

More precision



We have added advanced positioning precision and high rigidity to the pneumatic actuator.

The Koganei Alpha Series further enhances the drive module concept, supporting superior applications and labor savings in FA line design and manufacturing with higher performance.

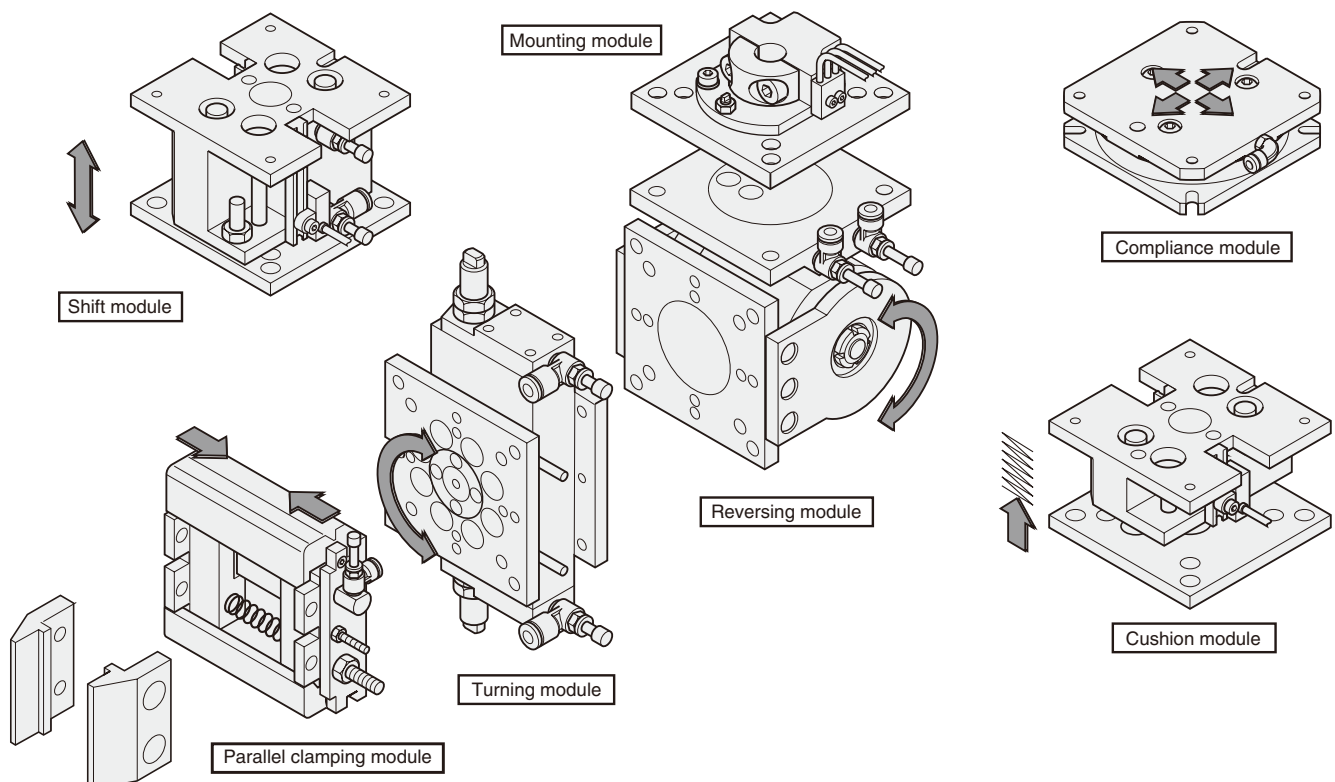
Systematic Handling Module

The handling module has mounting, turning, linear motion, positioning error correction, and gripping functions, which serve to shorten the design time regarding the material handling process, to reduce costs, and to deliver performance for the early set-up of automated lines.

Standardized modules

The handling operation is classified, standardized, and modularized into 7 functions.

As a result, designers can immediately complete the handling unit by combining modules organized by functions.

