

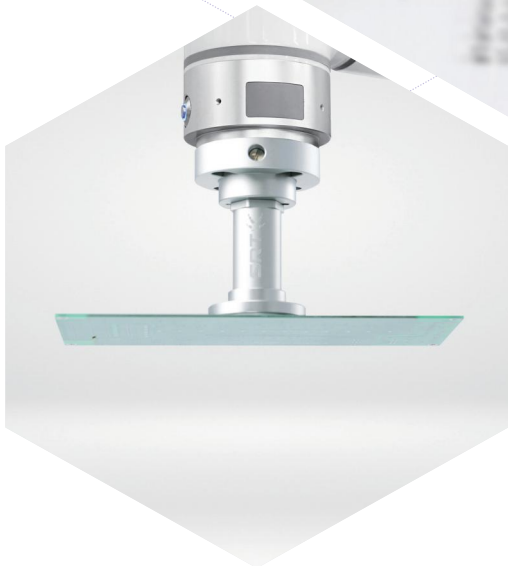
SOFT GRIPPER MODEL SELECTION MANUAL

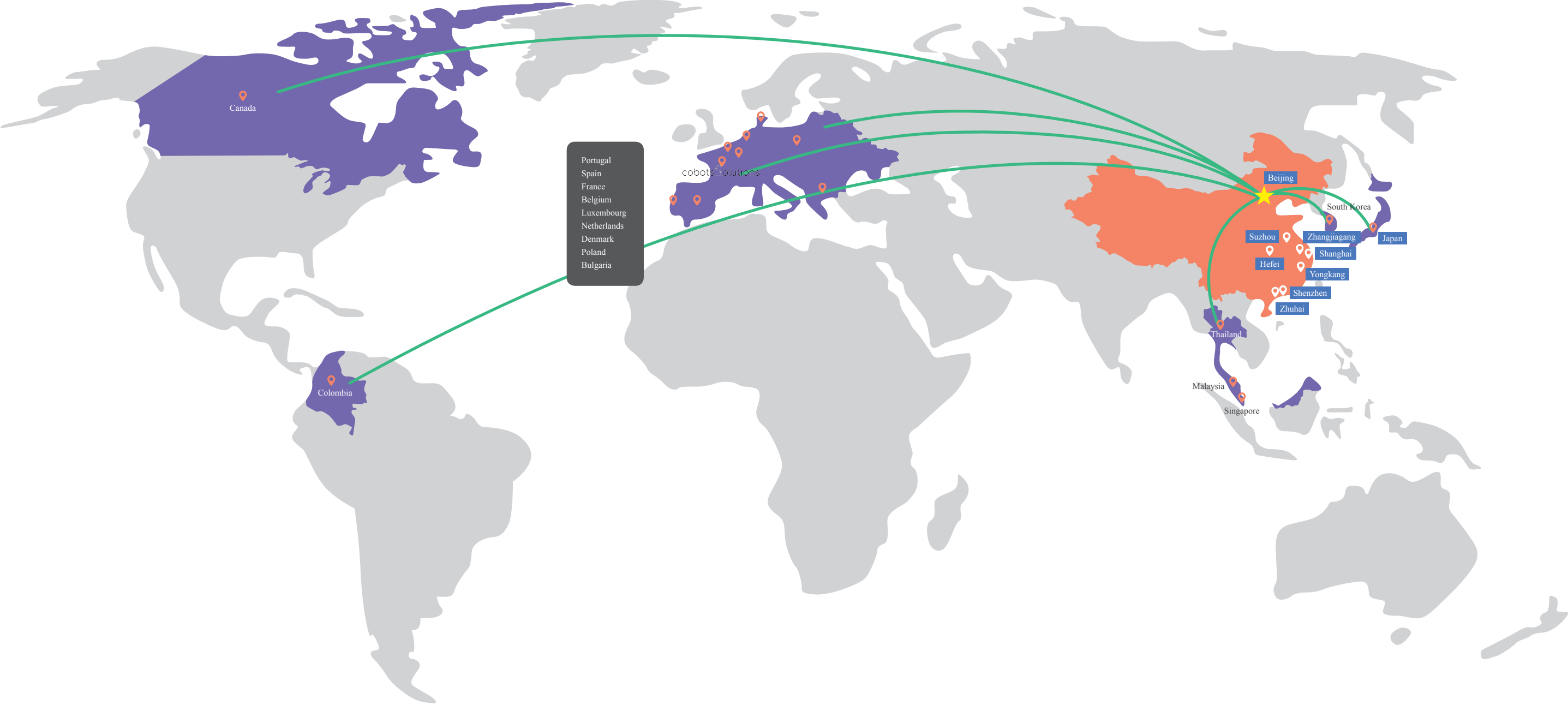
SRT is the pioneer of advanced technology and the supplier of innovative products

www.softrobottech.com

Application industry

- 3C industry
- Fresh food industry
- Bakery industry
- Medical industry
- Education industry
- Automobile industry
- Metal products industry
- Agriculture
- New energy industry
- Injection molding industry
- Packaging industry
- Ice industry
- Insulation cup industry





SRT is headquartered in Beijing, with branch offices in Suzhou, Shenzhen, Zhangjiagang, Yongkang, Hefei, Shanghai, Zhuhai, Tokyo, Japan, and agencies in 16 countries around the world. By virtue of reliable products and good-quality service, SRT has been cooperated with Foxconn, Delta, Schneider, BYD, CATL, KFC, Wuxi Well Foods, Huamei Mooncakes, Faurecia, Valeo, Bosch, HALS, Anson Technology and other leading enterprises in 3C, power battery, foods, automotive components and vacuum cup. The products have been sold to USA, Japan, Korea, Europe and many countries in Southeast Asia.

16 Overseas agents

Japan, South Korea, Thailand, Canada, Malaysia, Singapore, France, Spain, Poland, Denmark, Netherlands, Belgium, Luxembourg, Colombia, Portugal, Bulgaria.

We are committed to in the field of soft robotics
development and innovation

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ENTERPRISE PROFILE



Company Profile

Soft Robot Tech Co.,Ltd.(hereinafter referred to as SRT) is the first innovative technology group company in China to break through the key technologies of the entire industry-university-research chain of soft robots. The flexible gripper developed by SRT based on soft robot technology can mimic the simple and repetitive labour of human hands, and achieve the gripping and handling of nearly 96% of shaped and fragile objects in industrial production, solving the problem of the "last centimetre" of industrial automated production, and is a key component for the realisation of intelligent upgrading. Meanwhile, the company also owns advanced machine vision AI technology, intelligent logistics and warehousing system based on automation and IoT technology, semiconductor-related process technology, and rehabilitation system combining the theory of soft body pneumatic muscle and rehabilitation medicine. Currently, the products of the company cover industrial end-effector, industrial digital equipment and digital solutions, exoskeleton robots for rehabilitation, and intelligent manufacturing talent training solutions for education.



Business Radiation

As a technology group serving the world, SRT serves more than 500 top industry customers worldwide and sells its products to 30 countries including the United States, Japan, Korea, and Europe and Southeast Asia. Our products and solutions have been applied in many industries such as fresh food, 3C electronics, semiconductors, automotive parts, new energy, modern agriculture, rehabilitation and medical equipment, education and training, and vacuum vessels.

Patent Honors

Over the years, SRT has always insisted on independent research and development, and its research and development capability and scientific and technological innovation level continue to be in the forefront of the industry. At present, the Company has applied for nearly 200 patents, including 66 invention patents, and passed the national high-tech enterprise certification, was named the 3rd batch of national key "little giant" enterprises, the 3rd batch of national SRDI "little giant" enterprises, the first batch of Beijing's SRDI "little giant" enterprises, Beijing's SRDI "SMEs; won the first prize of the HICOOL Global Entrepreneurship Competition in 2021, and won the first prize of the 2020 "Maker China" SMEs Innovation and Entrepreneurship Competition National Finals, etc.



QUALIFICATION HONOR



- China's 3rd batch of professional, focus"little giant"enterprises
- China's 3rd batch of professional, fine, characteristic and novel "little giant" enterprises
- Beijing's 1st batch of professional, fine, characteristic and novel "little giant" enterprises
- Beijing "professional, fine, characteristic and novel" SME
- National High-tech Enterprise
- Zhongguancun High-tech Enterprise
- ISO9001 quality system certification
- Production Permit of Medical Device
- Medical Device Registration Certificate of the People's Republic of China
- Council member of China Association of Assistive Products
- Member unit of China Food and Packaging Machinery Industry Association
- Beijing's new technology and product (service)
- Beijing municipal enterprise S & T R & D organization
- Expert unit of Zhejiang Intelligent Manufacturing Committee
- 2021: The 1st prize of HICOOL Global Entrepreneur Summit and Entrepreneurship Competition
- 2020: Special award of enterprise group of Maker Beijing Entrepreneurship and Innovation Competition
- 2020: The 1st prize of enterprise group of "Maker in China" SME Innovation and Entrepreneurship Competition
- 2019: Silver award of commercial and industrial growth group of national competition of CASIC Cup 6th "Creation of Youth" China Youth Innovation and Entrepreneurship Competition
- 2019: Winning prize of ZGC U30 Be Young Be Creative



- EU CE certification
- EU RoHS certification
- EU AP test
- Germany LFGB test
- US FDA test
- Japan JFSL370 test
- "Zhongguancun Standard" product certification



PRODUCT DESCRIPTION



At present, in the field of end clamp, the commonly used traditional clamps including cylinder grippers, vacuum chucks, etc. are often affected by factors such as product shape, type, location, etc., and are unable to grasp the object smoothly.

The main feature of SRT flexible end clamp is that it is made of polymer silicone flexible material, which can grasp the workpiece gently and non-destructively, and features extremely high adaptability. When contacting the product, it can cover the target object adaptively, without pre-adjustment according to the size, shape, material, etc. of the product. Compared with traditional clamps, it doesn't have high requirements for product size and shape.

Grasping System

// Using supporting pneumatic control module and SRT soft end fixture, the fixture can coordinate with displacement mechanism like mechanical arm, quickly compose soft grasping system, replace traditional fixture and complete improvement of grasping abilities. //

Grasping principles



Features

- One can deal with many**
Soft grippers can grasp varieties of pieces with all types of shape, size and weight, totally covering the application field of traditional mechanical gripper. Due to the softness of the fixture, even the position of the piece changes within a range, smooth grasping can still be guaranteed, so requirement of positioning accuracy of the grasping system is reduced. The gripper has good stability and airtightness, and can work normally in dust, oil / liquid environment.
- Coated grasping Multiple Security**
With the design form imitating the starfish mechanism, it simulates the human hand to hold the object, and the grasping action is more stable. The flexible fingers are completely made of flexible material, which will not produce rigid impact when in contact with the object, neither will cause damage to the grasped object, and it is extremely safe for the operator. Moreover, the product has passed several international certifications and can be directly contacted with food without contaminating the grasped items.
- High precision and speed, dealing with more situations**
The operating frequency of soft gripper can be 300CPM, maximum repeating precision 0.08mm and maximum load 7kg, Limit load 10kg, The lifespan of grasping can reach more than 3 million times, easily satisfying most requirements of assemblies.
- Lower cost with higher return**
The design of soft gripper overturns traditional design mode, which only needs one simple supporting bracket and one pneumatic controlling circuit. Workshop doesn't need to change its former assemblies, decreasing the cost of manufacturing and maintenance to minimum.
- Extremely convenient from mounting to maintain**
The modulization design of finger significantly simplifies the mounting, debugging and maintenance. Only one simple mounting bracket and one pneumatic controlling circuit is needed for mounting and debugging. Maintenance can be carried out after removing the finger module.

Suitable fields

The grasping action of the Soft Finger Gripper is similar to that of a human finger. It is flexible and can automatically wrap the product without causing physical damage to the product. It is suitable for the fields such as food, automobile, daily chemical, medical, 3C electronics etc., it can be integrated into the smart assembly, automatic sorting, logistics warehousing and food processing lines, and can also be used as functional accessories for scientific research and experimental equipment, intelligent entertainment equipment or service robots, and it is the ideal choose for realizing intelligent, non-destructive grasping actions with high safety and high adaptability.



* Part of the industry display

Product Category

Currently, our company has five product series of flexible end clamps, each series of products can be applied to different application scenarios to achieve stable grasping of various types of products which is difficult for traditional clamps.

01

> SFG Soft Finger Gripper

02

> ISC Inner Soft Clamp

03

> MVG Mini Vacuo Gripper

04

> NBM Nimble Bubble Module

05

> VFC VanDer Waals Force Suction Cup

SFG Soft Finger Gripper



SFG Soft Finger Gripper is an innovative flexible clamp that imitates the starfish design and simulates human grasping. It can achieve bending deformation by inflating, adaptively wrap the target object to complete the grasping action; it achieves reverse deformation by pumping to complete the placement or pre-grasping action; due to its good compatibility, diversified types and gentle action, it is suitable for grasping most items of special shapes and vulnerable items.

Application situation

abnormal and fragile objects

Reciprocating positioning accuracy/mm

0.08mm

Load/g

0-10000g

Weight/g

250-1550g

Driving type

Specific pneumatic control module

Movement confirm

Control unit feedback

ISC Inner Soft Clamp



ISC airbag internal support clamp is an innovative soft fixture, whose design is mimicking self-defense morphology of puffer fish. Through inflating air with pressure, the fixture can expand and complete internal support grasping. Since the pressure of input air can be precisely controlled, the grasping force on fixture to working piece can be controlled, which is not easy to damage workpiece.

Application situation

Circular and bottle-shaped workpiece grasping

Reciprocating positioning accuracy/mm

0.1mm

Load/g

0-1984g

Weight/g

36-56g

Driving type

Specific pneumatic control module

Movement confirm

Control unit feedback

MVG Mini Vacuo Gripper



MVG Mini Vacuo Gripper features bionic design that mimics the chameleon hand. Vacuum driven, small size, easy to use in arrays. It features simple structure, lightweight, easy to operate, flexible grasping and controllable force, and stronger scenario adaptability. Moreover, it boasts flexible grasping without damage to the workpiece. The product provides many types of plastic heads and supports customization with higher flexibility.

Application situation

Small size and lightweight workpiece grasping

Reciprocating positioning accuracy/mm

0.05mm

Load/g

0-267g

Weight/g

34-41g

Driving type

Specific pneumatic control module

Movement confirm

-

NBM Nimble Bubble Module



NBM Nimble Bubble Module is a new type of flexible end-effector. It is made of special soft anti-skid and anti-friction silicone with the advantages of large airbag expansion range, good flexibility, low cost and flexible installation. It can be freely combined with multiple modules to quickly form flexible clamps of any type, and boasts high flexibility and high load.

Application situation

abnormal and fragile objects

Reciprocating positioning accuracy/mm

0.1mm

Load/g

50-250g

Weight/g

4.9-19.4g

Driving type

Specific pneumatic control module

Movement confirm

Control unit feedback

VFC VanDer Waals Force Suction Cup



VFC van der Waals force suction cups are inspired by the observation and imitation of the microscopic characteristics of gecko feet. Through special polymer materials and μm-level surface micro-molding processes, the suction cups can generate strong intermolecular forces with the surface of various objects to absorb. The strength can reach 0.5kg/cm², which greatly expands the application scope of automation equipment.

Application situation

LCD panel, plane with holes, vacuum environment

Reciprocating positioning accuracy/mm

-

Load/g

0-1000g

Weight/g

270-290g

Driving type

No energy consumption, direct adsorption

Movement confirm

-

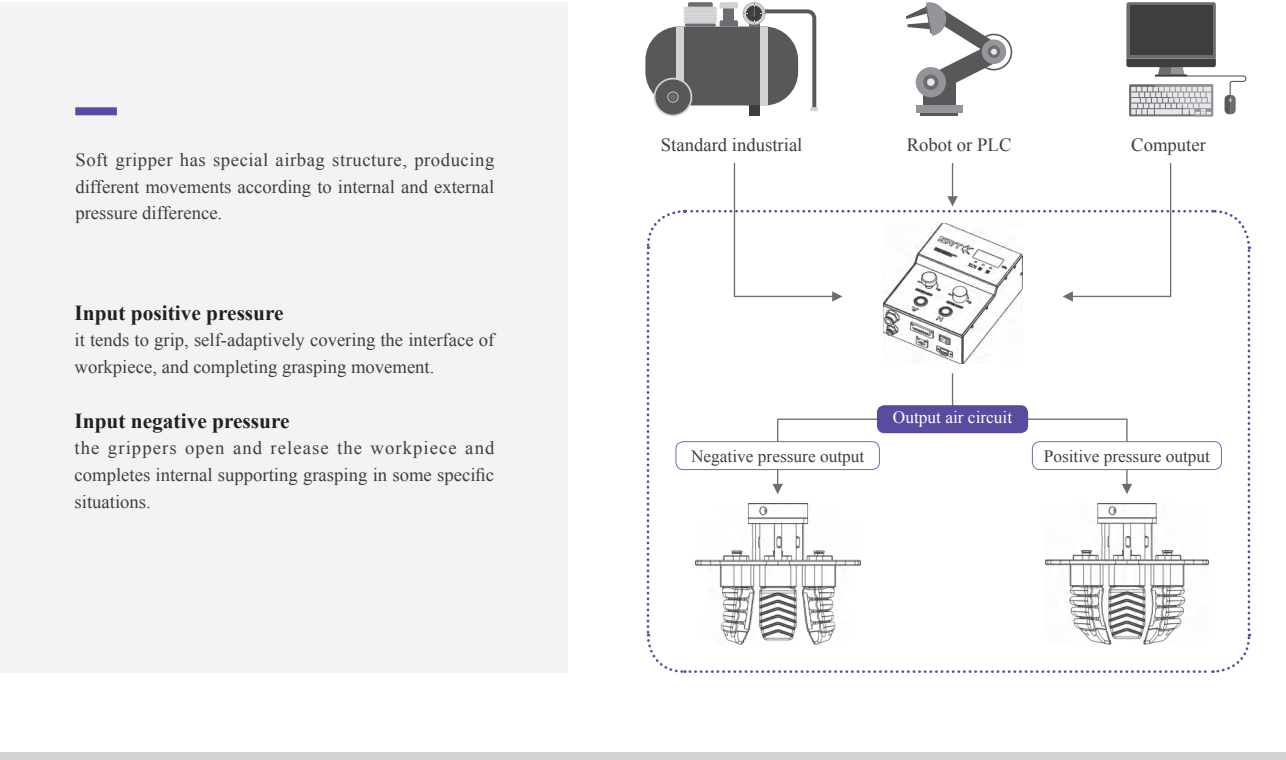
SFG SOFT FINGER GRIPPER



SFG Soft Finger Gripper is a new type flexible gripper developed by SRT. Its main components are made of flexible materials. It can simulate the grasping action of human hands, and can grasp objects of different sizes, shapes and weights with one set of gripper. Different from the rigid structure of traditional gripper, the flexible gripper has soft pneumatic "fingers", which can adaptively wrap the target object without pre-adjustment according to the precise size and shape of the object, and get rid of the restriction that traditional production line requires equal size of the production objects. The finger of the gripper is made of flexible material with gentle grasping action, which is especially suitable for grasping easily damaged or soft indeterminate objects.

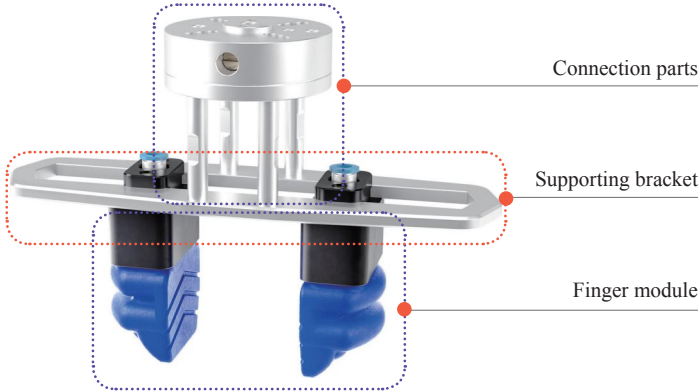
In the grasping industry, the commonly used traditional clamps including cylinder grippers, vacuum chucks, etc. are often affected by factors such as product shape, category, location, etc., and is unable to grip the object smoothly. The flexible gripper based on flexible robot technology developed by SRT can perfectly solve this industrial problem and make the automatic production line take a qualitative leap.

