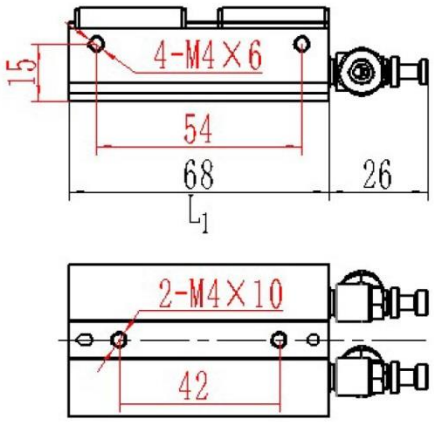
4 fingers, long board W80, top view. Finger spacing can be 80mm or 50mm, and it can also be integrated into 6 fingers or 8 fingers

Model	Finger length	Size B	Integer N	Open and close travel distance L	Length L1	Height H	Self-weight	Load
FA4MR66W30L12	66mm	26.5mm	0-3	12mm	52mm	115mm	360g	550g
FA4MR66W30L24	66mm	26.5mm	0-3/7	24mm	68mm	115mm	415g	750g
FA4MR66W30L48	66mm	26.5mm	0-3/7	48mm	104mm	115mm	520g	900g
FA4MR86W30L24	86mm	33.5mm	0-3/7	24mm	68mm	135.5mm	460g	850g
FA4MR86W30L48	86mm	33.5mm	0-3/7	48mm	104mm	135.5mm	565g	1100g
FA4MR100W30L24	100mm	40mm	0-3/7	24mm	68mm	150.5mm	515g	1000g
FA4MR100W30L48	100mm	40mm	0-3/7	48mm	104mm	150.5mm	620g	1300g
The adjustable installation block can be optionally chosen with either TA (long) or TB (short)			The multi-finger connecting board offers a choice between B (short) W30 or A (long) W50					

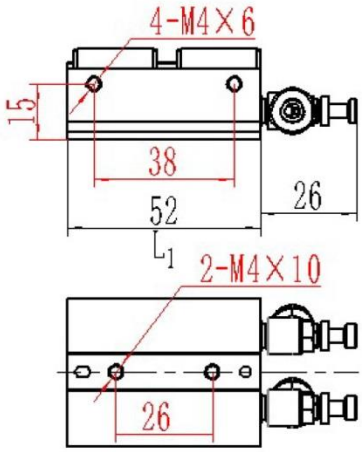
FA2/4 finger installation dimensions



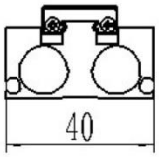
Opening and closing travel: L48mm installation dimensions



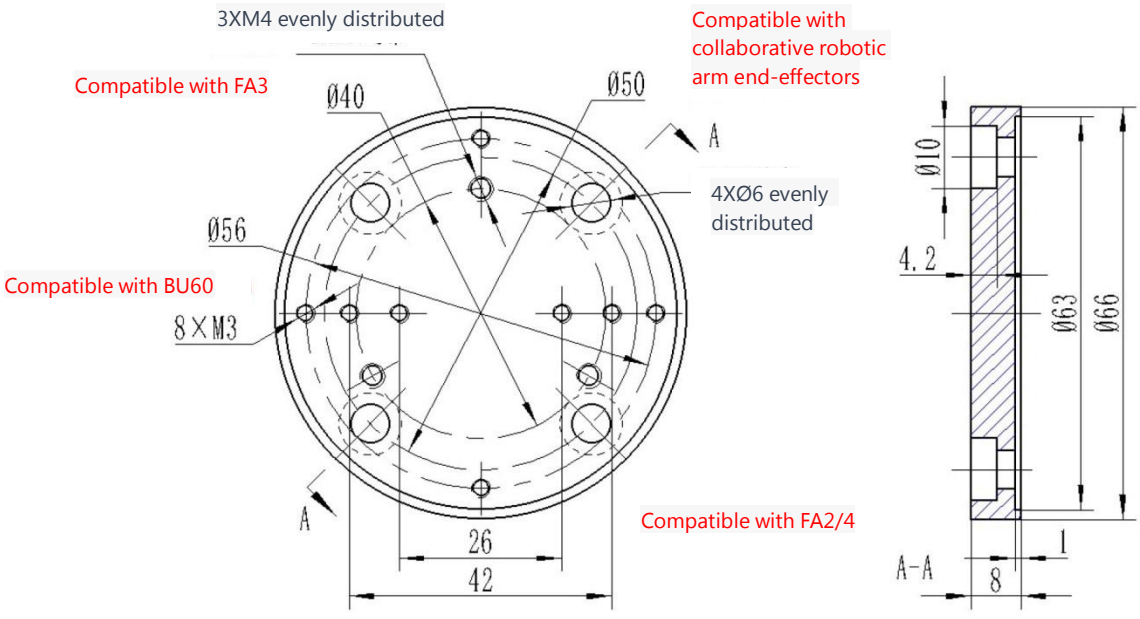
Opening and closing travel: L24mm installation dimensions



