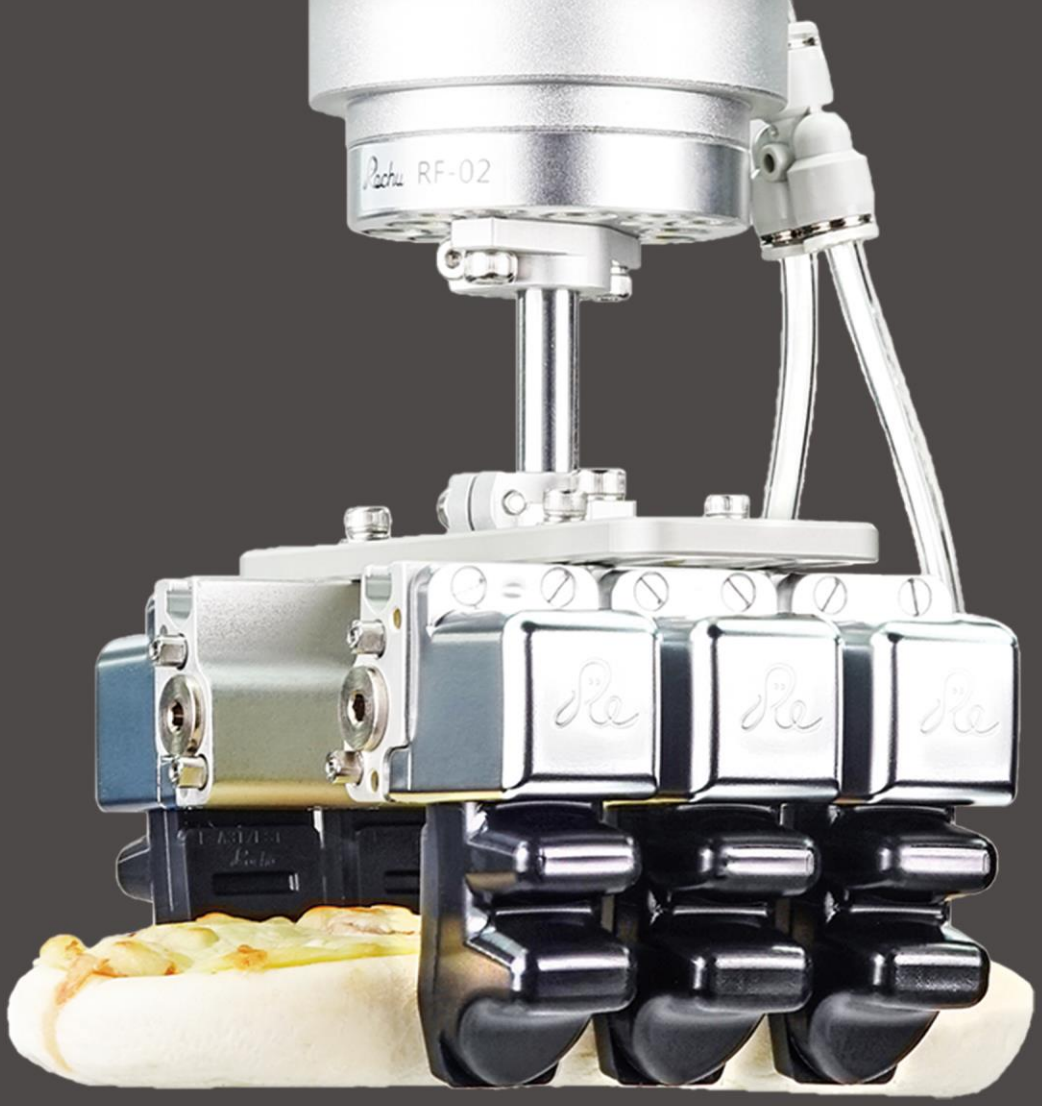


Rochu®

Give your robot a soft hand

Catalog **Version 2.5**

Suzhou Rochu Robotics Co.,Ltd.

Company Profile

Suzhou Rochu Robotics Co., LTD., located in Suzhou city, China who focus on soft robotic technology and provide soft gripper solutions for industrial automation and robotics. Rochu soft robotic gripper based on nano-material and bionic design. Our main products are the Soft Grippers and Control Units. The soft grippers are creating new applications for industry robot, like 3C electronic pars, food packaging, automobile parts, garment manufacturing, medical instruments, robot education, logistics and so on.

Rochu Robotics have a good know-how of the soft gripper design, and materials processing. We have a professional laboratory in with a CNAS, ISO17025 certification.Our modern factory is over 3000 square meters, which also has passed ISO9001 certification. Rochu soft gripper have passed the FDA, EU 1935/2004 / EC food-safe test. Our product have CE certification for safety and RoHS certification. In 2020 we have obtained dozens of patents, and exported to EU, Japan, South Korea, Germany, and other international markets.

Rochu, give your robot a soft hand. We are looking forward to a good cooperation with you.

Certification

Patents

Product Advantage

scan to watch videos

The pneumatic gripper is made of soft material. The gentle gripper can pick and place flimsy and soft object without damage easily. The soft gripper adapts to the shape and size of the product quickly in centimeter range. With speed up to **300 cycles/min, ±0.05mm precision, millions lifetime, flame retardant, good chemical and temperature resistance**, the soft gripper can be used in many industrial applications.It is a ideal robot gripper for flexible production lines.

The Rochu gripper is made of pure soft material. The grabbing force is adjustable. It will not damage the fragile products or scratch surface. It is also safe for operators. The material passed **FDA and EC1935 food-safe** testing.

The **modular finger** makes the construction of Rochu gripper **quick and easily**.

Multiple **all-in-one control unit** are applicable to **multiple working conditions**. Not only production line bus also mobile robot, desktop robot, AGV or school labs.

Applications

scan to watch videos

Food

Food safe materials. FDA and EC-1935 certification. Used for pick and place of fruits, dough, candies, pastry and vegetables.

3C-electronics

It is used for high-precision plug and pull of small electronic parts. Assembling, sorting, testing and packaging of ceramic and plastic parts in mobile phone, PCBs, silicon wafers, optic glasses.

Fabric

can be used to pick the soft breathable fabric layers. pick only the first layer from multi-layers.

Automobile

Used for sorting, handling, loading and unloading of automobile parts, like headlights, special-shaped parts, bearing, soft battery core, seat slide rails or seat headrest.

Smart picking

Smart picking / Bin picking with AI technology in the warehousing and logistics industry.

Medical Supplies

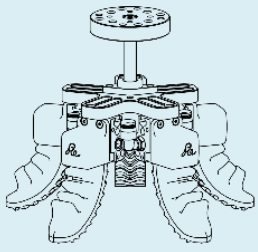
It is used for pick and place of medical supplies such as glass tubes, breathing mask, bags and other plastic and rubber parts

Working principle

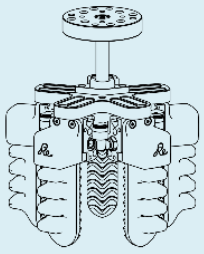
scan to watch videos

Rochu soft robotic grippers is a pneumatic driving gripper. By positive pressure or vacuum air flow, the soft gripper open or grab.
By adjusting the air pressure to control the grabbing force(soft finger) or opening space(soft beak).

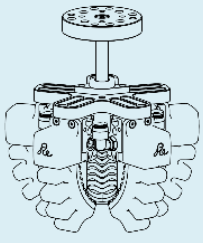
Finger



Open



Release



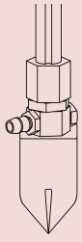
Grab

-100 ~ 120 kPa (Material: Normal)

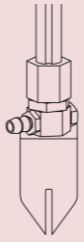
-100 ~ 300 kPa (Material: Strong)

(Safe working pressure range)

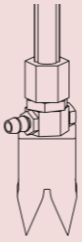
Beak



Grab



Release



Open

-100 ~ 50 kPa

(Safe working pressure range)

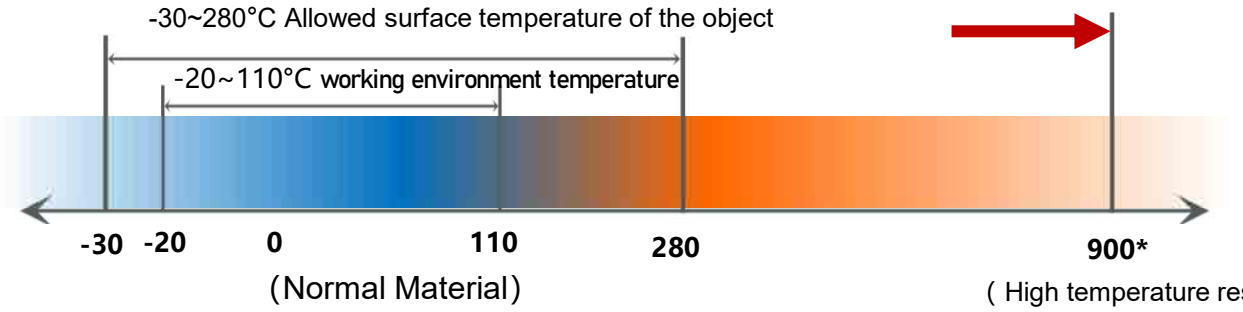
The working pressure must be kept within a safe range, overload may cause irreversible damage of the finger. It is recommended to use our "Rochu control unit" to ensure the life time of the soft finger and beak.

Finger material characteristics

scan to watch videos

Material safety performance

Heat resistance



* High temperature resistant material need to be customized, please contact us.

Chemical resistance

Classify	Actual Conditions	Performance
Weather Ability	General aging resistance	excellent
	UV-Resistance	good
	Ozone resistance	good
Oil Resistance	vegetable oil	excellent
	gasoline, light oil	Normal
Solvent Resistance	Alcohol and ethanol by 96%	good
	Organic solvents (benzene, toluene, acetone, ethyl acetate)	Normal
acid and alkali resistance	Strong acid (hydrochloric acid, sulfuric acid, nitric acid, etc.)	Normal
	Strong alkali (sodium hydroxide, potassium hydroxide, etc.)	Normal
	Weak acid pH: 6-7 (low concentration phosphoric acid, oxalic acid, etc.)	good
	Weak alkali pH: 7-8 (low concentration ammonia, etc.)	good
	Hydrofluoric acid and other highly corrosive substances	No good
The other	Resistance to the steam	excellent
	abrasive resistance	Normal

Antistatic materials (AS)

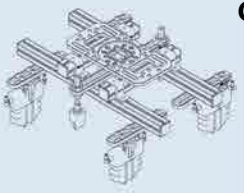
Project	Test specification	Material	
		Anti-Static Material (AS)	Normal Material
surface resistance[Ω]	IEC 61340-2-3:2016	10^6—10^9	$>10^{10}$

General Index

GC
Gripper Combination

Standard GC

page. 11



Non-standard GC

page. 14

Food packaging

page. 15

3C-electronics Parts

page. 17

Automobile parts

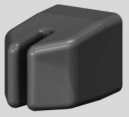
page. 19

Fabric

page. 20

BM / B
Beak Module/ Soft Beak

BM *page. 23*
Beak Module



B *page. 23*
Soft Beak

FM / F
Finger Module / Finger

FM *page. 27*
Finger Module

F *page. 46*
Finger

CM
Connection module

SMP *page. 50*
Slide Mounting Plate

CM *page. 52*
Connection Module

FCM *page. 53*
Flange Connection Module

QCM *page. 56*
Quick changer Module

CU
Control Unit

Basic control mode *page. 59*

Cylinder + Finger module combination
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Standard control mode *page. 62*

PCU
Passive Control Unit
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iPCU
Integrated Passive Control Unit
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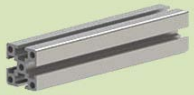
Mobile Mode *page. 67*

ACU
Active Control Unit
page. 68

Other parts

CP *page. 71*
connection part



P *page. 72*
Profile

TN *page. 72*
T-Nut

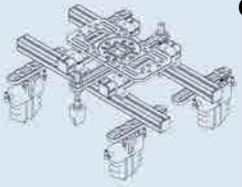
BR *page. 73*
Bracket

1

GC
Gripper Combination

Standard GC

page. 11



Non-standard GC

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Food packaging

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3C-electronics Parts

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Automobile parts

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Fabric

page. 20

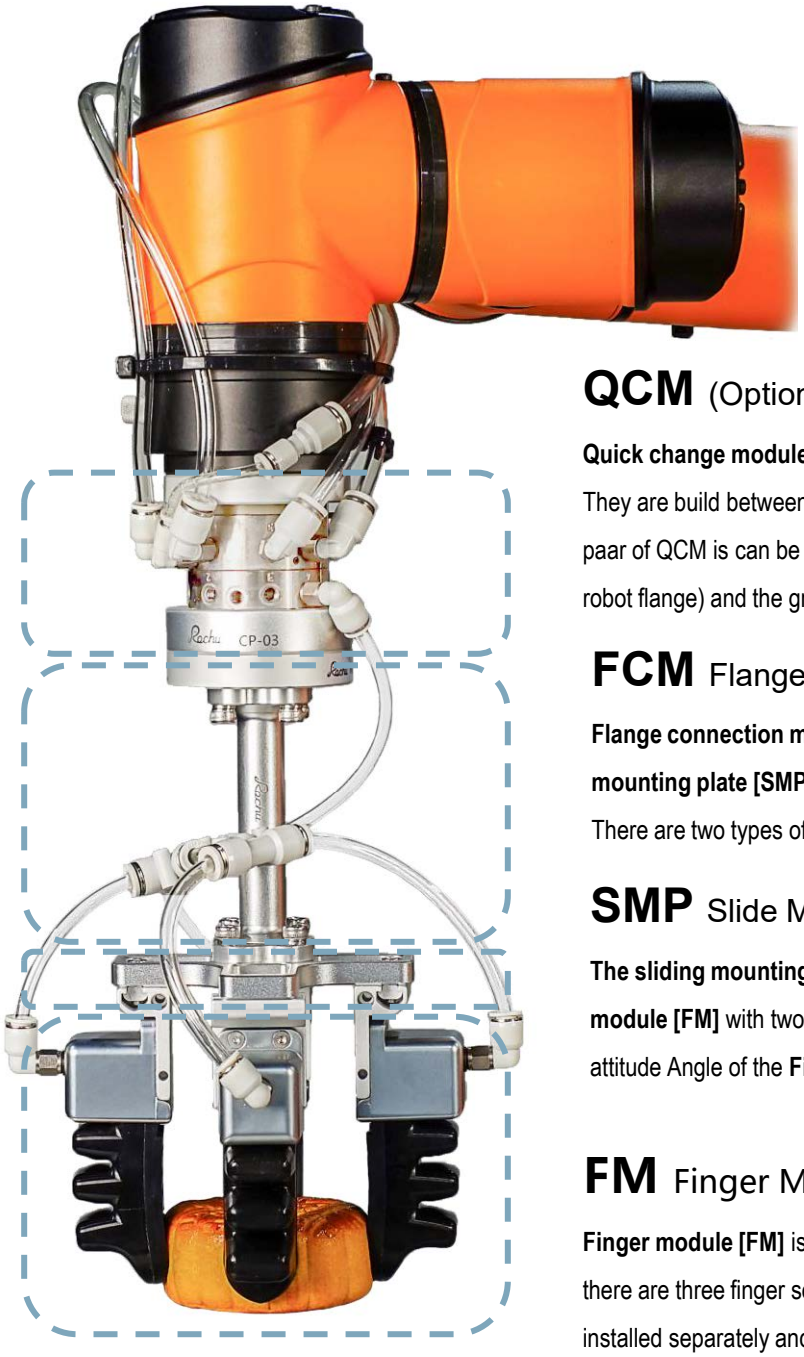
Gripper Combination

GC

scan to watch videos

Standard Finger Gripper Combination

A standard Rochu Soft finger Gripper Combination **[GC]** is build of different modules and named in a standard way . The building of modules can be in the following steps: 1. Finger module **[FM],** 2.Slide Mounting plate **[SMP],** 3.Flange Connection Module **[FCM],** 4.Quick changer Module **[QCM]** (Optional)**.**



QCM (Optional) Quick changer module

page. 56

Quick change module [QCM] is an optional module for quick changing of grippers. They are build between the **flange connection module [FCM]** and the robot flange. A paar of QCM is can be uncouple into two parts. The robot side (**R side**, fixed on the robot flange) and the gripper side (**G side**, fixed on the gripper).

FCM Flange connection module

page. 53

Flange connection module [FCM] is fixed between the robot flange and the **slip mounting plate [SMP].** It can also be connected with **quick change module [QCM],** There are two types of **[FCM],** the spring type **(S)** and rigid rod type **(R).**

SMP Slide Mounting Plate

page. 50

The sliding mounting plate [SMP] is the standard mounting plate for Rochu **finger module [FM]** with two standard sliding slot and scale line. The mounting position or attitude Angle of the **Finger module [FM]** in the slider can be adjusted freely.

FM Finger Module

page. 27

Finger module [FM] is the actuator of Rochu gripper. According to the finger size, there are three finger series, finger (A), finger (B) and finger (C). The FM can be installed separately and easy to replace.

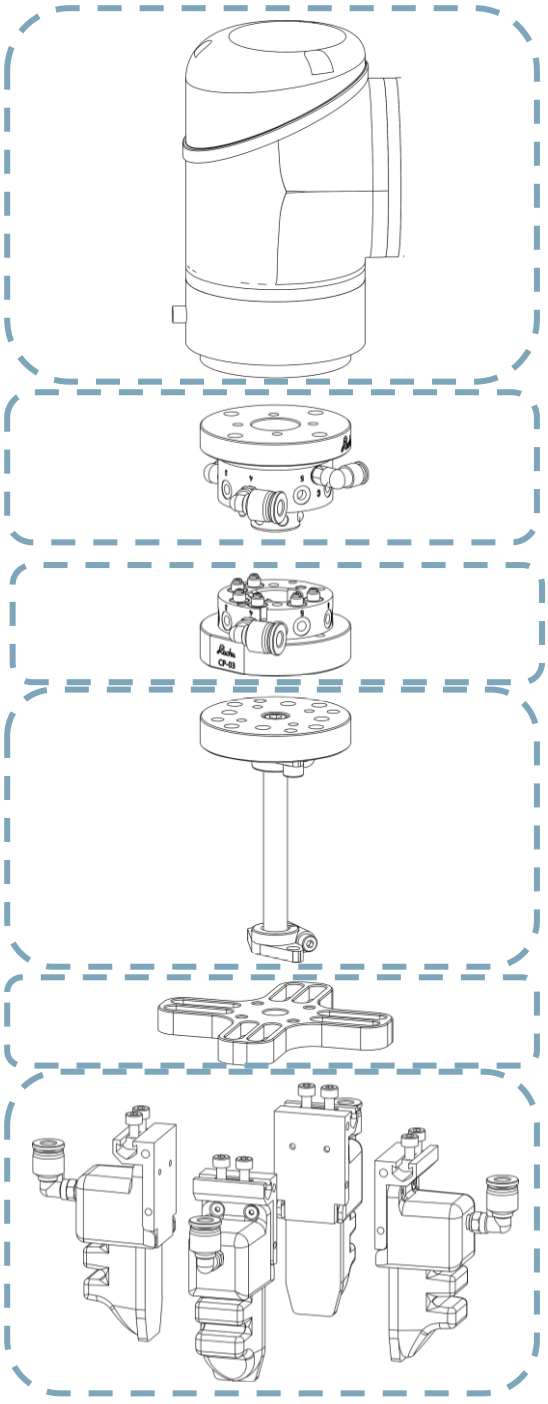
Gripper Combination

Encoding Method of standard Finger Gripper Combination

scan to watch videos

GC - 4 FMA3V5/ LS1 – SMP4S – FCMR04 - QCM02G - QCM02R

① ② ③ ④ ⑤



Cobot Arm

⑤ QCM-02R
page. 57

④ QCM-02G
page. 57

③ FCM-R04
page. 54

② SMP-4S
page. 51

① 4 x FM-A3V5/LS1
page. 41

Gripper Combination

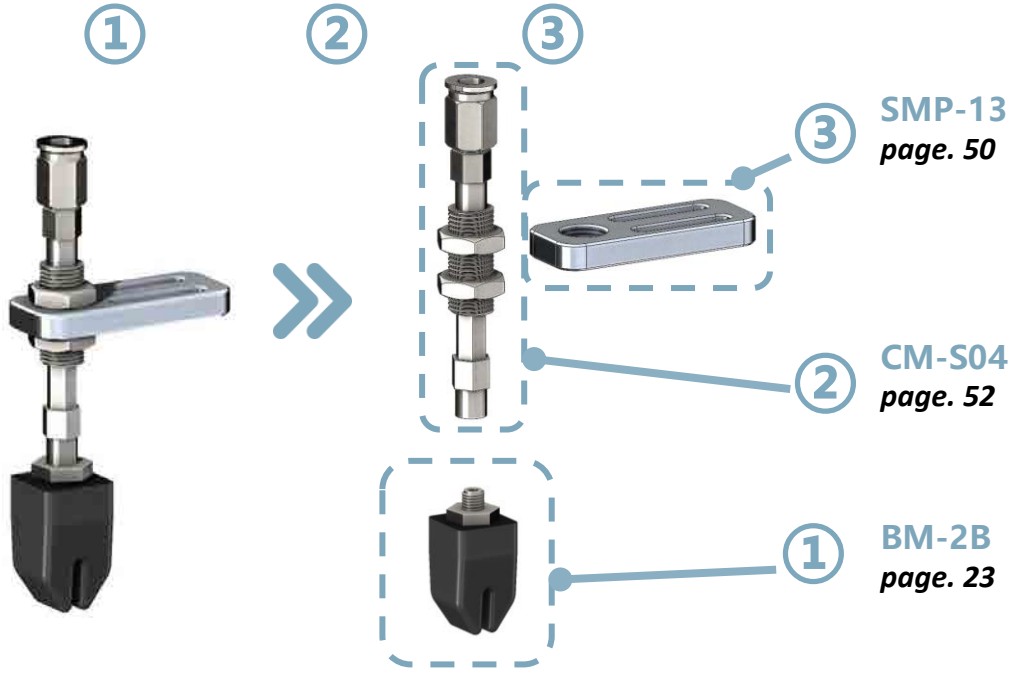
Standard Beak Gripper Combination

scan to watch videos

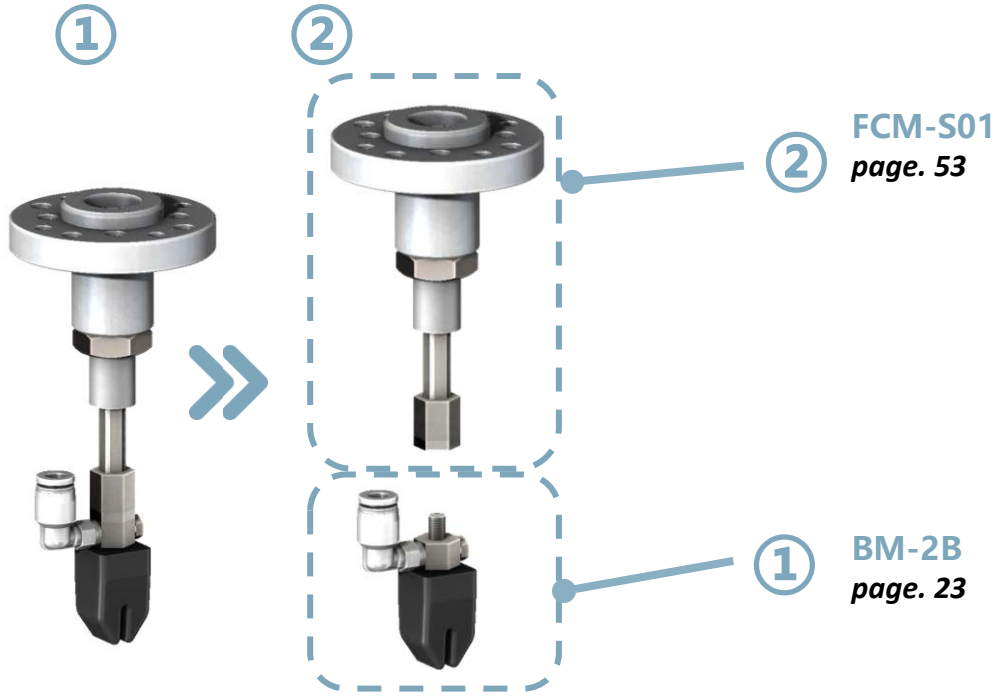
Standard beak gripper combination[GC] is build of different modules and named in following way :
1.Beak Module**[BM]**， 2. Connection module**[FCM] /[CM]** 3.Slide mounting plate**[SMP]** （optional）

Encoding Method of standard Beak Gripper Combination

GC – BM2B – CMS04 – SMP13



GC – BM2B – FCMS01



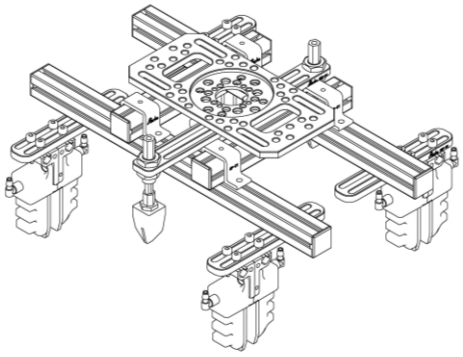
Gripper Combination

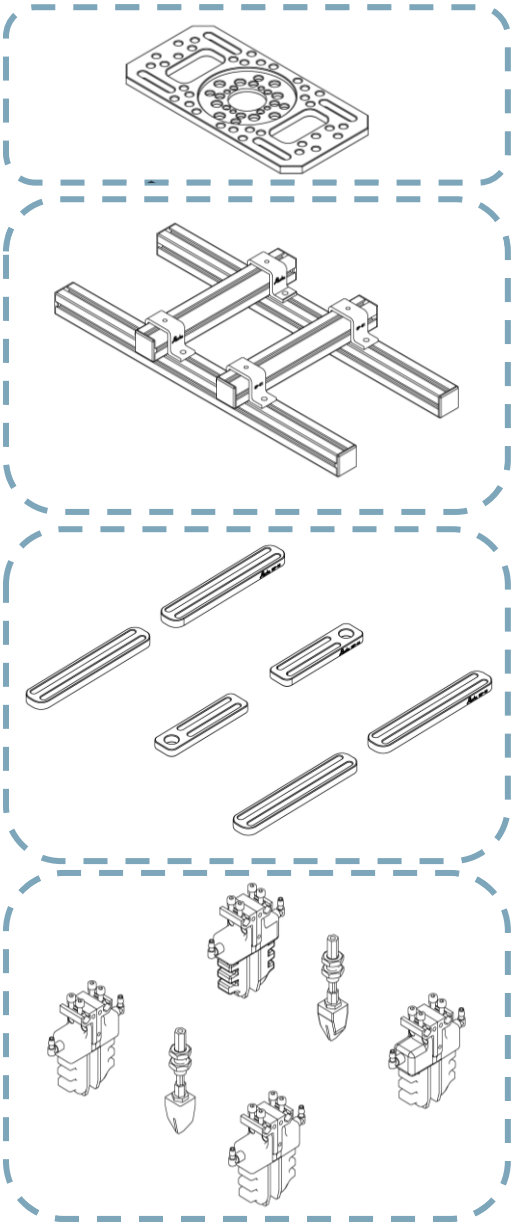
Non-standard Gripper Combination

scan to watch videos

Features

- Suitable for large size or irregular shape products.
- The standard gripper combination [GC] or finger module [FM] are fixed on the on aluminum profiles[P] or connection parts[CP].
- It can also add suction cups, sensors or cylinders or other components.
- The gripper plan is listed with BOM (build of Material).