Working Principles



Components and Index

Components



Connection parts

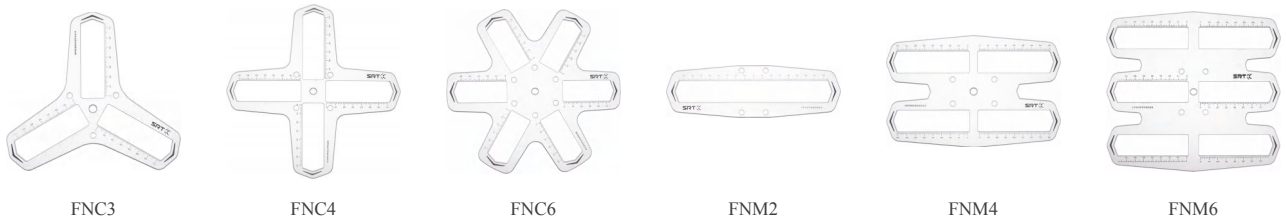


TC4

See the P16

Supporting bracket

See the P17



Finger module

See the P18



Load calculation

$T=k \cdot m \approx N \cdot R \cdot \mu \cdot F / 10$

* Confirm part of the variables according actual working conditions when using.

- T

Fixture's rated load (kg)
- k

Safety factor of automation equipment (in cluding acceleration allowance)
- m

Weight of workpiece(kg)
- N

Number of fingers
- R

Grasping pattern coefficient

Coated grasping1.4

Vertical grasping0.8
- μ

Friction coefficient

Aluminum alloy and finger module0.89

Steel and finger module0.49

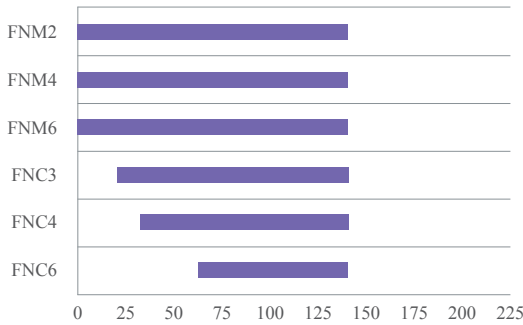
Plastics and finger module0.96

Glass and finger module0.98

PCB and finger module0.89
- F

Normal pushing force of finger(N)

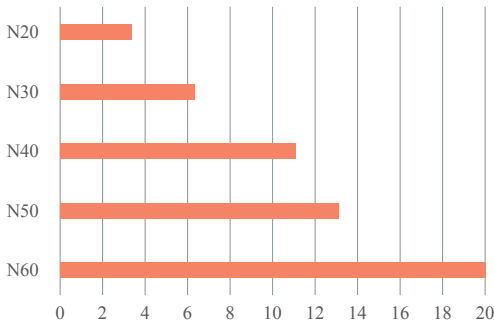
Supporting bracket performance index



Finger gaps adjusting range/mm

- Select proper fixture supporting bracket pattern according to size and shape of workpiece.For detailed parameters of supporting brackets, please refer to page 17.
- If standard bracket doesn't satisfy working condition, you can also customize supporting brackets according to selected finger model. For detailed information of finger model, please refer to page 18.

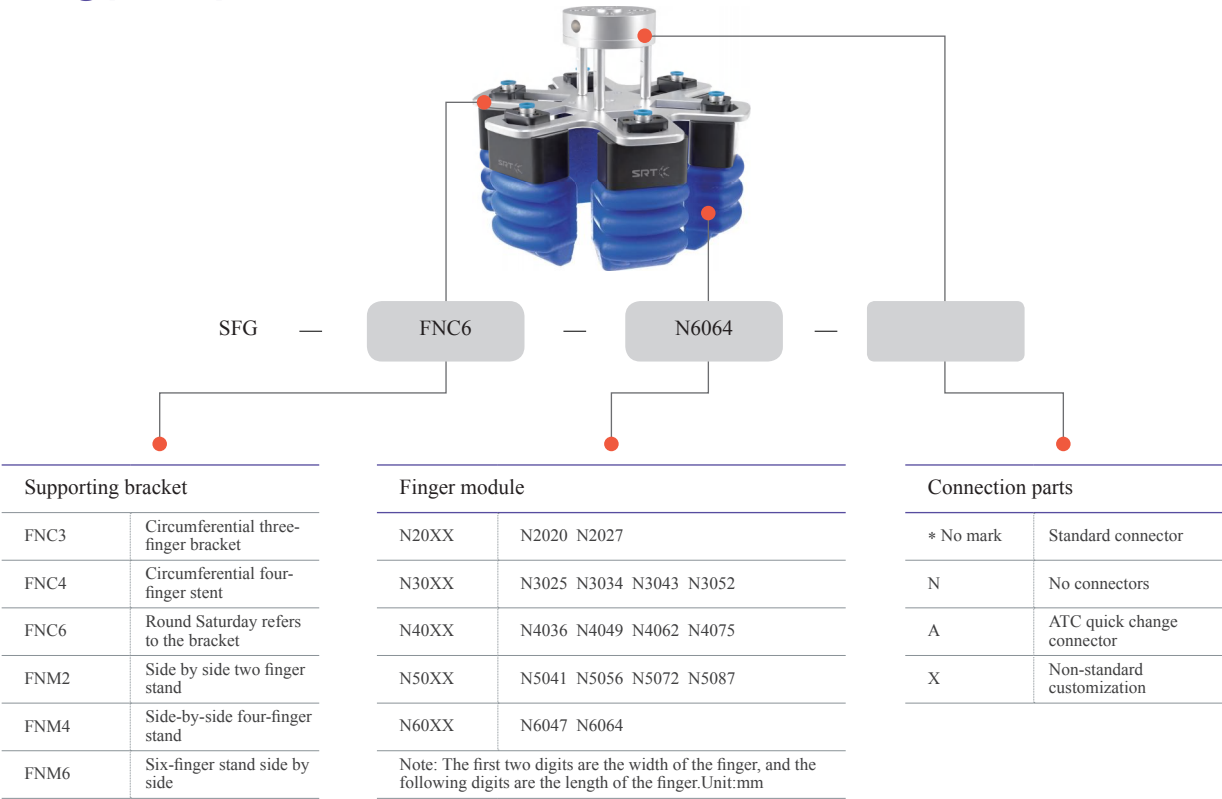
Finger pushing force index



Finger pushing force/N

- Select proper soft finger module according to weight, size and shape of workpiece.For detailed information of finger model, please refer to page 18.
- If standard model doesn't satisfy working condition, you can also customize nonstandard soft finger module. For detailed information, please refer to page 22.

Coding principles



Finger module coding rules

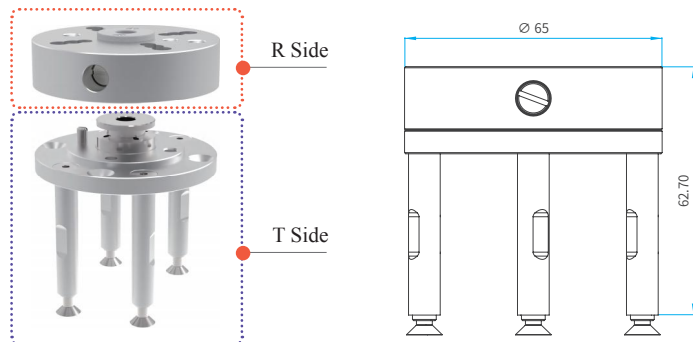
serial number	Category	Code	Description	Schematic
1	Finger module	N3025	Standard finger module name	
2	Fingertip shape	T	Fingertip plus boss type	According to the special workpiece, Customize the corresponding shape of the fingers
		L	Fingertip lengthened type	
3	Functional material coated	a	Anti-static finger	
		w	Wearing resistance finger	
		p	Anti-dust finger	
		e	Force enforcement finger	
		g	Increased stiffness of the finger	
4	Installation and air intake method	* No mark	Top air intake, top installation	
		S	Matching finger connectors	
		B	Front air intake, front installation	
		U	Top air intake, front installation	
		R	Side air intake, top surface installation	

* After selecting model according to coding principles, please submit to SRT sales to continue purchasing. If you need to know special finger categories, models or meet with problems in selecting model, please directly contact with SRT technical staff.

Mounting part

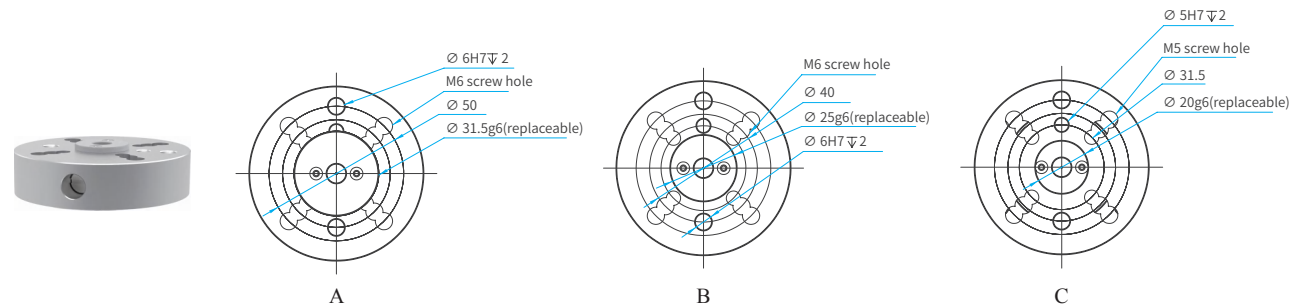
Connection parts

TC4 is a modular accessory that cooperates with the SFG series of flexible gripper and the mechanical connection of the machine. Fast deployment and rapid replacement of fixtures can be completed by loosening fewer screws.



Model	TC4
Rated load/kg	4
Maximum load/kg	20
T side flange weight/g	110
R side flange weight/g	99
gross weight/g	209

■ R Side mechanical port



* The flange size of the robot mounting part is compatible with the three common sizes in ISO9409-1:200 (GB/T14468.1:2004).

- Adaptive mechanical arms



Four-axis horizontal (SCRAR) robot
Delta



Industrial Robot Arm
Nachi Fujikoshi



Four-axis Parallel (DELTA) Robot

ABB



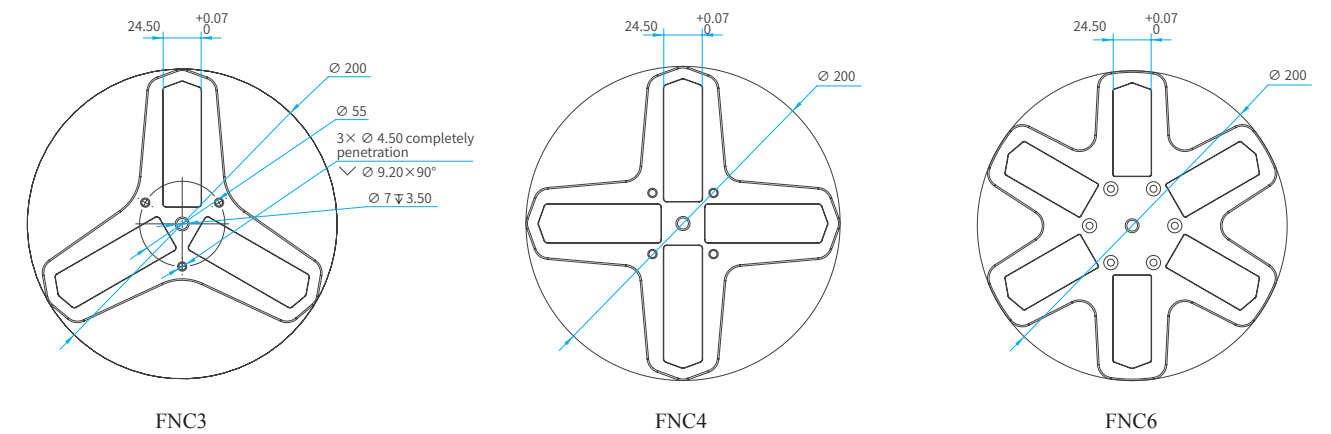
Six-axis assistance robot
UR



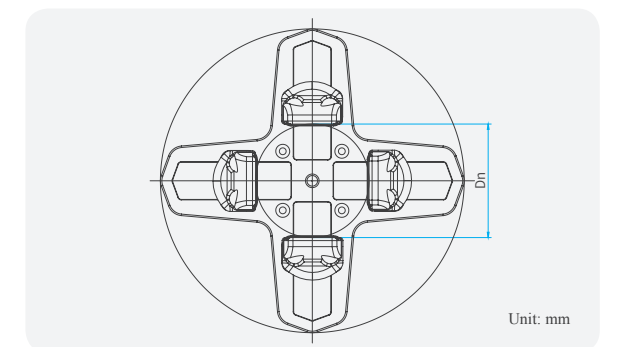
Six-axis assistance robot
AUBO

Supporting bracket

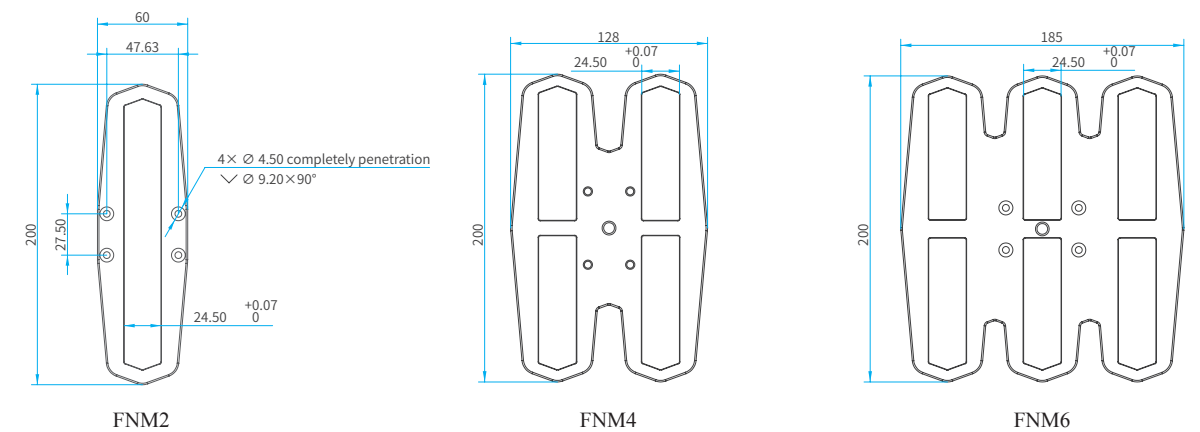
- **FNC Circumferential bracket**



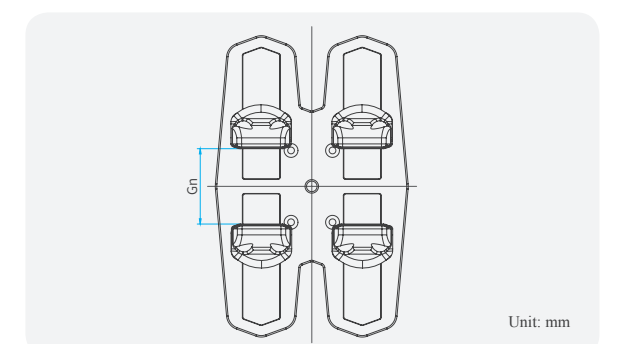
Model		FNC3	FNC4	FNC6
weight/g		111	135	197
Dn(mm)	N20	28-145	34-145	70-145
	N30	25-142	31-142	67-142
	N40	22-133	38-133	67-133
	N50	28-134	48-134	84-134
	N60	34-125	58-125	102-125



■ FNM Side by side stand



Model		FNM2	FNM4	FNM6
weight/g		88	189	284
Gn(mm)	N20	6-145	16-145	16-145
	N30	3-142	13-142	13-142
	N40	0-133	6-133	6-133
	N50	3-134	7-134	7-134
	N60	0-125	0-125	0-125

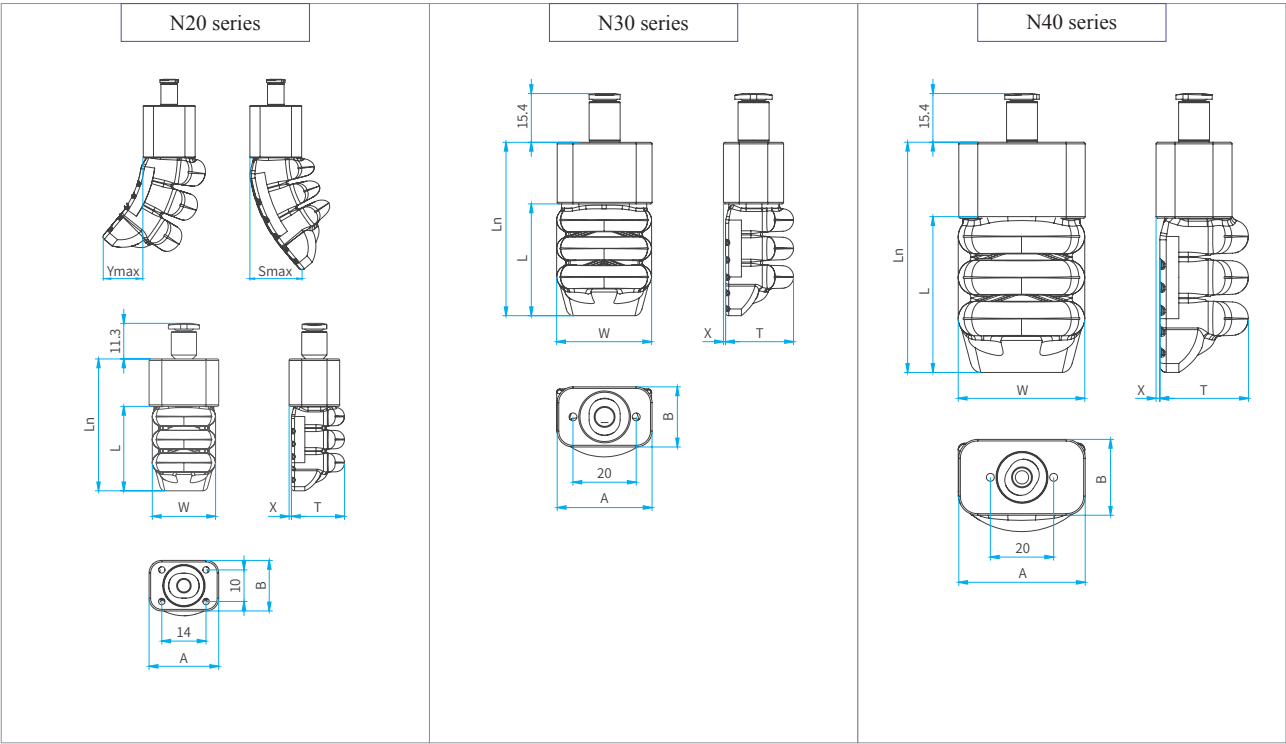


* The thickness of the stents is 5.5mm;

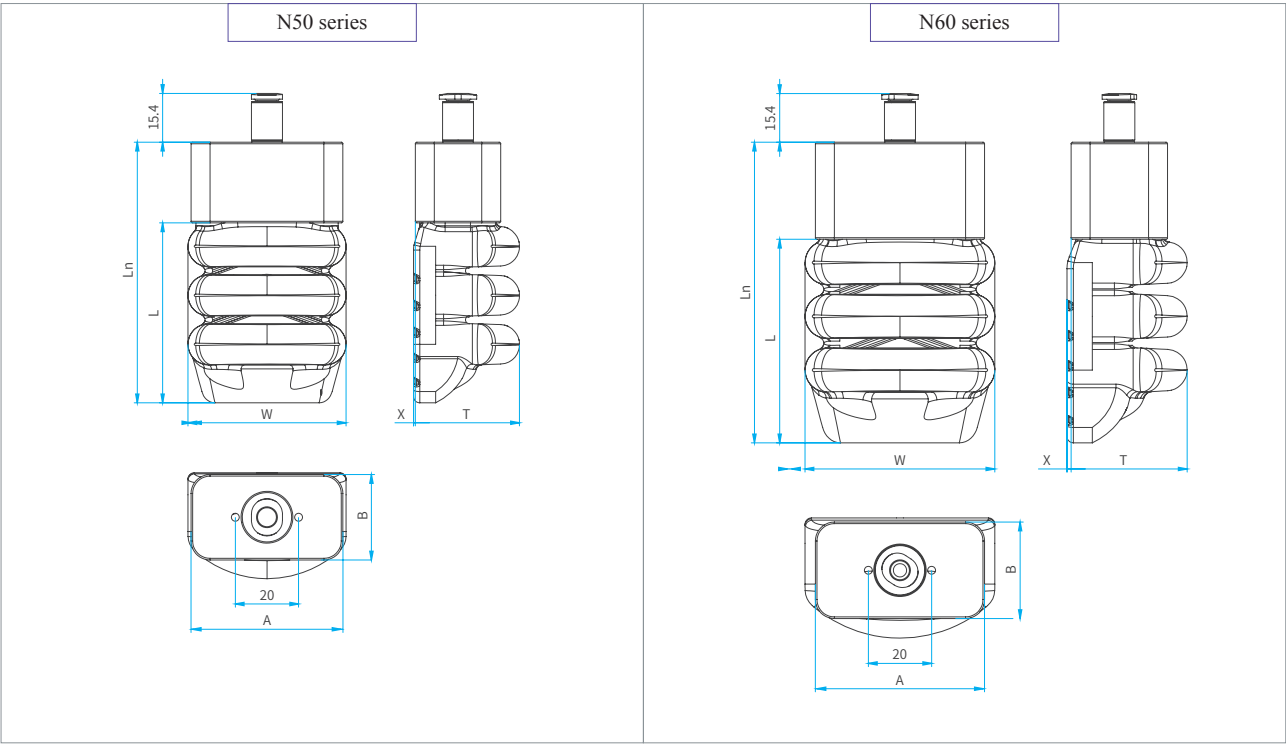
* The side-by-side fingertip distance of FNM4 is 67mm, and the side-by-side fingertip distance of FNM6 is 62mm.