Opening and closing travel: L12mm installation dimensions



L12/24/48mm side views are all the same

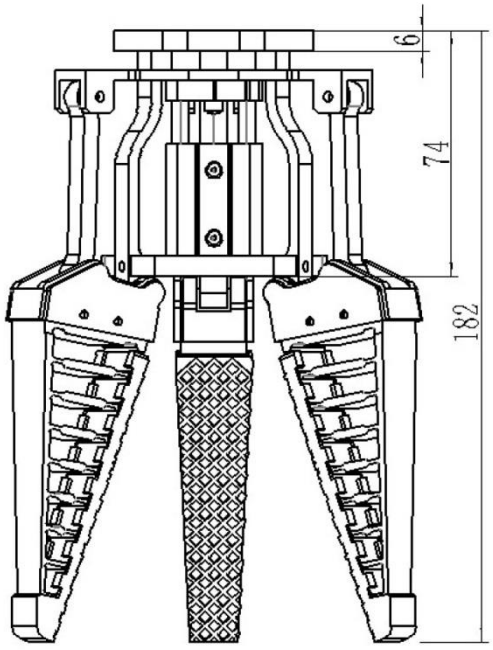


Dimensions for the FA series robotic gripper to collaborative robotic arm adapter plate

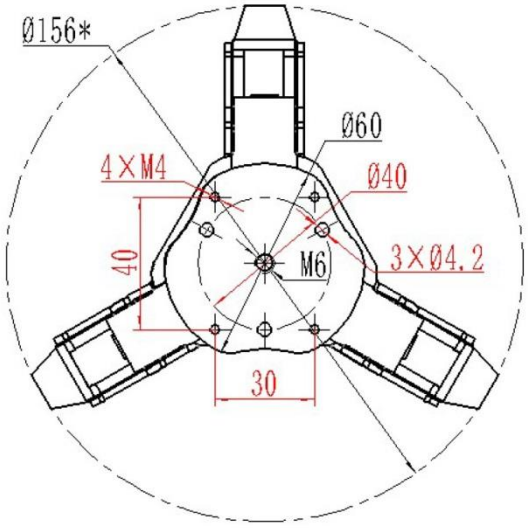
3 fingers FA mechanical gripper

FA3MR100R15C Pneumatic 3 finger gripper

FA3MR100R15MP Electric 3 finger gripper



FA3MR100R 3 finger gripper



The electric and pneumatic versions have identical exterior dimensions. There is a minor size difference between the silicone-coated and non-silicone-coated fingers

Note: The maximum open size of 156mm can be adjusted smaller

Model	Self-weight	Load	Grasping frequency	Grasping range	Grasping shape
FA3MR100R15C	470g	1100g	90 times/minute	Diameter: 20-100mm	Best for spherical objects. Cylindrical objects Partially elongated shapes
FA3MR100R15MP	520g	1100g	30 times/minute		
FA3MR100 adjustable	+50g	350g		Diameter: 20-140mm	