connection part **CP-95** *page. 71*

connection part 4 x **CP-01** *page. 71*

Profile *page. 72*
2 x **P-20200**
2 x **P-20400**

Slide mounting plate
4 x **SMP-03** *page. 50*
2 x **SMP-14**

Finger Module *page. 41*
8 x **FM-B4V5/LS1**

Gripper combination
2 x **GC-BM2B-CMS04** *page. 23*

BOM List

Product Name	Product code	Quantity
connection part	CP-95	1
connection part	CP-01	4
Profile	P-20200	2
Profile	P-20400	2
Slide mounting plate	SMP-03	4
Slide mounting plate	SMP-14	2
Finger Module	FM-B4V5/LS1	8
Standard Gripper combination	GC –BM2B-CMS04	2

Gripper Combination

GC

scan to watch videos

Food packaging Applications:

- Surround gripper, suitable for ball or square candy, pastry or fruit

GC – 4FMA3V5/LS1 - SMP4S - FCMR02

PCU-HMN *page. 63*
Passive Control Unit –**High speed model***

*: For more Control Units on page. 69

According to the shape, volume, weight and material of different objects, Finger Module or Slide mounting plate should be replaced to get a better grasping ability. More FM s. page. 27. More Slide mounting plate [SMP] s. page. 51

Grippers

Finger Module: FM-B3V5/LS1
Slide mounting plate: SMP-3S

GC-3FMB3V5/LS1–SMP3S

Finger Module: FM-A5V5/LS1

GC-4FMA5V5/LS1-SMP4S

Finger Module: FM-A5V5/LS1
Slide mounting plate: SMP-4L

GC-4FMA5V5/LS1-SMP4L

Gripper Combination

Food packaging Applications:

- Line-finger gripper, suitable for strip, olive fruit, food

scan to watch videos

GC-6FMA3V4/LS1-CP04-FCMR02

iPCU-HMN *page. 64*

Integrated Passive Control Unit -- **High speed model***

*: For more Control Units on page. 69

According to the shape, volume, weight and material of different objects, Finger Module or Slide mounting plate should be replaced to get a better grasping ability. More FM s. page. 27. More Slide mounting plate [SMP] s. page. 51

Grippers

Finger Module: FM-C5V5/LS1
Slide mounting plate: SMP-2S

GC-2FMC5V5/LS1-SMP2S

Finger Module: FM-B4V4/LS1
Slide mounting plate: SMP-2S

GC-4FMB4V4/LS1-SMP2S

Finger Module: FM-A6V4/LS1

GC-8FMA6V4/LS1-CP04

Gripper Combination

GC

scan to watch videos

3C-Electronics Applications:

- Soft beak for micro - small parts

GC – BM20006 – CMS04

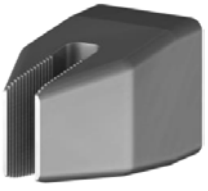
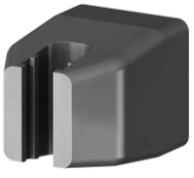
iPCU-CMN

Integrated Passive Control Unit -- **Compact model***

page. 65

*: For more Control Units on page. 69

According to the shape, volume, material of the clamping object and working space to choose Beaks.
More soft beaks see page. 23.

Flat piece	Hole	Vertical cylinder	Vertical piece	Horizontal piece
				
Beak: B-20005V	**Beak: B-3B18**	**Beak: B-4B**	**Beak: B-2B**	**Beak: B-20006**
				
				

Gripper Combination

scan to watch videos

3C-Electronics Applications:

- Gripper combination for flat object

GC – 2FMA3V5/LS1– SMP2L

iPCU-CMN *page. 65*

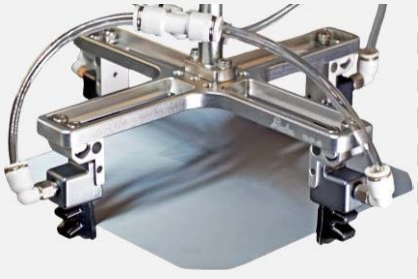
Integrated Passive Control Unit -- **Compact model***

*: For more Control Units on page. 69

Grippers

Finger Module: FM-C3V5/LS1
Slide mounting plate:SMP-4L

Finger Module: FM-A4V5/LS1
Slide mounting plate:SMP-3L



GC-4FMC3V5/LS1-SMP4L

GC-3FMA4V5/LS1-SMP3L

BOM List

Product Name	Product code	Quantity
Finger Module	FM-A3V5/LS8 [AS]	8
Profile	P-20400	2
Profile	P-20300	2
connection part	CP-01	4
connection part	CP-04	1
Flange connection module	FCM-R08	1

PCB

Silicon wafers

Lens

Coating glass

Gripper Combination

GC

scan to watch videos

Automobile parts Applications:

- Gripper combination handling car lighting parts, seat slide rails, bearings, soft battery core, etc

BOM List		
Product Name	**Product code**	**Quantity**
Finger Module	FM-A3V5/LS8 [AS]	4
Slide mounting plate	SMP-02	4
Profile	P-20300	2
connection part	CP-04	1
Flange connection module	FCM-R06	1

PCU-SMN *page. 63*

Passive Control Unit – **Standard model ***

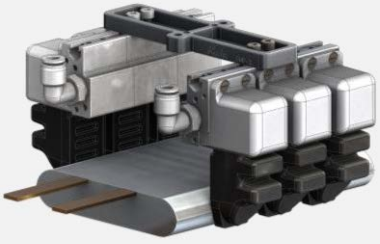
*: For more Control Units on page. 69

Grippers

Finger Module: FM-A4V5/FS3
Slide mounting plate:SMP-4S

GC-4FMA4V5/FS3-SMP4S

Finger Module: FM-A3V4/LS1
Slide mounting plate:SMP-2L



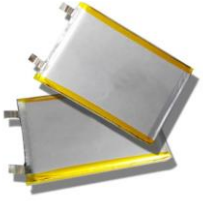
GC-6FMA3V4/LS1-SMP2L

Finger Module: FM-A4V4/LS1
Slide mounting plate:SMP-2S

GC-8FMA4V4/LS1-3SMP2S

Car lighting parts

Bearing



Soft battery core

seat slide rails

Seat headrest

Gripper Combination

scan to watch videos

Fabric Picking Applications:

- Beak gripper combinations, can be used to pick the soft breathable thin fabric layers. Pick only the first layer from multi-layers.

BOM List

Product Name	Product code	Quantity
Gripper combination	GC –BM20006-CMS04-SMP13	8
Profile	P-20400	2
connection part	CP-04	1
Flange connection module	FCM-R04	1

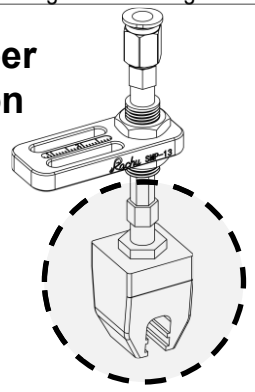
Note: For large fabric (e.g. t-shirts, sweatshirts, etc.). Multiple separate beak grippers should be installed along the fabric edge.

BOM List

Product Name	Product code	Quantity
Gripper combination	GC –BM20006-CMS04-SMP13	6
Profile	P-20200	1
Flange connection module	FCM-R08	1

Note: For hard material (e. g., denim, etc.). Multiple Beak grippers should be installed tightly in a line.

Beak Gripper combination



GC –BM20006-CMS04-SMP13

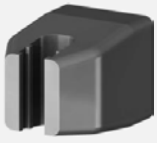
Control Unit

PCU-SMN *page. 63*

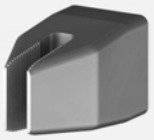
Passive Control Unit – **Standard model ***

*: For more Control Units on page. 69

More Beaks **



B-20006



B-20005V

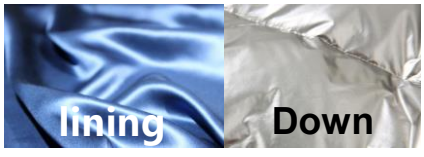
B-2B

B-3B18

page. 23

**: A stable pick and place of different fabrics (gram weight, thickness and hardness) are related on Beak and working pressure.

Apply to the fabric



Gripper Combination

GC

scan to watch videos

Fabric Picking Applications：

- The two-fingers gripper can grasp thicker and harder fabrics, like wool, towel, blanket, etc.

Customized gripper combination

BOM List		
Product Name	Product code	Quantity
Gripper combination	GC –2FMB4V5/FS3-SMP2S	2
Profile	P-20200	1
Flange connection module	FCM-R04	1

Gripper Combination

GC –2FMB4V5/FS3-SMP2S

Control Unit

PCU-SMN *page. 63*

Passive Control Unit – **Standard model ***

*: For more Control Units on page. 69

More Finger Modules **

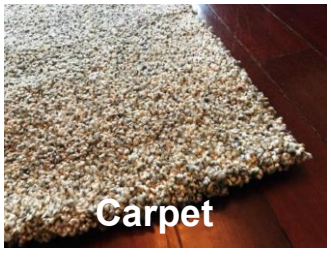
FM-A4V5/FS3

FM-B4V5/FS3

FM-C5V5/FS3

**: A stable pick and place of different fabrics (gram weight, thickness and hardness) are related on finger Module and fingertip distance Dn (page. 44)

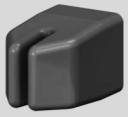
Fabrics



2

BM / B
Beak Module/ Soft Beak

BM *page. 23*
Beak Module



B *page. 23*
Soft Beak

FM / F
Finger Module / Finger

FM *page. 27*
Finger Module

F *page. 46*
Finger

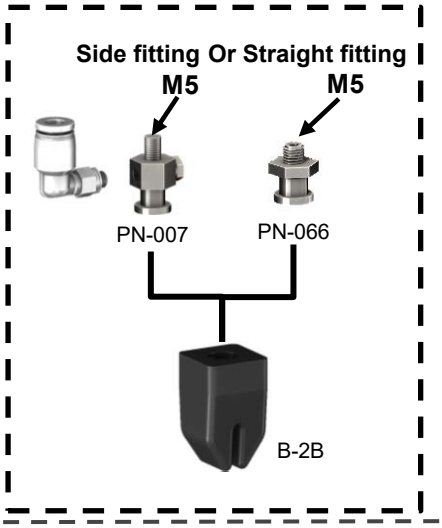
Beak Module [BM]

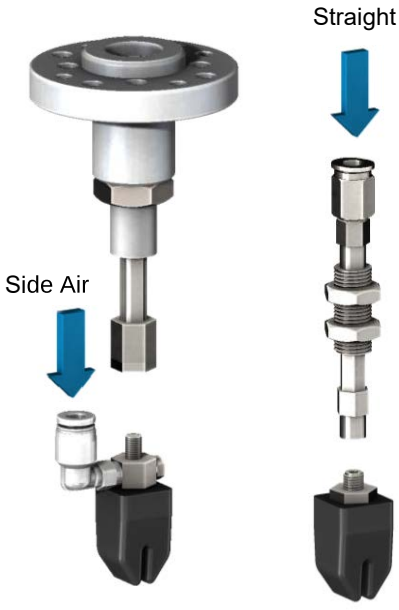
scan to watch videos

Features

- Mounting on connection module [CM] or flange connection module [FCM]
- Beak module [BM] contains Beak[B] and matching fittings
- There are two fittings, the straight fitting (PN-066) or the side fitting (PN-007).
- The soft beak[B] can be replaced

BM-2B



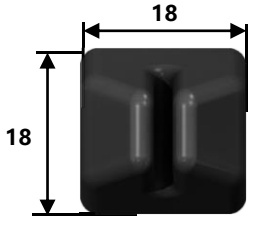


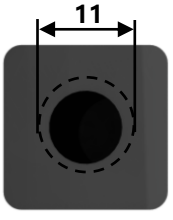
Beak [B]

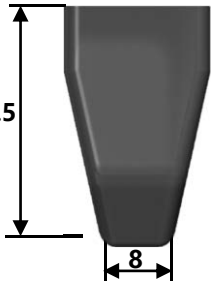
Features

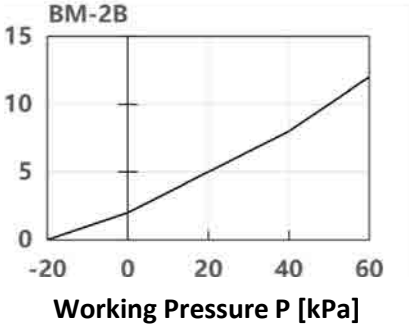
- Replaceable
- Open in positive pressure, grab in vacuum
- Adjust the fingertip distance G by adjusting the air pressure.
- It can be used as clamp or spread in hole

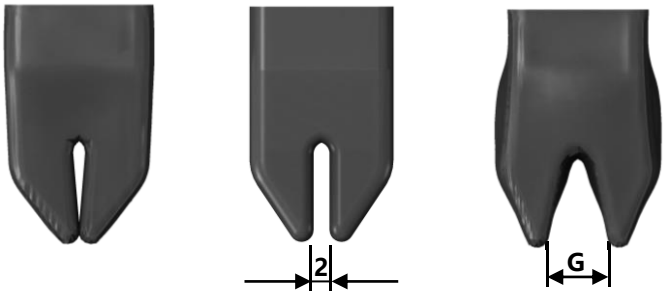
B-2B











Parameters

Name:	B-2B	Fitting diameter:	11mm	Weight	6.1g	Max Load:	15g
Max Frequency:	300 cycles/min	Precision:	0.05mm	Safe pressure:	-100~60 kpa	Life time:	0.5-1 million cycles*

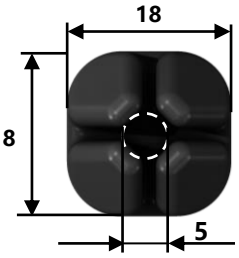
* : One cycle time= one open + one grab. The life time is closely related to the working pressure P. Pls. always use Rochu controll Unit. The working pressure shall not exceed the safe working pressure range.

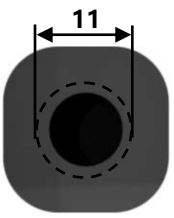
BM, B

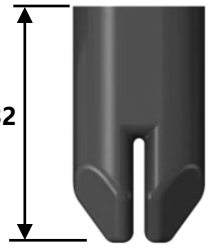
Beak[B]

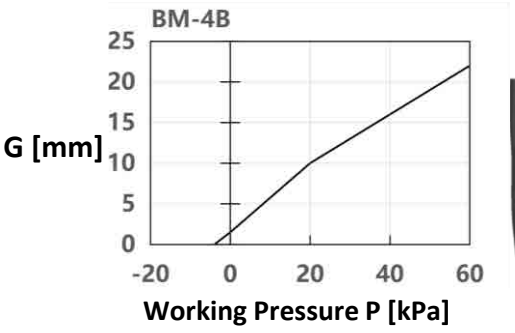
scan to watch videos

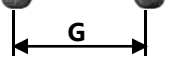
B-4B

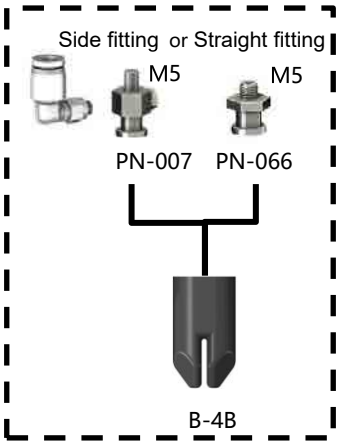








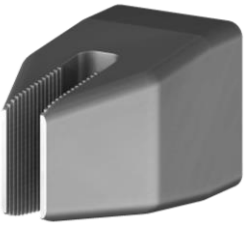


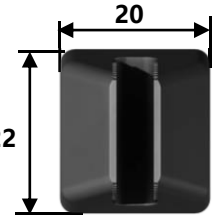


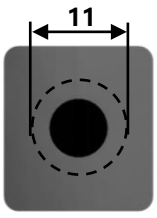
Parameters

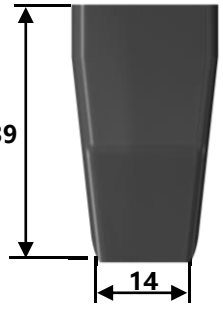
Name:	B-4B	Fitting diameter:	11mm	Weight	6.4g	Max Load:	30g
Max Frequency:	300 cycles/min	Precision:	0.05mm	Safe pressure:	-100~60 kpa	Life time:	0.5-1 million cycles*

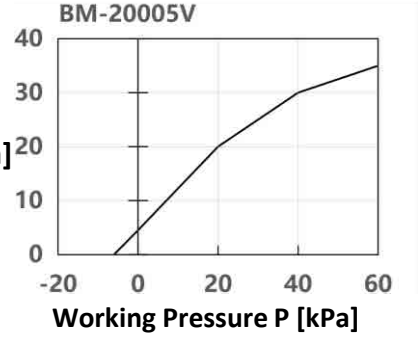
B-20005V

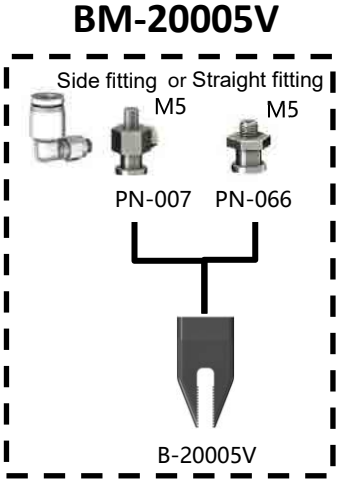












Parameters

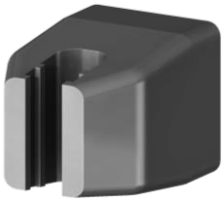
Name:	B-20005V	Fitting diameter:	11mm	Weight	10g	Max Load:	30g
Max Frequency:	300 cycles/min	Precision:	0.05mm	Safe pressure:	-100~50 kpa	Life time:	0.5-1 million cycles*

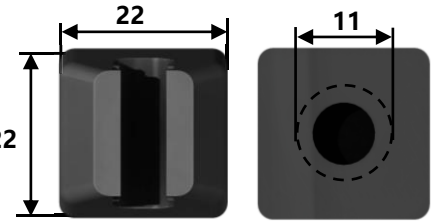
* : One cycle time= one open + one grab. The life time is closely related to the working pressure P. Pls. always use Rochu controll Unit. The working pressure shall not exceed the safe working pressure range.

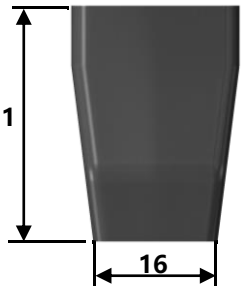
Beak

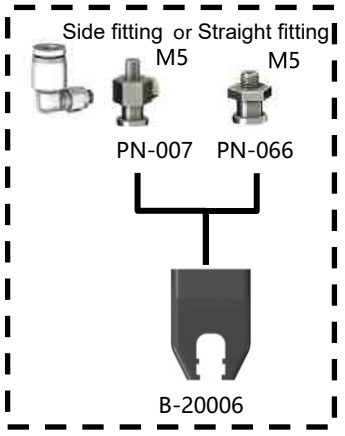
scan to watch videos

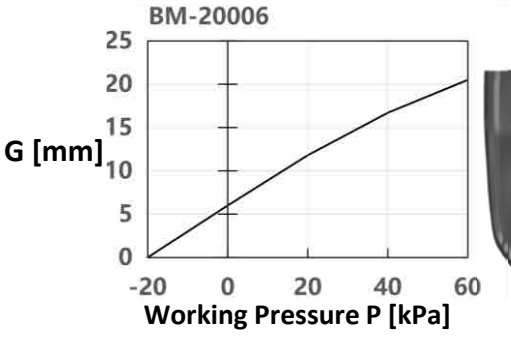
B-20006

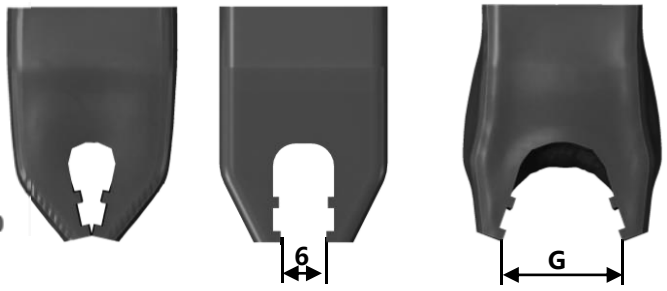








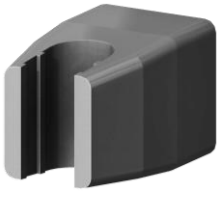


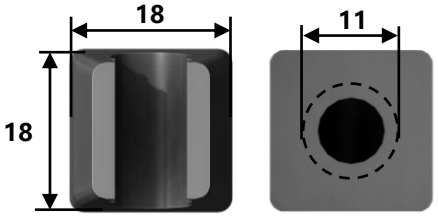


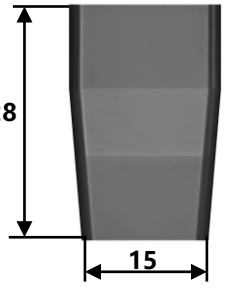
Parameters

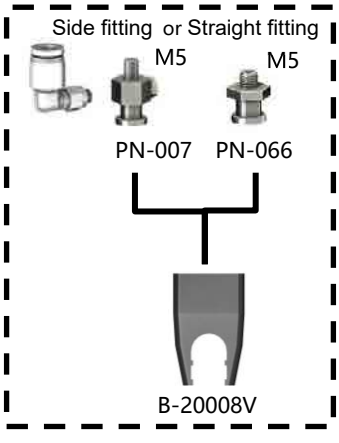
Name:	B-20006	Fitting diameter:	11mm	Weight	9.8g	Max Load:	30g
Max Frequency:	300 cycles/min	Precision:	0.05mm	Safe pressure:	-100~45 kpa	Life time:	0.5-1 million cycles*

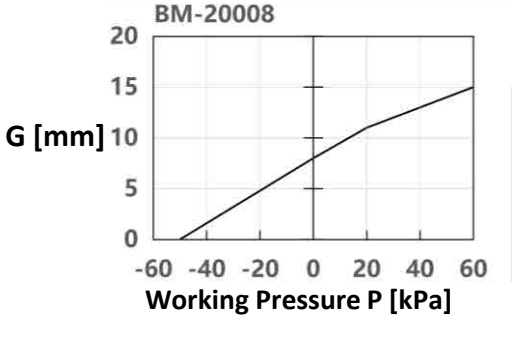
B-20008

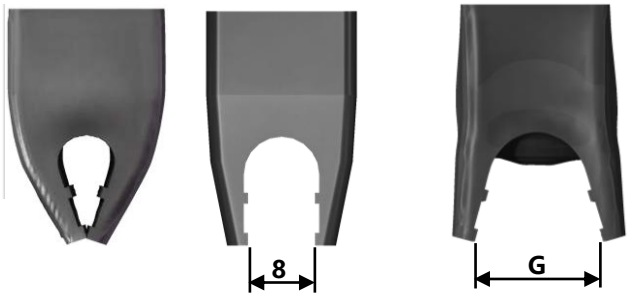












Parameters

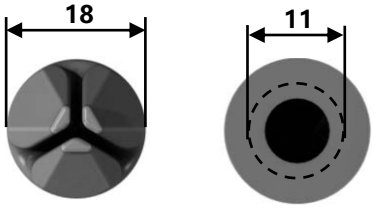
Name:	B-20008	Fitting diameter:	11mm	Weight	6.5g	Max Load:	10g
Max Frequency:	300 cycles/min	Precision:	0.05mm	Safe pressure:	-100~50 kpa	Life time:	0.5-1 million cycles*

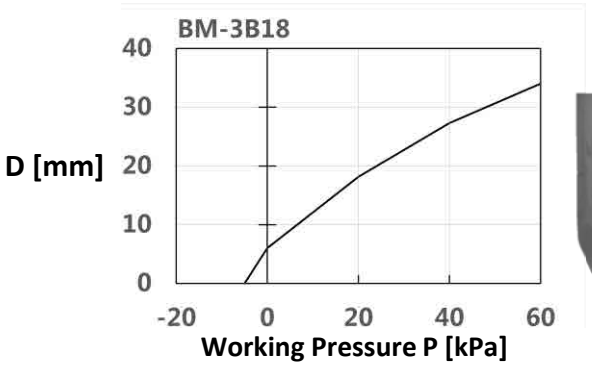
* : One cycle time= one open + one grab. The life time is closely related to the working pressure P. Pls. always use Rochu controll Unit. The working pressure shall not exceed the safe working pressure range.

