Precision transmission components
Quality Innovation Service

SFT

SFPG Series Air Gripper

Linear Cross Roller Guide
High Rigidity | High Stability | High Accuracy

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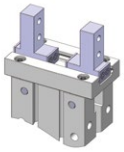
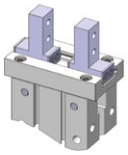
SFPG Series Air Gripper

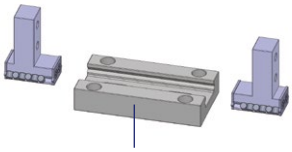
VARIOUS FINGER TYPES
Tube ID. (Double acting)
10, 16, 20, 25

Available FINGER TYPES
Standard(W) Narrrow(N)
To meet the usage requirements under various working conditions.


Standard(W)

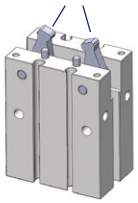

Narrow(N)

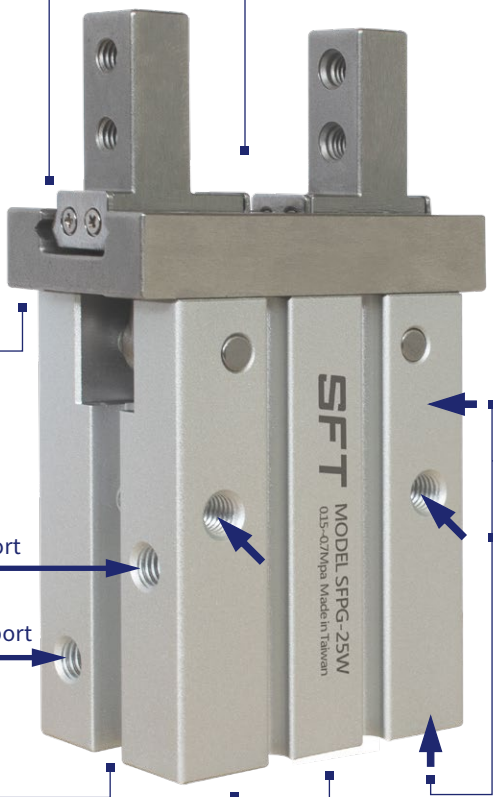
Linear cross roller bearing guide
SFPG air grippers adopt an integrated cross-roller linear guide design. This make the gripper with high rigidity, stability and accuracy.


Linear cross roller guide finger

Locating pin
The bottom of the linear guide is equipped with locating pins to prevent deviation between the guide and the body.

Locating pins prevent deviation between the guide and the body

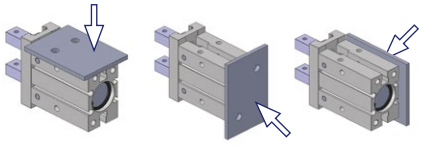




Finger closing port

Finger opening port

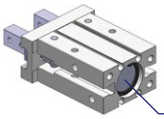
Fixed installation on three sides
Both the side and bottom have mounting holes,easy for installation and use under different conditions.


Side Bottom Front

Square switch mounting groove
Sensor switch No.: WA11046

Circular sensor mounting groove
Sensor switch No.: ALA-T93S

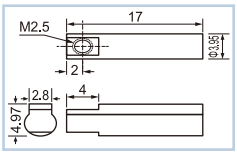
Comes with a built-in fixed center positioning hole
Enhancing the fixed accuracy.
Improving the consistency of repetitive disassembly and positioning.


Positioning Hole

Tube ID (mm)	Style	Operation	Operating pressure range / Double Acting	Operating Temperature	Lubricator	Repeatability (mm)	Max. operating frequency	Installation	Port size	Sensor switch
10	Double acting	Air Filter mesh with 40μm up	0.2~0.7 MPa (28~100 psi) (2.0~7.0 bar)	-20~70°C	No need	±0.01	180 (c.p.m)	1. Side 2. Front tapped hole 3. Front through hole 4. Bottom	M3 X 0.5	WA11046 (Side)
16			0.15~0.7 MPa (22~100 psi) (1.5~7.0 bar)						M5 X 0.8	ALA-T93S (Front) WA11046 (Side)
20										
25										