Soft finger module

The flexible finger module is the core component of the SFG soft flexible gripper. The executive part is made of food-grade silicone rubber, which is safe, reliable and highly flexible. The N20 series are suitable for picking small items; N40/N50 fingers have a rich variety of fingers, a wider range of grasping, and mature technology.



Parameter \ Model		N2020	N2027	N3025	N3034	N3043	N3052	N4036	N4049	N4062	N4075
W/mm		20		30				40			
L/mm		21.7	29	28	37	45.9	54.8	37.7	50.8	63.6	76.6
Ln/mm		36.7	44	47	56	64.9	73.8	61.7	74.8	87.6	100.6
T/mm		16	16.8	20.5	21.5	22	22	26.5	28	28.5	28.5
X/mm		1.5	1.5	1.5	1.5	1.5	1.5	0	0	-0.5	-0.5
A/mm		22	22	30	30	30	30	40	40	40	40
B/mm		16	16	19	19	19	19	24	24	24	24
Smax/mm		5	10	6	15	23	30	9	19	25	37
Ymax/mm		6	11.5	10	19	28	36	13	24	36	50
Weight/g		18.9	20.6	40.8	44.3	48	52	74.4	85.5	96.5	105.5
Pushing force on fingertip/N		4	3.8	8	7	5.6	4.6	12	11	8.5	7
Single finger load coefficient/g	Vertical	200	180	370	300	185	150	560	500	375	300
	Coated	290	300	480	500	380	300	690	710	580	570
Maximum Operating frequency (cpm)		< 300									
Standard working lifespan/times		> 3,000,000									
Working pressure/kPa		-60~100									
Air tube diameter/mm		4				6					



N5041	N5056	N5072	N5087	N6047	N6064
50			60		
43.8	59	74.1	89.6	49.3	66.2
69.3	84.5	99.6	115.1	80	96.9
31.5	33.5	33.5	34	35.2	38
1.5	1.5	0	0.5	0	0
48	48	48	48	53.5	53.5
27	27	27	27	30.5	30.5
12	20	36	46	18	31
17	31	47	60	24	40
104.3	121.2	140.8	157.8	158.1	186.6
19	17	13.5	11	26	25
710	670	600	500	750	750
1200	1300	1100	1000	1600	1750

Push force of single finger test display

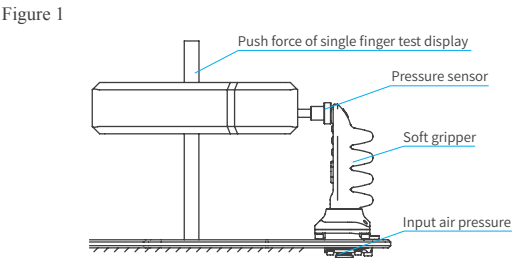
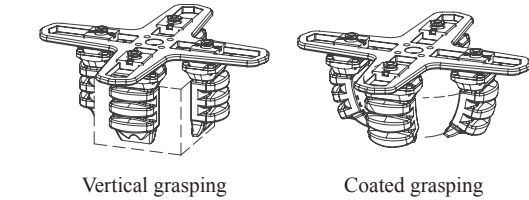


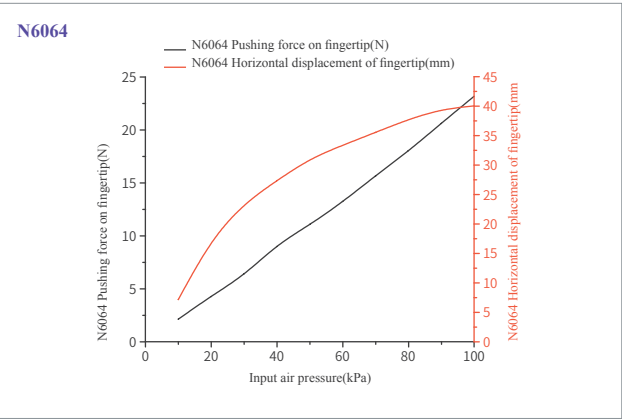
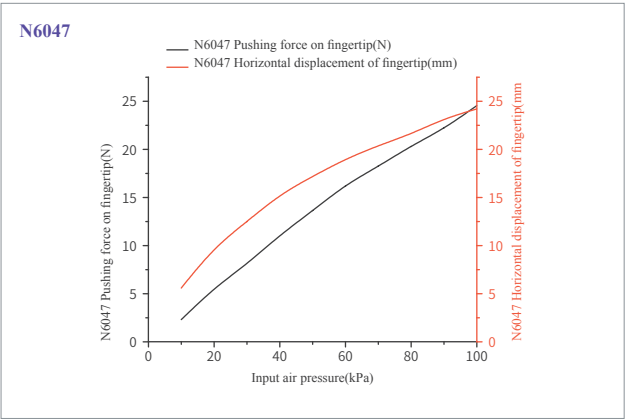
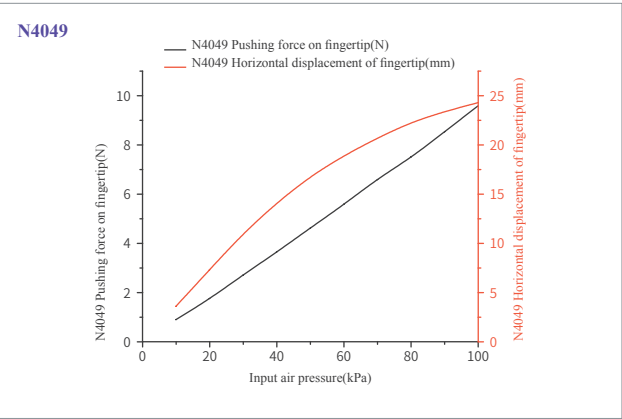
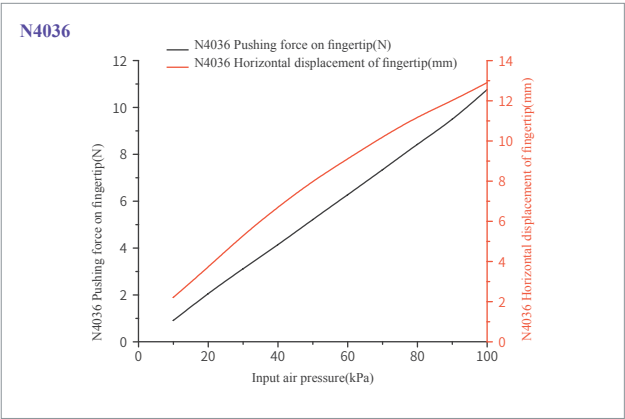
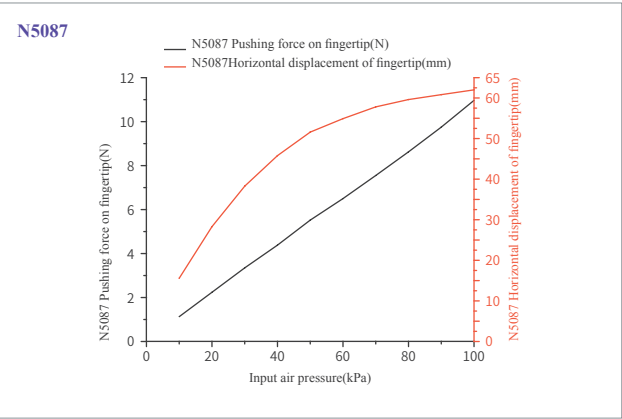
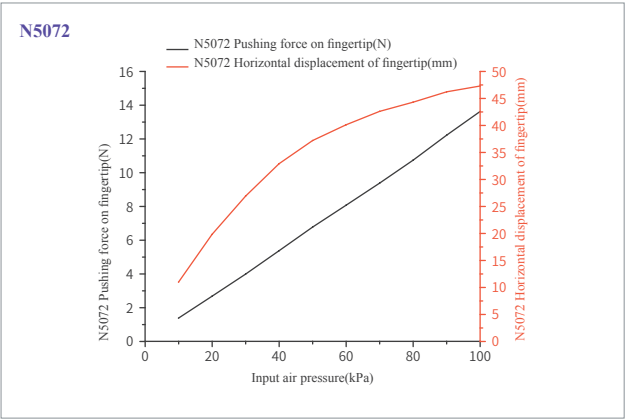
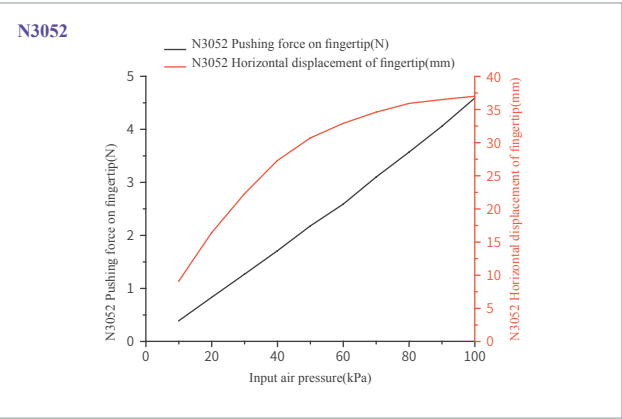
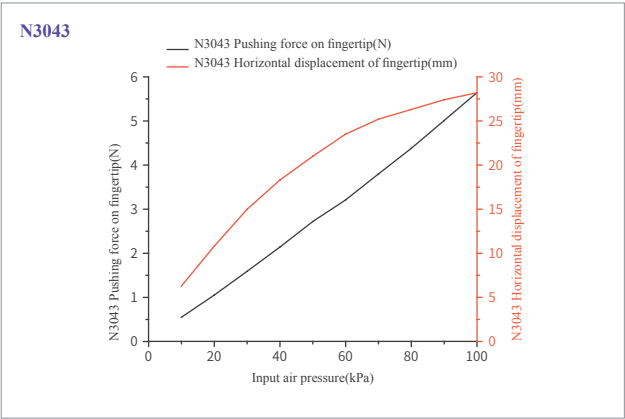
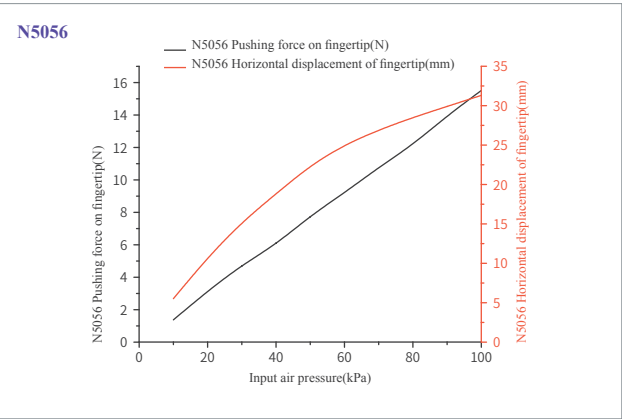
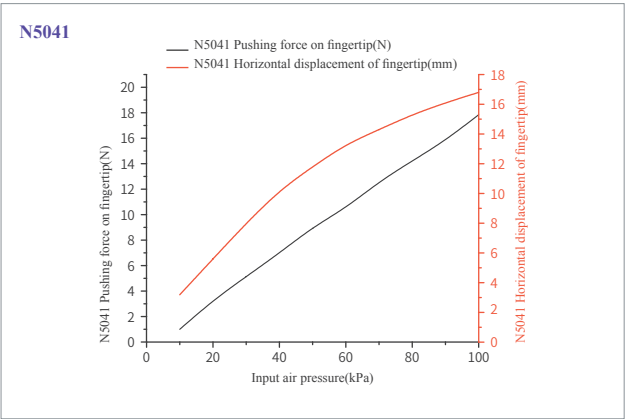
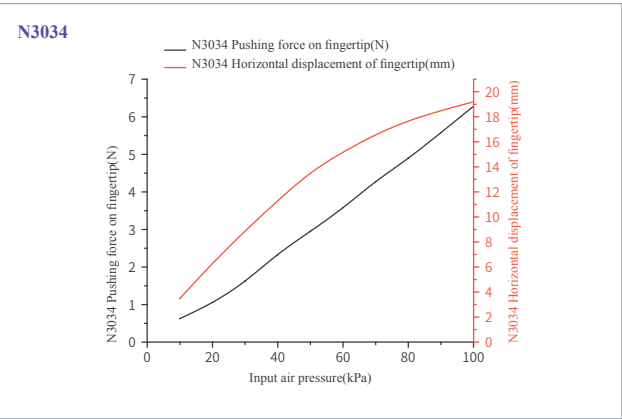
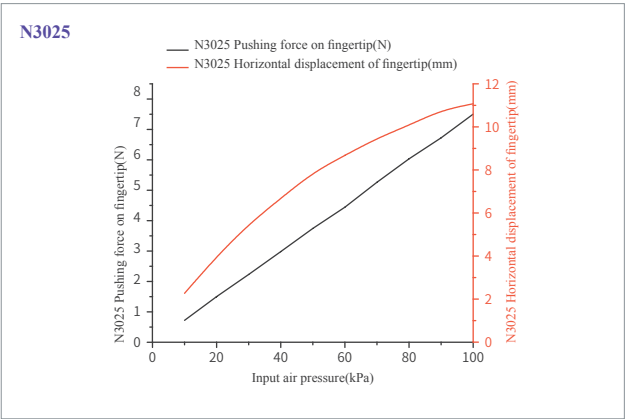
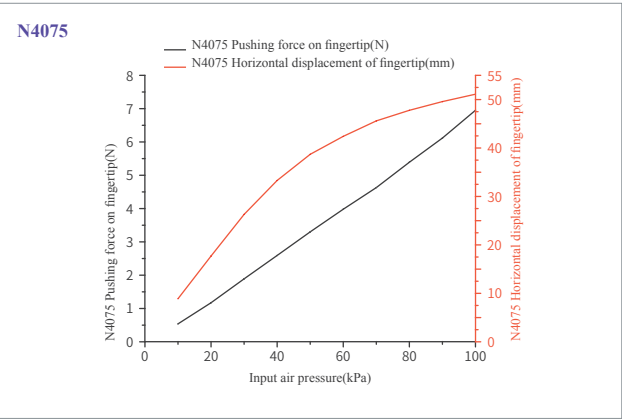
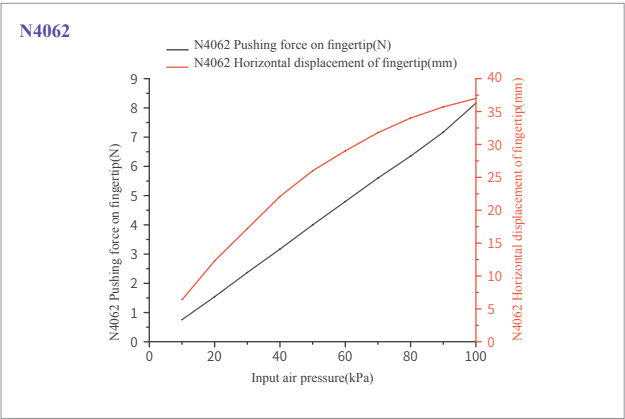
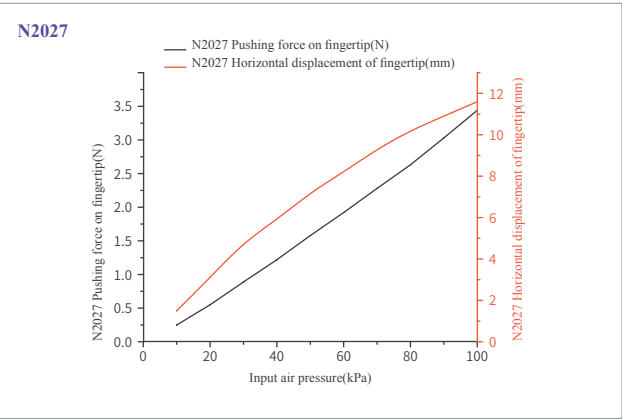
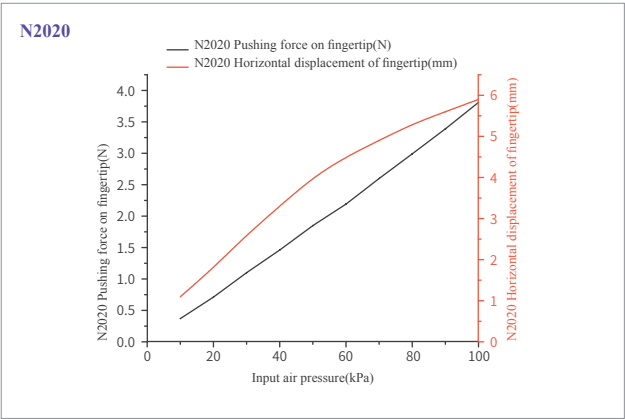
Figure 2



Parameters specification:

- Smax and Ymax are obtained under -50kPa and 100kPa;
- Pushing force on fingertip is obtained under 100kPa, as shown in Figure 1;
- Single finger load coefficient refers to the load increasing of each added finger, when there are more than 2 fingers on the gripper. Vertical grasping and coated rasping are specified in Figure 2, just for reference.