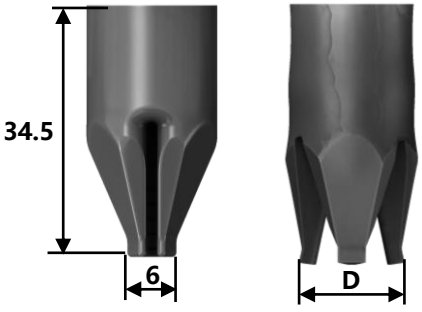
BM, B
Beak

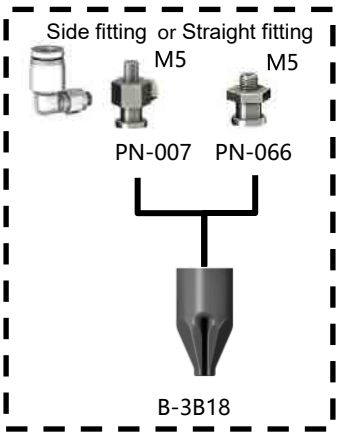
scan to watch videos

B-3B18





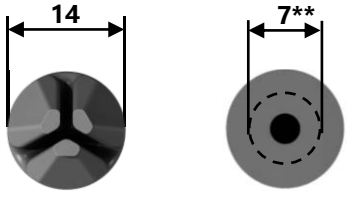


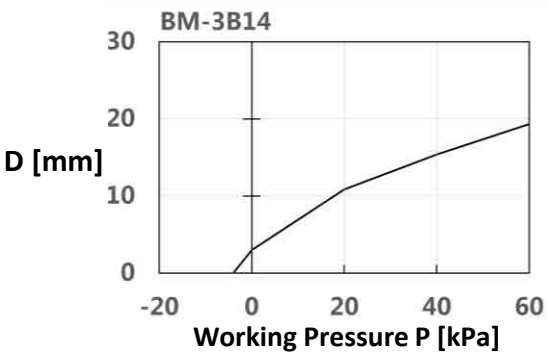


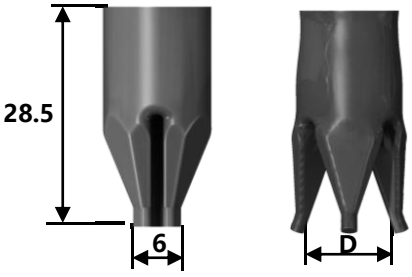
Parameters

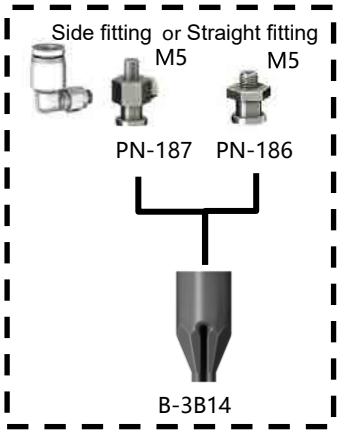
Name:	B-3B18	Fitting diameter:	11mm	Weight	6.4g	Max Load:	15g
Max Frequency:	300 cycles/min	Precision:	0.05mm	Safe pressure:	-100~50 kpa	Life time:	0.5-1 million cycles*

B-3B14









Parameters

Name:	B-3B14	Fitting diameter:	7mm	Weight	6.1g	Max Load:	10g
Max Frequency:	300 cycles/min	Precision:	0.05mm	Safe pressure:	-100~45 kpa	Life time:	0.5-1 million cycles*

* : One cycle time= one open + one grab. The life time is closely related to the working pressure P. Pls. always use Rochu controll Unit. The working pressure shall not exceed the safe working pressure range.

Finger Module

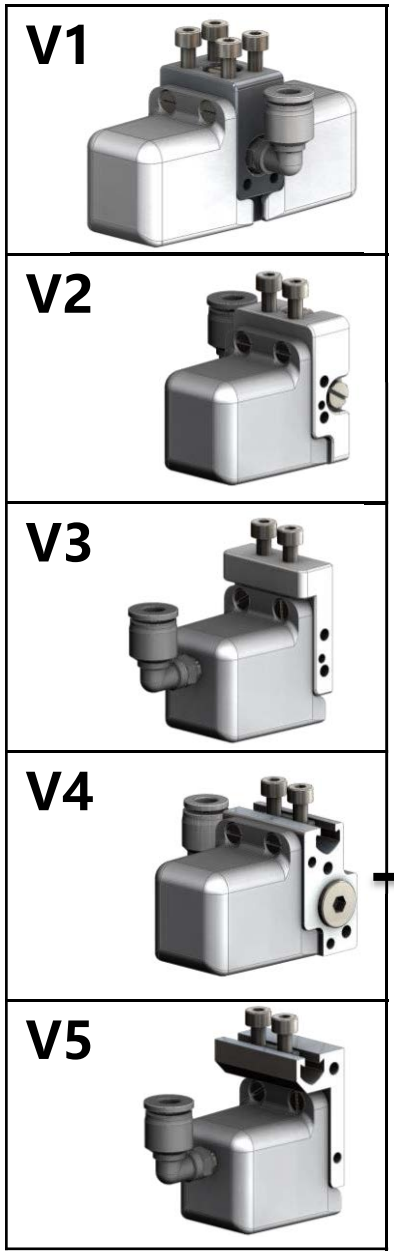
F

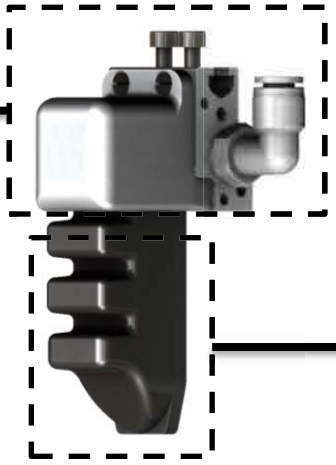
scan to watch videos

Structure of Finger Module [FM]

- Finger Module [FM] is the actuator of Rochu gripper, which is assembled of Finger [F] and Assembly module.
- There are five Assembly modules with different air intake, installation position, combination mode.
- There are 18 size of Fingers [F] with different with different lengths and widths.
- According to the weight and size of the object , choose the right gripping force.
- The gripping force is depends on the finger size, material, working pressure and finger distance. Calculation way see page 44.

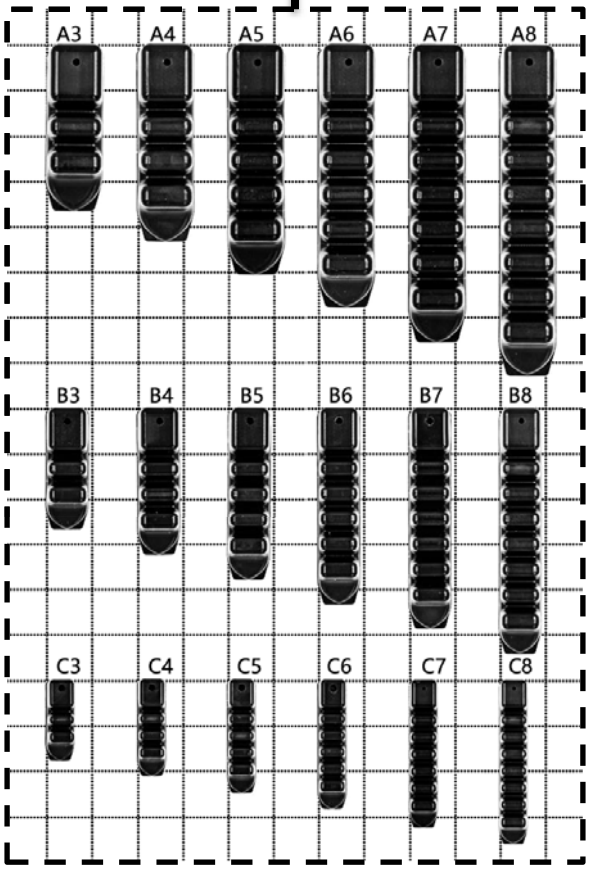
- **Assembly module**





FM–A4V4/LS1[AS]

- **Soft Fingers [F]**



Finger Module

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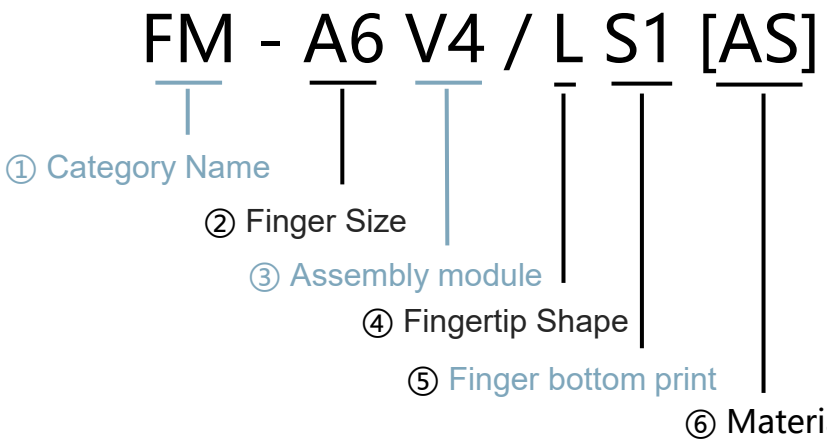
Encoding Method



① Category name	FM Finger Module	
② Finger Size	[example] A6：Type A & 6 Segments page. 47	
③ Assembly module	V1	Page.: 30
	V2	Page.: 33
	V3	Page.: 36
	V4	Page.: 39
	V5	Page.: 41
④ Fingertip shape	Refer to the Encoding method of Rochu finger[F]：page. 46 [AS]=Anti-static	
⑤ Finger bottom print		
⑥ Material		

Finger Module

scan to watch videos

Assembly modules

- There are five Assembly modules with different air intake, installation position, combination mode.

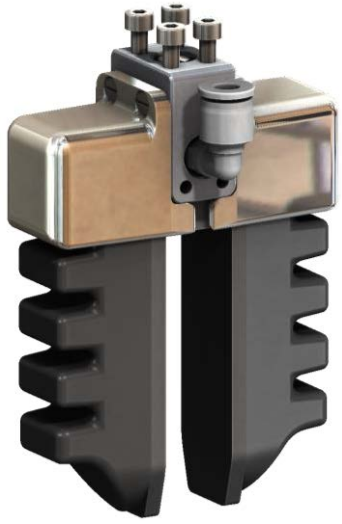
Assembly modules	Picture	Features
V1 Compact two-fingers module		• Features: two fingers combination, compact structure. Finger spacing and mounting Angle are unadjustable, be good at clamping small, light and thin object. • Installation: can be screwed on three sides (optional). • Air intake: Air intake on three sides (optional). • Additional Sensor module is possible
V2 Single-finger Module		• Features : single finger module, compatible with Slide mounting plate [SMP] (page.50), adjustable spacing and Angle. • Installation: can be screwed on four sides (optional). • Air intake: Air intake on three sides (optional). • Additional Sensor module is possible
V3 Single-finger Module		• Features: single finger module, compatible with Slide mounting plate [SMP] (page.50), adjustable spacing and Angle. • Installation: can be screwed on three sides (optional). • Air intake: Air intake on one side (back of finger). • Additional Sensor module is possible.
V4 Series-finger Module		• Features: Series-finger Module, can be used alone or in series . • Only one air intake when more finger module build in series. More fingers in series are good at large and heavy object. • Compatible with Slide mounting plate [SMP] (page.50). The finger module position is adjustable in three dimensions.(page.39). • Air intake: Air intake on left or right sides (optional).
V5 Series-finger Module		• Features: Series-finger Module, can be used alone or in series . • mindest finger distance is only 10mm. Be good at thin and large object. • Compatible with Slide mounting plate [SMP] (page.50). The finger module position is adjustable in three dimensions.(page.41). • Air intake: single air intake on finger back side.

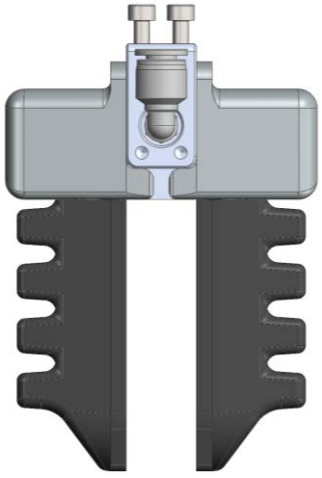
Finger Module

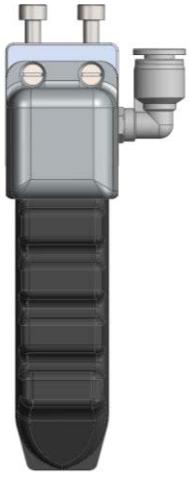
scan to watch videos

V1 Assembly module: Compact two-fingers module

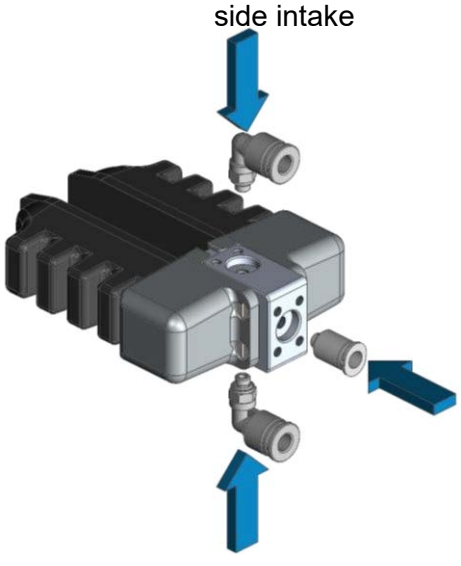
- Features: two fingers combination, compact structure. Finger spacing and mounting Angle are unadjustable, be good at clamping small, light and thin object.
- Installation: can be screwed on three sides (optional).
- Air intake: Air intake on three sides (optional).
- Additional Sensor module is possible



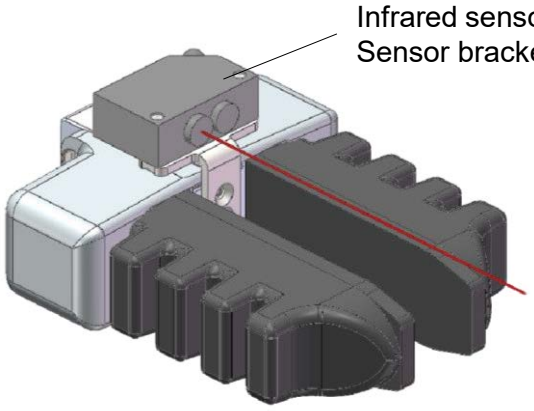




- Air intake on three sides (optional)



- Additional Sensor module



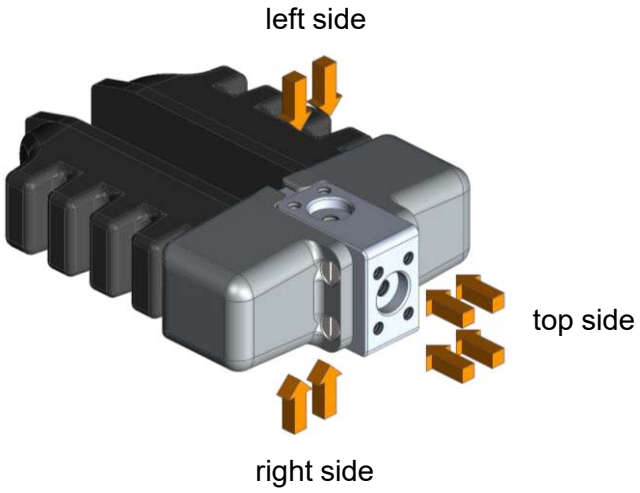
Finger Module

scan to watch videos

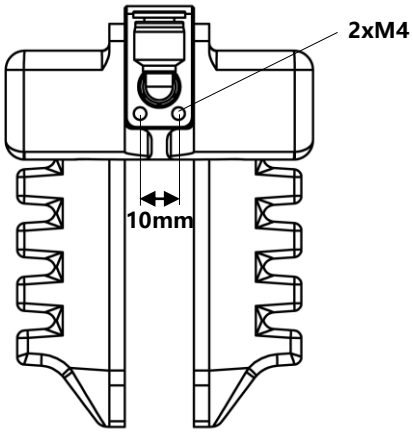
V1 Assembly module: Compact two-fingers module

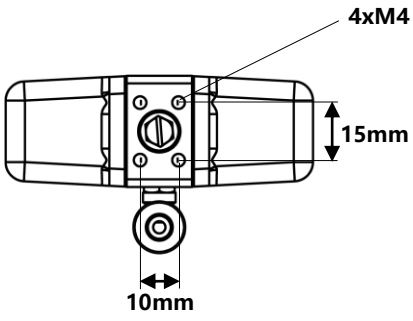
Installation

- can be screwed on three sides (optional).

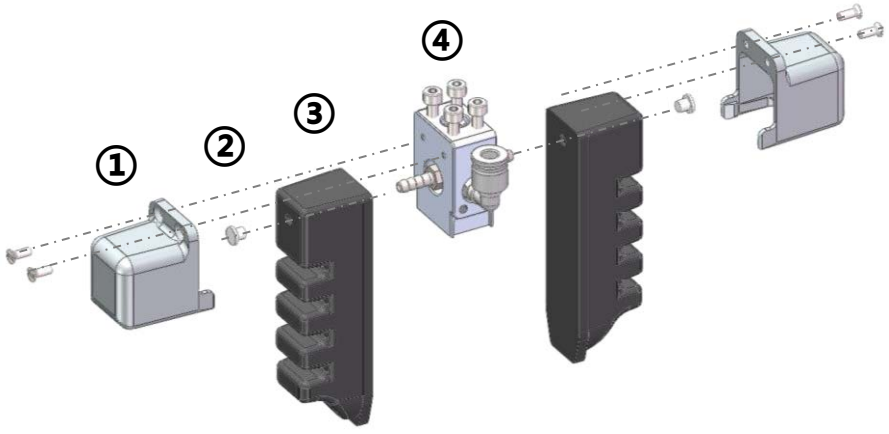


- Drawing





Assembing

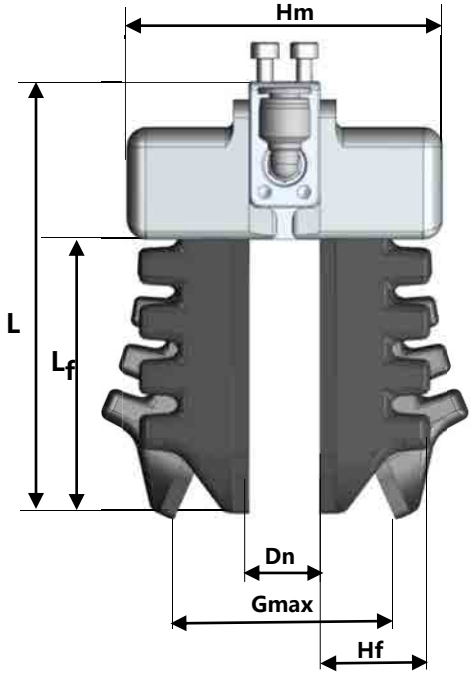


Spare part :

① S-AV4
② PN-166
③ F-A5T/LF1
④ MB-AV1

Finger Module

V1 Assembly module: Compact two-fingers module



Finger size	Finger Module	Dn [mm]	*Gmax [mm]	Hm [mm]	Hf [mm]	Lm [mm]	Lf [mm]	Wm [mm]	Wf [mm]	weight [g]
A3	FM-A3V1	18	34	80	28	81	41	29	24	153
A4	FM-A4V1	18	38	80	28	95	55	29	24	167
A5	FM-A5V1	18	56	80	28	109	69	29	24	181
A6	FM-A6V1	18	84	80	28	123	83	29	24	195
A7	FM-A7V1	18	96	80	28	137	97	29	24	210
A8	FM-A8V1	18	108	80	28	151	111	29	24	224
B3	FM-B3V1	18	38	65	21	64	31	23	18	77
B4	FM-B4V1	18	44	65	21	74.5	41.5	23	18	85
B5	FM-B5V1	18	50	65	21	85	52	23	18	94
B6	FM-B6V1	18	64	65	21	95.5	62.5	23	18	102
B7	FM-B7V1	18	78	65	21	106	73	23	18	110
B8	FM-B8V1	18	92	65	21	116.5	83.5	23	18	118
C3	FM-C3V1	15	25	47	14	46	21	21.5	12	42
C4	FM-C4V1	15	33	47	14	53	28	21.5	12	44
C5	FM-C5V1	15	39	47	14	60	35	21.5	12	45
C6	FM-C6V1	15	55	47	14	67	42	21.5	12	47
C7	FM-C7V1	15	73	47	14	74	49	21.5	12	48
C8	FM-C8V1	15	91	47	14	81	56	21.5	12	50

* : finger material = Normal , G_{max} measured when real working pressure P= -80kPa (vacuum)

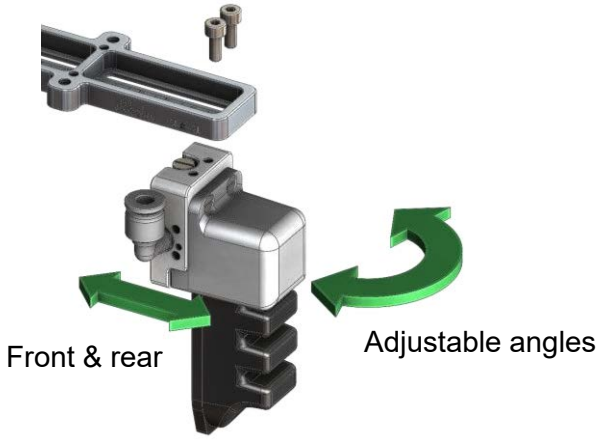
Finger Module

scan to watch videos

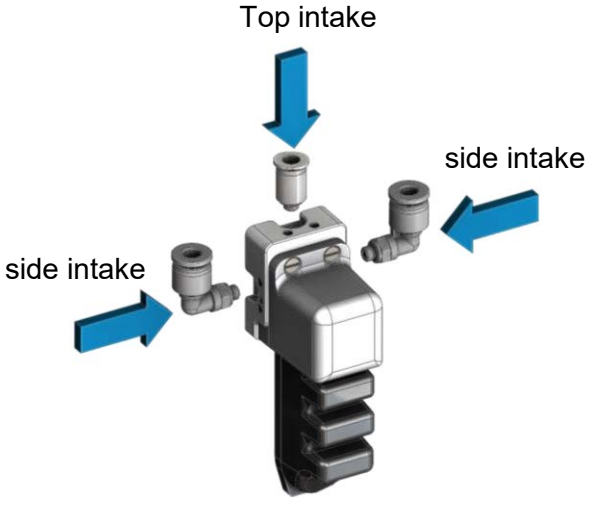
V2 Assembly module--- Single-finger Module

- Features : single finger module, compatible with Slide mounting plate [SMP] (page.50), adjustable spacing and Angle.
- Installation: can be screwed on four sides (optional).
- Air intake: Air intake on three sides (optional).
- Additional Sensor module is possible

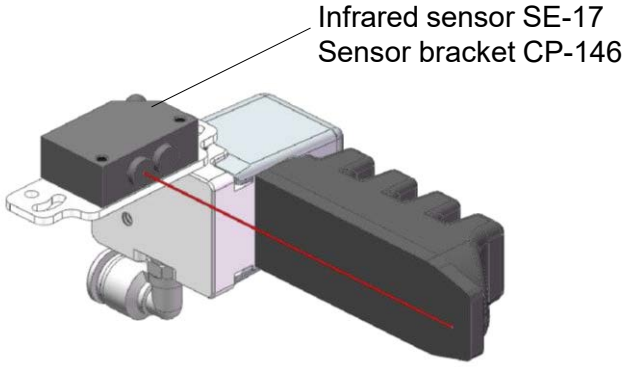
- When mounting with the Slide mounting plate, the front and rear positions and mounting angles are adjustable



- Air intake on three sides (optional).



- Additional Sensor module



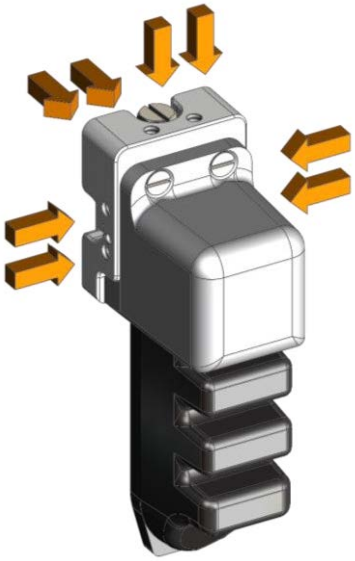
Finger Module

scan to watch videos

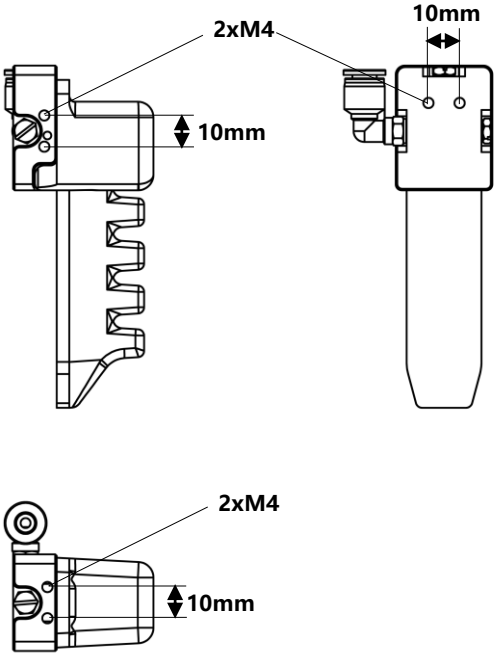
V2 Assembly module--- Single-finger Module

Installation

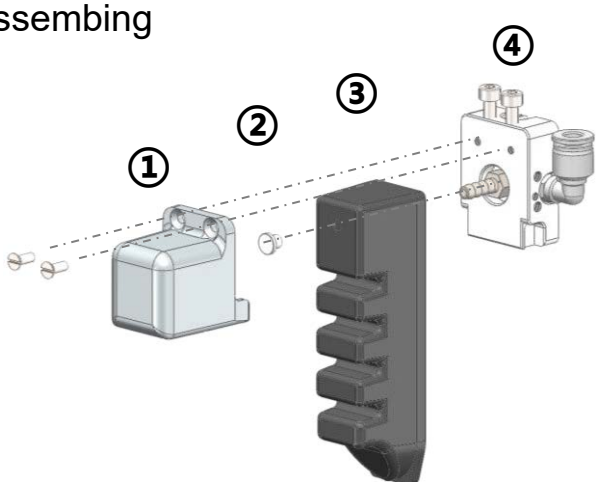
- can be screwed on four sides (optional).