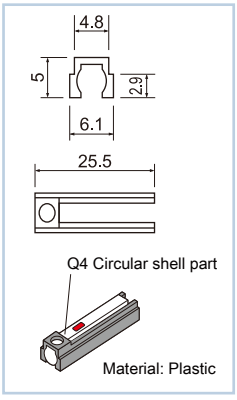
	Bore Size	Double acting	Finger type	Magnetic non-contact switch sensor	Sensor switch length	Number of Sensor switch
SFPG	20	D	W	ALA-T93S	L2	S1
	10		W: Standard	16/20/25 type Front installation	L2 : 2M	S1 : 1 piece
	16		N: Narrow	WA11046	L3 : 3M	S2 : 2 pieces
	20			10/16/20/25 type Side installation	LN : Non	SN : Non
	25			N : Non		

ALA-T93S



Front installation

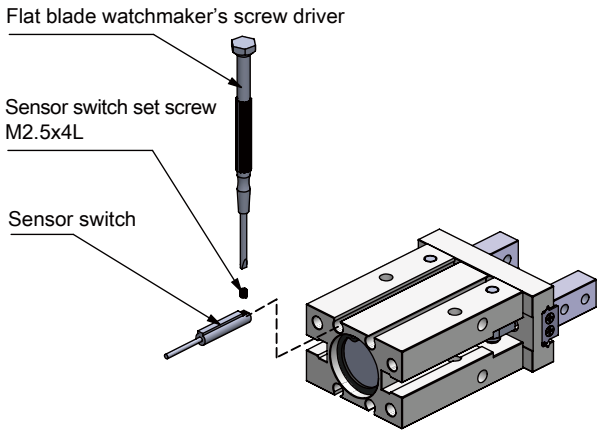
WA11046



Side installation

Installation of sensor switch

When securing the sensor switch , please insert it in the direction indicated in below illustration, place it in position, and then tighten the screw on the sensor with a a flat blade watchmaker's screwdriver.



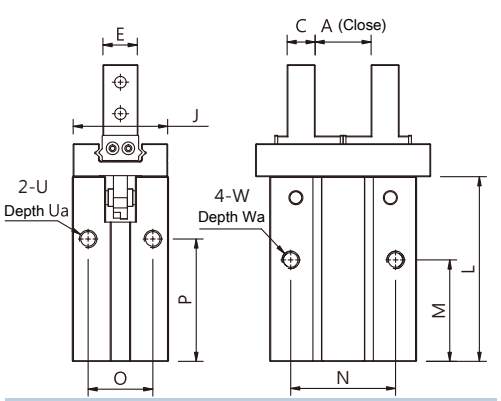
Air Gripper Comparison Table

SFT	SMC	Mindman	AirTAC
SFPG-16D (Cross Roller)	**MHZ2-16D**(Ball)	**MCHC-16D**(Ball)	**HFZ-16D**(Ball) **HFK-16D**(Roller)
SFPG-20D (Cross Roller)	**MHZ2-20D**(Ball)	**MCHC-20D**(Ball)	**HFZ-20D**(Ball) **HFK-20D**(Roller)

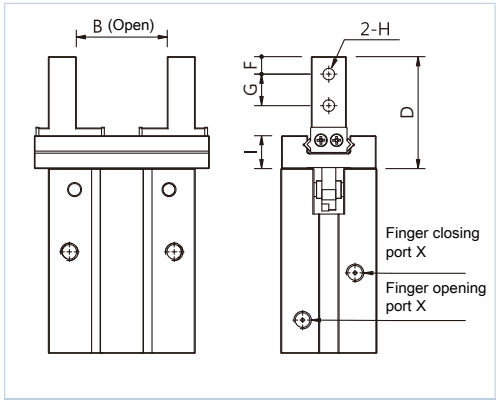
Features

1. The gripper utilizes crossed roller guide rails, providing better rigidity and higher precision.
2. Gripper lifespan test for 5 million opening and closing cycles.
3. German Klüber lubrication.
4. Crossed Rollers made in Japan.