Performance curve



SFG Soft Finger Gripper

ISC Inner Soft Clamp

MVG Mini Vacuo Gripper

NBM Nimble Bubble Module

VFC VanDer Waals Force Suction Cup

SCB Pneumatic Control Module



Material specification

SFG

Soft structure silicon rubber

Physical and chemical properties	
State	Solid
Color	Blue
Smell	None
Composition	Silica reinforced polysiloxane crosslinked polymer
Volatile small molecules	None
Precipitation of small molecules	None
Stability and reactivity	
Temperature resistant stability	The contact temperature is within the range of -40~150°C, and the ambient temperature is within the range of -30~120°C. The physical and chemical properties of the material are stable, and the output of the product is normal, but the life of the product fluctuates with temperature changes.
Weather resistant stability	Fine resistance under general atmospheric environment, but high concentration of ozone or intense ultraviolet environment will accelerate material aging.
Reactivity	Inert under room temperature, no reaction with most weak acids and bases. But HF, high concentration of strong acids and bases will accelerate material aging. Strong organic solvents (xylene, benzene, ethyl acetate, gasoline, etc.) will cause swelling reaction of the materials, which will affect the using performance of the materials.
Safety	
Human contact safety	No harm to human and can be contacted with for a long time.
Food safety	Has passed FDA, AP and JFSL370 tests

Functional material coated finger

There are five types of functional cladding fingers, namely anti-static fingers, wear-resistant fingers, dust-proof fingers, strength-enhancing fingers and stiffness-enhancing fingers. Functional cladding finger adds different functional cladding materials based on conventional materials, which can better cope with special working environments.

a

Anti-static finger



Based on regular materials, anti-static finger is added with static electricity dissipation silicone rubber coating, which effectively improves material volume electricity resistivity of contacting surface. Material volume electricity resistivity of grasping surfaces can achieve10⁵, conforming to requirements of national military standards for static electricity protection of military electronic products (GJB/Z 86-1997 anti-static electricity packing manual). The finger is suitable for electric components and parts which are sensitive to static electricity, and is able to avoid static electricity accumulation, protecting the components and parts from static electricity during grasping.

w

Wearing resistance finger



Wearing resistance finger applied under high wearing environment, added with special wearing resistant silicone rubber with reinforced components, whose surface strength is much higher than regular silicon rubber. Under the same experimental conditions (standard wearing test based on Akron abrasion tester), the wear loss is only 1/5 of regular silicon rubber.

p

Anti-dust finger



Surface of anti-dust finger is optimized, coated with a special layer, which effectively reduces the influence of dust accumulation adsorption of silicone rubber material.

e

Force enforcement finger



Through the composite technology with high modulus materials, the longitudinal elongation of finger web is limited, and the range of grasping force is improved.

g

Stiffness-enhancing fingers



Stiffness-enhancing fingers are mainly used in the conditions of large end load and high-speed displacement. After using high-hardness silicone rubber with special reinforcing components throughout the body, the overall rigidity is improved. During the actual grasping process, it is affected by The amplitude and duration of the shaking caused by the impact will be smaller than that of the standard model (Note: Under the same air pressure, the deformation of the stiffened finger is smaller than that of the standard finger).

SFG Soft Finger Gripper

ISC Inner Soft Clamp

MVG Mini Vacuum Gripper

NBM Nimble Bubble Module

VFC VanDer Waals Force Suction Cup

SCB Pneumatic Control Module

ISC INNER SOFT CLAMP



ISC internal support clamp is an innovative soft fixture, whose design is mimicking self-defense morphology of puffer fish. Through inflating air with pressure, the fixture can expand and complete internal support grasping.

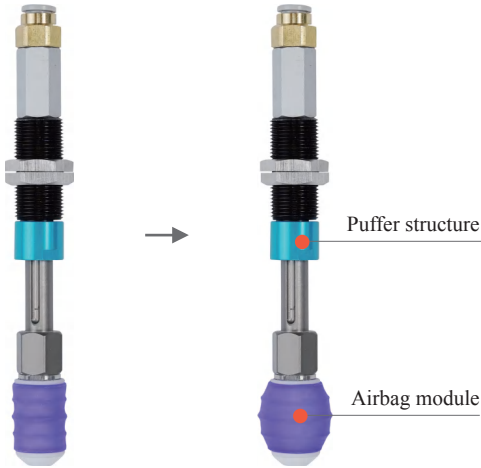
Due to contacting part with workpiece is soft silicon rubber, after adding pressure, there will be a “air cushion” layer between rigid supporting and contact surface, making stress uniform and not likely to damage the workpiece. In addition, input air pressure can be adjusted to control the extension of airbag and stress contacting with workpiece, so that significantly increase softness of grasping system.

Working Principles

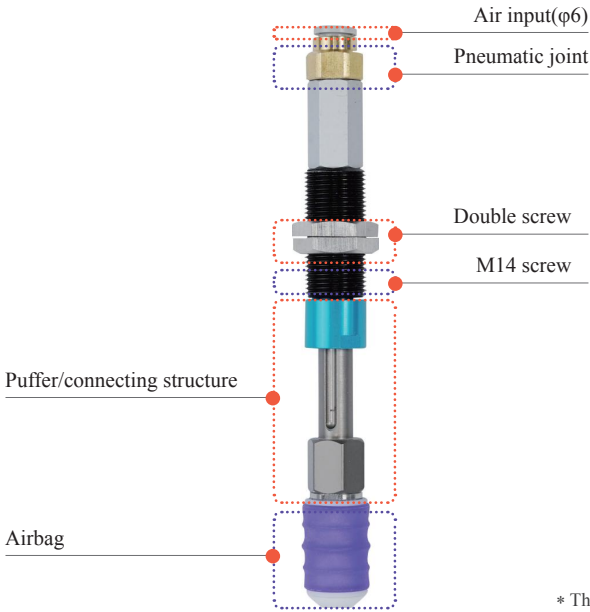
Internal support clamp has special airbag structure and can produce different deformation along with internal pressure.

Input positive pressure
Fixture extends, self-adaptively supporting at internal surface of the object and completing grasping.

Input negative pressure
Fixture presents natural state and releases the object.

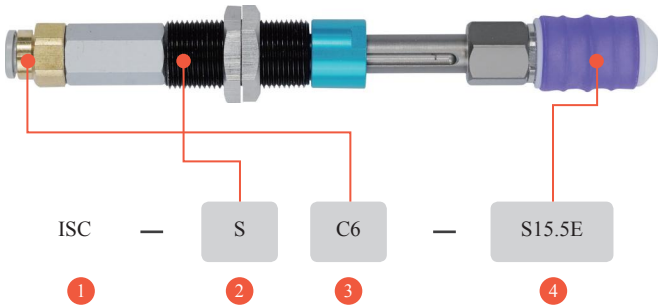


Structure display



* The buffer rod thread data is M14×1.0

Coding principles



1 Series name	
ISC	Internal support clamp
2 Buffer rod	
Code	Description
No mark	No buffer rod
S	With buffer rod

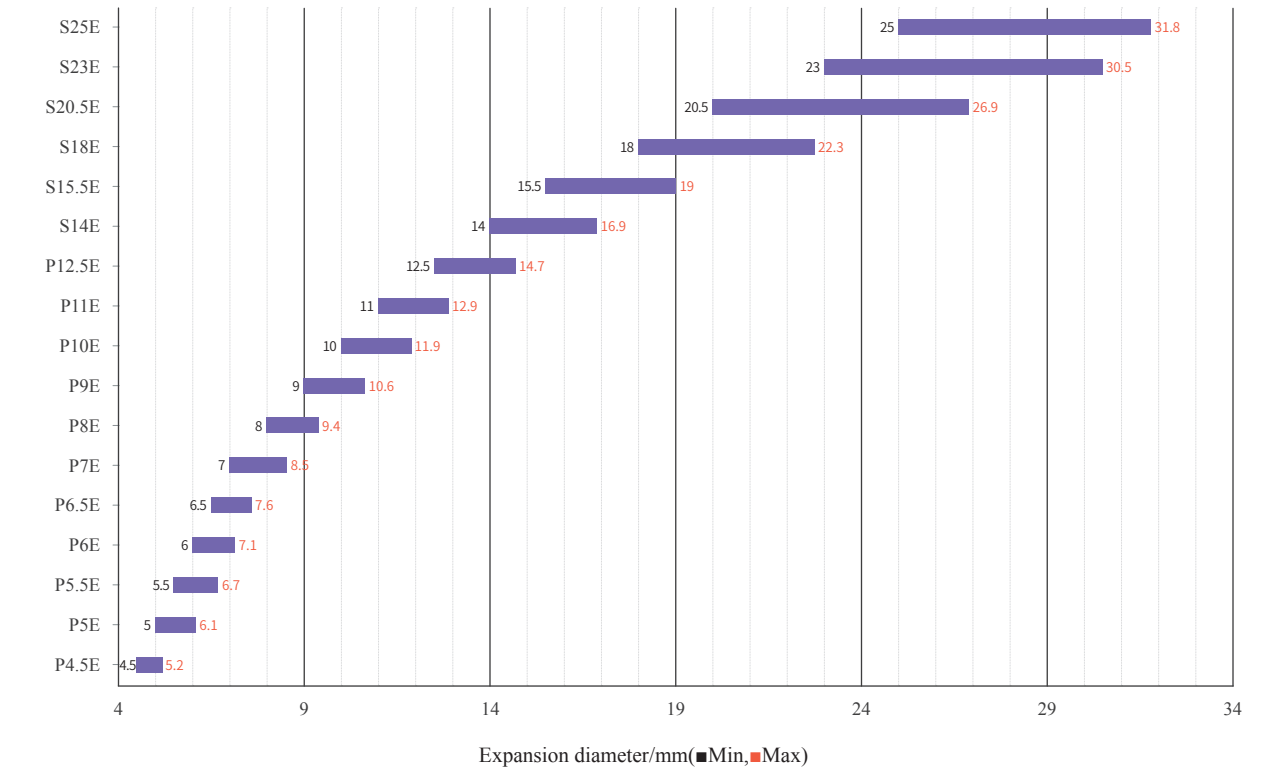
3 Pneumatic connector	
Code	Description
C4	Use φ4 air pipe
C6	Use φ6 air pipe
C8	Use φ8 air pipe

4 Airbag	
Code	Outer diameter of airbag without air pressure/mm
P4.5E	4.5
P5E	5
P5.5E	5.5
P6E	6
P6.5E	6.5
P7E	7
P8E	8
P9E	9
P10E	10
P11E	11
P12.5E	12.5
S14E	14
S15.5E	15.5
S18E	18
S20.5E	20.5
S23E	23
S25E	25

Technical parameter

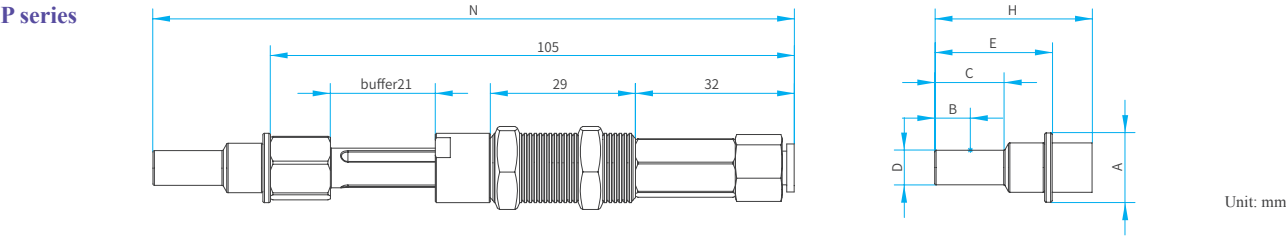
Driving media	Clean air	Standard working Lifespan	>100,000times
Maximum Operating frequency (cpm)	300	Whether can replace endently	<input checked="" type="checkbox"/> P series <input checked="" type="checkbox"/> S series

Performance and size



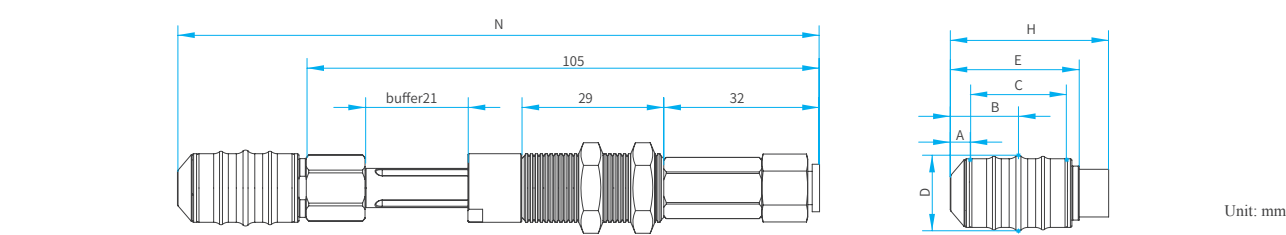
Appearance parameters

P series



Model	Total height of airbag module H	Contact surface diameter D	Diameter of structural part A	Height from the working diameter to the bottom B	Height of effective contact surface C	Working height of airbag module E	Total length N
ISC-P4.5E	25.5	4.5	14	4.5	8	17.5	E+105
ISC-P5E	27.5	5	14	5	10	19.5	E+105
ISC-P5.5E	27.5	5.5	14	5.5	10	19.5	E+105
ISC-P6E	30.5	6	14	6	12	22.5	E+105
ISC-P6.5E	30.5	6.5	14	6.5	12	22.5	E+105
ISC-P7E	31.5	7	14	7	14	23.5	E+105
ISC-P8E	31.5	8	14	8	14	23.5	E+105
ISC-P9E	32.5	9	14	9	15	24.5	E+105
ISC-P10E	32.5	10	14	10	15	24.5	E+105
ISC-P11E	35.5	11	14	11	16	28	E+105
ISC-P12.5E	37.5	12.5	14	12.5	18	30	E+105

S series



Model	Total height of airbag module H	Contact surface diameter D	guide height A	Height from the working diameter to the bottom B	Height of effective contact surface C	Working height of airbag module E	Total length N
ISC-S14E	32.3	14	3.3	13.9	19	26.3	E+105
ISC-S15.5E	32.3	15.5	3.3	13.9	19	26.3	E+105
ISC-S18E	40.8	18	5.5	19.8	24.6	34.8	E+105
ISC-S20.5E	40.8	20.5	5.5	19.8	24.6	34.8	E+105
ISC-S23E	40.8	23	5.5	19.8	24.6	34.8	E+105
ISC-S25E	40.8	25	5.5	19.8	24.6	34.8	E+105

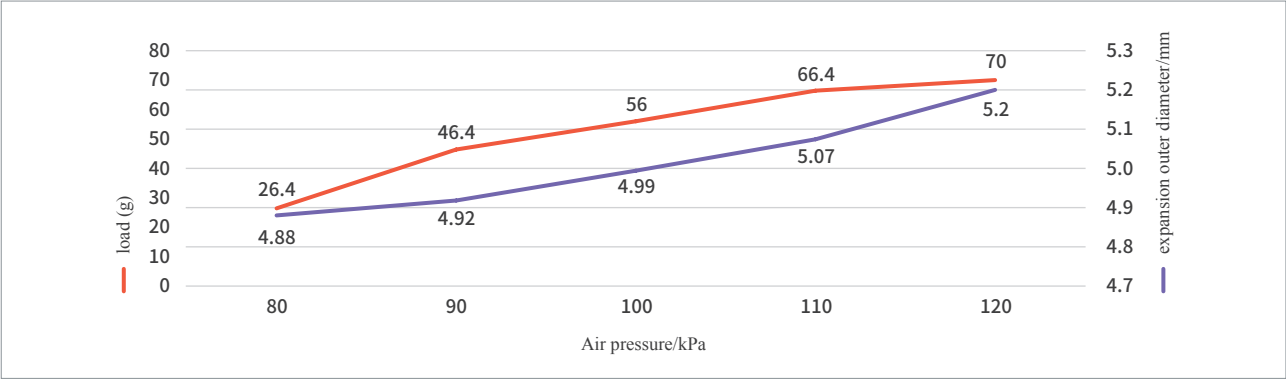
Expanded outer diameter

Model	Operating pressure range /kPa	Maximum expansion outer diameter/mm	Maximum load/g	Fixture weight/g	Model of metal rod	Mounting hole dimension/mm
ISC-SC6-P4.5E	0-120	5.2	70	36	VFNT 1421-G18	14.5
ISC-SC6-P5E	0-120	6.1	110	36	VFNT 1421-G18	14.5
ISC-SC6-P5.5E	0-120	6.7	288	36	VFNT 1421-G18	14.5
ISC-SC6-P6E	0-100	7.1	98	36	VFNT 1421-G18	14.5
ISC-SC6-P6.5E	0-100	7.6	368	36	VFNT 1421-G18	14.5
ISC-SC6-P7E	0-100	8.5	188	36	VFNT 1421-G18	14.5
ISC-SC6-P8E	0-100	9.4	213	36	VFNT 1421-G18	14.5
ISC-SC6-P9E	0-100	10.6	234	37	VFNT 1421-G18	14.5
ISC-SC6-P10E	0-100	11.9	328	37	VFNT 1421-G18	14.5
ISC-SC6-P11E	0-100	12.95	920	37	VFNT 1421-G18	14.5
ISC-SC6-P12.5E	0-100	14.71	1157	37	VFNT 1421-G18	14.5
ISC-SC6-S14E	0-100	16.9	1163	42	VFNT 1421-G18	14.5
ISC-SC6-S15.5E	0-100	19.2	896	44	VFNT 1421-G18	14.5
ISC-SC6-S18E	0-100	22.75	1642	48	VFNT 1421-G18	14.5
ISC-SC6-S20.5E	0-85	26.9	1696	52	VFNT 1421-G18	14.5
ISC-SC6-S23E	0-85	30.5	1920	54	VFNT 1421-G18	14.5
ISC-SC6-S25E	0-85	31.8	1984	56	VFNT 1421-G18	14.5

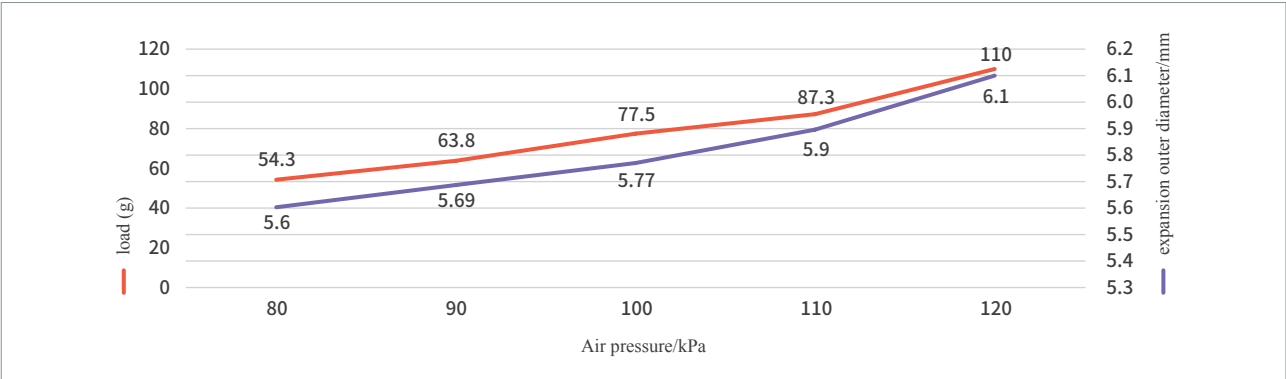
* P series Maximum load test object is model outer diameter +0.3mm;S series Maximum load test object is model outer diameter +1mm;The load test is measured by professional instruments.