- Drawing



Assembing



Spare Part :

① S-AV4

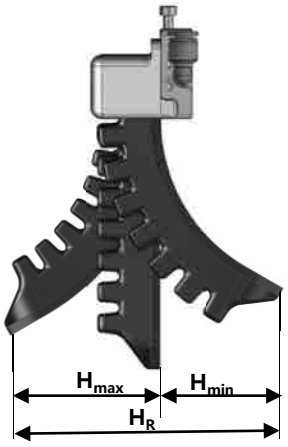
② PN-166

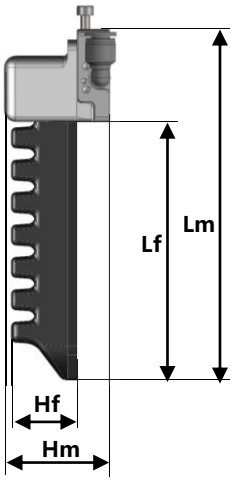
③ F-A5T/LS1

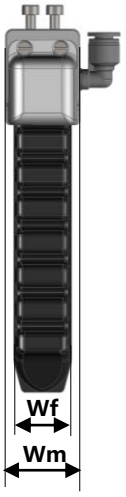
④ MB-AV2

Finger Module

V2 Assembly module--- Single-finger Module







Finger size	Finger Module	HR [mm]	*Hmax [mm]	*Hmin [mm]	Hm [mm]	Hf [mm]	Lm [mm]	Lf [mm]	Wm [mm]	Wf [mm]	Weight [g]
A3	FM-A3V2	16.5	8	8.5	45	28	82	41	31	24	92
A4	FM-A4V2	27	10	17	45	28	96	55	31	24	99
A5	FM-A5V2	43.5	19	24.5	45	28	110	69	31	24	106
A6	FM-A6V2	72	33	39	45	28	124	83	31	24	113
A7	FM-A7V2	90	39	51	45	28	138	97	31	24	120
A8	FM-A8V2	109	45	64	45	28	152	111	31	24	127
B3	FM-B3V2	19	10	9	37.5	21	65	31	25	18	52
B4	FM-B4V2	29	13	16	37.5	21	76	41.5	25	18	56
B5	FM-B5V2	40	16	24	37.5	21	86	52	25	18	60
B6	FM-B6V2	53	23	30	37.5	21	97	62.5	25	18	64
B7	FM-B7V2	75	30	45	37.5	21	107	73	25	18	68
B8	FM-B8V2	98	37	61	37.5	21	118	83.5	25	18	72
C3	FM-C3V2	10.5	5	5.5	30	14	44	21	18	12	27
C4	FM-C4V2	20	9	11	30	14	51	28	18	12	27
C5	FM-C5V2	27	12	15	30	14	58	35	18	12	28
C6	FM-C6V2	42	20	22	30	14	65	42	18	12	29
C7	FM-C7V2	63	29	34	30	14	72	49	18	12	30
C8	FM-C8V2	80	38	42	30	14	79	56	18	12	31

* : finger material = Normal , H_{min} measured when real working pressure P= 100kPa, H_{max} measured when real working pressure P= -80kPa (vacuum)

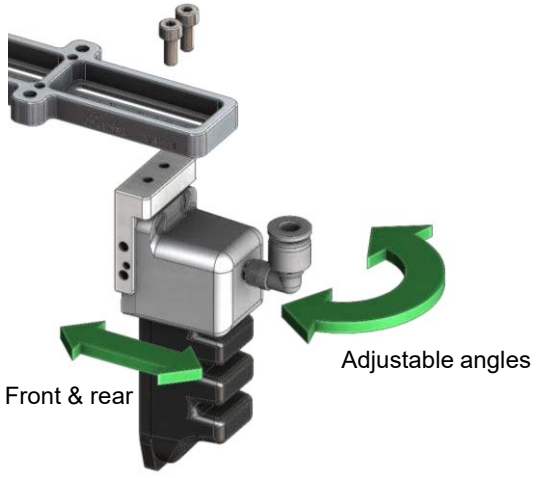
Finger Module

scan to watch videos

V3 Assembly module--- Single-finger Module

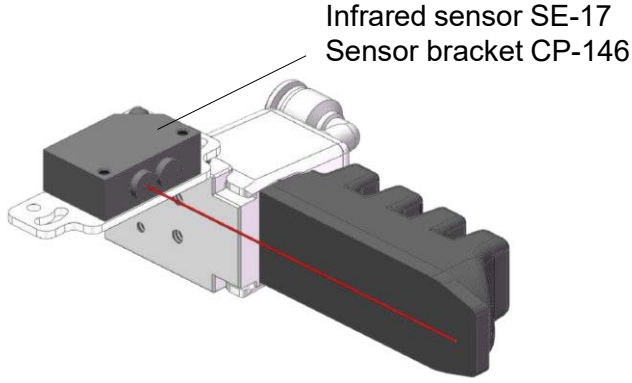
- Features: single finger module, compatible with Slide mounting plate [SMP] (page.50), adjustable spacing and Angle.
- Installation: can be screwed on three sides (optional).
- Air intake: Air intake on one side (back of finger).
- Additional Sensor module is possible.

- When mounting with the Slide mounting plate, the front and rear positions and mounting angles are adjustable



- Air intake on one side (back of finger).

- Additional Sensor module



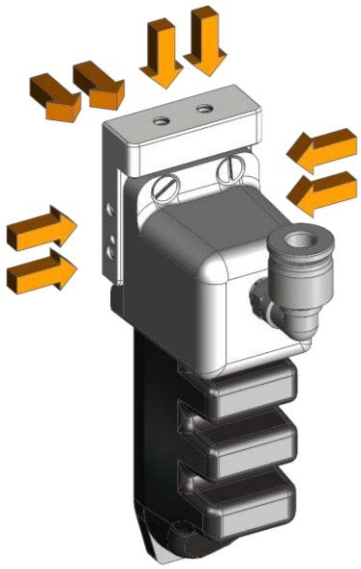
Finger Module

scan to watch videos

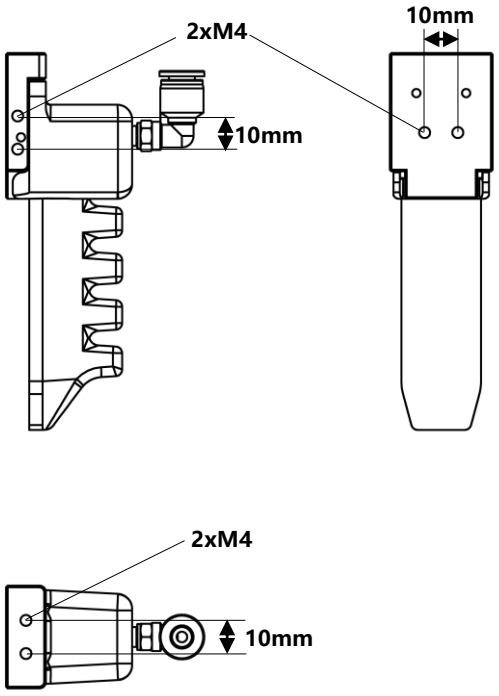
V3 Assembly module--- Single-finger Module

Installation

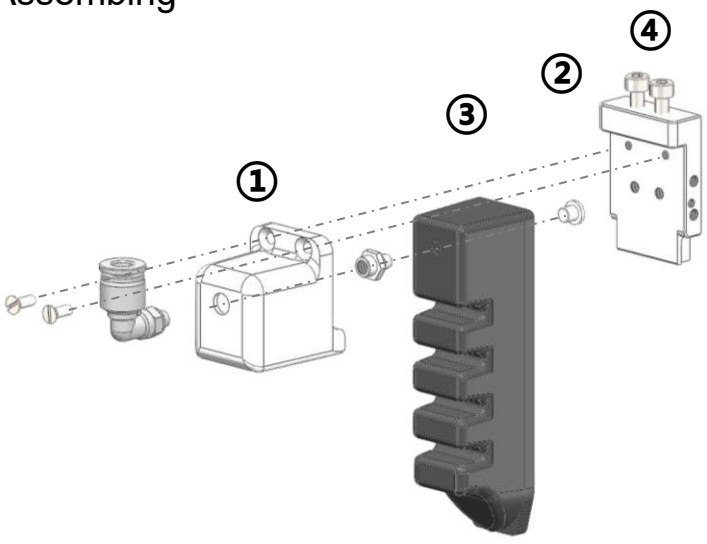
- can be screwed on four sides (optional).



- Drawing



Assembing



Spare Part :

① S-AV5

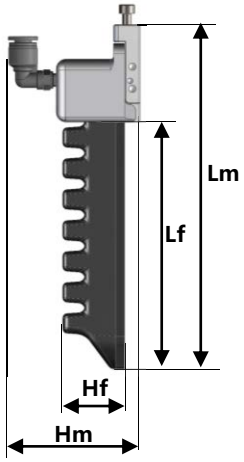
② PN-166

③ F-A5T/LS1

④ MB-AV3

Finger Module

V3 Assembly module--- Single-finger Module



Finger size	Finger Module	HR [mm]	*Hmax [mm]	*Hmin [mm]	Hm [mm]	Hf [mm]	Lm [mm]	Lf [mm]	Wm [mm]	Wf [mm]	Weight [g]
A3	FM-A3V3	16.5	8	8.5	60	28	85.5	41	31	24	77
A4	FM-A4V3	27	10	17	60	28	99.5	55	31	24	84
A5	FM-A5V3	43.5	19	24.5	60	28	113.5	69	31	24	91
A6	FM-A6V3	72	33	39	60	28	127.5	83	31	24	98
A7	FM-A7V3	90	39	51	60	28	141.5	97	31	24	105
A8	FM-A8V3	109	45	64	60	28	155.5	111	31	24	112
B3	FM-B3V3	19	10	9	53	21	68.5	31	25	18	43
B4	FM-B4V3	29	13	16	53	21	79.5	41.5	25	18	47
B5	FM-B5V3	40	16	24	53	21	89.5	52	25	18	51
B6	FM-B6V3	53	23	30	53	21	100.5	62.5	25	18	55
B7	FM-B7V3	75	30	45	53	21	110.5	73	25	18	59
B8	FM-B8V3	98	37	61	53	21	121.5	83.5	25	18	63
C3	FM-C3V3	10.5	5	5.5	46	14	51	21	18	12	24
C4	FM-C4V3	20	9	11	46	14	58	28	18	12	25
C5	FM-C5V3	27	12	15	46	14	65	35	18	12	26
C6	FM-C6V3	42	20	22	46	14	72	42	18	12	26
C7	FM-C7V3	63	29	34	46	14	79	49	18	12	27
C8	FM-C8V3	80	38	42	46	14	86	56	18	12	28

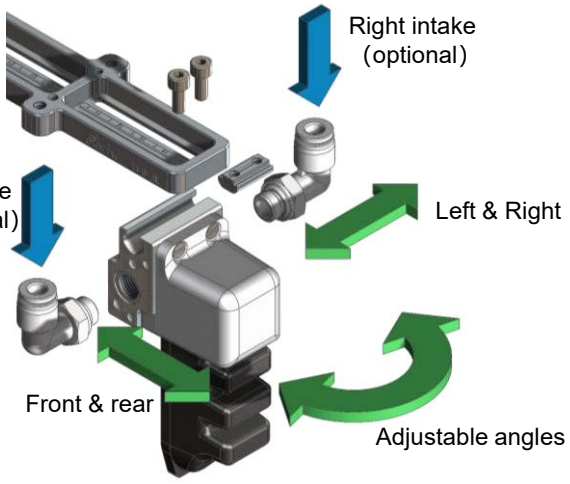
* : finger material = Normal , H_{min} measured when real working pressure P= 100kPa, H_{max} measured when real working pressure P= -80kPa (vacuum)

Finger Module

scan to watch videos

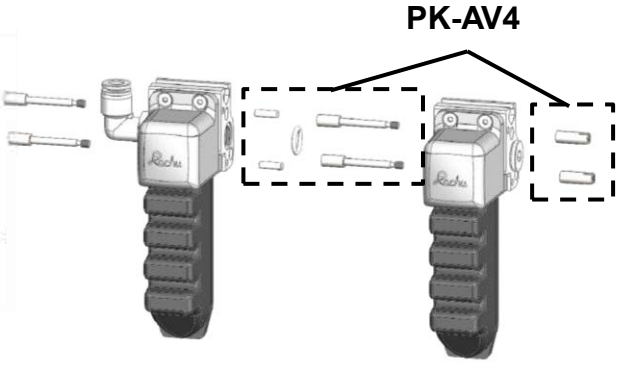
V4 Assembly module-- Series-finger Module

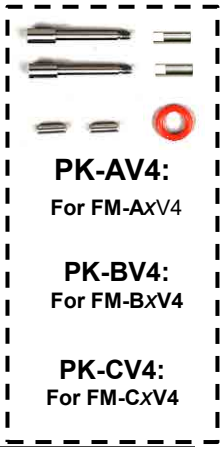
- Features: Series-finger Module, can be used alone or in series .
- Only one air intake when more finger module build in series. More fingers in series are good at large and heavy object.
- Compatible with Slide mounting plate [SMP] (page.50). The finger module position is adjustable in three dimensions
- Air intake: Air intake on left or right sides (optional).



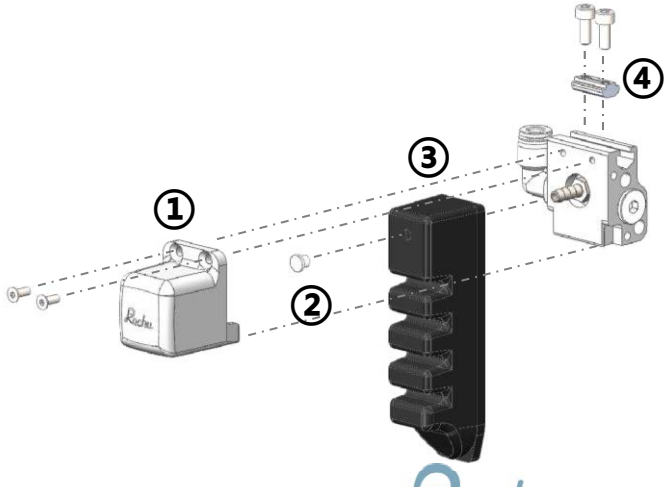
Series combination:

- More finger modules are combined in series to increase the Gripping force
- Only one air intake needed for confluence of all finger modules in series.
- Robust splicing with screw bolt in finger modules.
- Note: Two parts-kit [PK] are needed to screw two finger module together, which contains screw bolts, nuts, sealing gaskets and pins. The [PK] needs to be ordered separately.





Assembing



Spare Parts:

① S-AV4

② PN-166

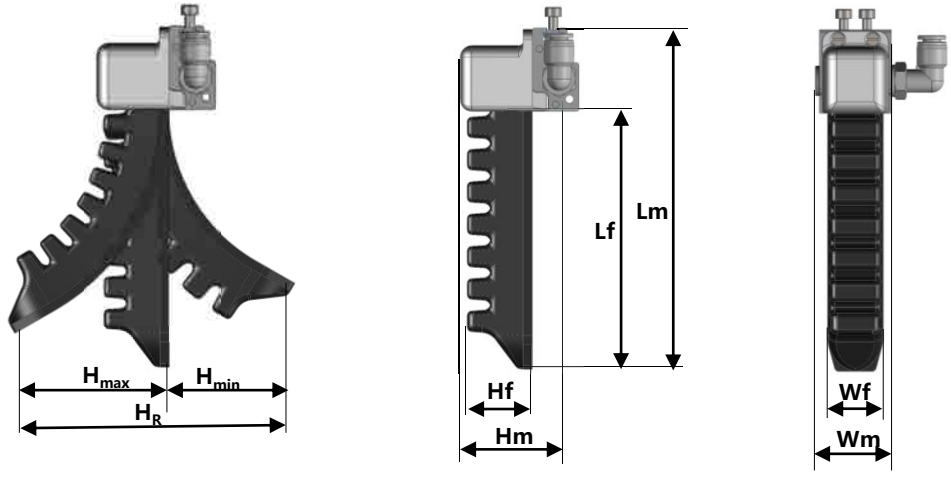
③ F-A5T/LS1

④ TN-03

FM

Finger Module

V4 Assembly module-- Series-finger Module



Finger size	Finger Module	HR [mm]	*Hmax [mm]	*Hmin [mm]	Hm [mm]	Hf [mm]	Lm [mm]	Lf [mm]	Wm [mm]	Wf [mm]	Weight [g]
A3	FM-A3V4	16.5	8	8.5	51	28	78	41	31	24	97
A4	FM-A4V4	27	10	17	51	28	92	55	31	24	104
A5	FM-A5V4	43.5	19	24.5	51	28	106	69	31	24	111
A6	FM-A6V4	72	33	39	51	28	120	83	31	24	119
A7	FM-A7V4	90	39	51	51	28	134	97	31	24	126
A8	FM-A8V4	109	45	64	51	28	148	111	31	24	133
B3	FM-B3V4	19	10	9	45	21	61	31	25	18	61
B4	FM-B4V4	29	13	16	45	21	72	41.5	25	18	65
B5	FM-B5V4	40	16	24	45	21	82	52	25	18	69
B6	FM-B6V4	53	23	30	45	21	93	62.5	25	18	73
B7	FM-B7V4	75	30	45	45	21	103	73	25	18	77
B8	FM-B8V4	98	37	61	45	21	114	83.5	25	18	81
C3	FM-C3V4	10.5	5	5.5	35	14	50	21	18	12	35
C4	FM-C4V4	20	9	11	35	14	57	28	18	12	36
C5	FM-C5V4	27	12	15	35	14	64	35	18	12	37
C6	FM-C6V4	42	20	22	35	14	71	42	18	12	38
C7	FM-C7V4	63	29	34	35	14	78	49	18	12	38
C8	FM-C8V4	80	38	42	35	14	85	56	18	12	39

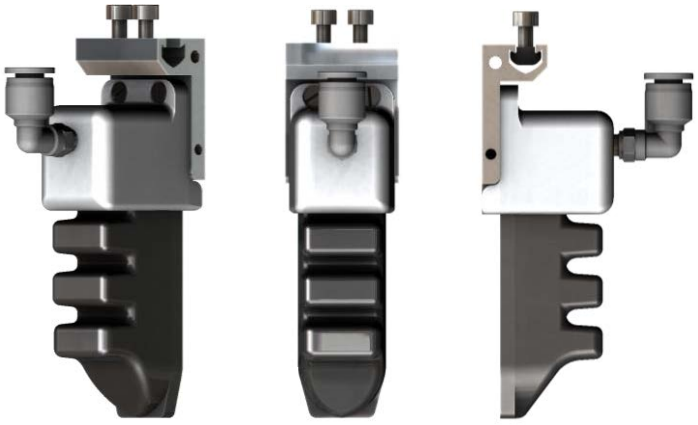
* : finger material = Normal , H_{min} measured when real working pressure P= 100kPa, H_{max} measured when real working pressure P= -80kPa (vacuum)

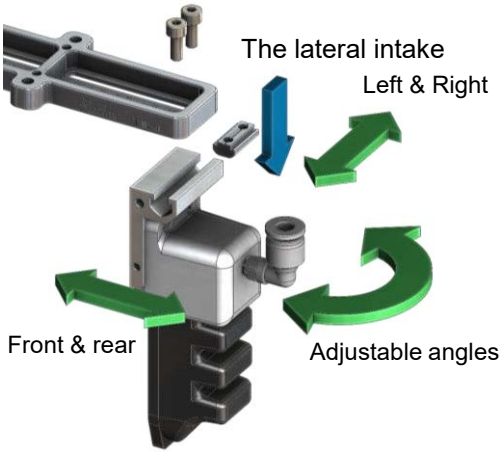
Finger Module

V5 Assembly module-- Series-finger Module

scan to watch videos

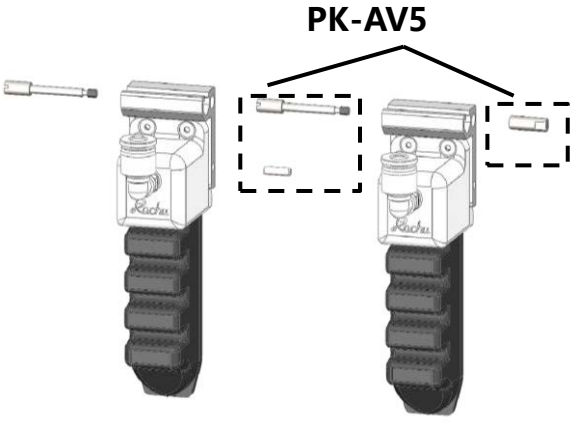
- Features: Series-finger Module, can be used alone or in series .
- mindest finger distance is only 10mm. Be good at thin and large object.
- Compatible with Slide mounting plate [SMP] (page.50). The finger module position is adjustable in three dimensions.
- Air intake: single air intake on finger back side.

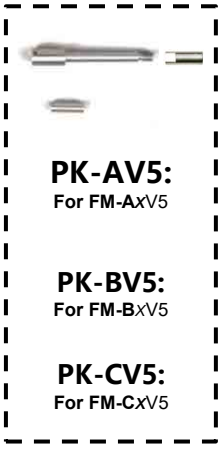




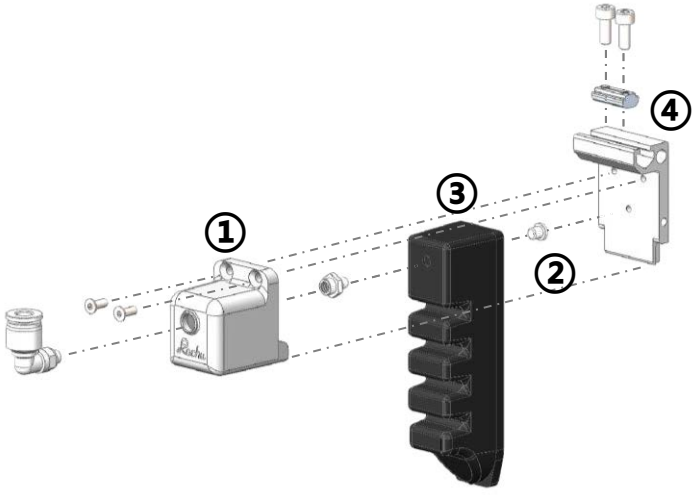
Series combination:

- More finger modules are combined in series to increase the Gripping force
- Robust splicing with screw bolt in finger modules.
- Note: Two parts-kit [PK] are needed to screw two finger module together, which contains screw bolts, nuts, sealing gaskets and pins. The [PK] needs to be ordered separately.





Assembing



Spare Part:

① S-AV5

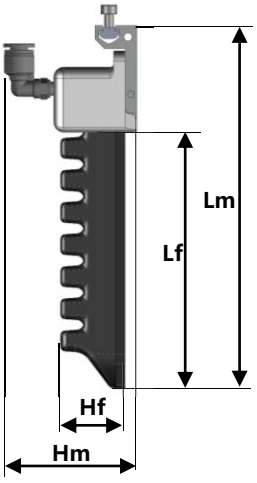
② PN-166

③ F-A5T/LF1

④ TN-03

Finger Module

V5 Assembly module-- Series-finger Module



Finger size	Finger Module	HR [mm]	*Hmax [mm]	*Hmin [mm]	Hm [mm]	Hf [mm]	Lm [mm]	Lf [mm]	Wm [mm]	Wf [mm]	Weight [g]
A3	FM-A3V5	16.5	8	8.5	58	28	88	41	31	24	76
A4	FM-A4V5	27	10	17	58	28	102	55	31	24	83
A5	FM-A5V5	43.5	19	24.5	58	28	116	69	31	24	90
A6	FM-A6V5	72	33	39	58	28	130	83	31	24	97
A7	FM-A7V5	90	39	51	58	28	144	97	31	24	104
A8	FM-A8V5	109	45	64	58	28	158	111	31	24	111
B3	FM-B3V5	19	10	9	51	21	71	31	25	18	44
B4	FM-B4V5	29	13	16	51	21	82	41.5	25	18	48
B5	FM-B5V5	40	16	24	51	21	92	52	25	18	52
B6	FM-B6V5	53	23	30	51	21	103	62.5	25	18	56
B7	FM-B7V5	75	30	45	51	21	113	73	25	18	60
B8	FM-B8V5	98	37	61	51	21	124	83.5	25	18	64
C3	FM-C3V5	10.5	5	5.5	44	14	53	21	18	12	28
C4	FM-C4V5	20	9	11	44	14	60	28	18	12	28
C5	FM-C5V5	27	12	15	44	14	67	35	18	12	29
C6	FM-C6V5	42	20	22	44	14	74	42	18	12	30
C7	FM-C7V5	63	29	34	44	14	81	49	18	12	31
C8	FM-C8V5	80	38	42	44	14	88	56	18	12	32

* : finger material = Normal , H_{min} measured when real working pressure P= 100kPa, H_{max} measured when real working pressure P= -80kPa (vacuum)

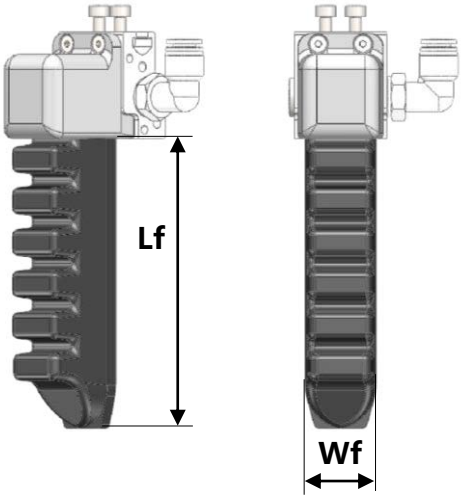
Finger Module

Size of finger module

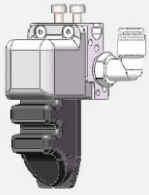
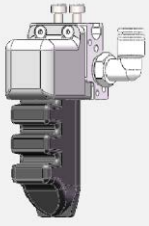
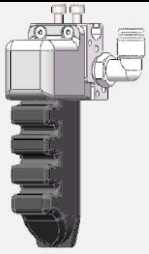
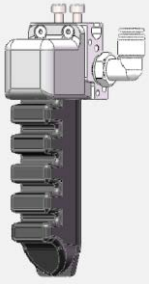
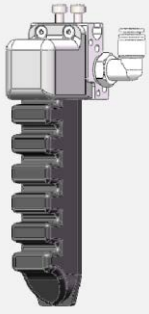
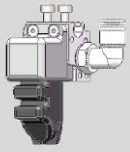
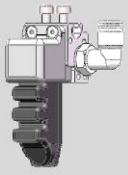
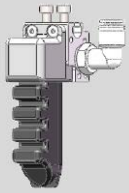
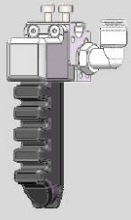
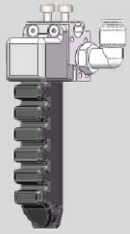
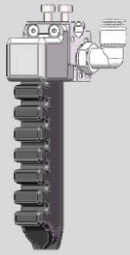
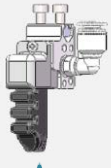
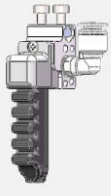
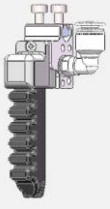
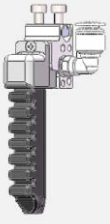
- According to finger Size,
  A3，A4，A5，A6，A7，A8;
  B3，B4，B5，B6，B7，B8;
  C3，C4，C5，C6，C7，C8,

There are also total 18 sizes of finger module.*

- Life time of finger module: 2 to 4 million cycles **



*: For customized finger, please contact our customer service
**: One cycle time= one open + one grab. The life time is closely related to the working pressure P. Pls. always use Rochu controll Unit. The working pressure shall not exceed the safe working pressure range.