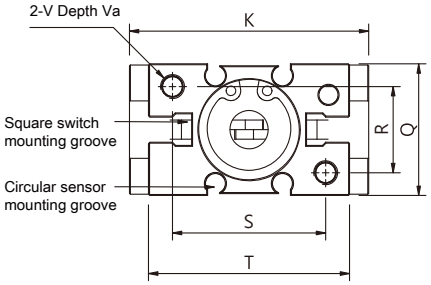
SFPG series Air Gripper

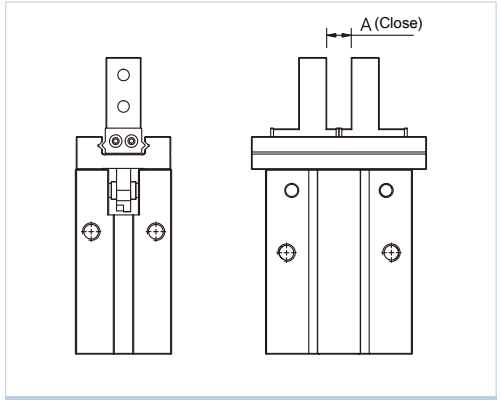


Standard W-Closing

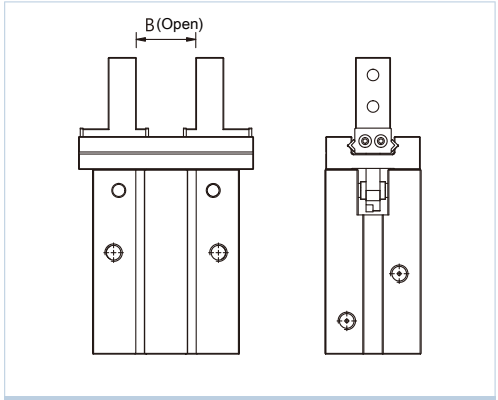


Standard W-Opening

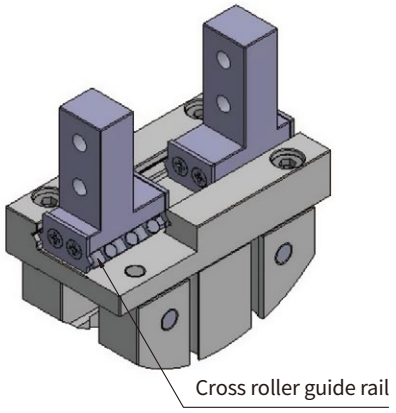




Narrow N-Closing



Narrow N-Opening



Bore Size	A	B	C	D	E	F	G	H	I	J	K	L	M	N	O	P
SFPG10W	10.5 $^{+0}_{-1}$	16.5 $^{+2}_{+0}$	4	19	5	3	5.7	M2.5	6	16	29	37.8	23	16	11.5	27
SFPG10N	6 $^{+0}_{-1}$	10 $^{+2}_{+0}$	4	19	5	3	5.7	M2.5	6	16	29	37.8	23	16	11.5	27
SFPG16W	16 $^{+0}_{-1}$	21 $^{+2}_{+0}$	5	24.8	8	4	7	M3	7.5	23	38	42.5	24.5	24	16	30
SFPG16N	6.5 $^{+0}_{-1}$	12 $^{+2}_{+0}$	5	24.8	8	4	7	M3	7.5	23	38	42.5	24.5	24	16	30
SFPG20W	16.5 $^{+0}_{-1}$	26.5 $^{+2}_{+0}$	8	32	10	5	9	M4	9.4	27	50	52.8	29	30	18.5	35
SFPG20N	7 $^{+0}_{-1}$	17 $^{+2}_{+0}$	8	32	10	5	9	M4	9.4	27	50	52.8	29	30	18.5	35
SFPG25W	19.5 $^{+0}_{-1}$	33.5 $^{+2}_{+0}$	10	39	12	6	12	M5	11	33	71	64	30	36	22	36.5
SFPG25N	9 $^{+0}_{-1}$	23 $^{+2}_{+0}$	10	39	12	6	12	M5	11	33	71	64	30	36	22	36.5

Bore Size	Q	R	S	T	U	Ua	V	Va	W	Wa	X	Weight/g	Acting type	External clamping Force(N)	Internal clamping Force(N)	Lubricatior
SFPG10W	16.5	12	19	23	M3	6	M3	6	M3	6	M3	56	Double acting	16	10	Few/ Not need
SFPG10N	16.5	12	19	23	M3	6	M3	6	M3	6	M3	56	Double acting	16	10	Few/ Not need
SFPG16W	23.5	15	22	30.5	M4	6	M4	8	M4	8	M5	113	Double acting	44	33	Few/ Not need
SFPG16N	23.5	15	22	30.5	M4	6	M4	8	M4	8	M5	113	Double acting	44	33	Few/ Not need
SFPG20W	27.5	18	32	42	M5	9	M5	11	M5	11	M5	228	Double acting	65	42	Few/ Not need
SFPG20N	27.5	18	32	42	M5	9	M5	11	M5	11	M5	228	Double acting	65	42	Few/ Not need
SFPG25W	33.5	22	40	52	M6	10	M6	12	M6	12	M5	420	Double acting	102	63	Few/ Not need
SFPG25N	33.5	22	40	52	M6	10	M6	12	M6	12	M5	420	Double acting	102	63	Few/ Not need