load curve

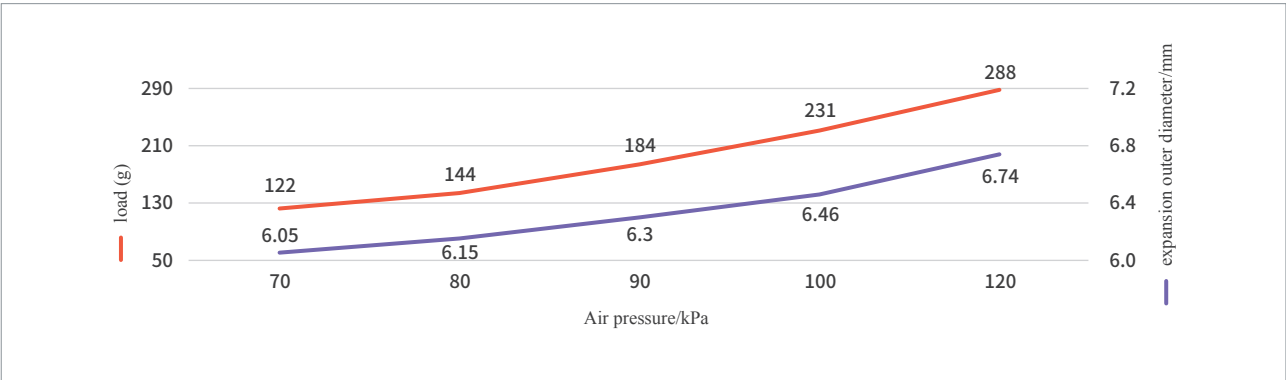
ISC-P4.5E



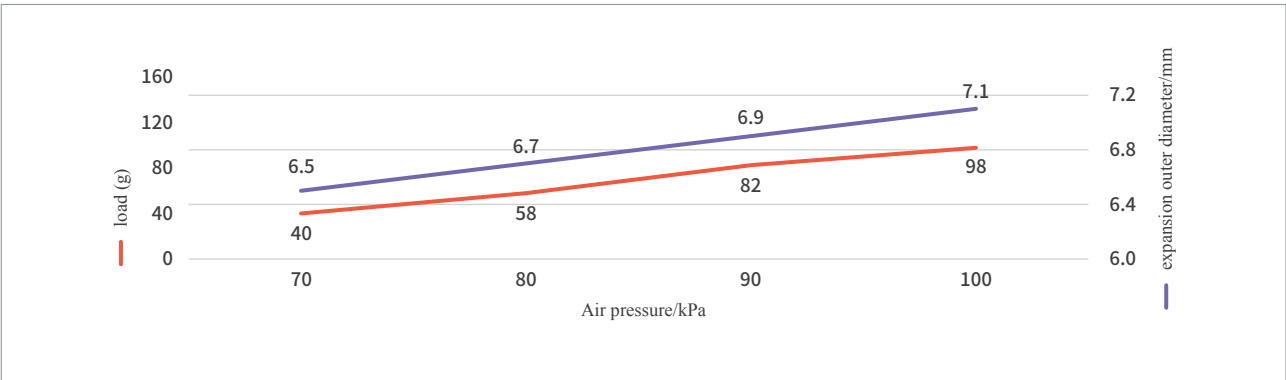
ISC-P5E



ISC-P5.5E

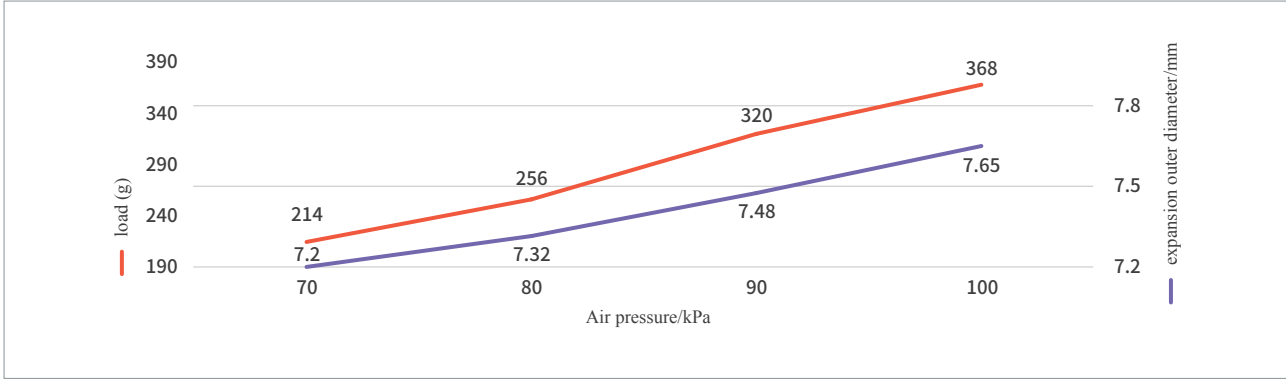


ISC-P6E

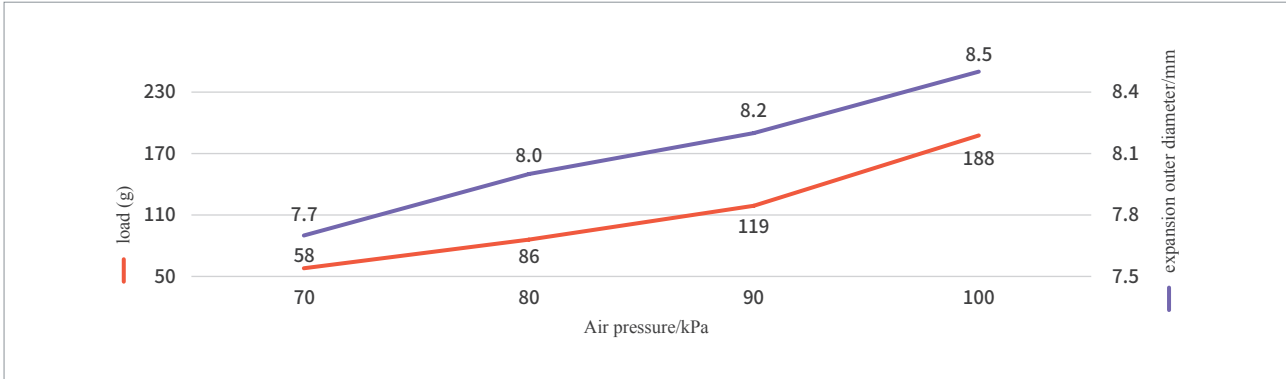


load curve

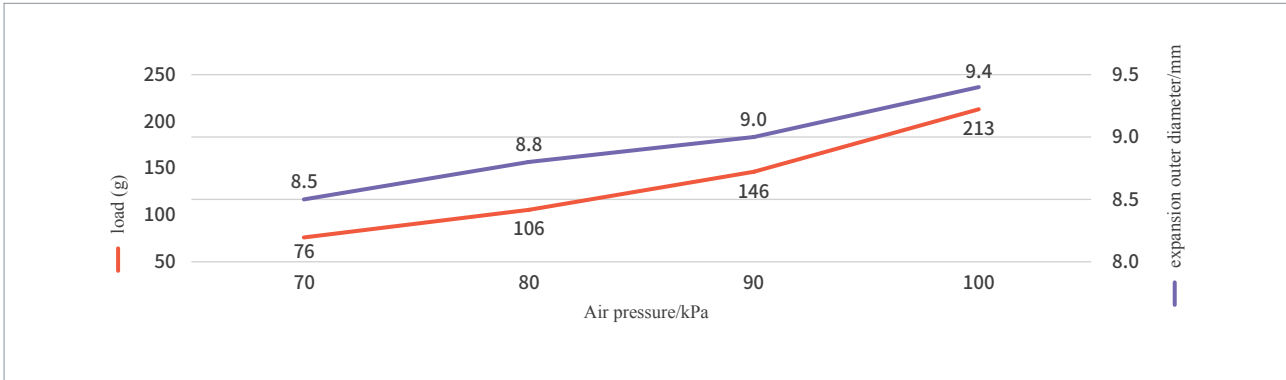
ISC-P6.5E



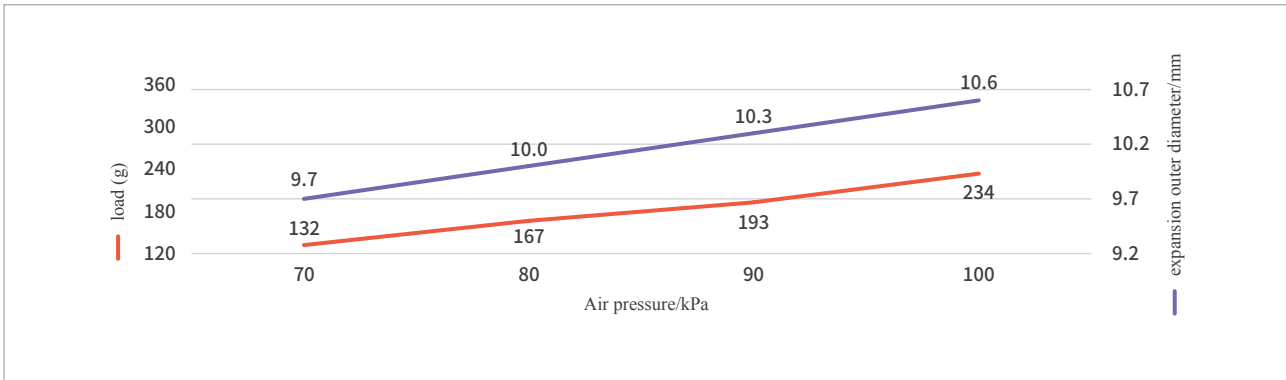
ISC-P7E



ISC-P8E



ISC-P9E



SFG Soft Finger Gripper

ISC Inner Soft Clamp

MVG Mini Vacuum Gripper

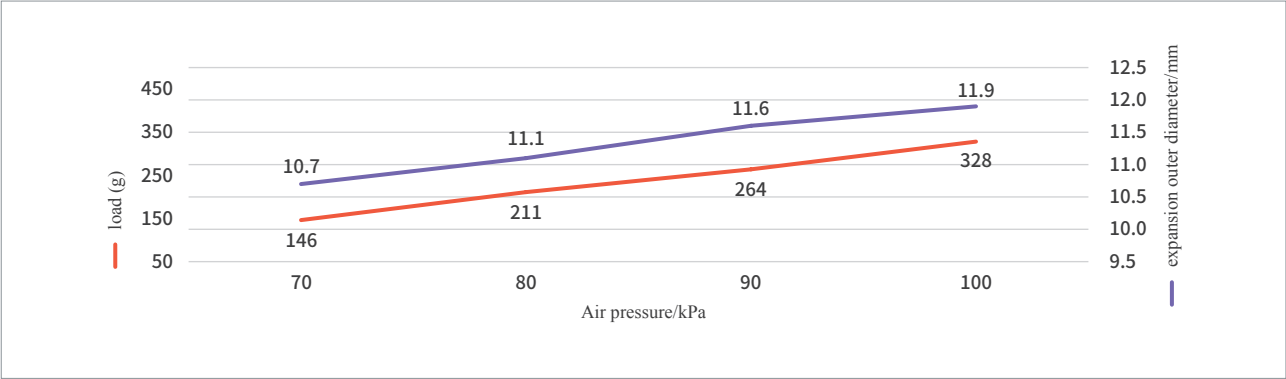
NBM Nimble Bubble Module

VFC VanDer Waals Force Suction Cup

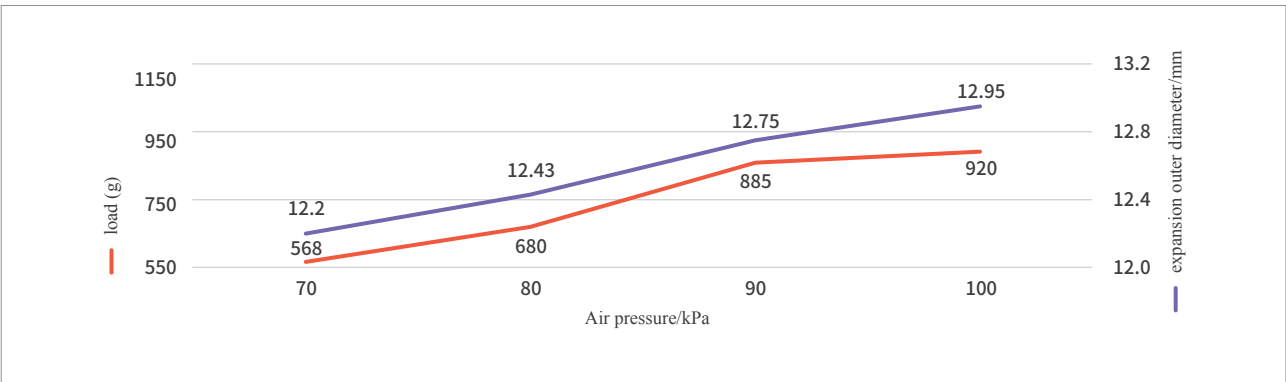
SCB Pneumatic Control Module

load curve

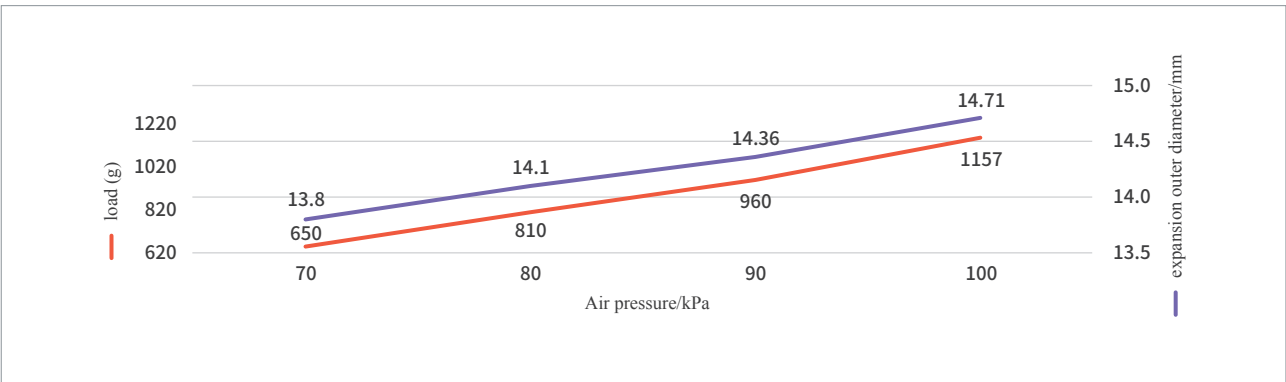
ISC-P10E



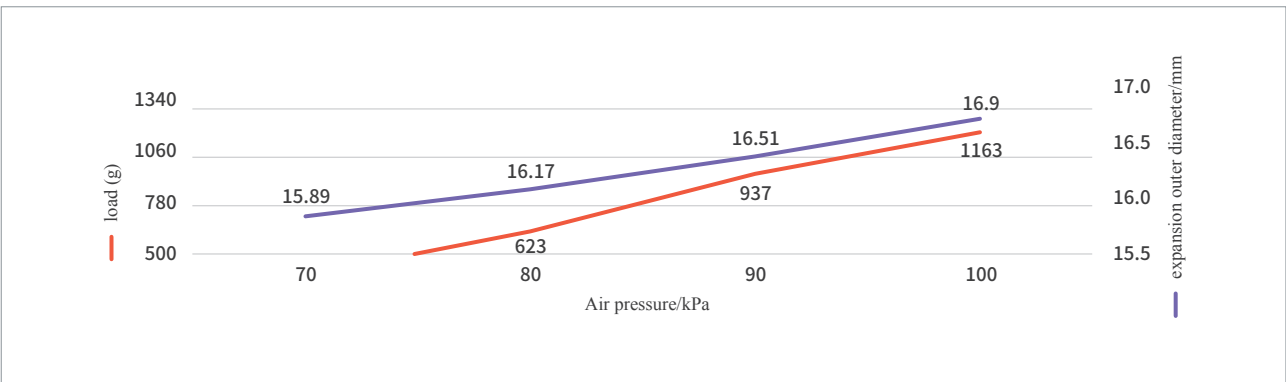
ISC-P11E



ISC-P12.5E

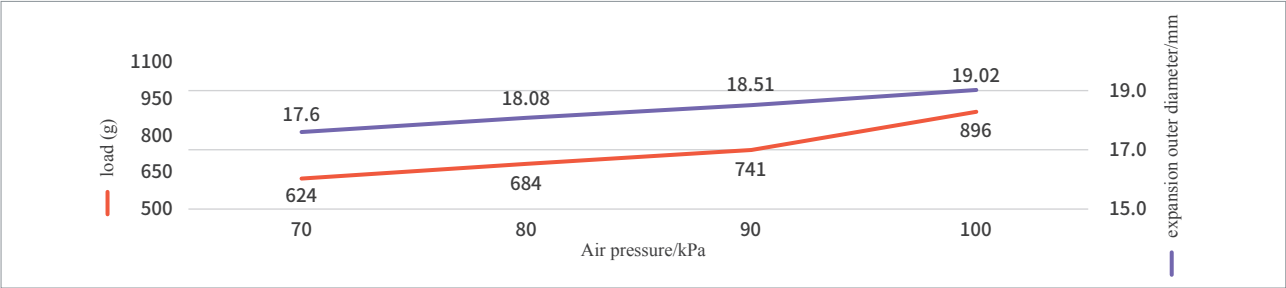


ISC-S14E

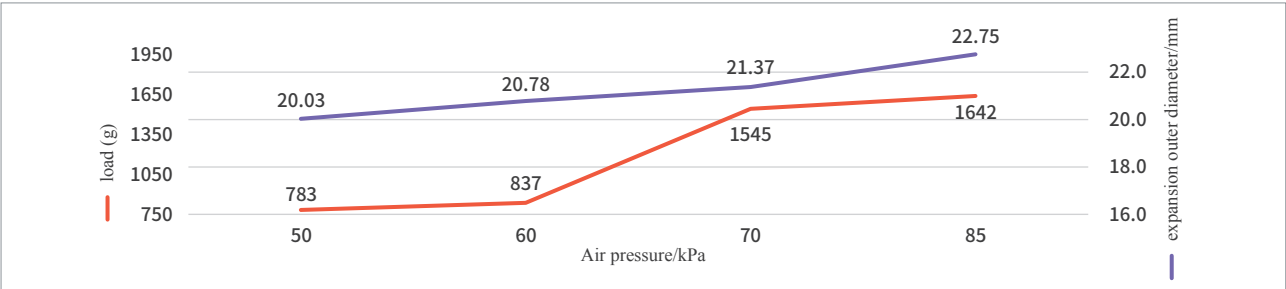


load curve

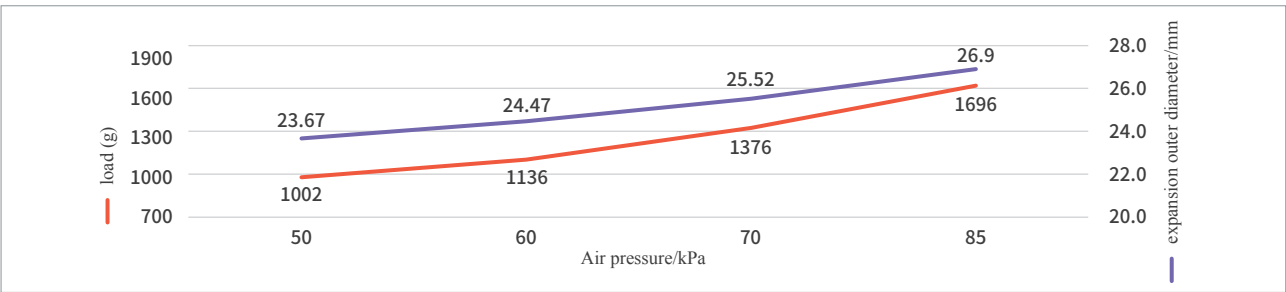
ISC-S15.5E



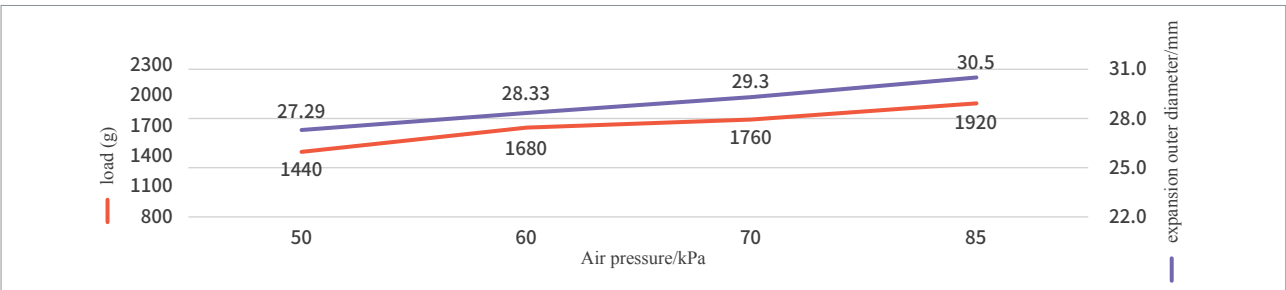
ISC-S18E



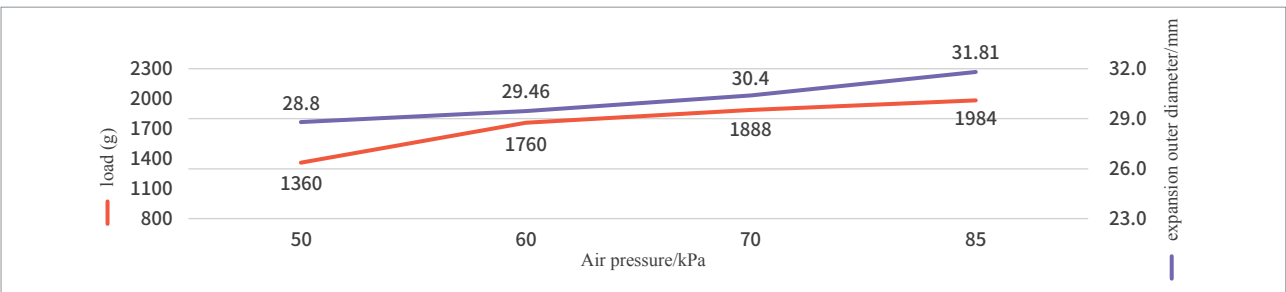
ISC-S20.5E



ISC-S23E



ISC-S25E



SFG Soft Finger Gripper

ISC Inner Soft Clamp

MVG Mini Vacuum Gripper

NBM Nimble Bubble Module

VFC VanDer Waals Force Suction Cup

SCB Pneumatic Control Module

MVG MINI VACUO GRIPPER

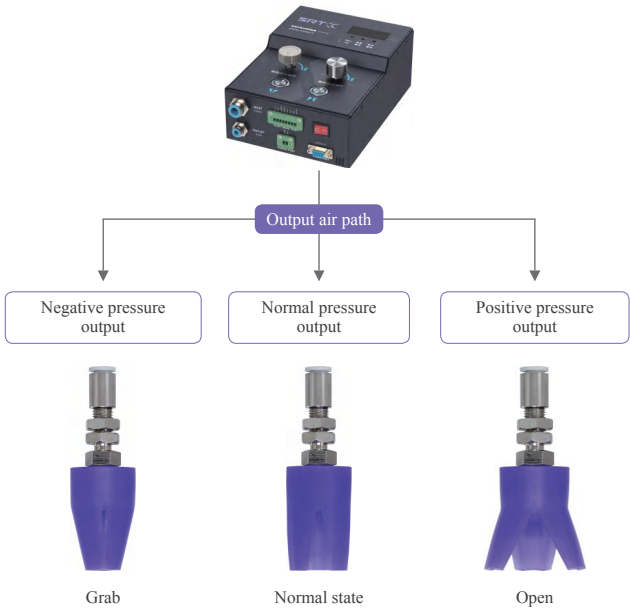


MVG Mini Vacuo Gripper features bionic design that mimics the chameleon hand. Vacuum driven, small size, easy to use in arrays. It features simple structure, lightweight, easy to operate, flexible grasping and controllable force, and stronger scenario adaptability. Moreover, it boasts flexible grasping without damage to the workpiece. The product provides many types of plastic heads and supports customization with higher flexibility.

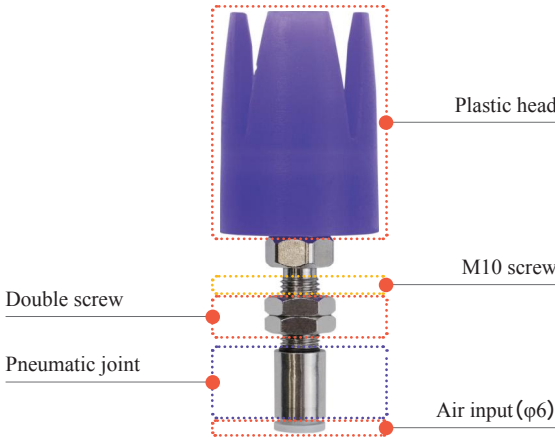
Working Principles

The minisized vacuum gripper has a special airbag structure, and the front end of the plastic head generates different actions according to the difference of internal and external pressure.

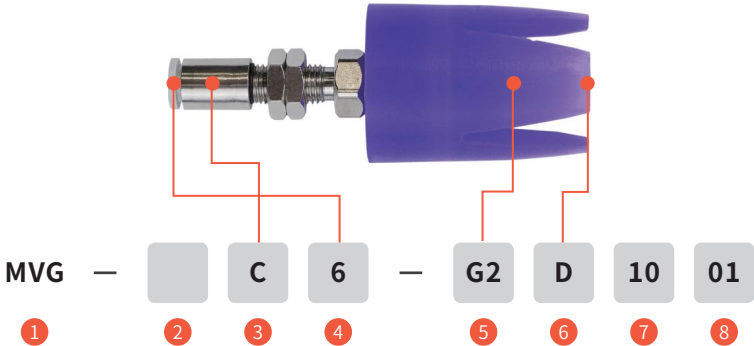
- Input negative pressure**
The clamping jaws are in a clamping state to complete the grasping action;
- Input positive pressure**
The clamping jaws are in an open state to release the object.



Structure display



Coding principles



1 Series name	
MVG	Mini Vacuo Gripper
2 Buffer rod	
Code	Description
No mark	No buffer rod
S	With buffer rod
3 Pneumatic connector	
Code	Description
C	Straight-through thread joint
L	Twisted thread joint
4 Tube diameter	
Code	Description
6	6mm air pipe
8	8mm air pipe

5 Number of fingertips	
Code	Description
G3	3 fingers
G4	4 fingers
6 Plastic head shape	
Code	Description
D	Round
L	Square
7 Diameter of plastic head	
size	14, 18, 24, 30mm
8 Fingertip spacing	
size	5.1, 5.6, 16, 22mm

Note: The item number of the customized model is connected with "/".

Technical parameter

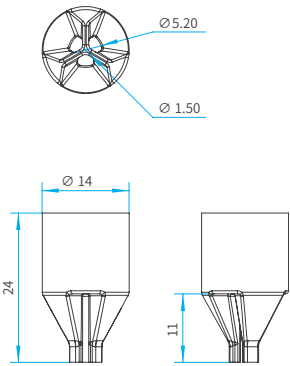
Driving media	Clean air	Standard working	> 150,000 times