	3 Segments	4 Segments	5 Segments	6 Segments	7 Segments	8 Segments	Wf [mm]
Finger Size	A3	A4	A5	A6	A7	A8	
Lf[mm]	41	55	69	83	97	111	
A		 ★	 ★				24
Model	B3	B4	B5	B6	B7	B8	
Lf[mm]	31	41.5	52	62.5	73	83.5	
B			 ★				18
Model	C3	C4	C5	C6	C7	C8	
Lf[mm]	21	28	35	42	49	56	
C		 ★					12

★ : **Major model**

Finger Module

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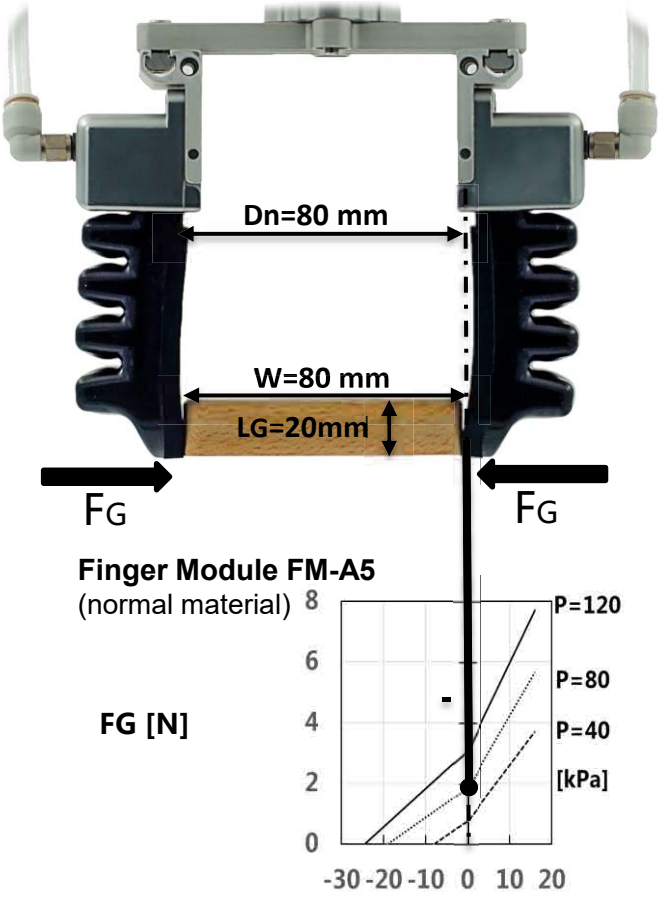
How to calculate the gripping force of Finger Module?

When the soft finger be pressured , it bends inward and create a horizontal Gripping force **FG** on the object. The Gripping force is related to the object shape, finger size, contact area, finger distance **Dn** (page.51) and working pressure **P**.

Example: Two FM-A5V5 finger modules(normal material) grasp the square object. The width of the object W=80mm, and the covering length of the fingertip LG=20mm:

Working condition 1:
Dn=80 [mm]
P=80 [kPa]

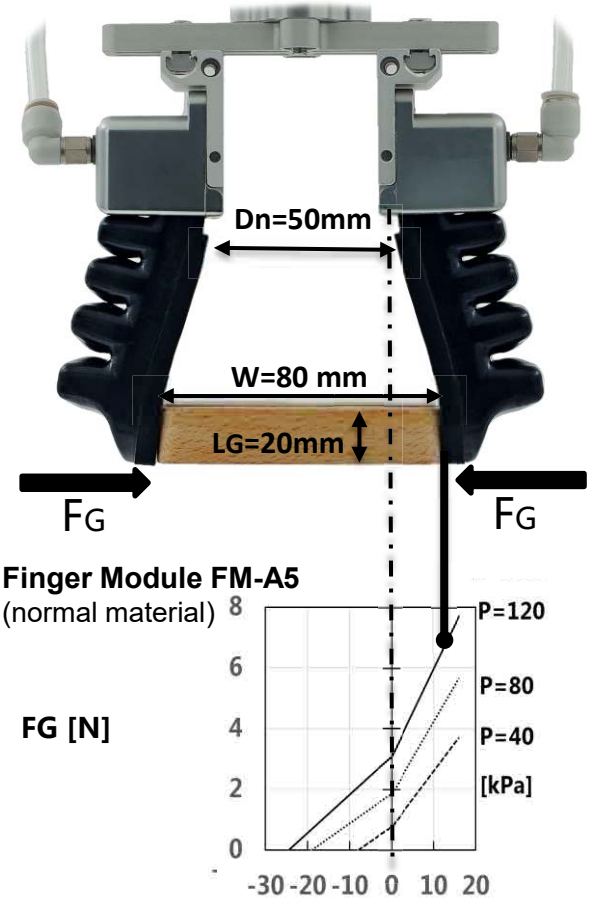


Finger Module FM-A5
(normal material)

T= (W-Dn) /2=0 [mm]

FG=1.85 [N]

Working condition 2:
Dn= 50[mm]
P=120 [kPa]



Finger Module FM-A5
(normal material)

By W>Dn,
T= (W-Dn) /2=15 [mm]

FG=7.3 [N]

1. Higher working pressure P, higher Gripping force FG.
2. Shorter finger distance Dn, higher Gripping force FG.
3. Bigger finger size, higher Gripping force FG.
4. The strong material finger can hold higher air pressure and has a stronger force than the normal material finger. (page.6)
5. Exceed the safe working pressure will cause irreversible damage to the soft finger and shorter life time, while shorter Dn may increase abrasion of the finger bottom.
6. More fingers in series (Page. 39,41) can also improve the overall Gripping force.
7. Beside the Gripping force FG, the real handling load of the gripper is also related to the shape of the object, friction coefficient, finger bottom print and machine speed, etc.

Finger Module

Finger Module Gripping force diagram (Normal material)

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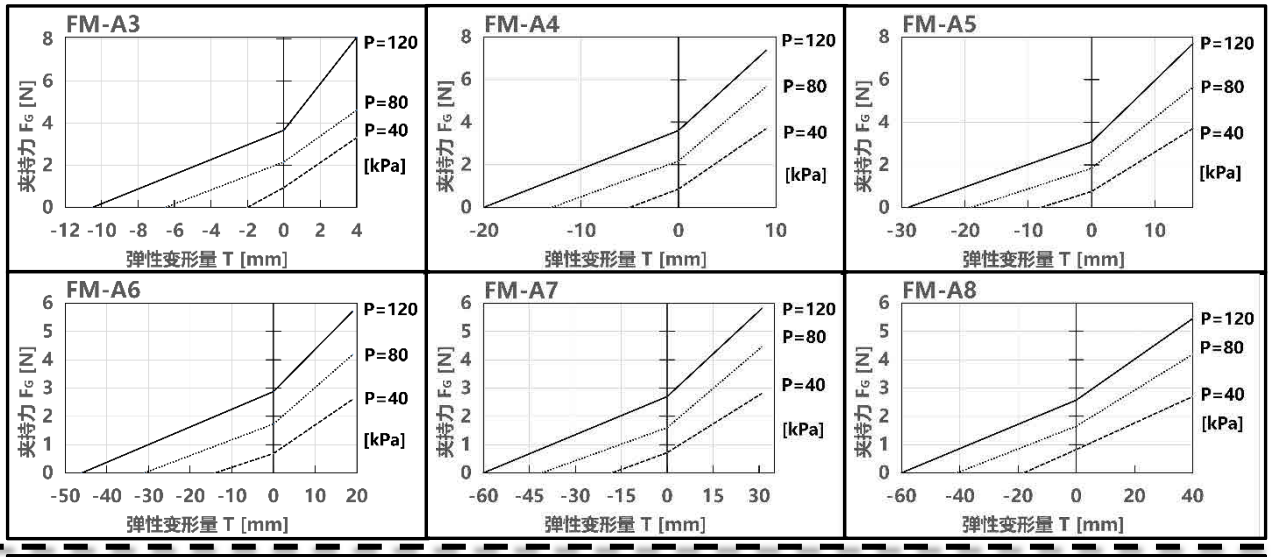
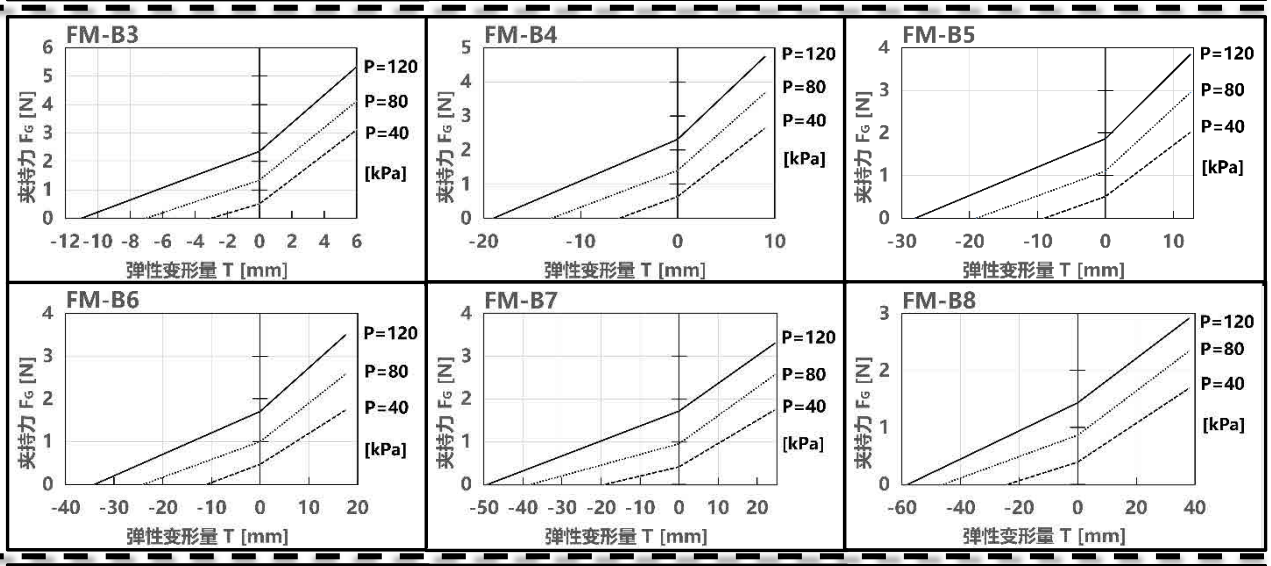
The values in the diagram are determined under the following conditions:

- Finger material: normal, fingertip & bottom print：LS1 (page.46)
- Square object
- Only the fingertips touch the object. By finger size A, the fingertip touch length is LG=20mm, by finger size B LG=15mm , and by finger size C LG=10mm.
- The following data are for reference only, and the values will vary under other working conditions

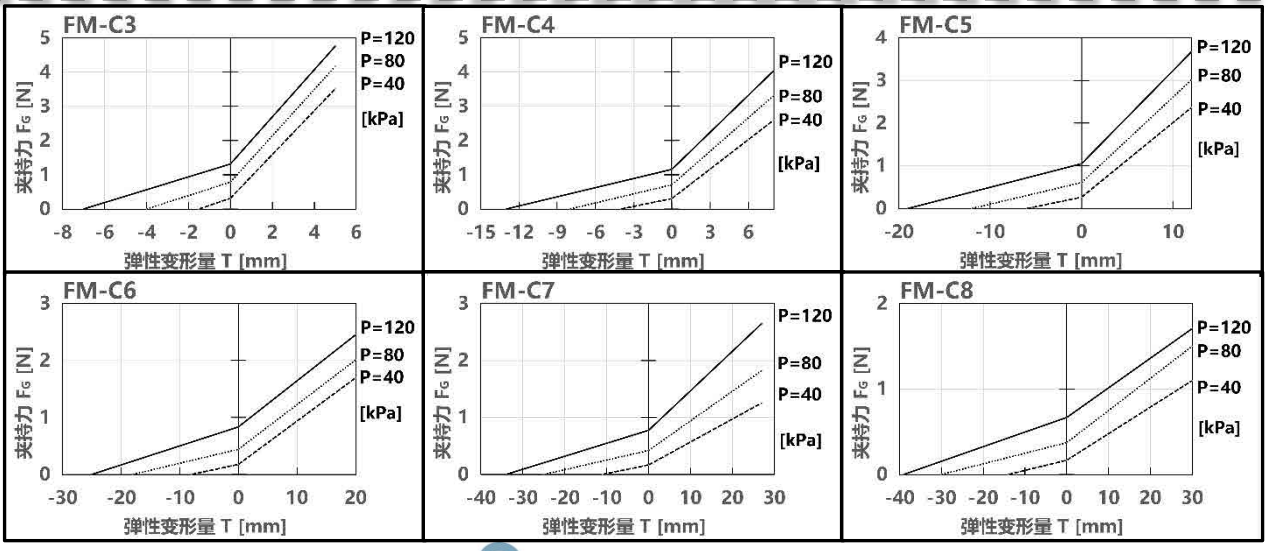
Finger size A3- A8



Finger size B3- B8



Finger size C3- C8



F

Rochu Soft Finger

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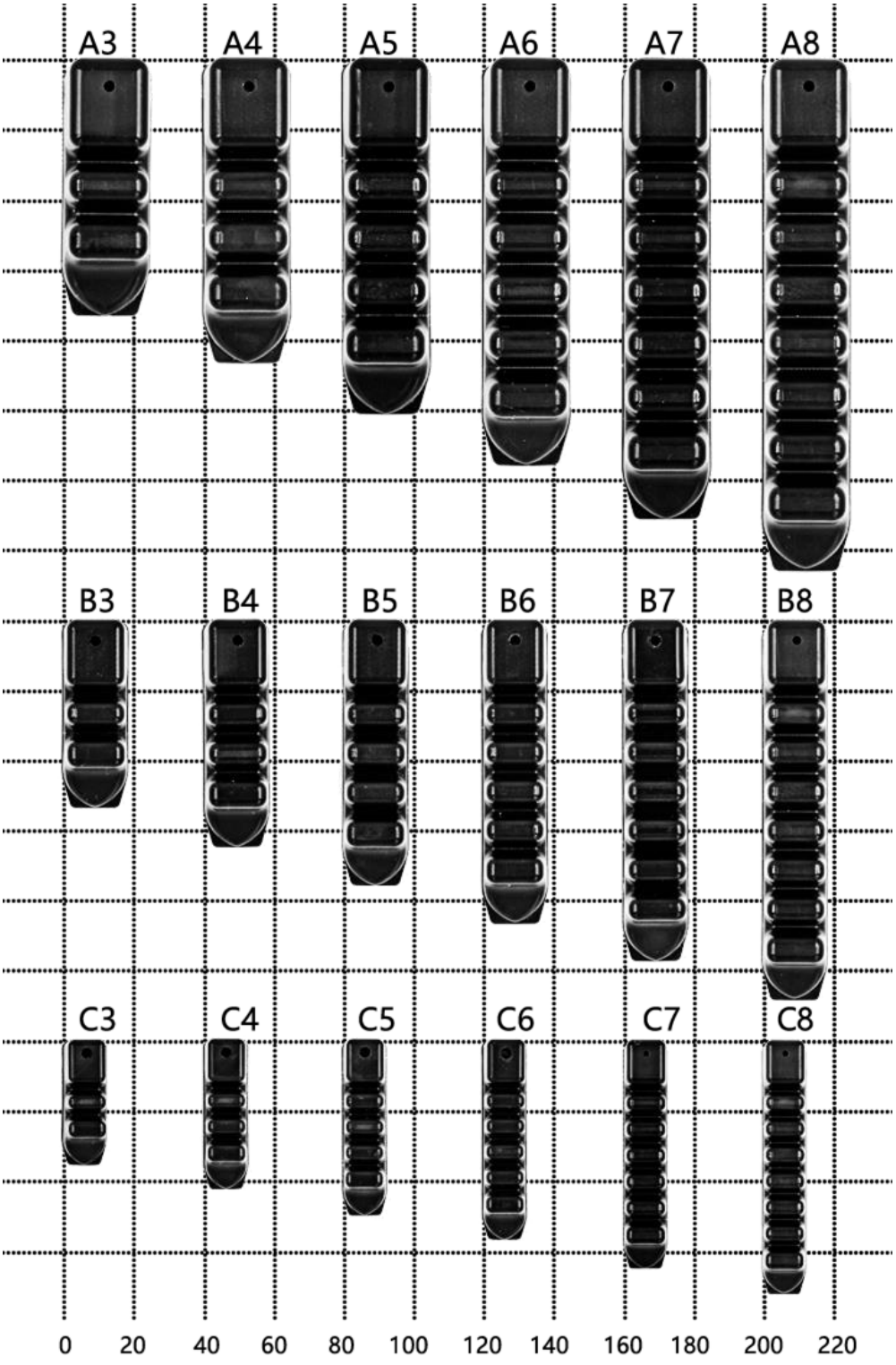
- **Rochu Finger [F]** is a finger module that can be replaced independently.
- There are also total 18 sizes of finger (A3，A4，A5，A6，A7，A8; B3，B4，B5，B6，B7，B8; C3，C4，C5，C6，C7，C8).
- With the same working pressure, the wider fingers have higher gripping force, and the shorter fingers have better positioning accuracy and stability.
- For customized finger size, please contact our customer service

Finger sizes



Rochu Soft Finger

F

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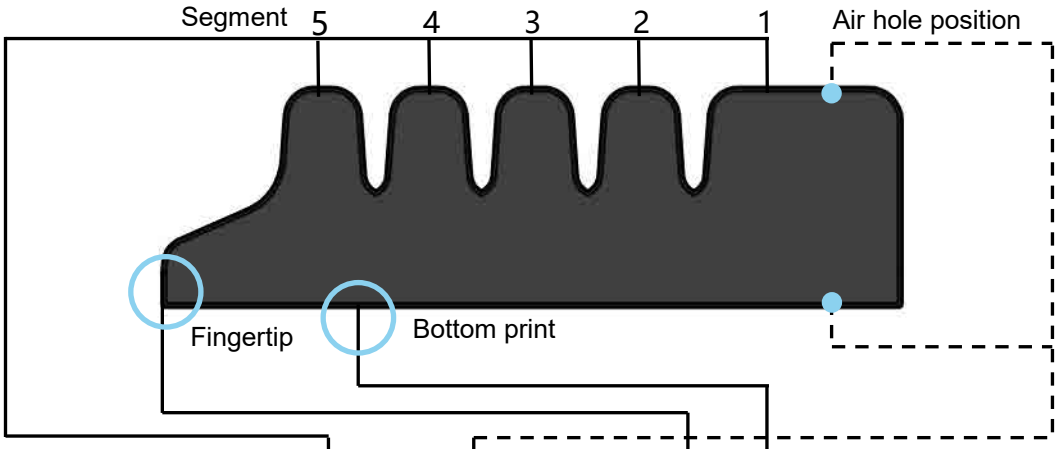
Encoding Method

- The finger bottom print and finger tip will affect the contact area and friction of the object.
- For customized bottom print and finger tip, please contact our customer service
- There are normal, strong [H] and anti-static[AS] finger material.
  - The strong material [H] has a higher working pressure range, and the gripping force is up to 300% compared with the normal material fingers.
  - Anti-static material [as], dust-free, suitable for electronic parts and clean room..



F - A 5 T / L S1 [AS]

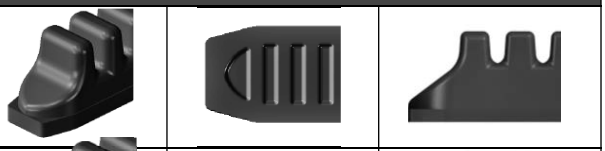
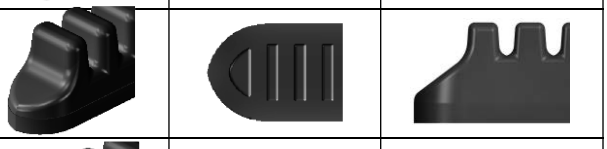
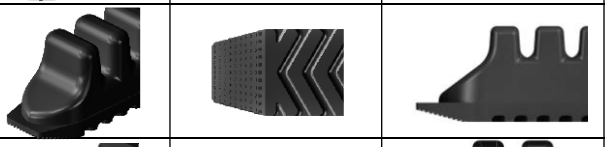
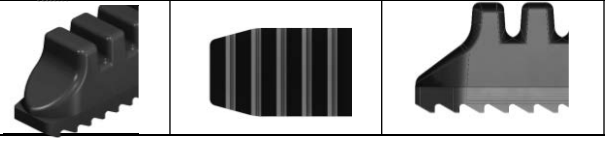
Finger-width | Finger length

A	Width A
B	Width B
C	Width C
AD	Width AD

3	3 Segment
4	4 Segment
…	…
8	8 Segment

T	Through air hole

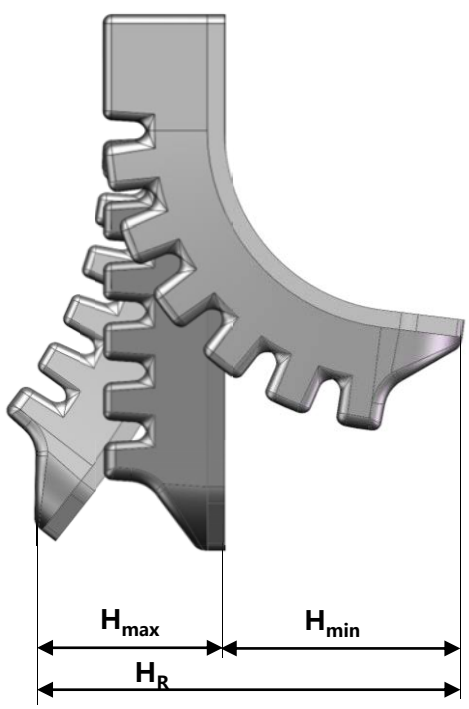
	Normal ★
H	Strong
AS	Anti-static

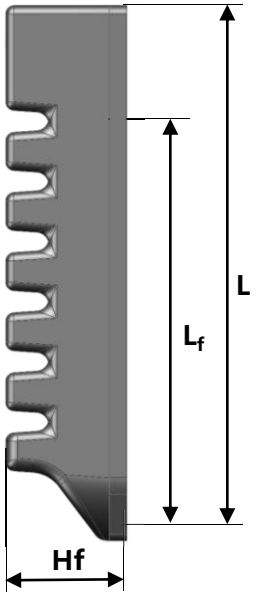
Fingertip & Bottom print	Description	Feature	Pictures
LS1 ★	**Line contact stripe 1**	Good versatility, wear resistance, suitable for food, metal, plastic and other rough object surface	
LF1	**Line contact Flat 1**	Suitable for dry and smooth surface, soft food. Liquid on the object surface will cause slip	
PS1	**Point contact stripe 1**	Suitable for cylindrical and spherical object; Wear resistant, suitable for rough workpiece surface	
FS3	**Flat contact stripe 3**	Suitable for fabrics	
LS8	**Line contact stripe 8**	wave structure, suitable for sheet metal parts, flat glass, PCB, auto headlights.	