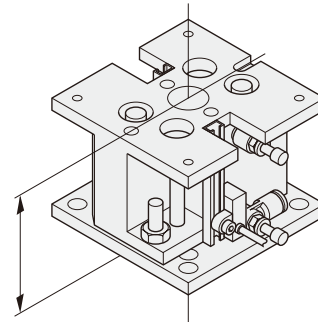


Assure high accuracy

High machining and assembly precision of the module ensure high accuracy in single-unit use or combination use.

Repeatability in each module	
Turning module	$\pm 0.03^\circ$
Reversing module	$\pm 0.03^\circ$
Shift module	$\pm 0.05\text{mm}$ [$\pm 0.0020\text{in.}$]
Cushion module	$\pm 0.05\text{mm}$ [$\pm 0.0020\text{in.}$]
Compliance module	$\pm 0.02\text{mm}$ [$\pm 0.0008\text{in.}$]
Parallel clamping module	$\pm 0.01\text{mm}$ [$\pm 0.0004\text{in.}$]

- Tolerance of the contact surface parallelism between mounting surface and mounted surface
= S : 0.04, M : 0.05, L : 0.06



- Tolerance of the coaxiality with the hypothetical center, as restricted by the locating pin = S : $\phi 0.04$, M : $\phi 0.05$, L : $\phi 0.06$

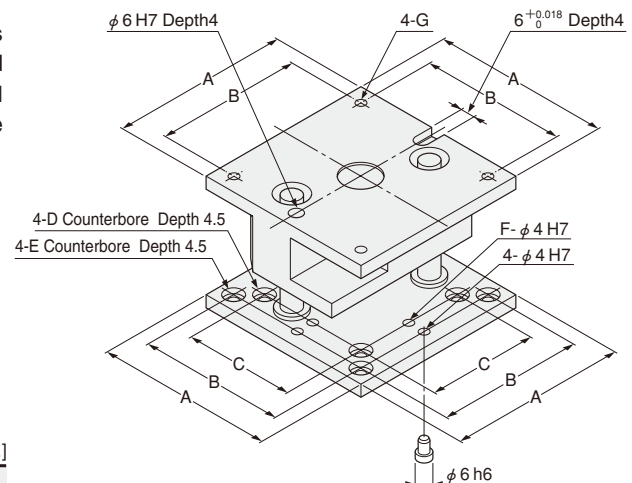
Commonality of mounting pitch

● Full choice mounting method

The Systematic Handling Module is a standard module that provides handling operations in the precision assembly field by 7 classified functions, for a complete series. Moreover, the module uses the full choice mounting method that makes any combinations possible while keeping the excellent positioning accuracy.

Features

- ① Common mounting dimensions for each size
- ② Bottom surfaces can be used to mount the same size or one smaller sized module.
- ③ To ensure accurate positioning of the handling modules, there are dowel pin holes on contacted surface of each modules, and locating pins are available (2 locating pins supplied with each module, with the exception of the parallel clamping module).



mm [in.]							
	A	B	C	D	E	F	G
S size	60 [2.362]	50 [1.969]	—	—	M4	—	M4
M size	80 [3.150]	65 [2.559]	50 [1.969]	M4		4 [0.157]	M5
L size	100 [3.937]	85 [3.346]	65 [2.559]				