Bore Size	Round sensor switch	Square sensor switch	Body	Rod cover	Gasket	Guide	Gripper	Actuating lever	Rolling element	Repeatability	Working place temperature	Operating frequency	Operating presssure range	Max. operating presssure range
SFPG10W	NON	6.3*4mm	Aluminum alloy	Stainless Steel	NBR	SUS	SUS	SUS	Roller SUJ2	0.01mm	0℃ ~50℃	150/S	1~7kgf/cm² 0.1~0.7MPa	7kgf/cm²
SFPG10N														
SFPG16W	Ø4													
SFPG16N														
SFPG20W														
SFPG20N														
SFPG25W														
SFPG25N														

Check the conditions → **Calculate the required gripping clamping force** → **Select the model based on the clamping force diagram**

Workpiece mass : 0.1kg

Clamping method: External diameter clamping

Clamping point：30mm

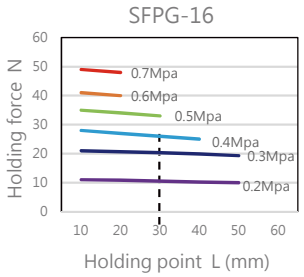
Operating pressure: 0.4 Mpa

Reference for machine selection based on the workpiece mass

Varies according to accessories , the workpiece friction coefficient and shape .
Please select obtained capacity that is 10 to 20 times the weight of the workpiece.
Additionally, during the transportation of the workpiece when there is a high acceleration and impact force . Much more sufficient safety factor is necessary.
EX: Clamping force need to be more than 20 times the weight of the workpiece.
greater than the workpiece weight:
Requested clamping force= 0.1 kg x 20 x 9.8 m/s2 ≈ 19.6 N or more.

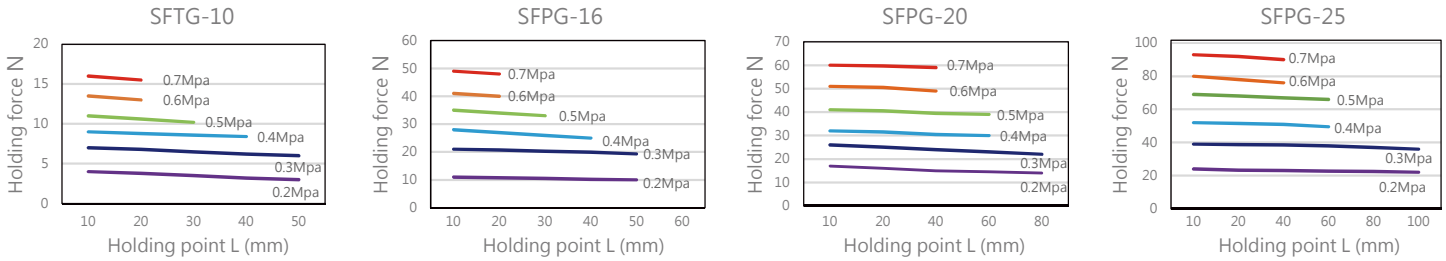
SFPG-16D

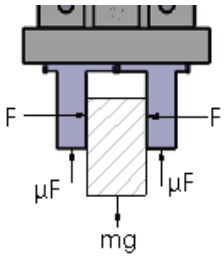
External diameter clamping force

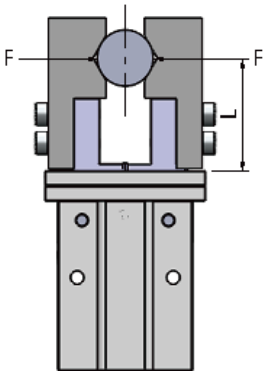


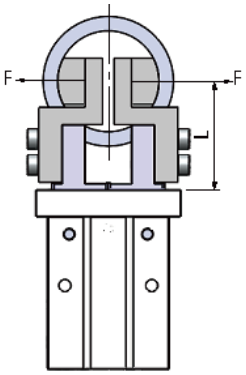
According to clamping distance L=at 30 mm and 0.4 MPa, the clamping force is determined to be 24 N.
The clamping force is 24.5 times the mass of the workpiece, exceeding the satisfies a gripping force setting value of 20 times or more.