Maximum Operating frequency (cpm)	300	Whether can replace endently	Yes

Performance and size

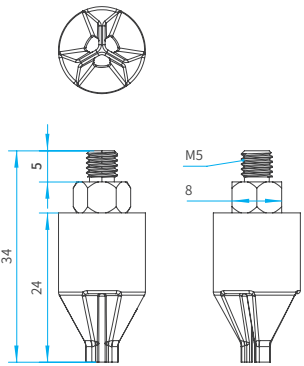
Appearance parameters

MVG-SC6/With buffer rod

MVG plastic head



MVG plastic head module

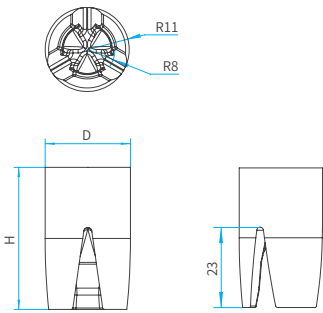


Unit: mm

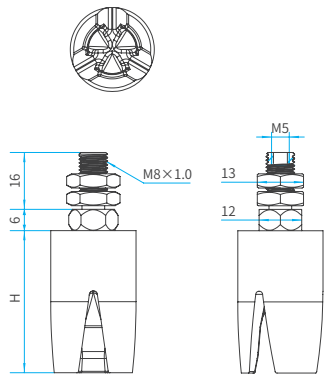
Model	size/mm		Fingertip distance/mm			weight/g	Maximum Working pressure/kPa	Maximum load/g
	Projection D	Height H	Natural state	minimum	Maximum			
MVG-SC6-G3D1401	Φ14	24	5.2	4.1	13.2	34.9	80	12.16
MVG-SC6-G3D1801	Φ18	27	5.6	4.5	13.8	40.5	80	12.16

MVG-SC6/No buffer rod

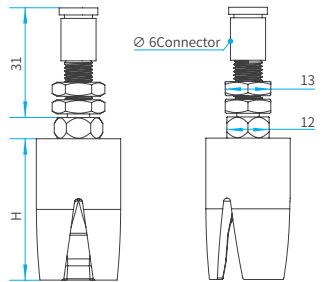
MVG plastic head



MVG plastic head module



MVG Mini Vacuo Gripper

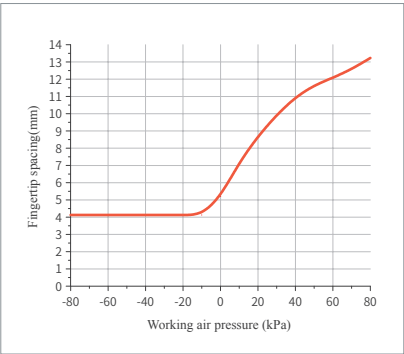


Unit: mm

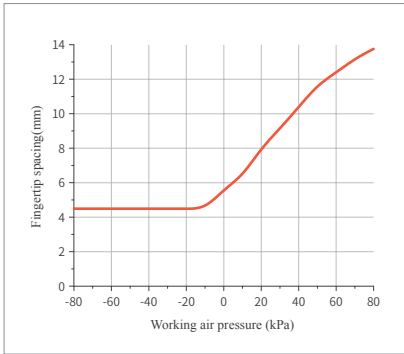
Model	size/mm		Fingertip distance/mm			weight/g	Maximum Working pressure/kPa	Maximum load/g
	Projection D	Height H	Natural state	minimum	Maximum			
MVG-C6-G3D2416	Φ24	40	16	7.25	27.65	34.1	80	206
MVG-C6-G4D3022	Φ30	43	22	9.65	42.2	40.5	80	267

Performance curve

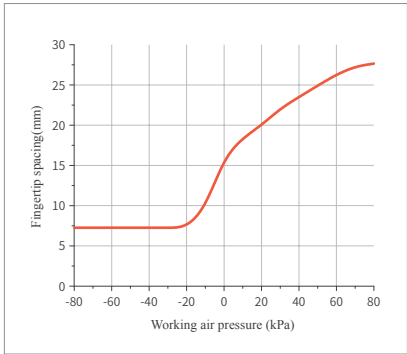
MVG-SC6-G3D1401



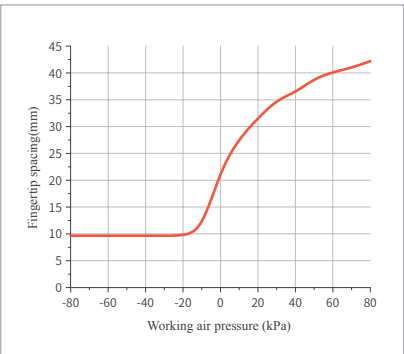
MVG-SC6-G3D1801



MVG-C6-G3D2416



MVG-C6-G4D3022



NBM NIMBLE BUBBLE MODULE



NBM Nimble Bubble Module is a new type of flexible end-effector. It is made of special soft anti-skid and anti-friction silicone with the advantages of large airbag expansion range, good flexibility, low cost and flexible installation. It can be freely combined with multiple modules to quickly form flexible clamps of any type, and boasts high flexibility and high load.

Working Principles

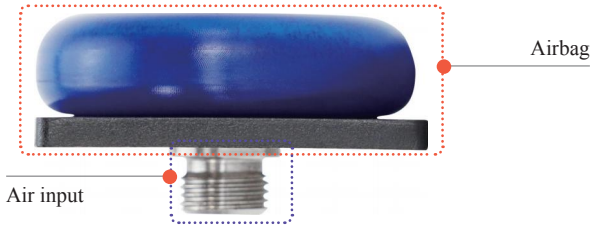
NBM Nimble Bubble Module realizes the expansion and contraction of the airbag by inflating and releasing air of a certain pressure into the internal flexible airbag, thereby completing the clamping and releasing actions of the clamp.

Positive pressure state
NBM airbag is in grasping state;

Pressurize releasing state
NBM airbag recovers to its original state (negative pressure can accelerate the recovery of airbag).



Structure display



Technical parameter

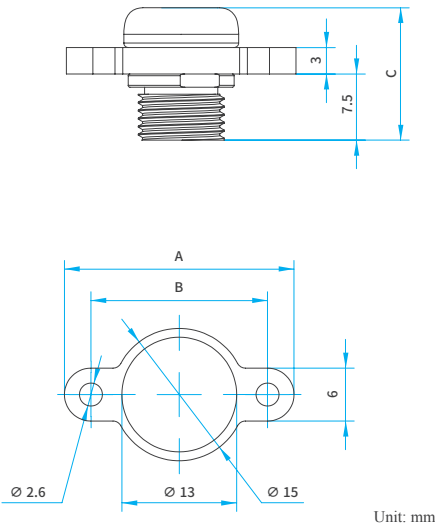
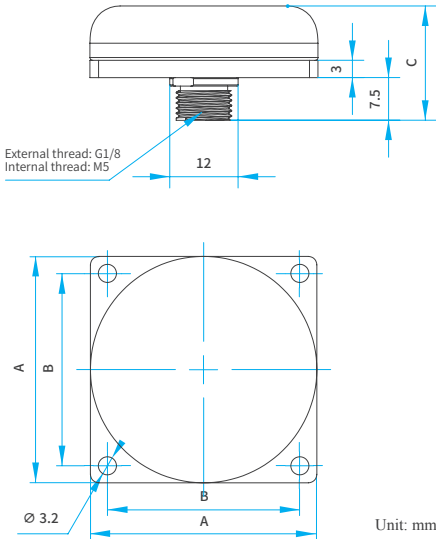
Driving media	Clean air	working Lifespan	40kPa≥500W	
Maximum Operating frequency (cpm)	300		60kPa≥300W	
Whether can replace endtly	Independent		80kPa≥100W	
			100kPa≥50W	

Performance and size

Appearance parameters

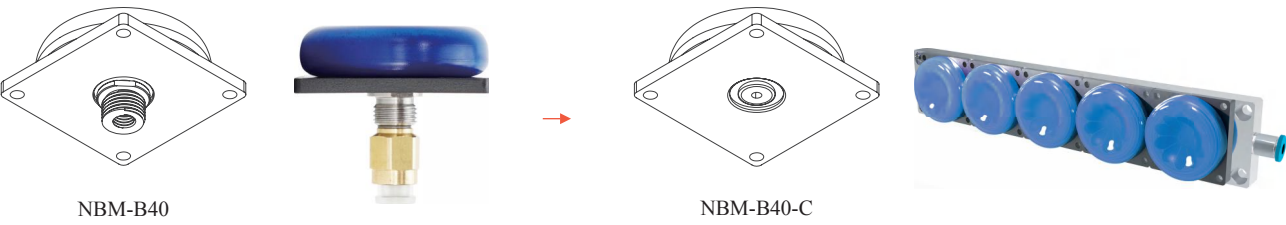
NBM-B20,B30,B40

NBM-B13



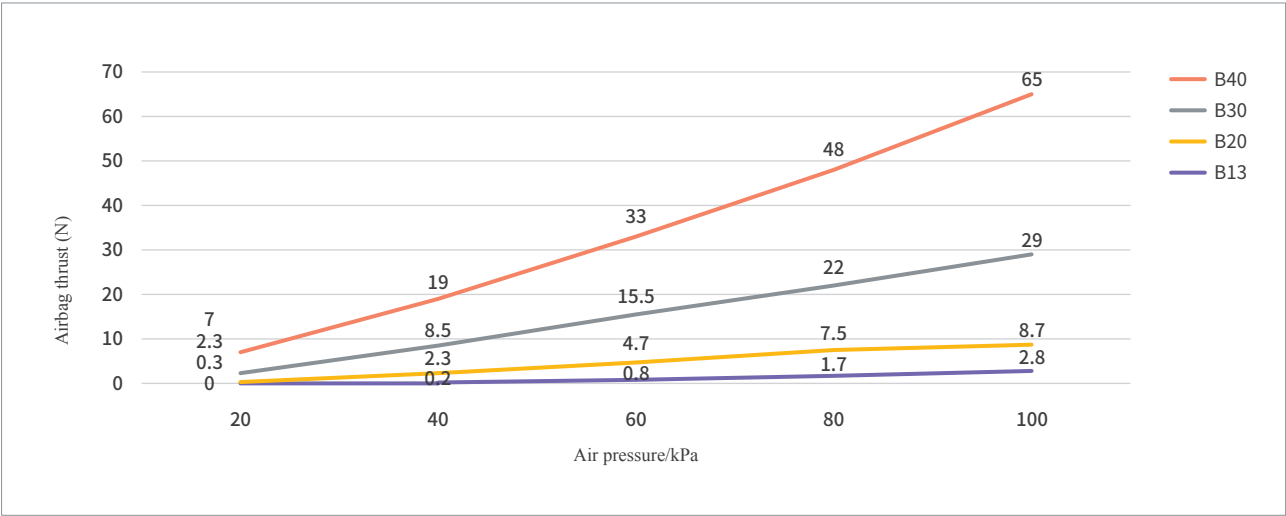
Model	size/mm			weight/g	Single load/g	ambient temperature/°C	Working pressure/kPa
	A	B	C				
NBM-B13	26	20	15	4.9	50	-40-50	-10-100
NBM-B20	25	19	16.5	7.1	100		
NBM-B30	32	26	19	11.7	125		
NBM-B40	40	34	21	19.4	250		

Installation method

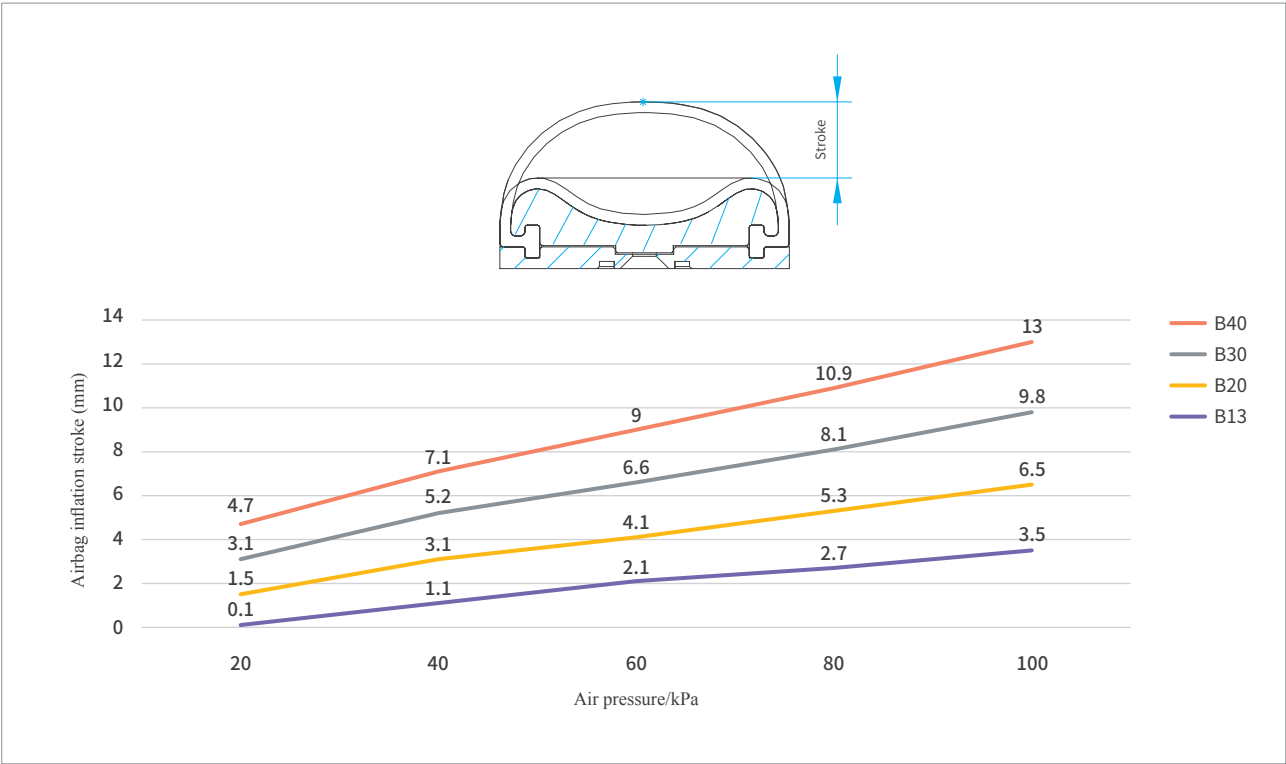


Performance curve

Thrust & air pressure curve (the airbag 2mm is away from the workpiece)