Optimum load mass

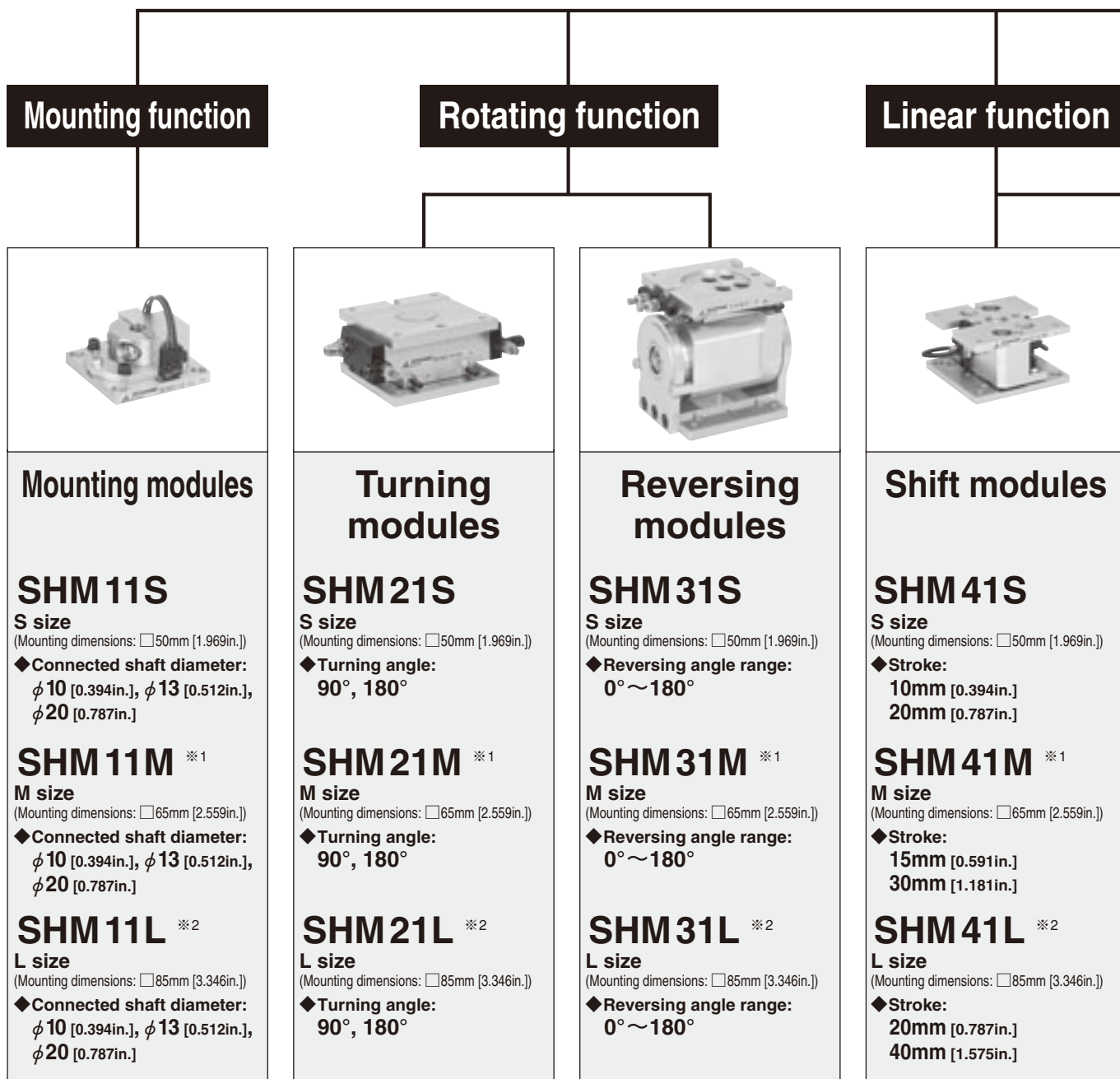
For the Systematic Handling Module, use the load masses shown below as a guide.

S size 250g [8.82oz.]
M size 500g [17.64oz.]
L size 1000g [35.27oz.]

- To calculate the maximum load mass, use the formula below.

Robot load capacity	—	Hypothetical mass with all connected modules	—	Load ratio	=	Load mass
S size : 3kg [6.6lb.] M size : 6kg [13.2lb.] L size : 9kg [19.8lb.]		S size : 1.5kg [3.3lb.] M size : 3kg [6.6lb.] L size : 5kg [11.0lb.]				S size : 250g [8.82oz.] M size : 500g [17.64oz.] L size : 1000g [35.27oz.]

The leading runner on the automated line, the Handling Module
This will be the STANDARD from now on.