★ : **Major model**

Rochu Soft Finger

Parameter





Finger size	HR [mm]	*Hmax [mm]	*Hmin [mm]	Hf [mm]	Lf [mm]	L [mm]	Wf [mm]	Weight [g]
F-A3	16.5	8	8.5	28	41	69	24	33
F-A4	27	10	17	28	55	83	24	40
F-A5	43.5	19	24.5	28	69	97	24	47
F-A6	72	33	39	28	83	111	24	55
F-A7	90	39	51	28	97	125	24	62
F-A8	109	45	64	28	111	139	24	69
F-B3	19	10	9	21	31	52	18	11
F-B4	29	13	16	21	42	62	18	16
F-B5	40	16	24	21	52	73	18	20
F-B6	53	23	30	21	63	83	18	24
F-B7	75	30	45	21	73	94	18	28
F-B8	98	37	61	21	84	104	18	32
F-C3	10.5	5	5.5	14	21	34	12	4
F-C4	20	9	11	14	28	41	12	5
F-C5	27	12	15	14	35	48	12	6
F-C6	42	20	22	14	42	55	12	7
F-C7	63	29	34	14	49	62	12	7
F-C8	80	38	42	14	56	69	12	8

* : finger material = Normal , H_{min} measured when real working pressure P= 100kPa, H_{max} measured when real working pressure P= -80kPa (vacuum)

3

CM
Connection module

SMP *page. 50*
Slide Mounting Plate

CM *page. 52*
Connection Module

FCM *page. 53*
Flange Connection Module

QCM *page. 56*
Quick changer Module

SMP

Slide Mounting Plate

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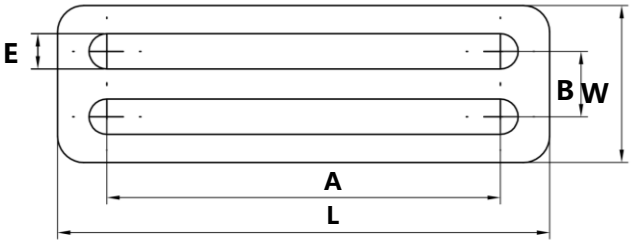
SMP

Features

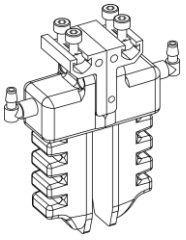
- Length SMP-01 / SMP-02 / SMP-03
- Assembling finger module **[FM]** and aluminum profile **[P]**
- Accessory package (PK-SMP01) included



Accessory package
PK-SMP01


2 x SF-081 (M4)


2 x SF-076 (M4x14)

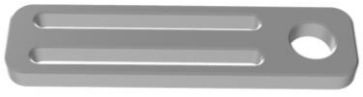


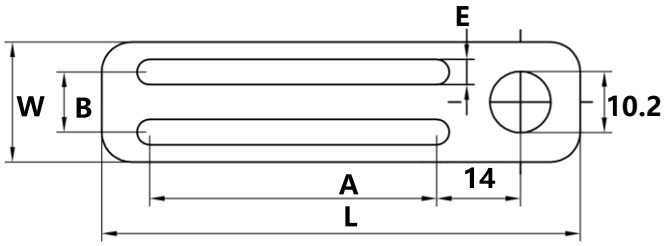
Model	A [mm]	B [mm]	E [mm]	L [mm]	W [mm]	Thickness [mm]	Weight [g]
SMP-01	50	10	4.2	65	20	6	10.8
SMP-02	75	10	4.2	90	20	6	16.1
SMP-03	100	10	4.2	115	20	6	18.5

SMP

Features

- Length SMP-13/ SMP-14 / SMP-15/ SMP-16
- Assembling **Connection module [CM]** and aluminum profile **[P]**
- Accessory package (PK-SMP01) included





Accessory package
PK-SMP01


2 x SF-081 (M4)


2 x SF-076 (M4x14)

Model	A [mm]	B [mm]	E [mm]	L [mm]	W [mm]	Thickness [mm]	Weight [g]
SMP-13	20	10	4.2	50	20	6	10.7
SMP-14	48	10	4.2	80	20	6	16.2
SMP-15	80	10	4.2	110	20	6	21.6
SMP-16	110	10	4.2	140	20	6	27.1

Slide Mounting Plate

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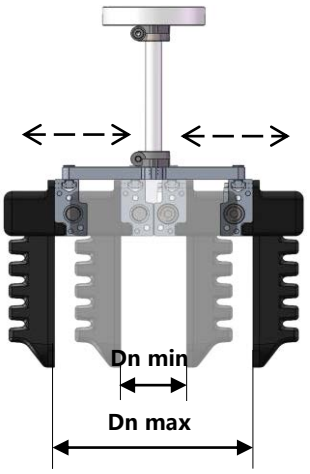
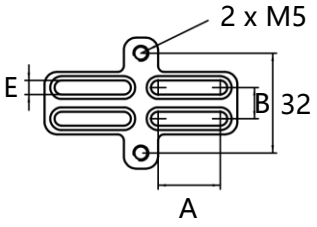
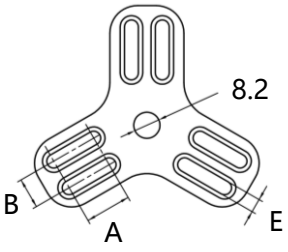
SMP- Multidirection

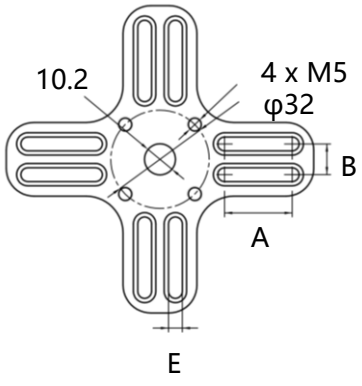


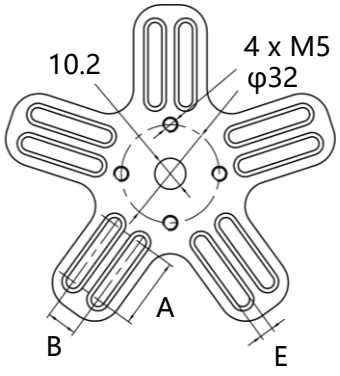
Features

- Different styles according to shape and slot length
- Assembling finger module [FM] and flange connection module [FCM]









SMP-2S

SMP-3S

SMP-4S

SMP-5S

SMP-2L

SMP-3L

SMP-4L

SMP-5L

Model	Slot Length A [mm]	Slot space B [mm]	Slot width E [mm]	Thickness [mm]	AP fingertip distance Dn [mm] Dnmin~Dnmax		Weight [g]
					FM V2,V4	FM V3,V5	
SMP-2S	20	10	4.2	8	40~69	10~37	18.9
SMP-2L	45	10	4.2	8	40~119	10~87	25.4
SMP-3S	15	10	4.2	10	58~82	28~50	42.4
SMP-3L	50	10	4.2	10	58~152	28~120	73.9
SMP-4S	22	10	4.2	10	72~104	41~72	52.3
SMP-4L	67	10	4.2	10	72~194	41~162	86.2
SMP-5S	23	10	4.2	10	91~112	53~80	94.8
SMP-5L	78	10	4.2	10	91~222	53~109	179.7

*: Maximum clamping range of gripper combination Gmax=Dnmax+2Hmax, Hmax Please refer to the finger module parameters page.

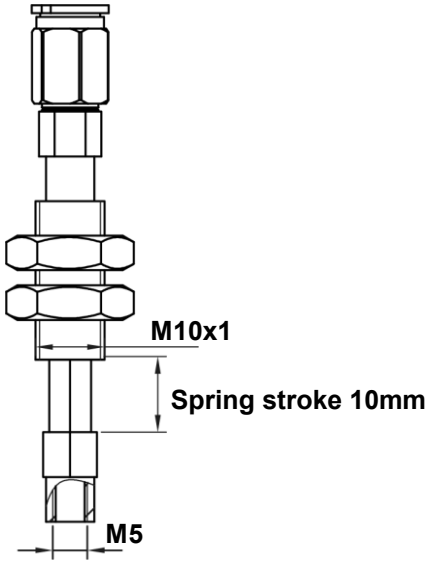
Connection Module

CM - spring connection module of beak module

Features

- The Rochu beak **modules [BM]** can be build on
- It can be installed on the sliding mounting plate **[SMP]**

CM-S04



Weight 28g Elastic force 0~4N

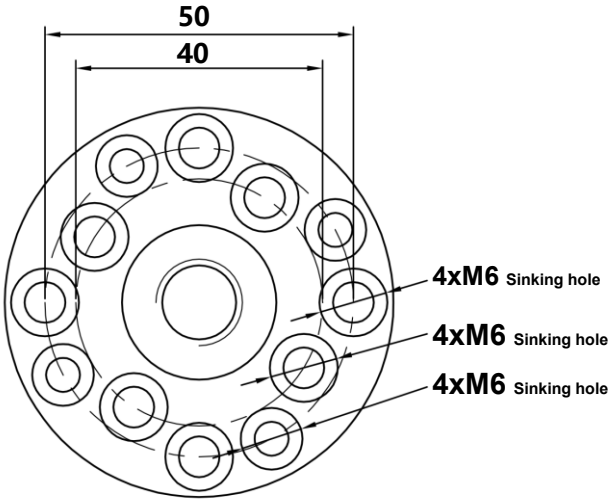
Flange connection Module

- **Flange connection module [FCM]** is fixed between the robot flange and the **slip mounting plate [SMP].** It can also be connected with **quick change module [QCM**], There are two kinds of **[FCM],** the spring rod type **(S)** and rigid rod type **(R)**.

FCM-S01 Sping rod flange connection module

Features

- Meet ISO 9409-1:2004 robot flange standard
- Robot connection with the soft beak module [BM], or light soft grippers. The max. loading is 500g.
- Better adaptability in gripping of very different size object .
- Low positioning accuracy of FCM with spring rod. For better positioning, pls. use the [FCM] with rigid rod.
- Accessory package (PK-FCMS01) included



Weight 125g Elastic force 0~8N

Accessory package
PK-FCMS01

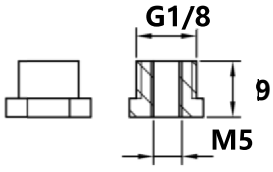

1 x CP-006


1 x CP-007

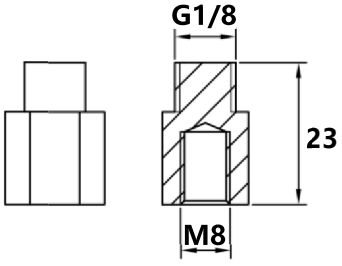

SF-083 (M8x10)


4 x SF-011 (M6x10)

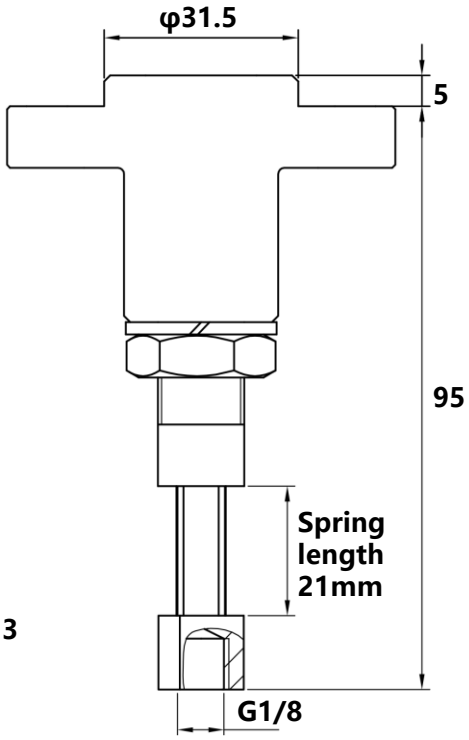

4 x SF-007 (M5x12)



CP-006



CP-007

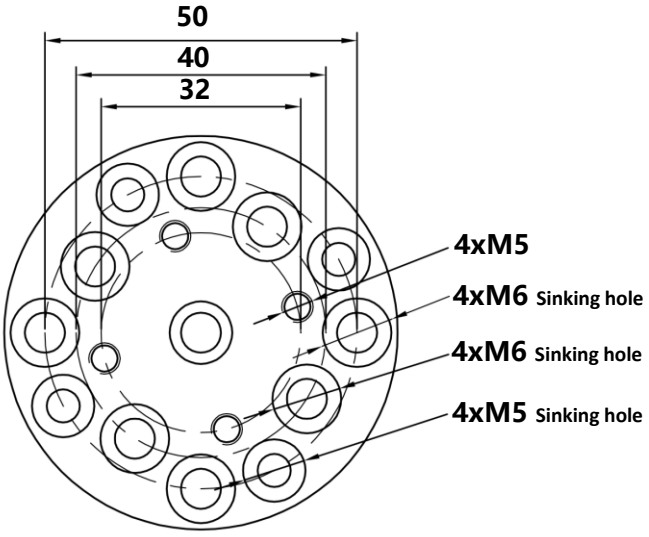


Flange connection Module

FCM-R02, FCM-R04 Rigid rod flange connection module (Light)

Features

- Meet ISO 9409-1:2004 robot flange standard .
- Light, suitable for light and small robot, max. loading 5kg
- It can be used in high-precision pick, place and assembling.
- Accessory package (PK-FCMR01) included

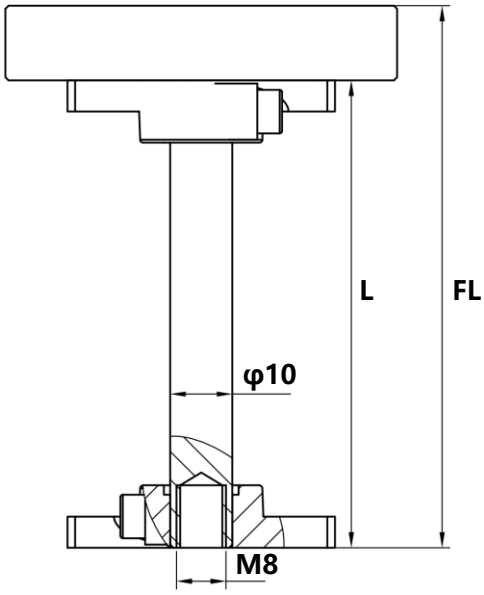


Accessory package
PK-FCMR01


1 x SF-83 (M8x10)

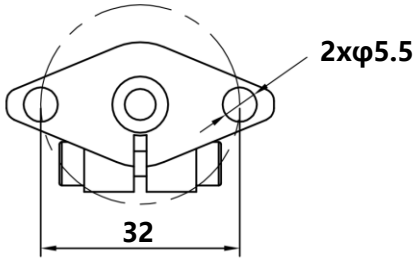

4 x SF-011 (M6x10)


6 x SF-007 (M5x12)



Rigid rod FCM (Light)

Model	L [mm]	FL [mm]	weight[g]
FCM-R02	50	62	147
FCM-R04	90	102	170



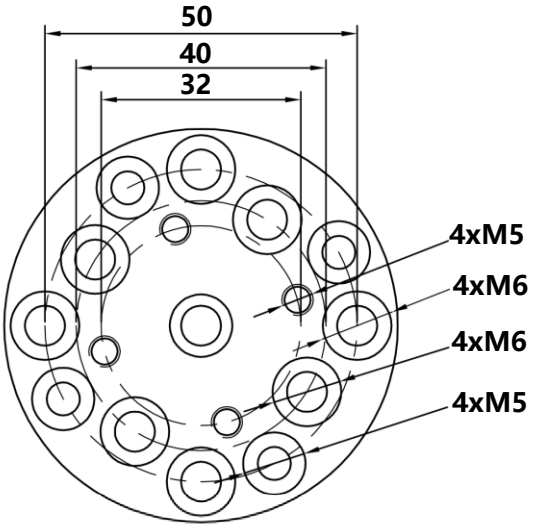
Flange connection Module

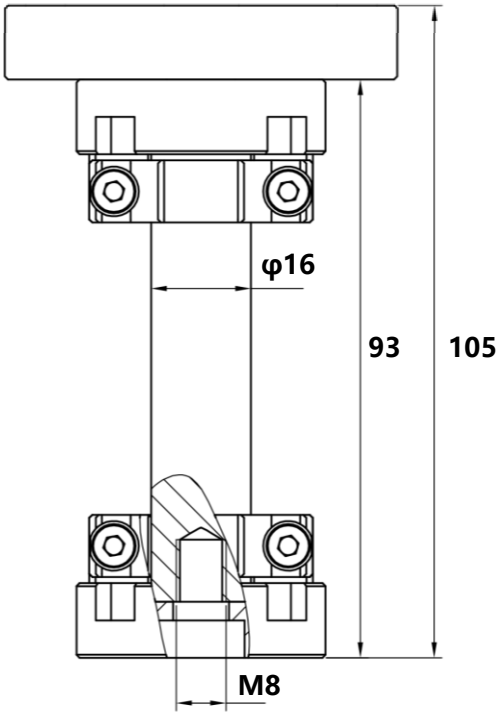
FCM-R06 Rigid rod flange connection module (Heave)

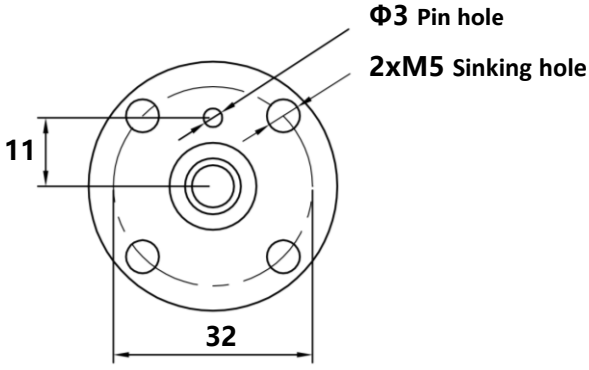
Features

- Meet ISO 9409-1:2004 robot flange standard .
- Robuster, suitable for non-standard gripper combination, max. loading 20kg
- It can be used in high-precision pick, place and assembling.
- Accessory package (PK-FCMR06) included

Weight 307.8g







Accessory package
PK-FCMR06


1 x SF-83 (M8x10)


1 x PIN-01


4 x SF-011 (M6x10)

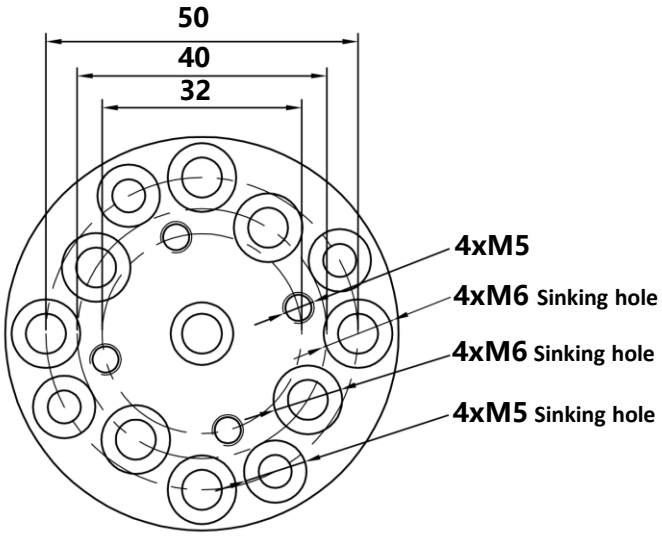

8 x SF-007 (M5x12)

Flange connection Module

FCM-R08 Rigid rod flange connection module

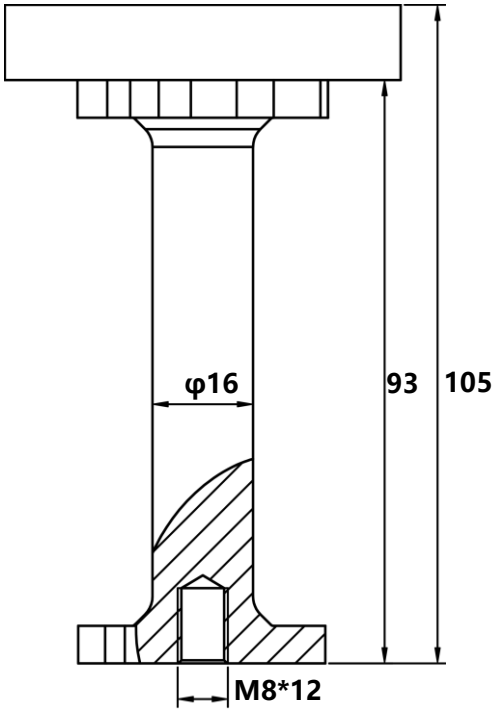
Features

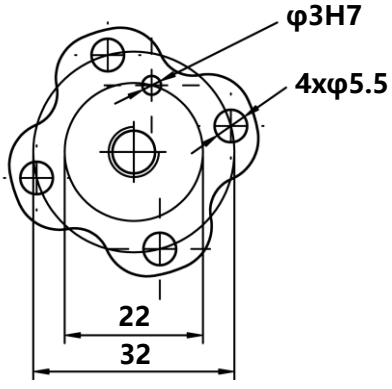
- Meet ISO 9409-1:2004 robot flange standard .
- Robuster, suitable max. loading 20kg
- It can be used in high-precision pick, place and assembling.
- Accessory package (PK-FCMR08) included



Accessory package
PK-FCMR08

- 1 x SF-83 (M8x10)
- 4 x SF-011 (M6x10)
- 8 x SF-007 (M5x12)
- 2 x SF-076 (M4x14)
- 2 x SF-081 (M4)
- 1 x PIN-01 (φ3x10)





Quick changer Module

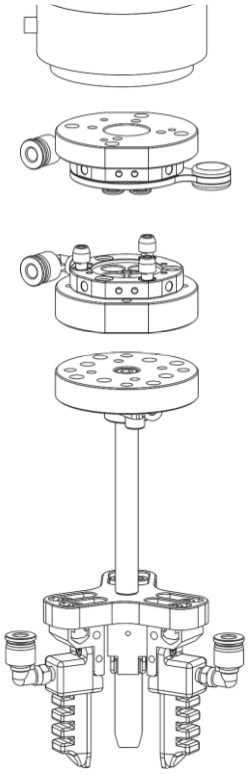
Quick change module **[QCM]** is used for quick replacement of gripper.Quick change module **[QCM]** is installed between the flange connection module **[FCM]** and robot flange, which is uncoupled into the robot side (**R side**) and the gripper side (**G side**).

scan to watch videos

QCM-01 (Manual quick change module)

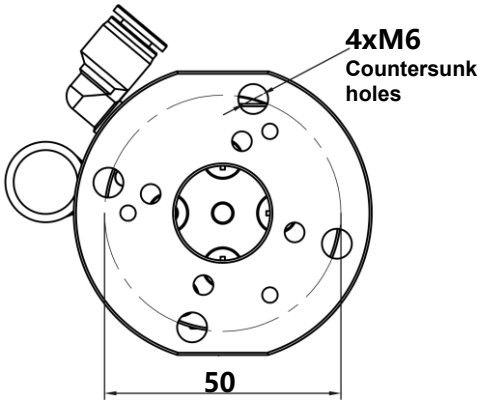
Features

- Conform to ISO 9409-1:2004 (i.e. GB / T 14468.1:2006)
- Manual locking/unlocking



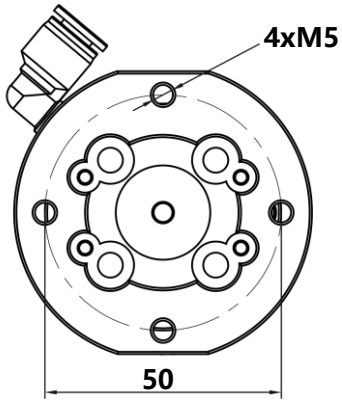
QCM-01R

(R-side, robot flange)



QCM-01G

(G-side, gripper)



Lock Max 2Nm

QCM-01R Weight [g]	146	QCM-01G Weight [g]	135
Vertical Force **F**	150[N]	Pneumatic ports	4
Rotational torque **Mt**	20[Nm]	Recommended load	5[kg]
Flip torque **Mb**	10[Nm]		

Quick Changer Module

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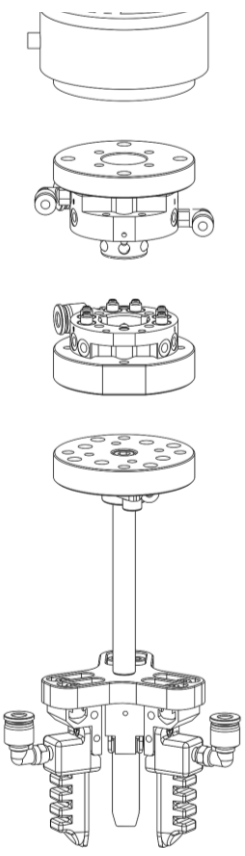
Quick change module **[QCM]** is used for quick replacement of gripper.Quick change module **[QCM]** is installed between the flange connection module **[FCM]** and robot flange, which is uncoupled into the robot side (**R side**) and the gripper side (**G side**).

QCM-02 (Pneumatic quick change module)

Features

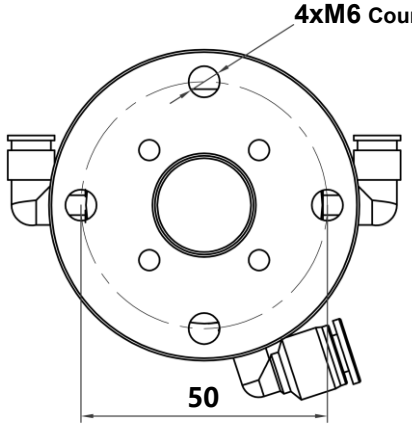
- Conform to ISO 9409-1:2004 (i.e. GB / T 14468.1:2006)
- Pneumatic control, self-locking when air cut off.
- Recommended load 5kg



QCM-02R

（ R-side, robot flange ）

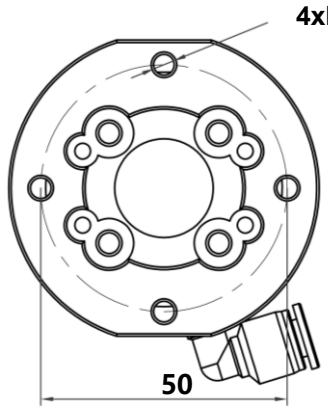
Weight 320g



QCM-02G

(G-side, gripper）

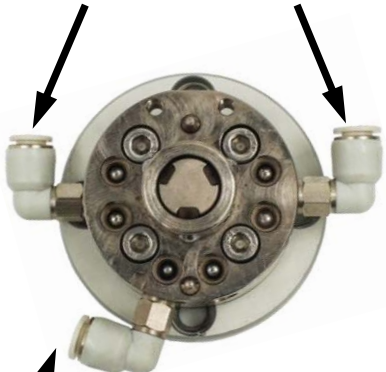
Weight 200g



Installation / control mode

- Quick change is controlled pneumaticly.
- R side air intake connected with Rochu control Unit
- G side air intake connected with Gripper
- For installation pls. watch the video

Quick changer lock/unlock air-control intake, M5+φ6 Air Pipe



QCM-02R

QCM-02G

Controll unit air intake, M5+φ6 air pipe

Gripper air intake, M5+φ6 air pipe

4

CU
Control Unit

Basic control mode page. 59

Cylinder + Finger module combination

Standard control mode page. 62

PCU page. 63
Passive Control Unit

iPCU page. 64
Integrated Passive Control Unit

Mobile Mode page. 67

ACU

Active Control Unit
page. 68

Control Unit

The Rochu control Unit [CU] provides pressure/vacuum for the soft gripper. There are three control modes, **basic control mode**, **standard control mode** and **mobile mode.** Different CU are used in different control modes.