Stroke & air pressure curve



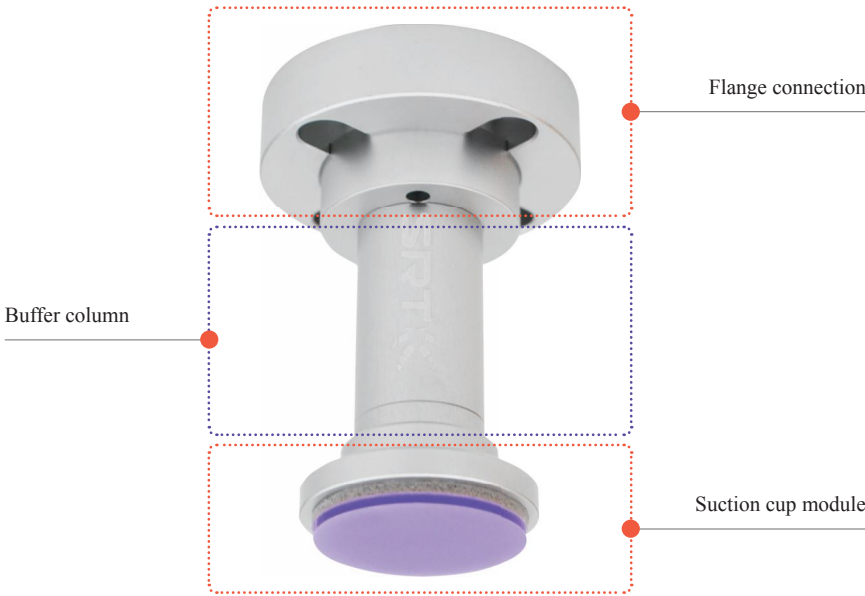
VFC VANDER WAALS FORCE SUCTION CUP



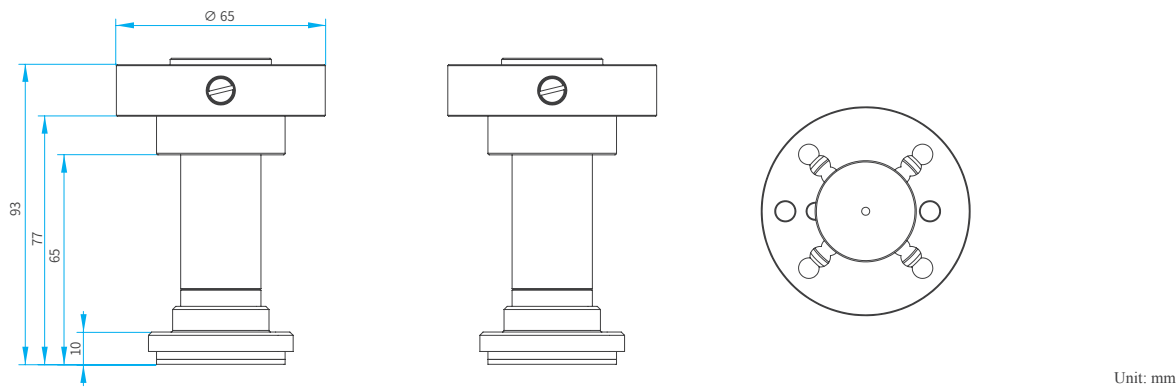
VFC van der Waals force suction cups are inspired by the observation and imitation of the microscopic characteristics of gecko feet. Through special polymer materials and μm -level surface micro-molding processes, the suction cups can generate strong intermolecular forces with the surface of various objects to absorb. The strength can reach $0.5\text{kg}/\text{cm}^2$. Thanks to its special adsorption mechanism, it does not require power supply, gas supply or programming. It is simple and reliable, and can adsorb porous workpieces, and can work normally even in the vacuum environment. In addition, there is no residue and marks on the surface of the workpiece, which greatly expands the application scope of automatic equipment.

- ✓ Simple and easy to use way
- ✓ Zero energy adsorption
- ✓ Traceless adsorption
- ✓ Suitable for various smooth surfaces
- ✓ Can be used in a vacuum environment

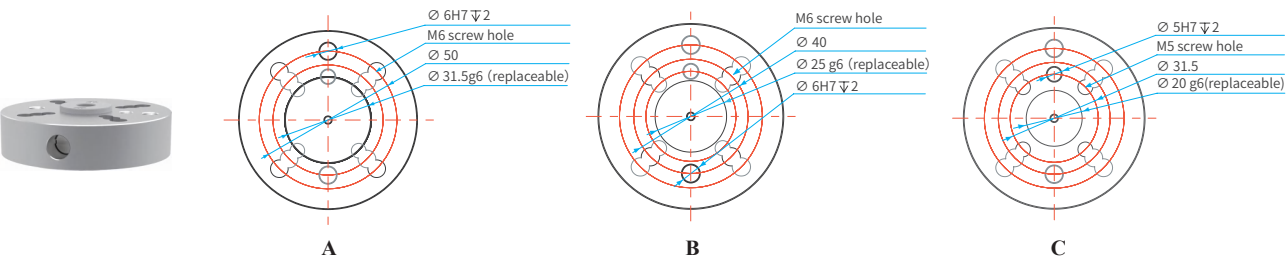
Structure display



Dimensions



Flange interface size



Technical parameter

Model	VFC-D20	VFC-D30	VFC-D40
Mad load/g	250	560	1000
Preloading/N	1.2-10	2.5-20	5-40
Adsorption surface diameter/mm	20	30	40
Overall weight/g	270	280	290
Working temperature/°C	0-50		
Storage temperature/°C	≤30°C		
Power off hold	Yes		
Protection level	IP42		
Suction cup material	silica gel		
Wear resistance	Depends on the surface roughness of the workpiece		
Change interval	>50000times, Depends on working environment		
cleaning method	1.Silicone roller 2. Isoacetone + clean cloth		
Applicable surface description	<div>■ The smoother the surface, the greater the effective contact area of the micro-level, the greater the load, and the smaller the preload force, the effective load force can be obtained;</div> <div>■ The rougher the surface, the smaller the effective contact area of the micro-level, the smaller the load, and the greater the need. A large preload force can obtain the required payload.</div> <div>■ The rough surface will aggravate the abrasion of the suction structure of the suction cup, resulting in a shortened life.</div>		

SCB PNEUMATIC CONTROL MODULE



The SCB pneumatic control module is a dedicated control module for the flexible fixture, which can output the safe pressure that the flexible fixture can withstand, which cannot be met by conventional business sources. The pressure of the inner body of the clip can be adjusted through the control module to achieve precise control of the gripping of the flexible clip.Among them, the SCB-PBS high-protection pneumatic control module features high protection level and is suitable for operation in harsh environments such as dusty, oily, and humid environments.

Technical parameter

Model	Manual control	IO Control	Pressure Releasing	pressure Display	State Display	Communication Control	Communication voltage Regulation	Gear Control	Power Protection	Over pressure Protection	Air providing Check	Air leakage Check	Alert Output	Output Completion	232	TCP
SCB-PBS	○	○	○	○	○	○			○	○	○	○	○	○	○	
SCB-PB	○	○	○	○	○	○			○	○	○	○	○	○	○	
SCB-PT	○	○	○	○	○	○	○	○	○	○	○	○	○	○	○	○
SCB-18IAS	○	○	○	○		○	○		○						○	

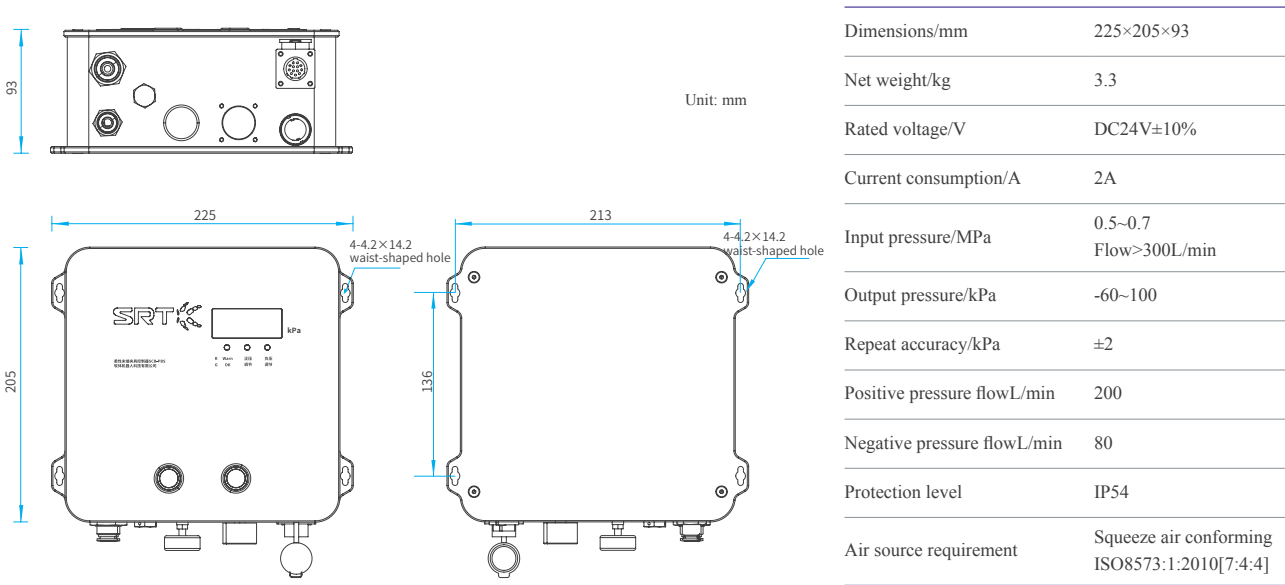
Category	SCB-PBS	SCB-PB	SCB-PT	SCB-18IAS
Pressure range/kPa	-60~100	-60~100	-80~100	-70~100
Positive pressure flow L/min	200	200	285	25
Negative pressure flow L/min	80	80	85	25
Repeat accuracy/kPa	±2	±2	±4	±5
Control method	Manual control, IO control and communication control	Manual control, IO control and communication control	Manual control, IO control and communication control	Manual control, IO control and communication control
Voltage regulation mode	Manual voltage regulation	Manual voltage regulation	Manual voltage regulation and communication voltage regulation	communication voltage regulation
Special functions	Air leak detection, signal output, alarm signal output, overpressure protection	Air leak detection, signal output, alarm signal output, overpressure protection	Air leak detection, signal output, alarm signal output, overpressure protection, support multiple communication protocols	Plug and play, standard communication protocol
Weight/kg	3.3	2.5	3	2.7
Volume (L×W× H)/mm	225×205×93	214×162×86	222×172×96	220×206×80
Protection level	IP54	IP42	IP42	IP31

SCB-PBS HIGH PROTECTION PNEUMATIC CONTROL MODULE

Panel introduction



Structural dimensions



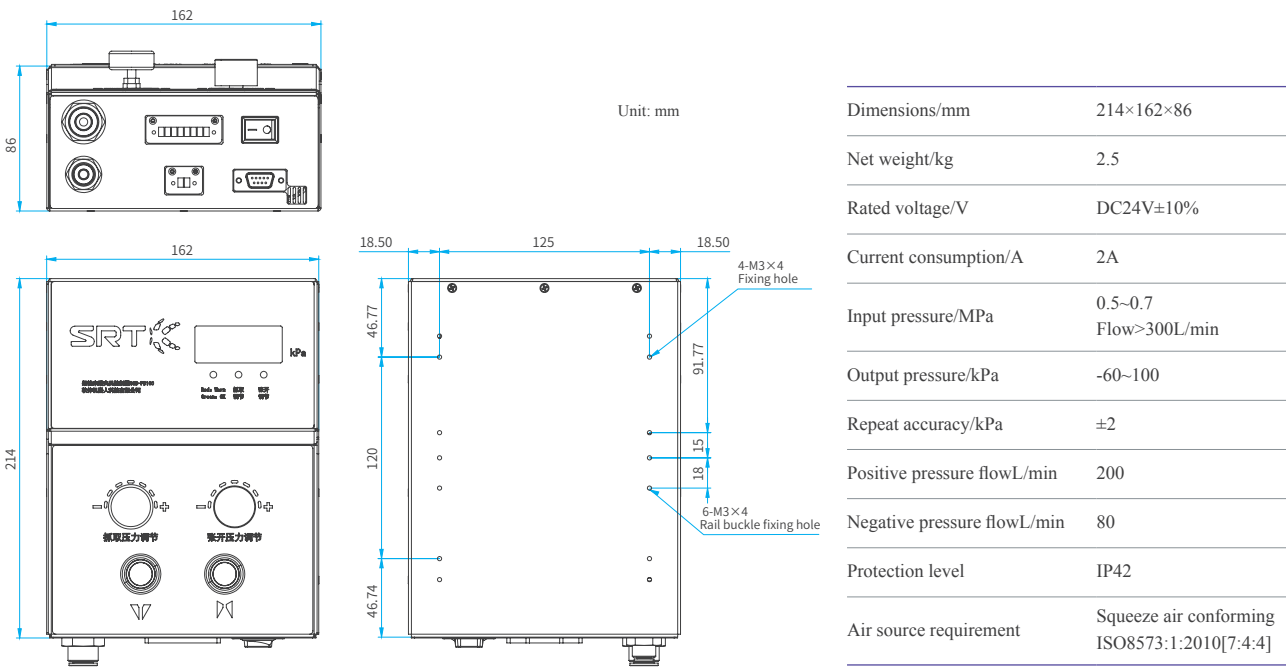
Aviation plug cable	Cable color	Wire number	Name	Specifications
	Red	1	24V+	DC 24V electric support
	Black	11	GND	
	Grey	12	IN-COM	
	Cyan	13	IN-P	
	Green	14	IN-N	Negative pressure trigger input
	Purple	8	IN-RST	Reset trigger input
	White	4	OUT-COM	Output COM port
	Blue	2	OUT-ERR	Alert signal output
	Pink	3	OUT-P	Positive pressure complete output
	Black and white	10	OUT-N	Negative pressure complete output
	Orange	6	DB9-2 RXD	Modbus-RTU communication protocol RS-232 communication port
	Yellow	5	DB9-3 TXD	
	Brown	9	DB9-5 GND	
	Red and white	7	NC	/

SCB-PB BASIC VERSION PNEUMATIC CONTROL MODULE

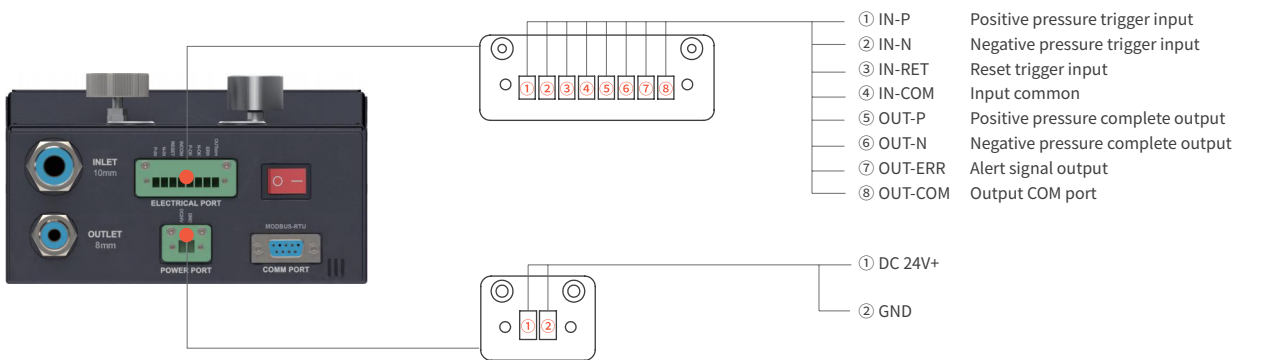
Panel introduction



Structural dimensions



Electrical port

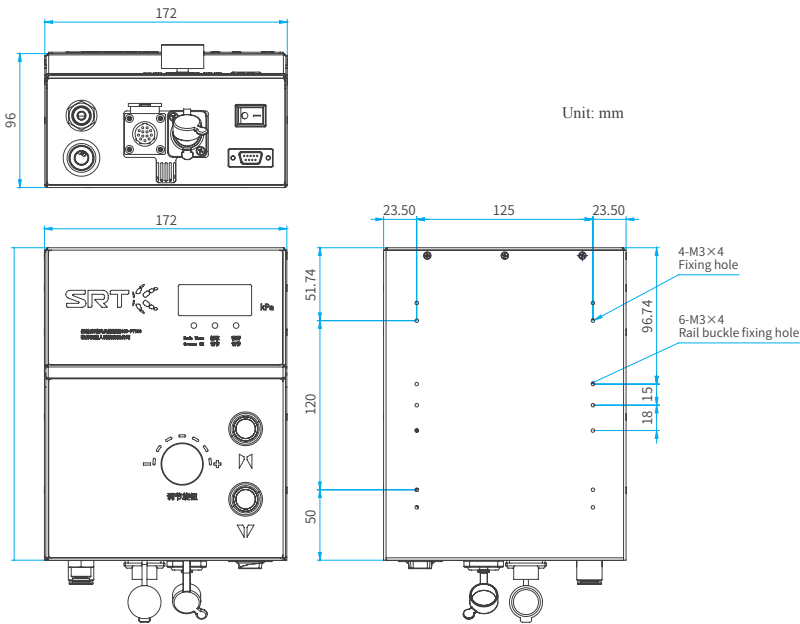


SCB-PT PROFESSIONAL PNEUMATIC CONTROL MODULE

Panel introduction



Structural dimensions

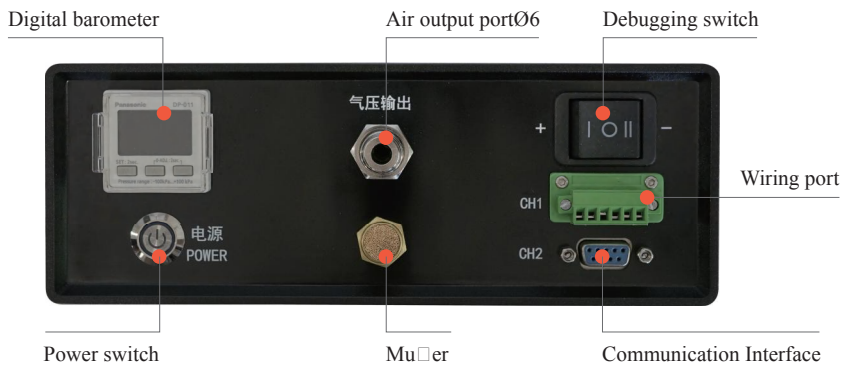


Dimensions/mm	222×172×96
Net weight/kg	3
Rated voltage/V	DC24V±10%
Current consumption/A	2A
Input pressure/MPa	0.6~0.8 Flow>400L/min
Output pressure/kPa	-80~100
Repeat accuracy/kPa	±4
Positive pressure flowL/min	285
Negative pressure flowL/min	85
Protection level	IP42
Air source requirement	Squeeze air conforming ISO8573-1:2010[7:4:4]