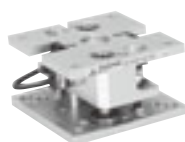
※1 : In addition to M size, S size mountings are also possible.

※2 : In addition to L size, M size mountings are also possible.

Systematic HandlingModule

Positioning error correction function

Gripping function



Cushion modules

SHM51S

S size
(Mounting dimensions: □50mm [1.969in.])

◆ **Stroke:**
5mm [0.197in.]
10mm [0.394in.]

SHM51M ※1

M size
(Mounting dimensions: □65mm [2.559in.])

◆ **Stroke:**
8mm [0.315in.]
15mm [0.591in.]

SHM51L ※2

L size
(Mounting dimensions: □85mm [3.346in.])

◆ **Stroke:**
10mm [0.394in.]
20mm [0.787in.]



Compliance modules

SHM61S, 62S

S size
(Mounting dimensions: □50mm [1.969in.])

SHM61M, 62M

M size
(Mounting dimensions: □65mm [2.559in.])

SHM61L, 62L

L size
(Mounting dimensions: □85mm [3.346in.])



Parallel clamping modules

SHM71S

S size
(Mounting dimensions: □50mm [1.969in.])

◆ **Gripping width:**
42mm [1.65in.]

SHM71M

M size
(Mounting dimensions: □65mm [2.559in.])

◆ **Gripping width:**
57mm [2.24in.]

SHM71L

L size
(Mounting dimensions: □85mm [3.346in.])

◆ **Gripping width:**
73mm [2.87in.]



Parallel clamping long modules

SHM72S

S size
(Mounting dimensions: □50mm [1.969in.])

◆ **Gripping width:**
140, 240, 340mm
[5.51, 9.45, 13.39in.]

SHM72M

M size
(Mounting dimensions: □65mm [2.559in.])

◆ **Gripping width:**
176, 276, 376mm
[6.93, 10.87, 14.80in.]

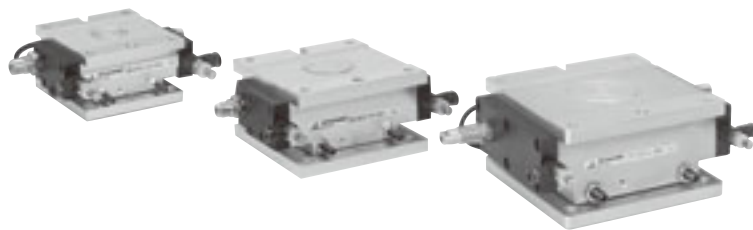
SHM72L

L size
(Mounting dimensions: □85mm [3.346in.])

◆ **Gripping width:**
318, 418, 518mm
[12.52, 16.46, 20.39in.]

● SHM62 is NZ specification.
For details, see p.1521.

TURNING MODULES



The module turns hand (gripper) units within ranges of -5° to 95° , or -5° to 185° .

● Locating pin

(Apply locking adhesive and insert it into the required hole.)

● Turning angle

The stopper and angle adjusting screw enable to set the turning angle anywhere within the range.

● Turning table

● Stopper

Note: Change the threaded location to align with the set turning angle. (Apply locking adhesive to tighten for locking.)

● Turning angle adjusting screw

Note: Although it is possible to use a turning angle adjusting screw for adjustment, always use a shock absorber at the swing end. Moreover, the range for turning angle adjustment is limited. For details, see p.1512.

● Main shaft

● Bearing

● Shock absorber

(Screw it in as far as the turning angle set position, and then return one-half rotation and secure it in place.)

● Piston

● Speed controller with quick fitting

The turning speed can be adjusted. (Be aware to avoid exceeding the operating speed range.)

Note: Since loosening the connection screws will go out of the assembly precision, do not disassemble.