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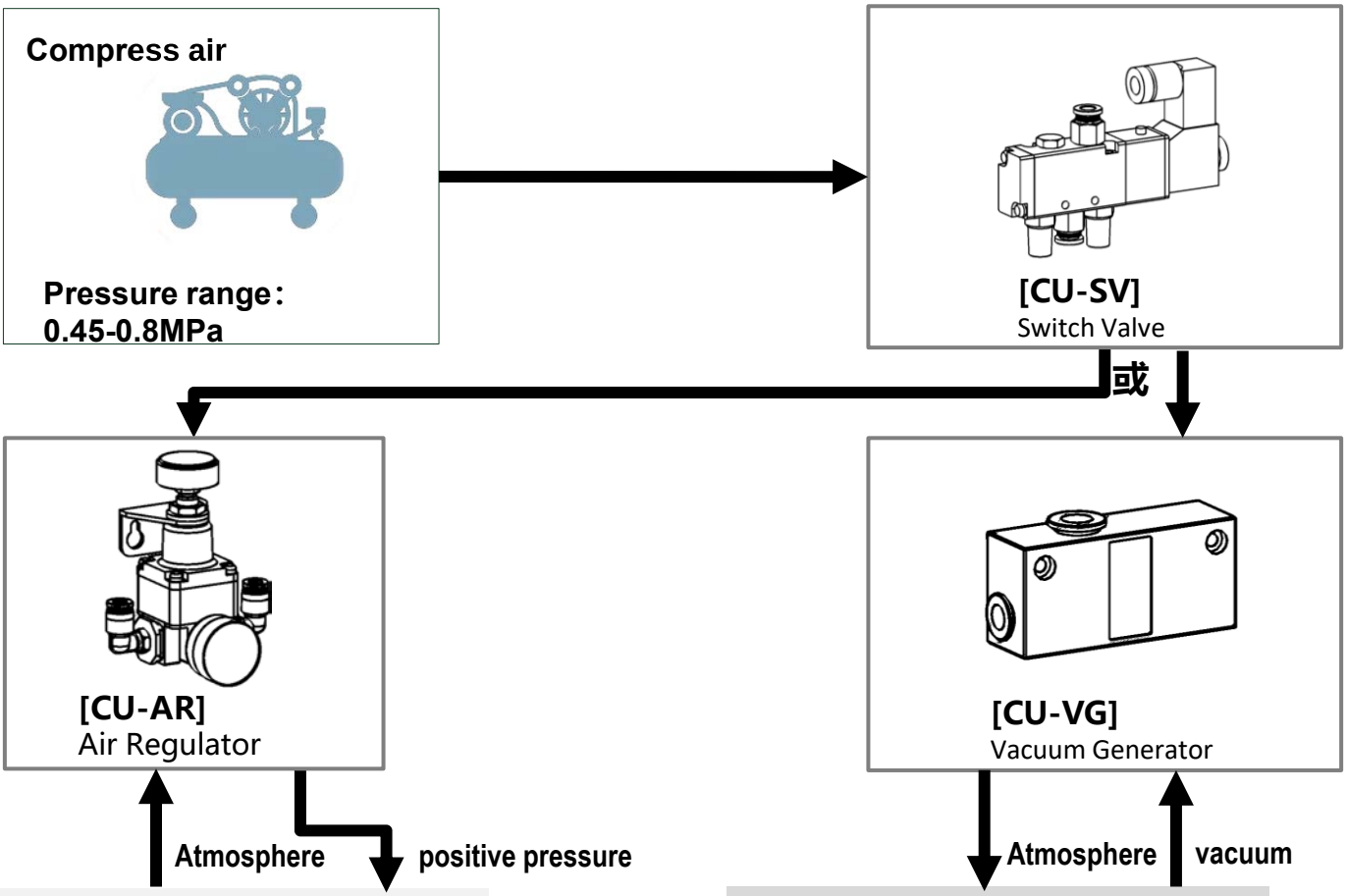
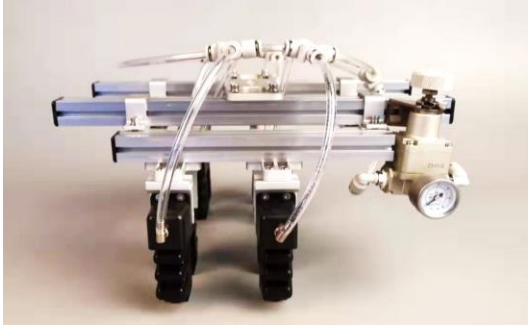
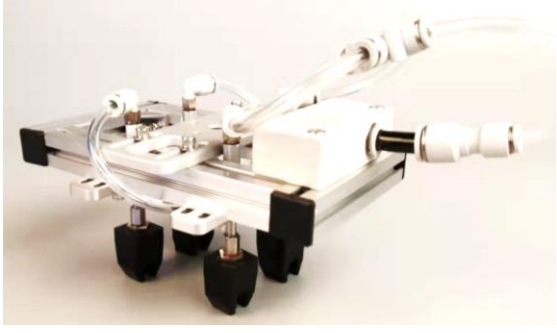
Basic control mode

- Only grab and release, no open functions.
- Easy piping, low cost







Control Unit

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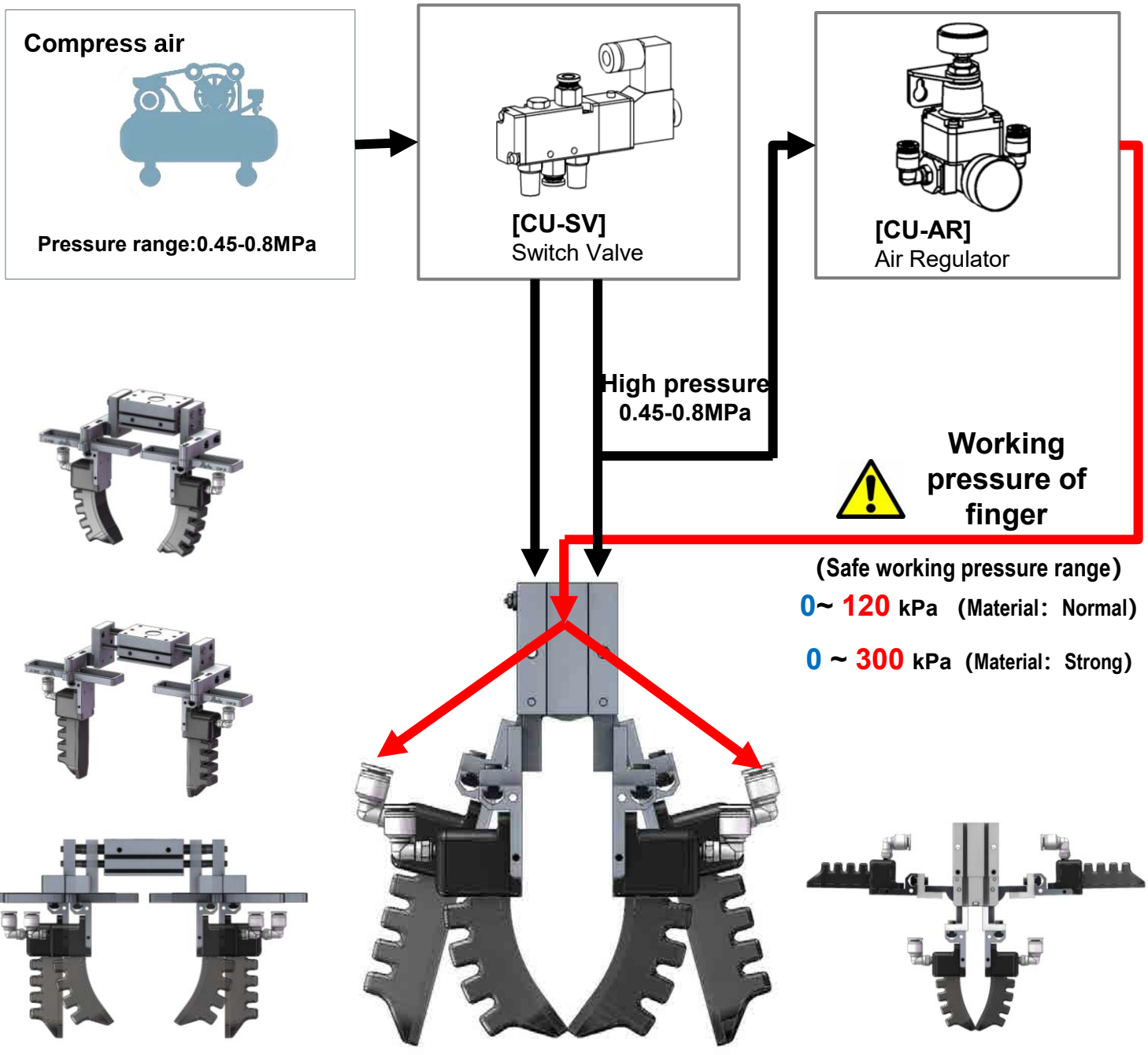
Basic control mode: Cylinder + Finger module combination

- Only grab and release status of finger, no open status
- Bigger gripping force: the maximal Gripping force can reach 70N
- Greater clamping space
- Easy piping, low cost.
- The finger module can be build on different cylinder, like parallel cylinder, Y-type cylinder or 180 degree cylinde



Parallel cylinder

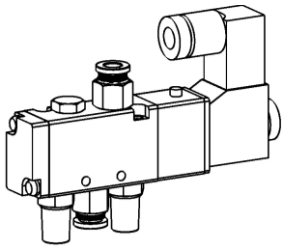
Y cylinder

180 degree cylinder

The working pressure must be kept within a safe range, overload may cause irreversible damage of the finger.

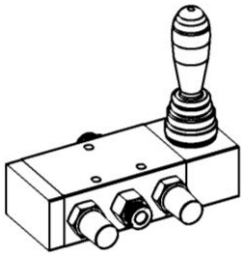
Basic control mode

CU-Parts



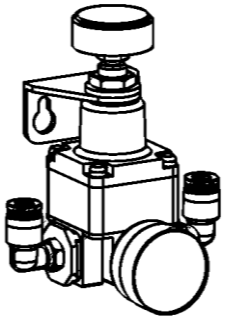
name	value
nominal voltage	24VDC±10%
rated power	2.5W
compression resistance	1.2MPa
working pressure	0.15~0.80MPa
Weight [g]	150
SIZE[mm]	100*55*18
protection level	IP65
life time	20million cycles

CU-SV01
Automatic
Switch Valve



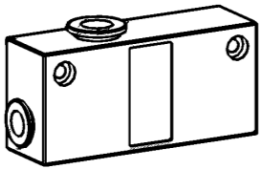
name	value
compression resistance	1.5MPa
working pressure	0~1.0MPa
size[mm]	81.5*69.5*90
life time	20million cycles

CU-SV02
manual
Switch Valve



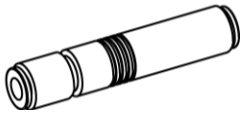
name	value
compression resistance	1.0MPa
working pressure	0.005~0.13MPa
Weight [g]	150
size[mm]	44.5*35*93

CU-AR01
Air Regulator



name	value
air supply pressure	0.45MPa
max vacuum	-88kPa
max vacuum flow[L/min]	40
air consumption[L/min]	78
size[mm]	78*23*38.5

CU-VG01
Vacuum Generator



name	value
Air supply pressure	0.45MPa
Max vacuum	-85kPa
Max vacuum flow[L/min]	12
Air consumption[L/min]	19
size[mm]	66*φ13

CU-VG02
Vacuum Generator

Standard Control Mode

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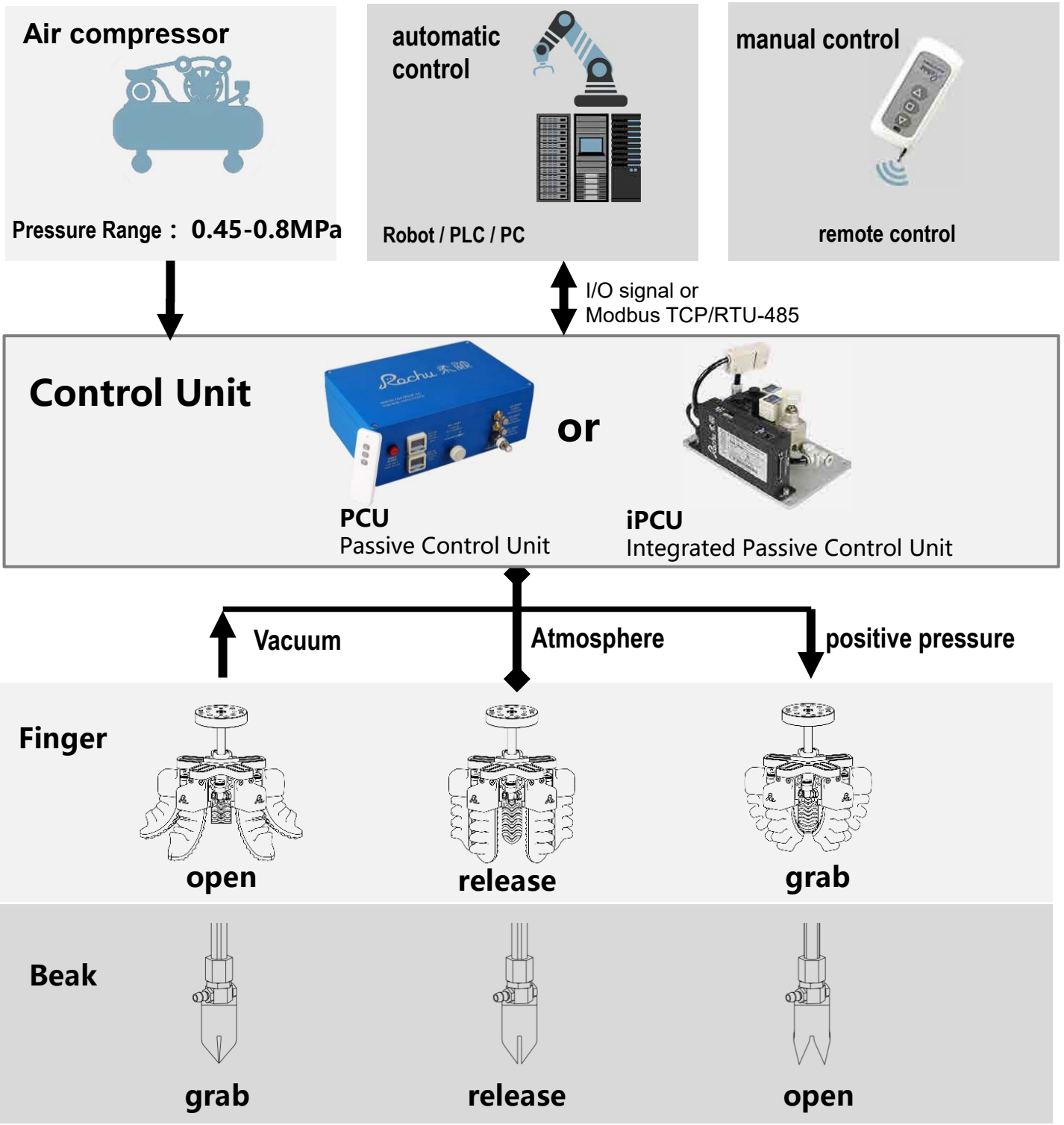
- All-in-one control unit driven by Compressed air.
- with both grab and open function and status signal feedback.
- adjustable grepping force and speed.
- Standard communication port with robot, PLC or PC



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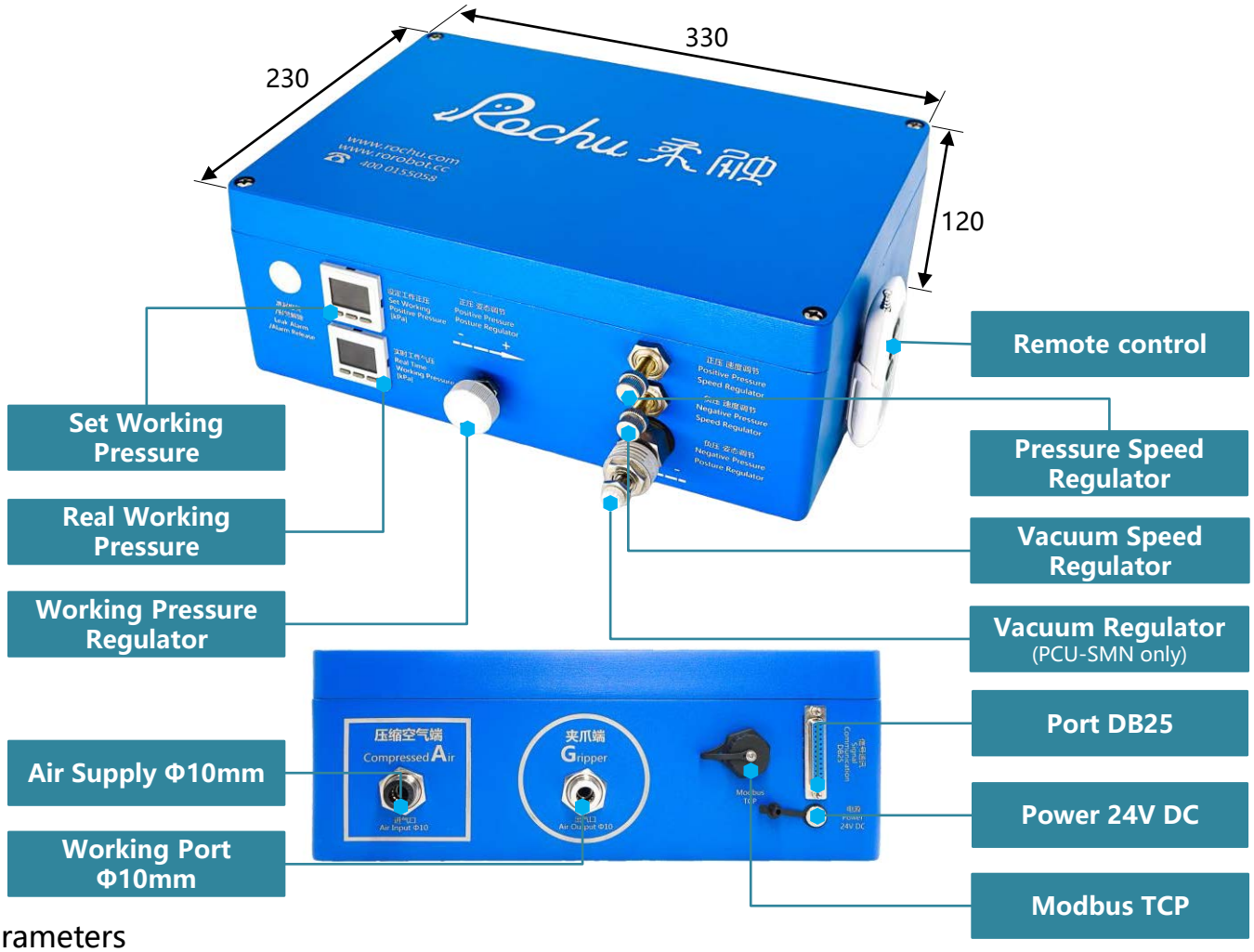
Standard Control Mode

PCU-SMN: Passive Control Unit – **Standard model**
PCU-HMN: Passive Control Unit – **High speed model**

- **PCU-SMN** is driven by compressed air. Standard communication port with robot, PLC or PC. Stable, long life time, fast speed, aluminium shell, high protection level, with CE certificate.
- **PCU-HMN** is the upgraded PCU-SMN, with larger air flow and faster speed.



Parameters

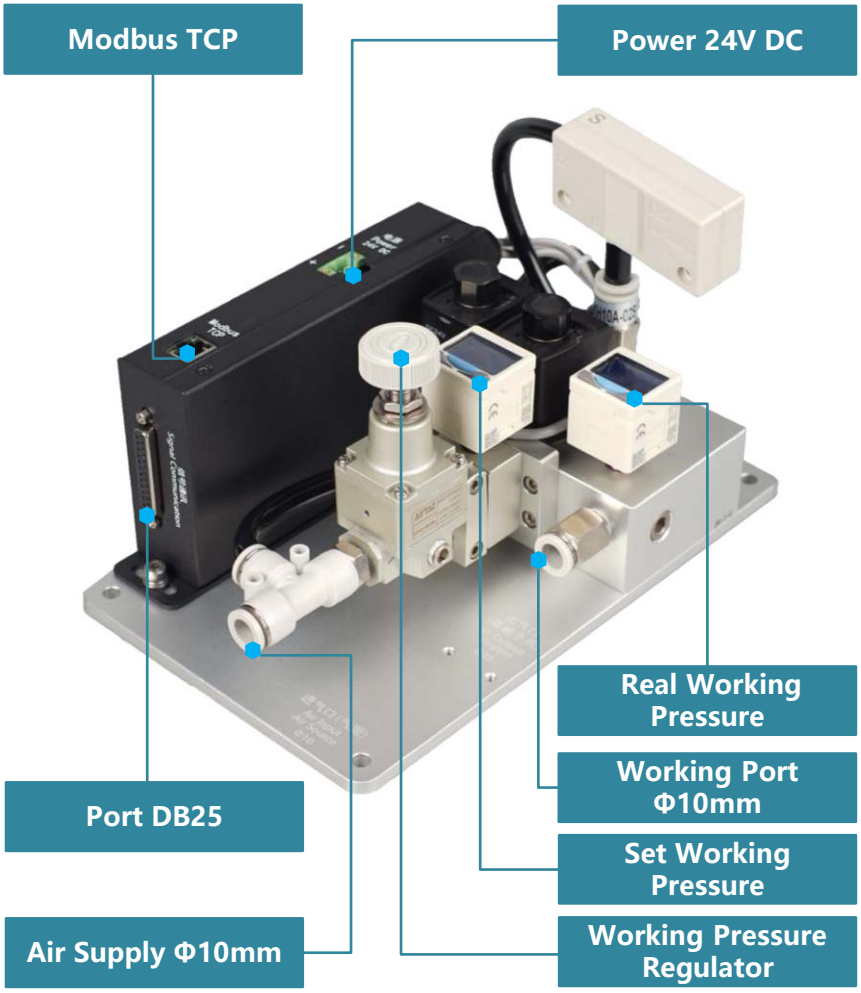
Item	Range	Item	Range
Rated voltage	24VDC±10%	Shell material	Aluminum
Rated Power	36W	Size [mm]	330*230*120
Input Air	0.45~1.0MPa Dry and clean air, Flow > 200L/min	Net Weight [kg]	5.8
Output pressure	-70~120kPa (PCU-SMN) | -70~350kPa (PCU-HMN)	Protection level	IP53
Working mode	During the reception of the signal, the gripper is continuously driven	Life time	20M cycles (one cycle time= one open + one grab)
control mode	a. I/O, 24VDC signal , DB25 Port	Feedback mode	a. I/O, Switching signal, DB25 port
	b. Modbus, TCP/RTU-485		b. Modbus, TCP/RTU-485
	c. remote controller, 315MHz		
Pressure flow	140L/min	vacuum flow	25L/min
Pressure flow*	200L/min (PCU-HMN)	vacuum flow*	40L/Min (PCU-HMN)

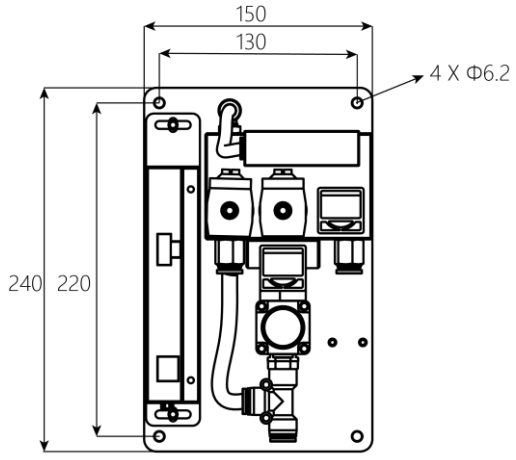
Standard Control Mode

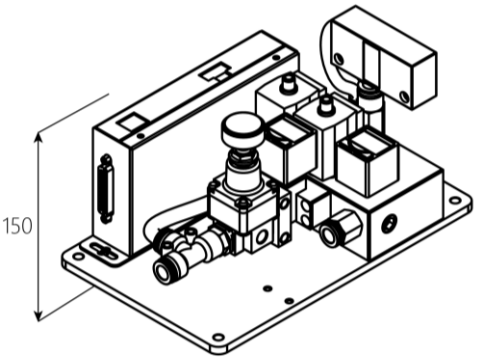
iPCU-SMN: Integrated Passive Control Unit – **Standard model**
iPCU-HMN: Integrated Passive Control Unit – **High speed model**

scan to watch videos

- **iPCU-SMN** is driven by compressed air. Standard communication port with robot, PLC or PC. Stable, long life time, fast speed, small and light, easy to be put into control cabinet or on robot shoulder
- **iPCU-HMN** is the upgraded iPCU-SMN, with larger air flow and faster speed.







Parameters

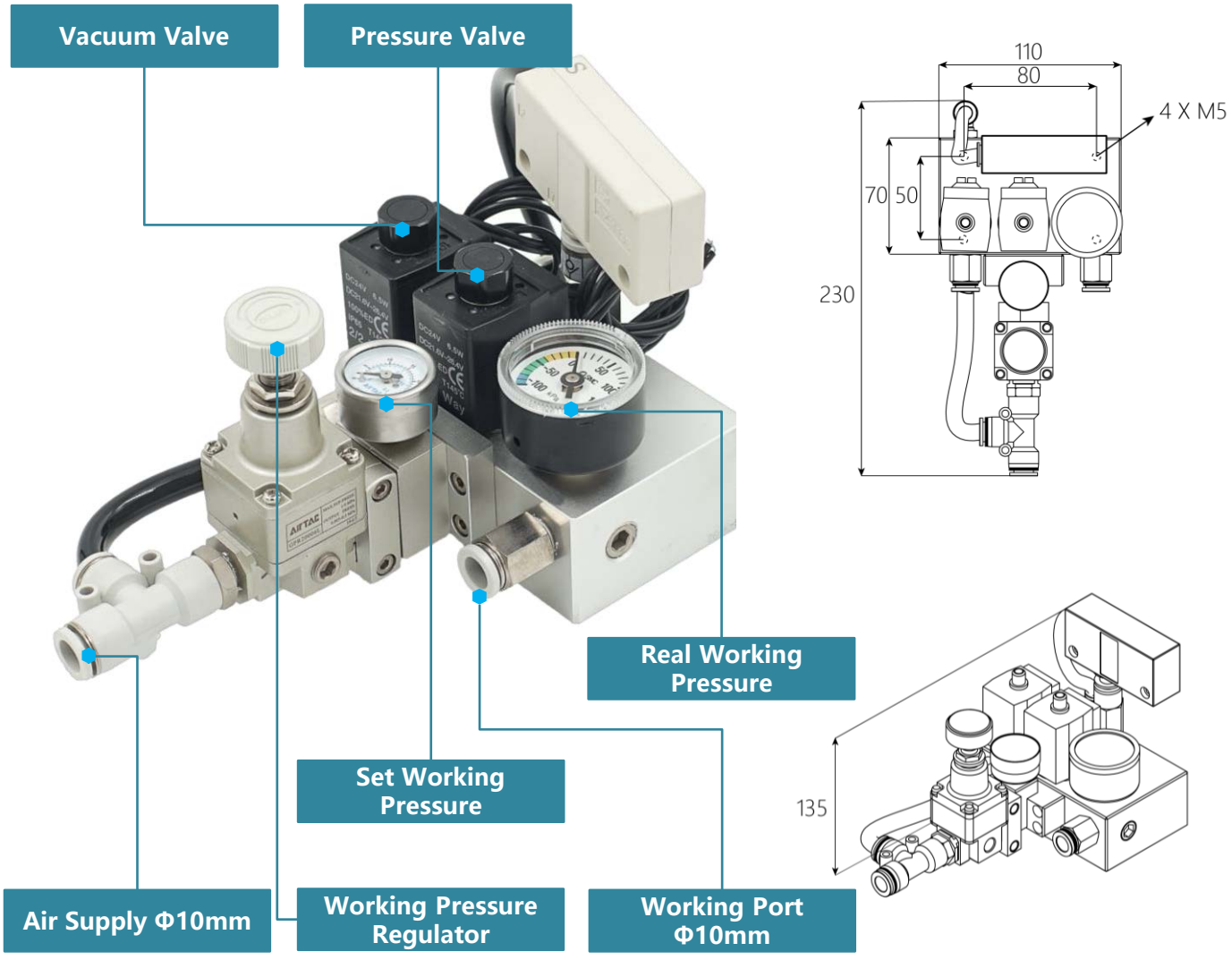
Item	Range	Item	Range
Rated voltage	24VDC±10%	Material	Aluminum alloy, PC
Rated Power	36W	Size [mm]	150*240*150
Input Air	0.45~1.0MPa Dry and clean air, Flow > 200L/min	Net Weight [kg]	2.8
Output pressure	-70~120kPa (SMN) | -70~350kPa (HMN)	Protection level	IP20
Working mode	During the reception of the signal, the gripper is continuously driven	Life time	20M cycles (one cycle time= one open + one grab)
control mode	a. I/O, 24VDC signal , DB25 Port	application environment	Avoid dust, oil and water
	b. Modbus, TCP/RTU-485	Feedback mode	a. I/O, Switching signal, DB25 Port
	c. remote controller, 315MHz		b. Modbus, TCP/RTU-485
Pressure flow	200L/min	vacuum flow	40L/min
Pressure flow*	210L/min (iPCU-HMN)	vacuum flow*	70L/Min (iPCU-HMN)

Standard Control Mode

iPCU-CMN Integrated Passive Control Unit -- **Compact model**

scan to watch videos

- **iPCU-CMN** is Is the most economical control unit. It is driven by compressed air and controlled by 24VDC., easy to be put into control cabinet or on robot shoulder.low cost solution.