Holding Force









Clamping the workpiece as shown in the diagram

F : Clamping force [N]
μ : Coefficient of friction between the gripper and Workpiece
m : Workpiece mass (kg)
g : Acceleration (=9.8m)/s²
mg : Workpiece weight (N)

The conditions under which the workpiece will not drop are :

$$2 \times \mu F > mg \quad (2 : \text{Number of fingers})$$

$$\text{Therefore } F > \frac{mg}{2 \times \mu}$$

$$F = \frac{mg}{2 \times \mu} \times a \quad (\text{Safety factor})$$

μ=0.2	μ=0.1
$F = \frac{mg}{2 \times 0.2} \times 4$ $= 10 \times mg$	$F = \frac{mg}{2 \times 0.1} \times 4$ $= 20 \times mg$
10 x Workpiece weight	20 x Workpiece weight

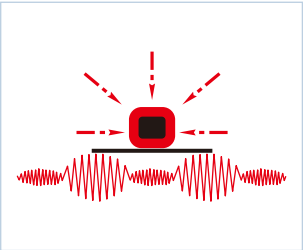
* 1.For safety, please choose a machine with a workload 10 to 20 times the weight of the workpiece when the coefficient of friction (μ) is greater than 0.2.
* 2. In cases of higher acceleration or usage with impact conditions, it's also necessary to allocate a larger safety factor.

Solid state electronic auto switch

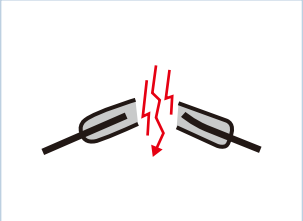
Features :

1. The two-wire parallel connection can replace the original sensor switch with the same wiring method.
2. No-contact solid-state electronic sensors utilize chip-based sensing without the need for electrical connections and are compatible with the entire 3 range of pneumatic grippers, eliminating the need for contact points.
3. Sensor switch with long lifespan, impact-resistant, and withstand vibrations. This is in contrast to glasses type , which are more prone to breakage.
4. The sensing magnetic field range covers the entire spectrum from 25 to 500 gauss, ensuring single-touch and error-free operation with high sensitivity and high repeatability. There are no issues with secondary induction or missed detections.
5. It can replace 3-wire NPN and PNP sensors.

Model	ALA-T93S	ALA-T93L (For light current)
Cable type	2-wire	
Switch	Normally Close	
Connection type	Electrical auto switches	
Loading capacity	24VDC Reload,PLC	IC circuit
Voltage range	24VDC (6-30V DC)	24VDC (20-30V DC)
Current range	100mA max.	
Connection capacity	0.6W max.	
Power consumption	0.02 m	
Voltage drop	4V max.	
Leakage current	0.65mA max.	0.135mA max.
Impact resistance	50G	
Vibration resistance	9G	
Allowable temperature range	-10°C~+70°C	
Cable type	2.9Ø, 2C, PVC	
Cable length	2m, 3m, 5m	
Light on	Auto switch to turn ON (Light ON)	
Insulation grade	IEC 529 IP67	
Light color	Red light	
Weight	12.8g (2m Cable) / 23.8g (3m Cable)	
Circuit protection	Surge protection Device	

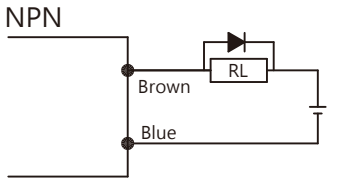


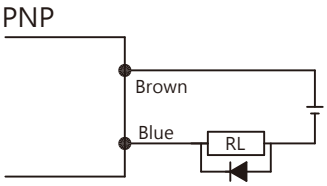
Solid state electronic auto switch



Fragile glasses tube switch

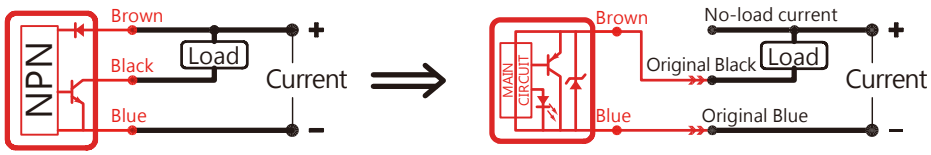
Wiring diagram:





3-Wire combine into 2-Wire

NPN :



PNP :