Specifications

Model		SHM21S		SHM21M		SHM21L	
		NA	MA	NA	MA	NA	MA
Mounting specification	Mounting surface	S		M		L	
	Mounted surface	S		M or S ^{Note1}		L or M ^{Note2}	
Media		Air					
Operating pressure range MPa [psi.]		0.2~0.6 [29~87]					
Proof pressure MPa [psi.]		1 [145]					
Operating temperature range °C [°F]		0~60 [32~140]					
Operation type and mechanism		Double acting type, rack & pinion drive, with shock absorber ^{Note3} , with turning angle adjusting mechanism					
Lubrication		Not required					
Turning angle range ^{Note4}		−5°~95°	−5°~185°	−5°~95°	−5°~185°	−5°~95°	−5°~185°
Effective torque ^{Note5} N·cm [in·lbf]		46.5 [4.1]		127.5 [11.3]		303 [26.8]	
Shock absorber		KSHA6×5-D		KSHA6×5-DE		KSHA6×8-F	
Allowable energy J [ft·lbf]		0.67 [0.49]		1.03 [0.76]		2.06 [1.52]	
Allowable moment N·cm [in·lbf]		60 [5.3]		120 [10.6]		240 [21.2]	
Allowable thrust load N [lbf.]		60 [13.5]		130 [29.2]		200 [45.0]	
Turning angle repeatability		±0.03°					
Operating speed range Degrees/s		40~320					
Sensor switches		Operation detection×2					
Mass g [oz.]		300 [10.6]	330 [11.6]	630 [22.2]	690 [24.3]	1300 [45.9]	1500 [52.9]

Notes: 1. Both M and S sizes can be mounted on SHM21M.
 2. Both L and M sizes can be mounted on SHM21L.
 3. Set the shock absorber at a one-half rotation returned position from the turning angle set position.
 4. Use the stopper and angle adjusting screw to set the turning angle anywhere within the range.
 5. Values at 0.5MPa [73psi.] air pressure.

Order Codes

SHM	21						
Module Turning module		Turning angle range NA : $-5^{\circ} \sim 95^{\circ}$ MA : $-5^{\circ} \sim 185^{\circ}$		Mounting specification S : Mounting pitch 50mm [1.969in.] M : Mounting pitch 65mm [2.559in.] L : Mounting pitch 85mm [3.346in.]		Lead wire length A : 1000mm [39in.] B : 3000mm [118in.]	
Alpha series systematic handling module		Sensor switch		Number of sensor switches 1 : With 1 sensor switch 2 : With 2 sensor switches		Sensor switch holder (with screw) Blank : No holder SHM21 : With holder for turning module	
Sensor switch		ZC130 : Solid state type 2-lead wire with indicator lamp DC10~28V ZC153 : Solid state type 3-lead wire with indicator lamp DC4.5~28V ※ Two locating pins are included.		Lead wire length A : 1000mm [39in.] B : 3000mm [118in.]		Sensor switch holder (with screw) Blank : No holder SHM21 : With holder for turning module	