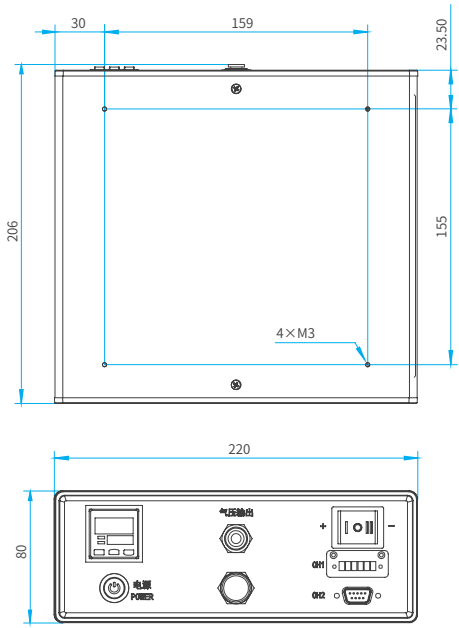
Aviation plug cable	Cable color	Wire number	Name	Specifications
	Red	1	24V+	DC 24V electric support
	Black	11	GND	
	Orange	6	IN-SW1	
	Yellow	5	IN-SW2	Gear position 2
	Brown	9	IN-SW3	Gear position 3
	Cyan	13	IN-P	Positive pressure trigger input
	Green	14	IN-N	Negative pressure trigger input
	Purple	8	IN-RST	Reset trigger input
	Grey	12	IN-COM	Input common
	Blue	2	OUT-ERR	Alert signal output
	Pink	3	OUT-P	Positive pressure complete output
	Black and white	10	OUT-N	Negative pressure complete output
	White	4	OUT-COM	Output COM port
	Red and white	7	NC	/

SCB-18IAS STANDARD ACTIVE PNEUMATIC CONTROL MODULE

Panel introduction

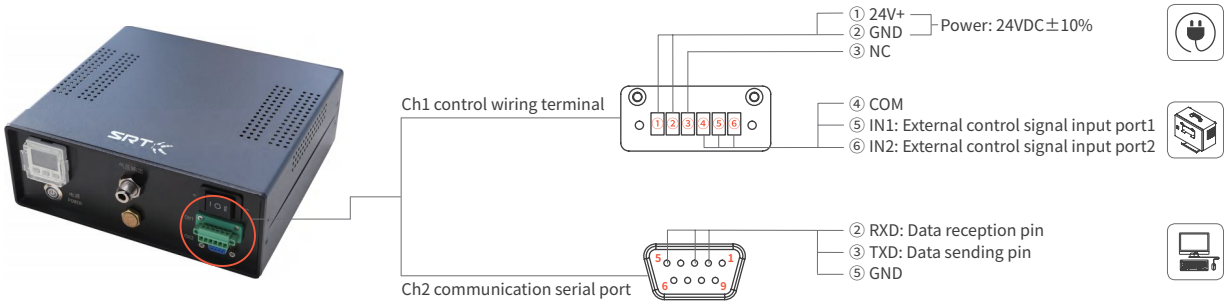


Structural dimensions



Dimensions/mm	220×206×80
Net weight/kg	2.7
Rated voltage/V	DC24V±10%
Current consumption/A	<3A
Output pressure/kPa	-70~100
Repeat accuracy/kPa	±5
Positive pressure flowL/min	25
Negative pressure flowL/min	25
Protection level	IP31
Air source requirement	No need for external air source

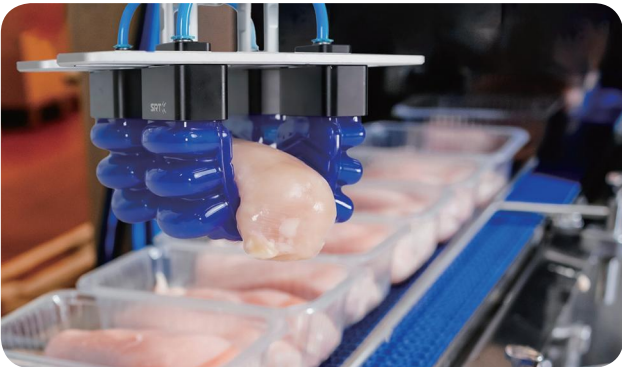
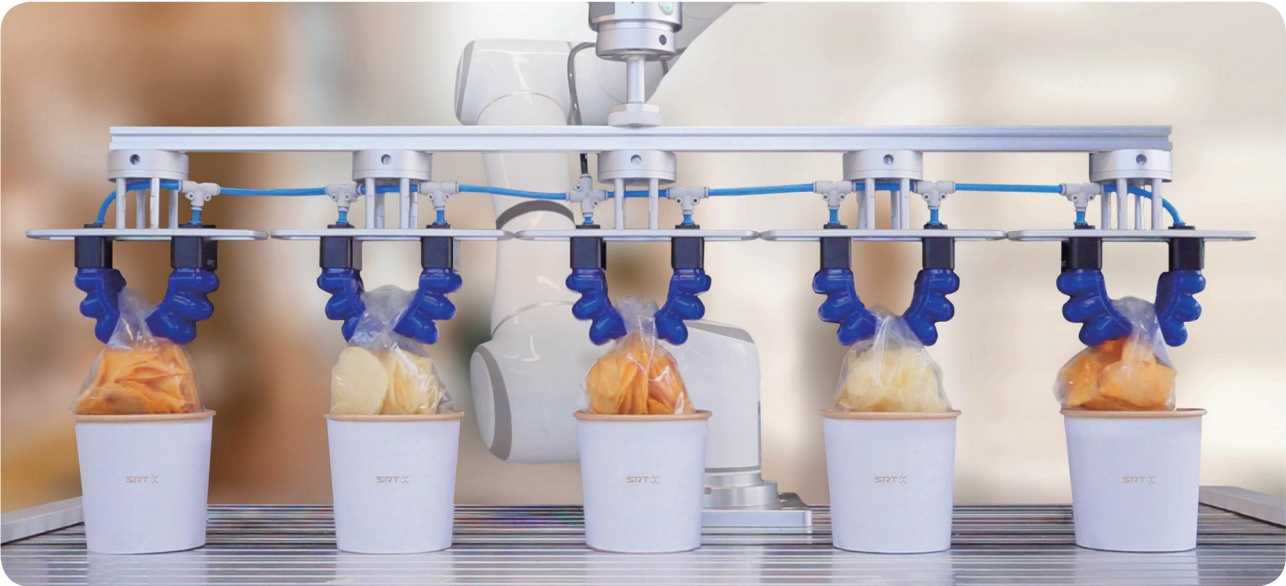
Electrical port



INDUSTRY APPLICATION

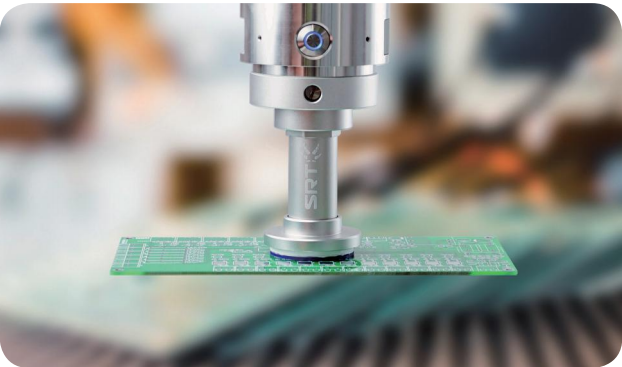
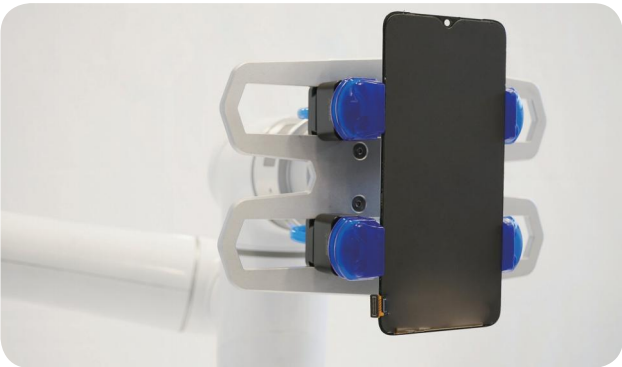
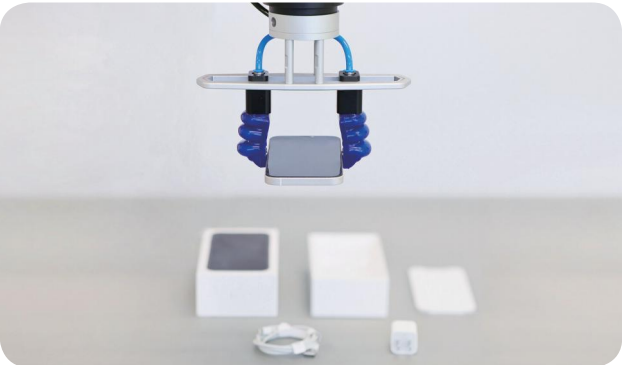
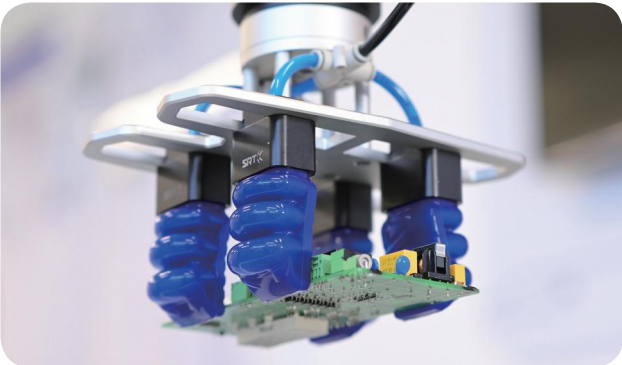
Fresh food industry

In fresh food production lines, manual sorting and packaging operations may cause uncontrollable hygienic conditions. When traditional mechanical processing equipment is in high-yield and long-term operation, due to the difference in shape, weight and volume of objects, problems such as unsuccessful grasping, material falling, and packaging damage are prone to occur, which reduces the production efficiency of the enterprise. SRT flexible grasping system complies with food hygiene and safety regulations. The soft material can reduce the loss of items. It has high adaptability and can realize packaging of various products in the same line, making the production line feeding smooth, improving production efficiency, reducing costs, allowing products to quickly flow to the market, and improving the operation efficiency.



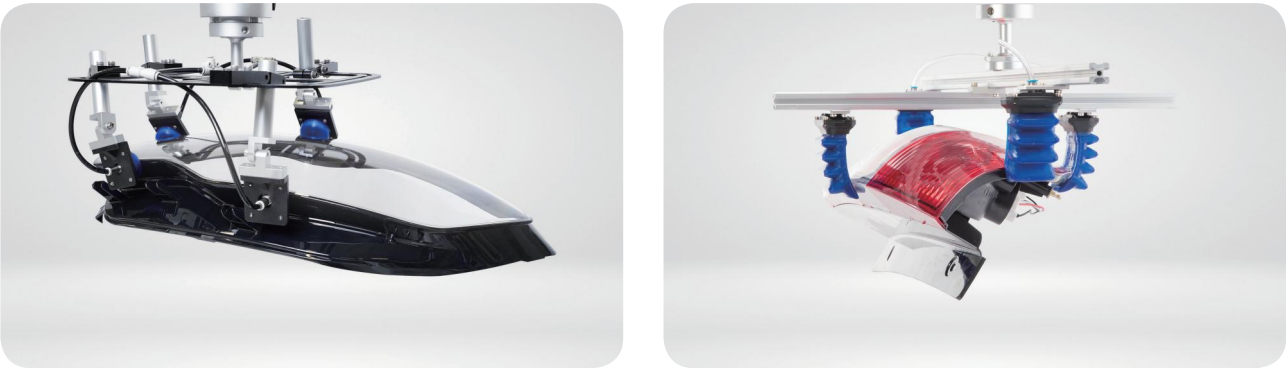
3C industry

The development of 3C electronics industry has always been based on innovation and continuous optimization, and the hardware manufacturers are seeking production and processing solutions which can reduce costs. The production line of most manufacturer uses the cylinder clamp + 2D vision solution for sorting, and the time of visual recognition will inevitably affect the rhythm of the production line. In addition, the overall equipment structure of traditional cylinder clamp is cumbersome, and it is easy to scratch the appearance of the object during operation. SRT flexible end clamp is easy to install and has the talent of "centimeter-level" positioning, which eliminates the inconvenience caused by visual components, and is very suitable for different production processes such as precision assembly, testing, loading and unloading, and packaging, improving the product quality and delivery efficiency.



Automobile industry

Auto parts manufacturing is the foundation of the auto manufacturing industry. After years of development, auto parts manufacturing has become a pillar industry. Because of the extensive, complex and cumbersome processes, and the production environment is often not very "friendly" to employees, there are still many production shackles on the processing production line. SRT flexible grasping system can not only deal with complicated processes, but also has excellent reliability and can operate at high speed in closed, vacuum and oily environments. With flexible material, it can perfectly avoid deformation and surface damage due to grasping during material handling. The start-up control system of the gripper can adjust the grasping force, and is capable of handling workpieces of different sizes and shapes, loading and unloading and other processes due to its strong adaptability, thereby improving the overall production efficiency of the factory.

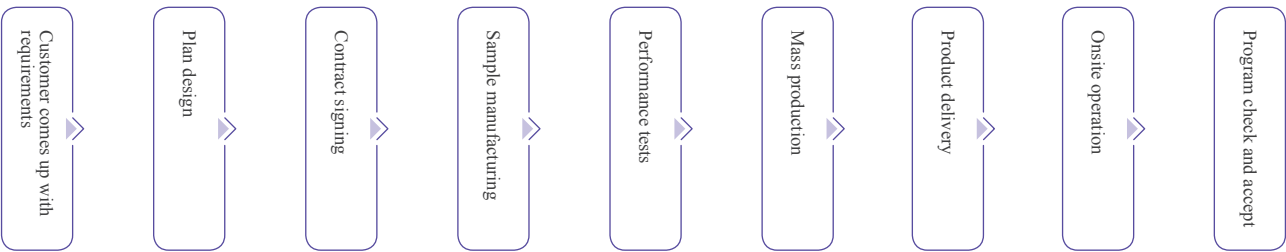


Other industry



CUSTOMIZED SERVICE

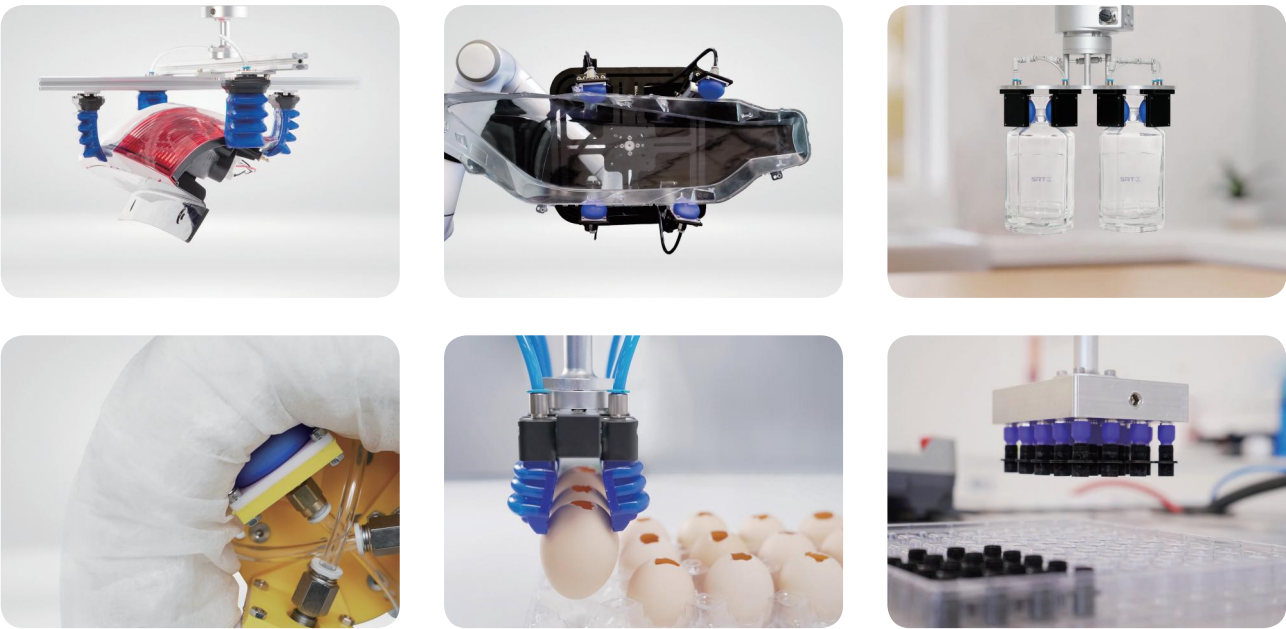
We can do requirements analysis and recommend best model of soft grippers according to customer's conditions. When the existing products cannot satisfy customer's needs, we can design customized grippers according to the requirements of customers. At the same time, SRT can also integrate suitable robots according to the customer's actual task requirements, provide overall design services such as visual identification, system construction, action programming, etc., and provide turnkey services for customers.



We can design non-standard products according to customer's requirements for the convenience of some special object grasping.



Soft gripper bracket can be customized for large size and abnormal workpiece.



MODEL SELECTION GUIDE

“

SRT flexible gripper has various models, aiming at different shapes, sizes and weights, it has launched targeted solutions:

- Ball-like and flat objects should choose circular distributed grippers. Long and slim objects should select symmetric distributed grippers.
- Smaller objects should select tight grippers with short fingers. Bigger objects should select adjustable grippers with longer fingers.
- Lighter objects can select small grippers with less fingers. Heavier objects can select big grippers with more fingers.

”

Model selection cases

Grasped object shape	Diameter range/mm	Typical application	Recommended gripper model	Sketch
 <p>Ball object</p>	4~15	Soybean Jewellery Electrical components	MVG-SC6-G3D1801	
			SFG-FNM2-N2020	
	15~30	Electrical components Chocolate balls	SFG-FNM2-N2027	
			SFG-FNC3-N3025	
	25~50	Apricot Cherry tomatoes Golf balls	SFG-FNC3-N3034	
			SFG-FNC3-N4036	
	40~110	Apple Yogurt	SFG-FNC3-N3034	
			SFG-FNC3-N4049	
	80~200	Muskmelon Pet balls	SFG-FNC3-N4049	
 <p>Flat objects (Top grasping)</p>	5~20	Rings	MVG-SC6-G3D1801	
			SFG-FNM2-N2020	
	10~35	Bottle cap Seal	SFG-FNC3-N2027	
			SFG-FNC3-N3025	
	25~50	Persimmon Ink pad box	SFG-FNC3-N3034	

Model selection cases

Grasped object shape	Diameter range/mm	Typical application	Recommended gripper model	Sketch
 Flat objects (Top grasping)	40~60	Cup	SFG-FNC3-N4049	
			SFG-FNC4-N5056	
	50~120	Vermicelli Instant noodles	SFG-FNC4-N4049	
			SFG-FNC4-N5056	
	80~200	Bowls	SFG-FNC4-N3034	
SFG-FNC6-N4049				
80~200	Packed yogurt	SFG-FNM6-N4049		
  slender item (side grab)	25~50	Pens Erasers	SFG-FNM2-N3034	
	40~110	Crab sticks Chocolate bars	SFG-FNM4-N3025	
			SFG-FNM4-N3034	
	80~200	Remote controllers Face cleansing foam	SFG-FNM2-N3034	
			SFG-FNM4-N3034	
	5~20	Mobile phones	SFG-FNM2-N4049	
	10~35	Mouses Power adapters Tea boxes Tissue Wine glasses	SFG-FNM4-N3034	
			SFG-FNM4-N4049	
	25~50		SFG-FNM4-N5056	
			SFG-FNM6-N5056	

PARTNER

* Partial display

Durable and stable | Reliable data | Exploration and innovation | Empowering customers

cobots Solutions



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