Parameters

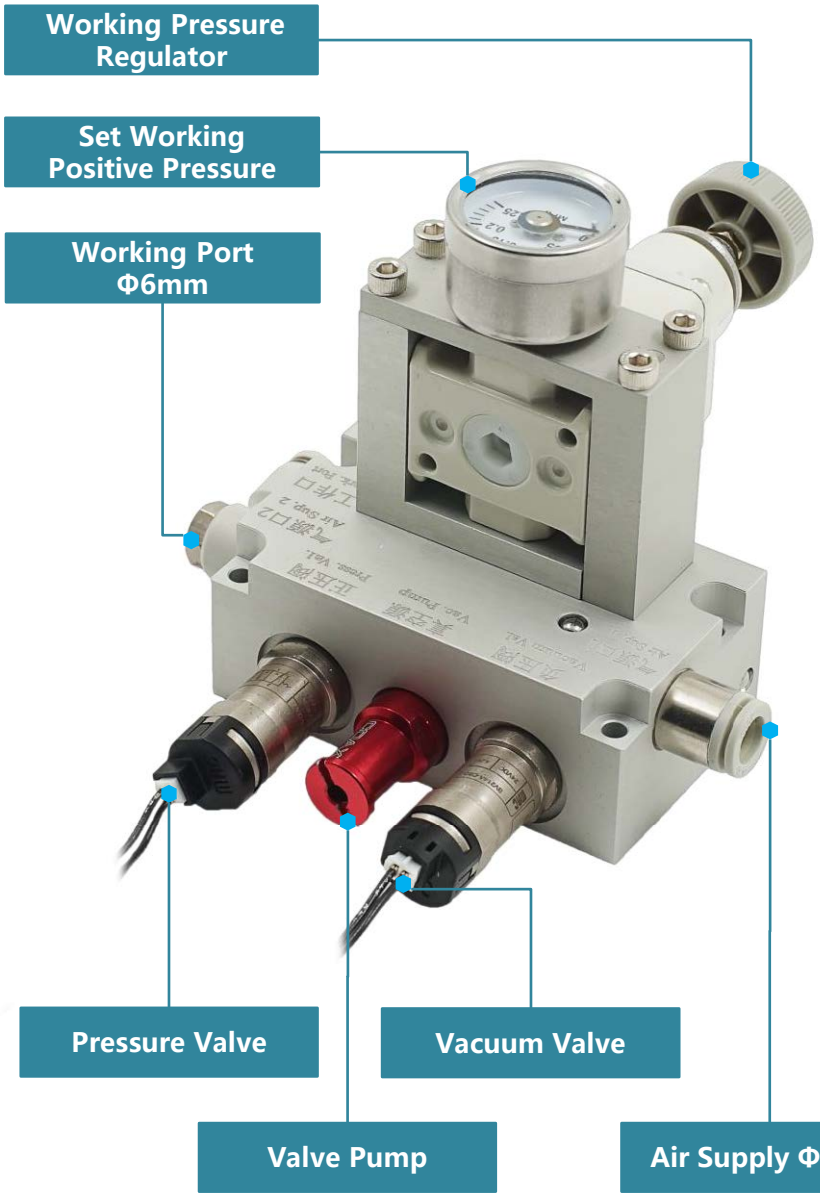
Item	Range	Item	Range
Rated voltage	24VDC	Material	Aluminum alloy, PC
Rated Power	13W	Size [mm]	110*230*135
Input Air	0.45~1.0MPa Dry and clean air, Flow > 200L/min	Net weight [kg]	1.8
Output pressure	-70~120kPa / -70~350kPa	Protection level	IP65
Pressure regulator	Manual	Life time	20M cycles (one cycle time= one open + one grab)
Pressure flow	200L/min	vacuum flow	40L/min

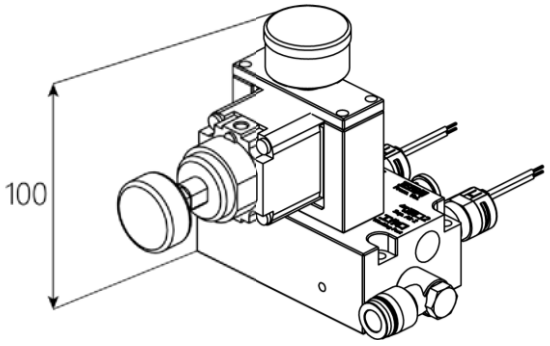
Standard Control Mode

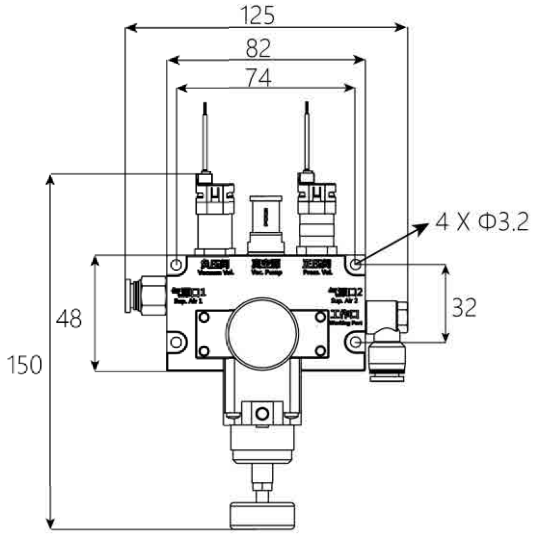
iPCU-LMN Integrated Passive Control Unit -- **Light model**

scan to watch videos

- **iPCU-LMN** is the smallest and lightest control unit. It is driven by compressed air and controlled by 24VDC., easy to be put into control cabinet or on robot shoulder.







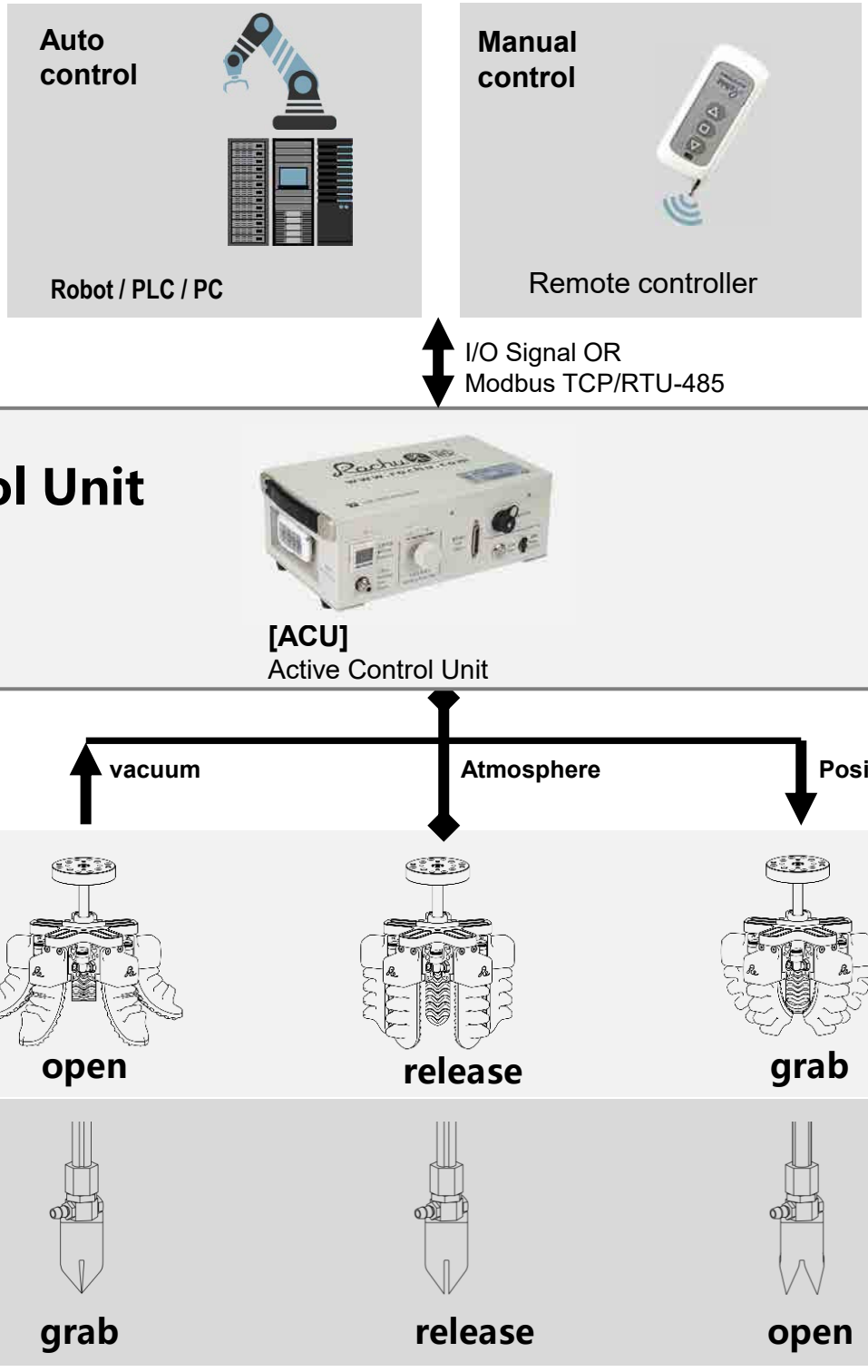
Parameters

Item	Range	Item	Range
Rated voltage	24VDC	Material	Aluminum alloy, PC
Rated Power	8W	Size [mm]	125*150*100
Input Air	0.45~1.0MPa Dry and clean air， Flow＞200L/min	Net Weight [kg]	0.7
Output pressure	-70~400kPa	Protection level	IP30
Pressure regulator	Manual	Life time	20M cycles (one cycle time= one open + one grab)
Pressure flow	90 L/min	vacuum flow	27 L/min

scan to watch videos

Mobile Mode

- All-in-one control unit with built-in air pump and lithium battery.
- Easy to use， safe and quite
- with both grab and open function and status signal feedback.
- adjustable gripping force , slow speed.
- Standard communication port with robot, PLC or PC.
- It can be used in mobile robot, desktop robot, AGV or school labs.



Mobile Mode

ACU-MMN Active Control Unit -- **Standard model**

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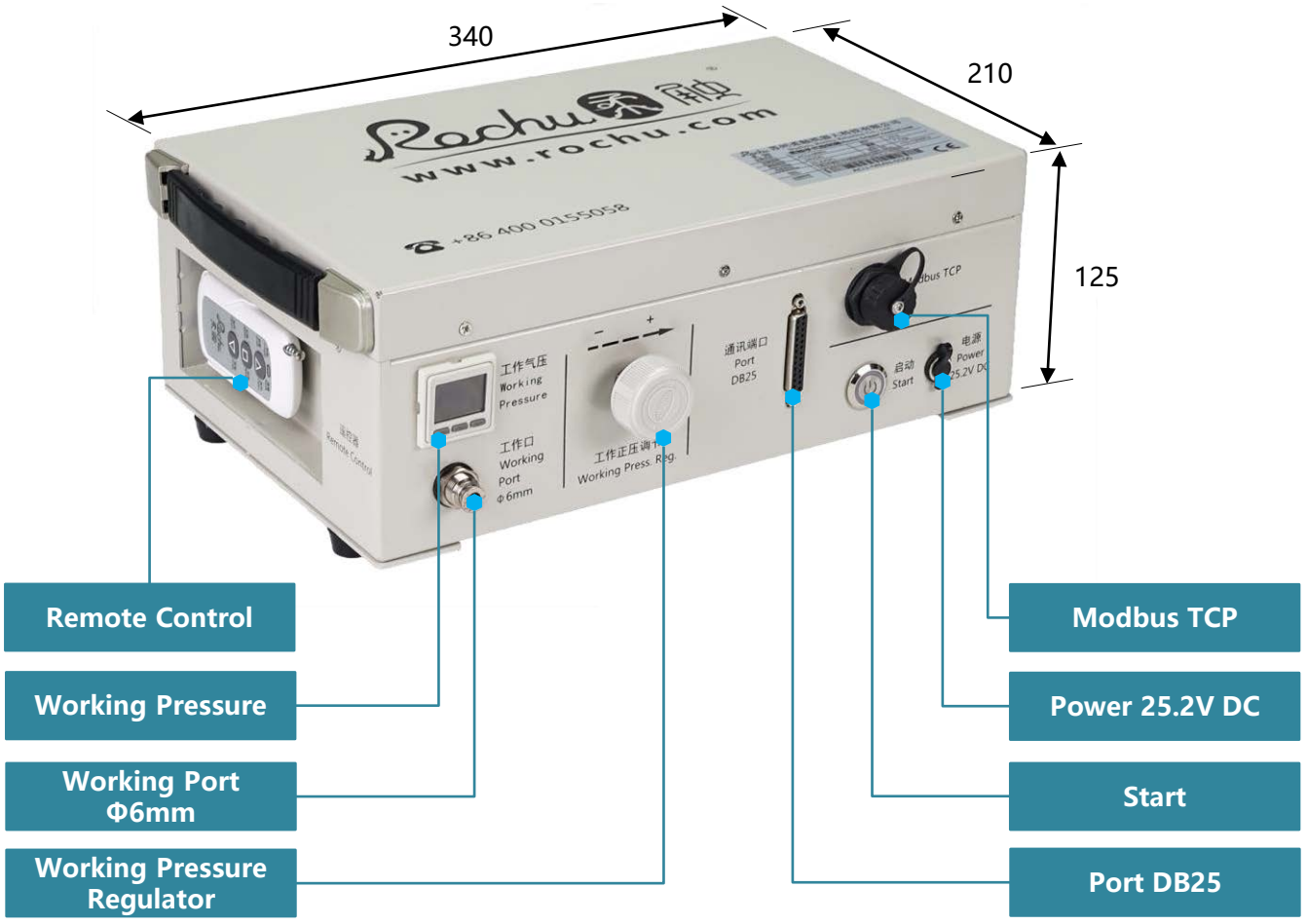
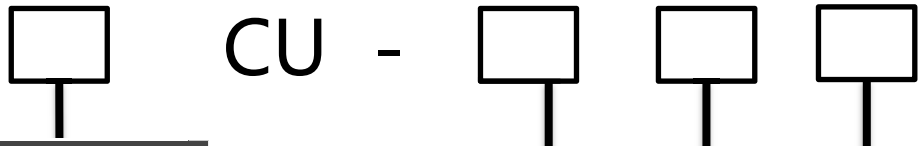


Parameters

Item	Range	Item	Range
Rated voltage	25.2V DC	Shell material	Steel
Rated Power	120W	Size [mm]	340*210*125
Output pressure	-70~120kPa	Weight [kg]	7.7
Life time	1000 hours	Protection level	IP53
Control mode	a. I/O，24VDC signal，DB25 Port	Feedback mode	a. I/O，Switching signal，DB25 Port
	b. Modbus，TCP/RTU-485		b. Modbus，TCP/RTU-485
	c. Remote control, 315MHz	Battery working time	3.5 hours
Pressure flow	8 L/min	vacuum flow	8 L/min

Control Unit

Encoding Method



Type	
Mark	content
P	passive
A	Active
iP	Integrated passive

Functional characteristics				
Mark	content	Type		
		P	A	iP
S	Standard	●		●
C	Compact			●
H	High speed	●		●
L	Light		●	●
M	Mobile		●	

Air Pressure Regulation Mode						
Mark	content	F.C.				
		M	S	H	C	L
M	Manual	●	●	●	●	●
V	Electronic, input signal 0-10V	●	●	●		
A	Electronic, input signal 4-20mA	●	●	●		

Output pressure						
Mark	content	F.C.				
		M	S	H	C	L
N	normal	●	●	●	●	●
H	High pressure		●	●	●	

Parameters

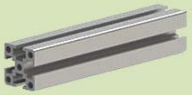
Control Unit		Function							
Model		Shell	Manual Pres. Reg.	Electronic Pres. Reg.	Remote Control	Status Feed-back	Speed Reg.	Positive pressure flow [L/min]	Vacuum flow [L/min]
common Model 【Note 1】	PCU-SMN	●	●		●	●	●	140	25
	PCU-HMN	●	●		●	●		200	40
	iPCU-SMN		●		●	●		200	45
	iPCU-HMN		●		●	●		210	70
	iPCU-CMN		●					200	45
	iPCU-LMN		●					90	27
	ACU-MMN	●	●		●	●		8	8
Special Model 【Note 2】	ACU-MVN	●		●	●	●		8	8
	ACU-LMN	●	●					2	2
	PCU-SVN	●		●	●	●		140	25
	PCU-HVN	●		●	●	●		200	65
	iPCU-SVN			●	●	●		230	50
	iPCU-HVN			●	●	●		140	70

NOTE1: Common model, standing stock.
NOTE2: Special model, please consult your local dealer for delivery time.

5

Other parts

CP *page. 71*
connection part



P *page. 72*
Profile

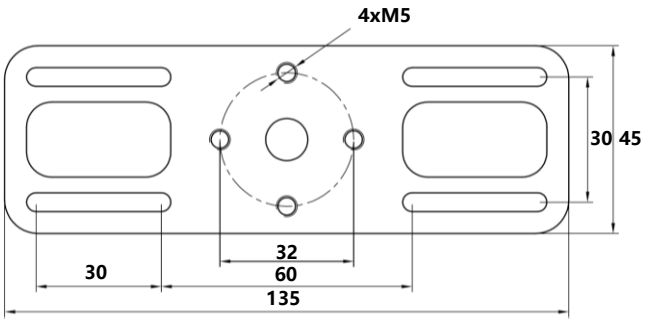
TN *page. 72*
T-Nut

BR *page. 73*
Bracket

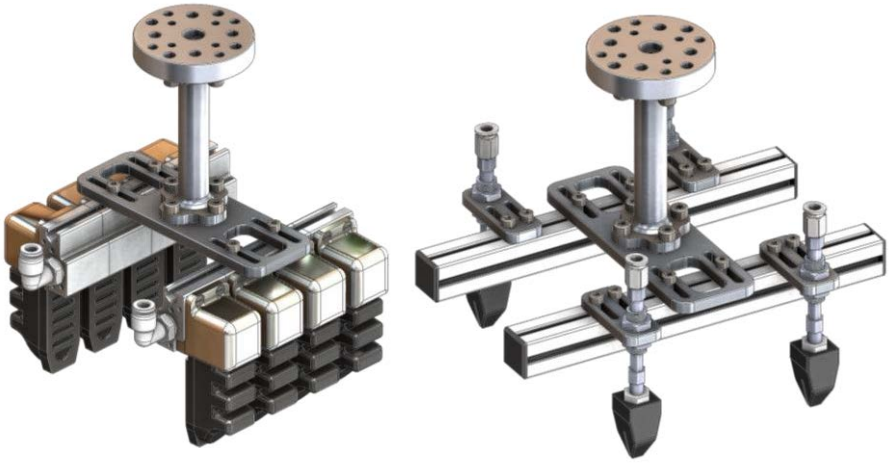
connection part

CP-04

- Connector plate for profile **[P]** or finger module **[FM]**
- Accessory package PK-CP04 included

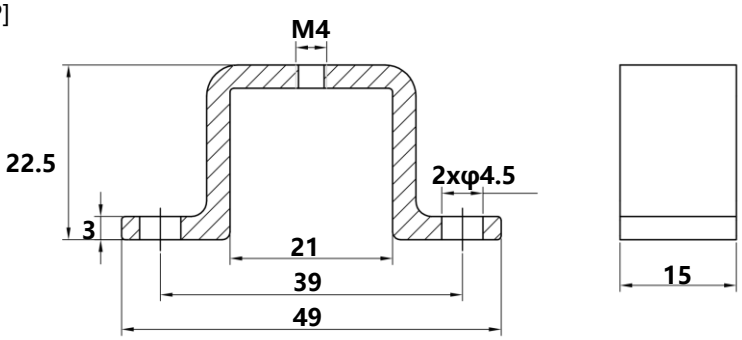


Accessory package
PK-CP04
4 x SF-081 (M4)
4 x SF-076 (M4x14)



CP-01

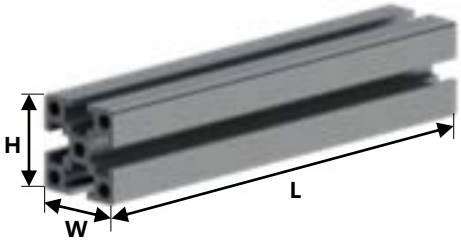
- cross fixing of two aluminium profiles [P]
- Accessory package PK-CP01 included



Accessory package
PK-CP01
2 x SF-081 (M4)
2 x SF-075 (M4x12)

P, TN

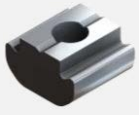
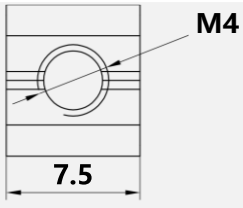
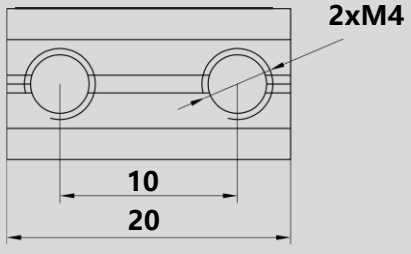
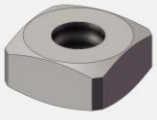
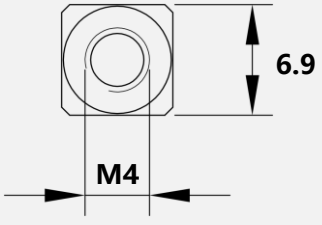
Profile

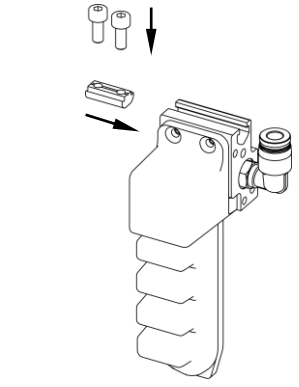


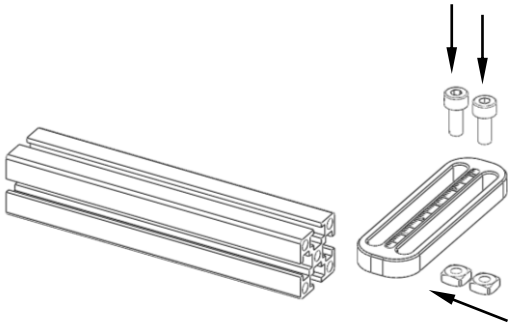
Type	L [mm]	W [mm]	H [mm]
P-20100	100	20	20
P-20150	150	20	20
P-20200	200	20	20
P-20300	300	20	20
P-20400	400	20	20
P-20500	500	20	20

Nut

T-nut [TN] is a standard nut used to fix the Rochu finger module [FM], the sliding mounting plate [SMP] and the Aluminium Profile [P].

Item	3D Drawing	Dimension drawing
TN-01		
TN-03		
SF-81		

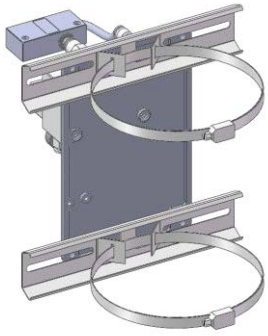




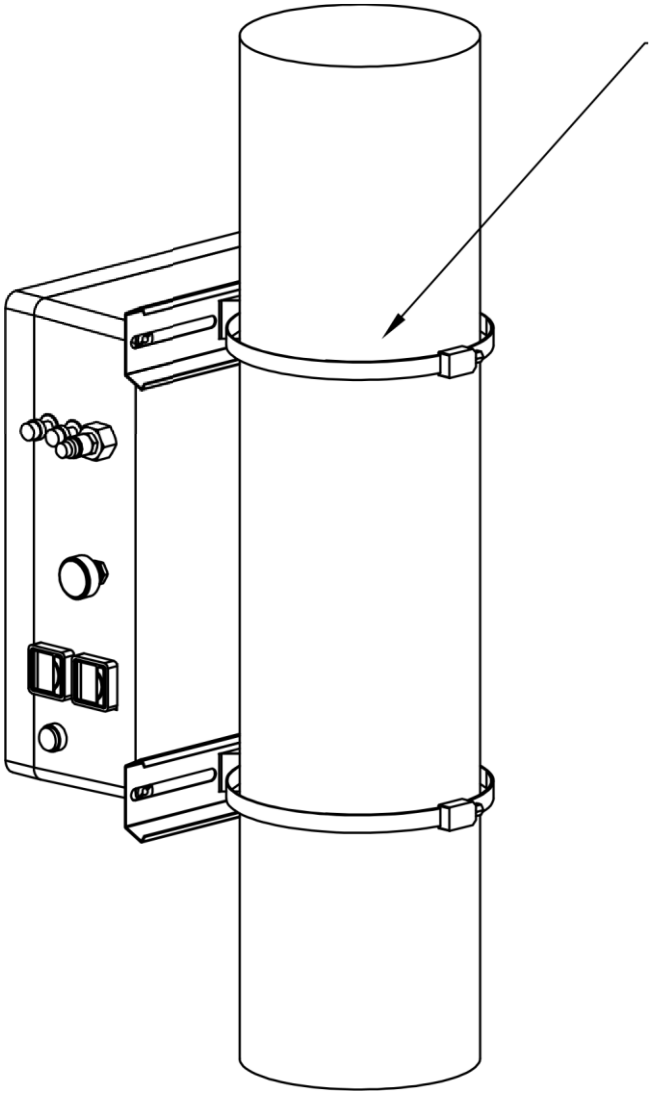
Bracket

BR-06 Bracket

It can be used to fix the PCU control unit or iPCU control unit on circular or square pipe



For round tube φ 50---180mm,
For square tube circumference 140-500mm



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