Order codes for sensor switches only

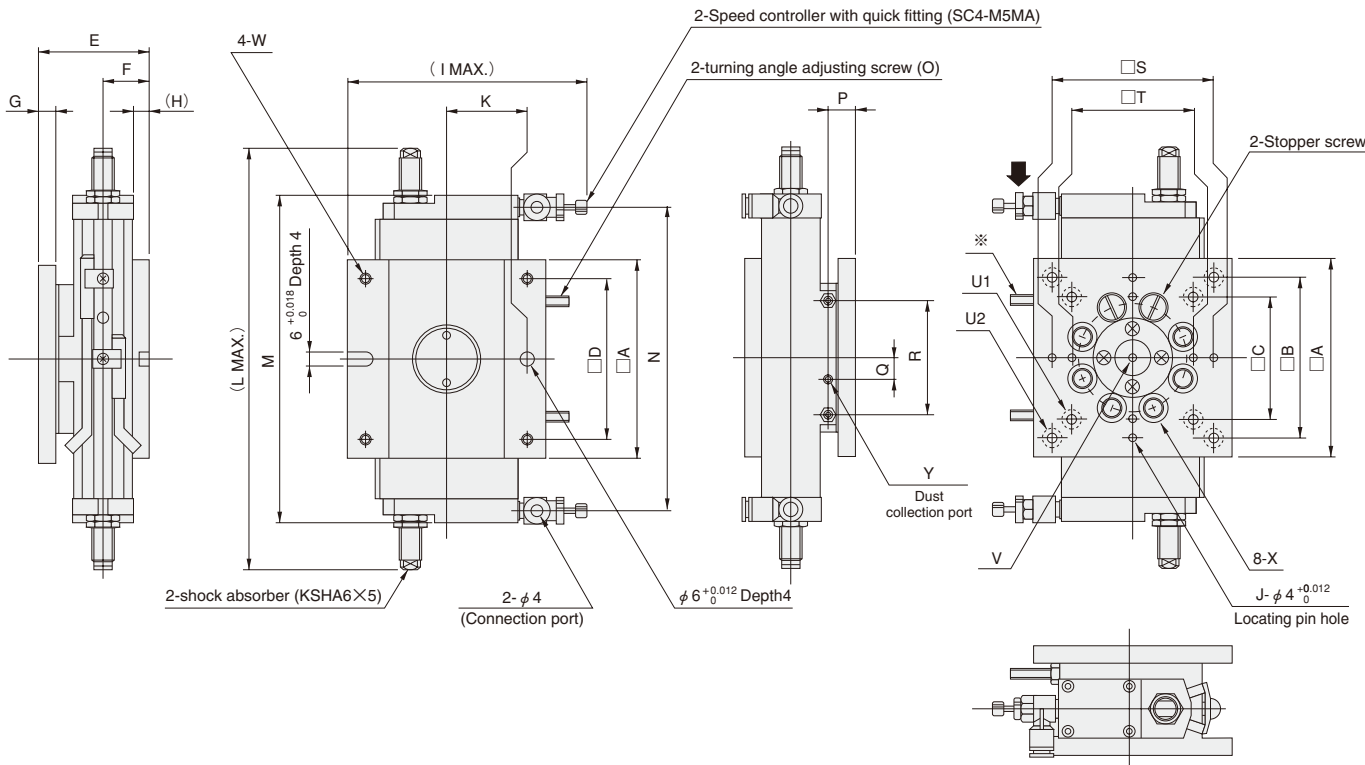
Lead wire length A : 1000mm [39in.] B : 3000mm [118in.]		Sensor switch holder (with screw) Blank : No holder SHM21 : With holder for turning module	
Sensor switch		ZC130 : Solid state type 2-lead wire with indicator lamp DC10~28V ZC153 : Solid state type 3-lead wire with indicator lamp DC4.5~28V	

● For details of sensor switches, see p.1544.

Dimensions of SHM21S, M, L (mm)



SHM21 Mounting specification Range of turning angle adjustment



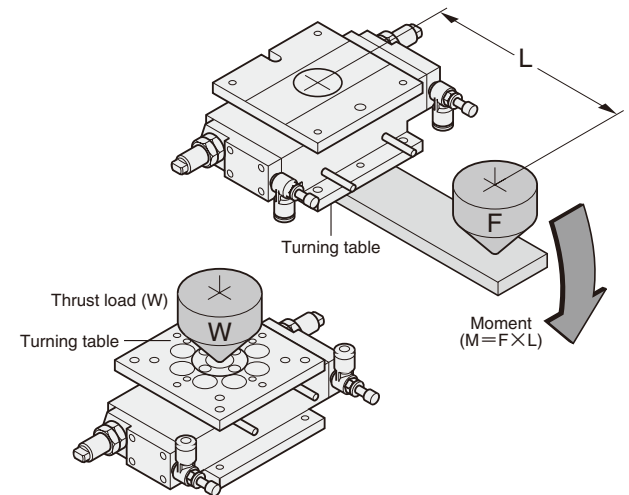
Remarks: 1. Tolerance of the contact surface parallelism between mounting surface and mounted surface=S : 0.04, M : 0.05, L : 0.06
2. Coaxiality tolerance between the hypothetical turning center, as restricted by the locating pin, and the actual turning center=S : ϕ 0.04, M : ϕ 0.05, L : ϕ 0.06

In the drawing above, air is supplied from the fitting marked arrow \rightarrow to rotate the turning table in a counterclockwise direction and bring it into contact with the adjusting screw marked with ※ as the 0° state.

Code Model	A	B	C	D	E	F	G	H	I	J	K	L	M	N	O	P	Q	R	S	T	U1	U2	V	W	X	Y
SHM21S-NA	60	50	—	50	35	14.5	6	5.5	83	4	25.0	110	79	70	M3	9.5	6	32	50±0.03	—	—	4-φ 4.5 4-φ 8 Counterbore Depth 3	φ 3 ₀ ^{+0.012} Depth 3	M4	M8×1	M3
SHM21S-MA												130	99	90												
SHM21M-NA	80	65	50	65	45	19.0	7	7.0	96	8	32.5	140	99	90	M4	11.5	8	46	65±0.03	50±0.03	4-φ 4.5 4-φ 8 Counterbore Depth 4.4 (from the back side)	φ 4 ₀ ^{+0.012} Depth 3	M4	M8×1	M3	
SHM21M-MA												170	131	122												
SHM21L-NA	100	85	65	85	55	21.5	8	8.0	120	8	42.5	177	120	110	M6	15.0	10	58	85±0.05	65±0.03	4-φ 5.5 4-φ 9.5 Counterbore Depth 4.4 (from the back side)	φ 4 ₀ ^{+0.012} Depth 3	M5	M10×1	M5	
SHM21L-MA												228	171	161												

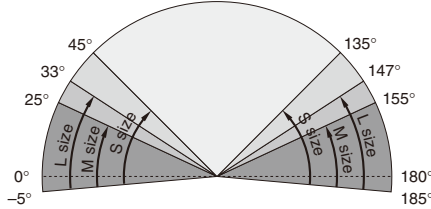
Allowable thrust load and allowable moment

Do not apply either the thrust load (W) or moment ($M=F \times L$) exceeding the allowable values listed on p.1511.

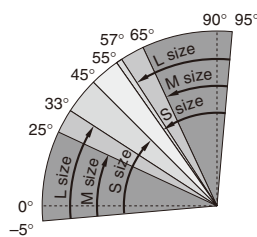


Range of turning angle adjustment

180° turning angle MA type



90° turning angle NA type



The arrows \rightarrow show the range of turning angle adjustment by changing the shock absorbers' mounting positions. For adjustment other than that shown above, consult us.

SHOCK ABSORBERS

Specifications

● KSHA Series for Turning Module

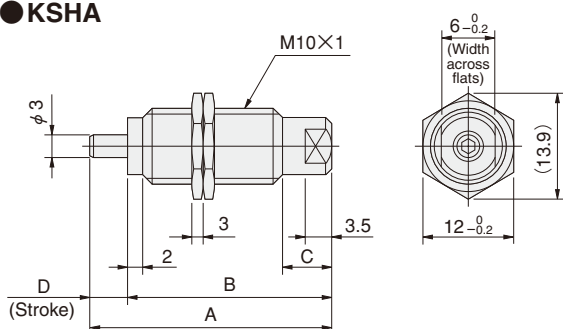
Basic model	KSHA6×5-D	KSHA6×5-DE	KSHA6×8-F
Item			
Maximum absorption J [ft·lbf]	1.0 [0.74]	1.5 [1.11]	2.9 [2.14]
Maximum impact speed m/s [ft./sec.]	1.0 [3.28]		
Maximum operating frequency cycle/min	60		30
Absorbing stroke mm [in.]	5 [0.197]		8 [0.315]
Operating temperature range °C [°F]	0~60 [32~140]		
Mass g [oz.]	10 [0.35]		20 [0.71]

● KSHAH Series for Reversing Module

Basic model	KSHAH6×3	KSHAH6×4	KSHAH6×5
Item			
Maximum absorption J [ft·lbf]	0.3 [0.22]	0.9 [0.66]	1.4 [1.03]
Maximum impact speed m/s [ft./sec.]	0.1 [0.33]		
Maximum operating frequency cycle/min	60		
Absorbing stroke mm [in.]	3 [0.118]	4 [0.157]	5 [0.197]
Operating temperature range °C [°F]	0~60 [32~140]		
Mass g [oz.]	14 [0.49]	18 [0.63]	22 [0.78]

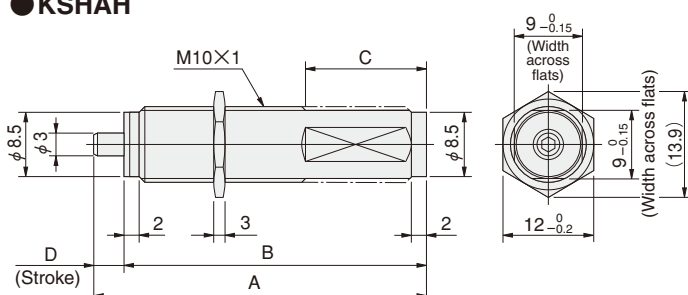
Dimensions (mm)

● KSHA



Model	A	B	C	D
KSHA6×5-D	30.5	25.5	7	5
KSHA6×5-DE				
KSHA6×8-F	48	40	10	8

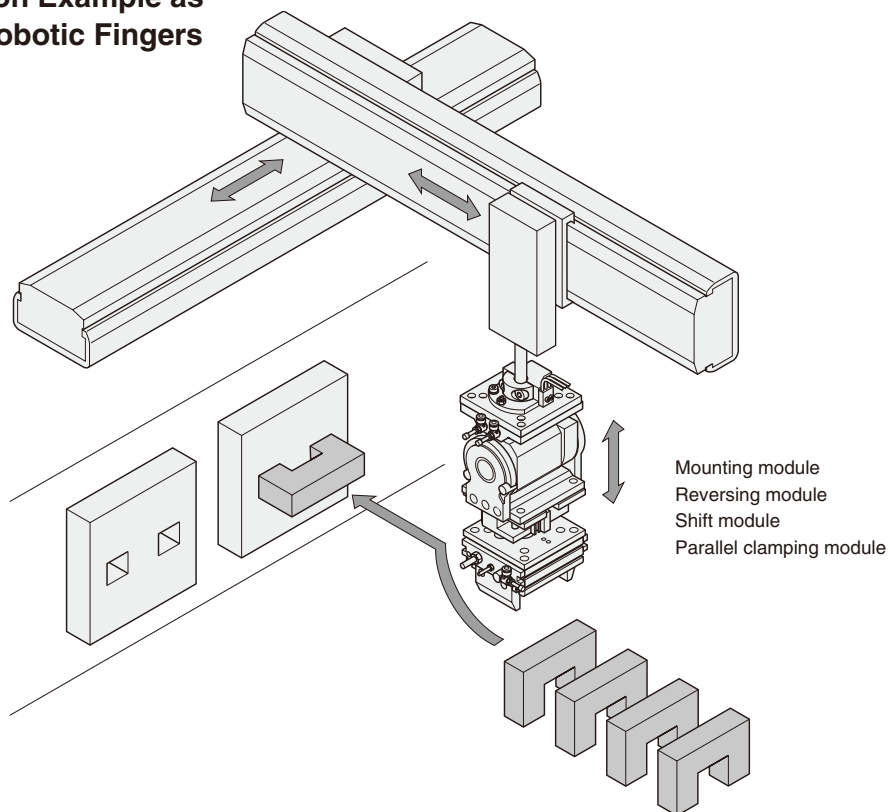
● KSHAH



Model	A	B	C	D
KSHAH6×3	33	30	16	3
KSHAH6×4	44	40		4
KSHAH6×5	53	48	22	5

Either single use or various combinations are possible.

● Application Example as Robotic Fingers



● Application Example for Conveyor Line

