More precision

alpha series

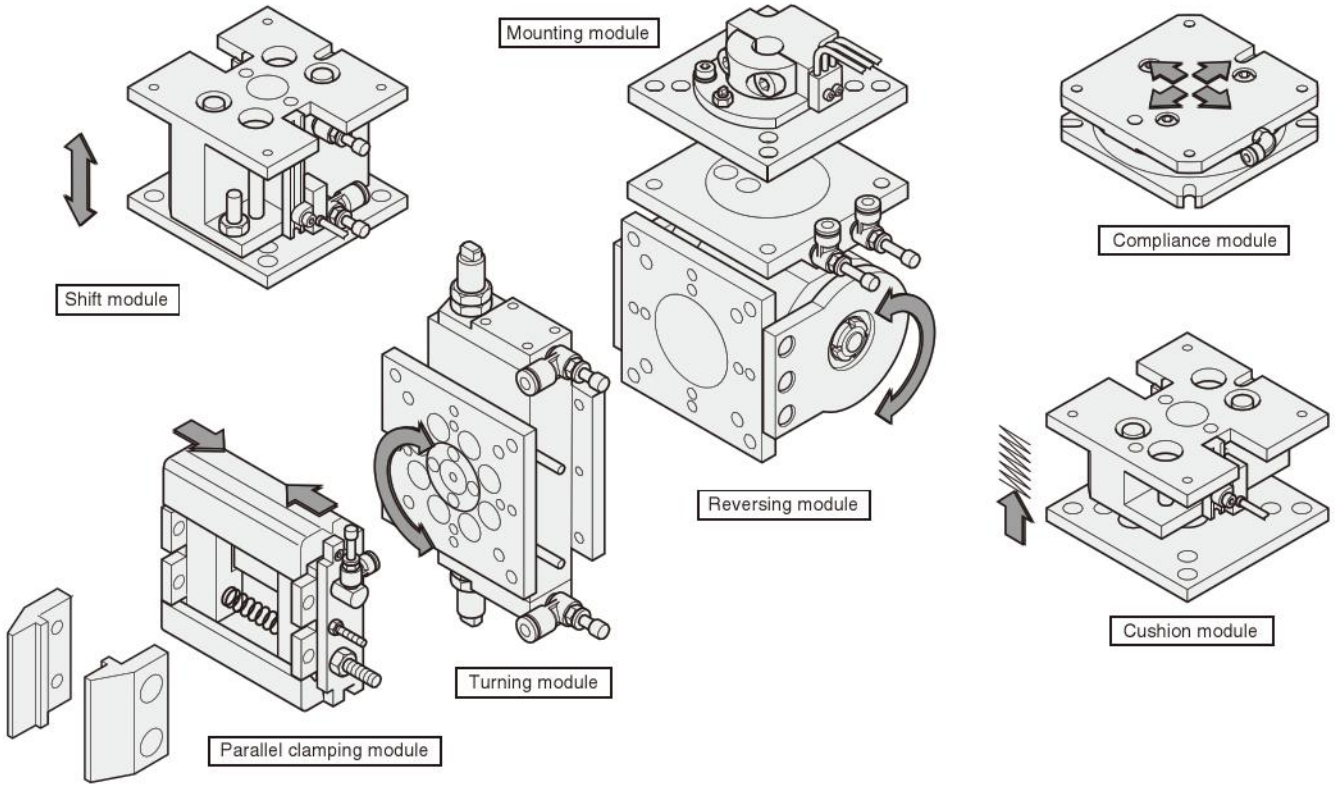
We have added advanced positioning precision and high rigidity to the pneumatic actuator.
The Koganei Alpha Series further enhances the drive module concept, supporting superior applications and labor savings in FA line design and manufacturing with higher performance.

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.

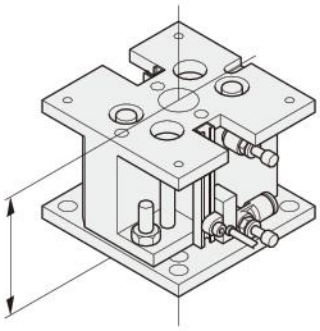


Assure high accuracy

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

Repeatability in each module	
Turning module	±0.03°
Reversing module	±0.03°
Shift module	±0.05mm [±0.0020in.]
Cushion module	±0.05mm [±0.0020in.]
Compliance module	±0.02mm [±0.0008in.]
Parallel clamping module	±0.01mm [±0.0004in.]

● 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 : ϕ 0.04, M : ϕ 0.05, L : ϕ 0.06

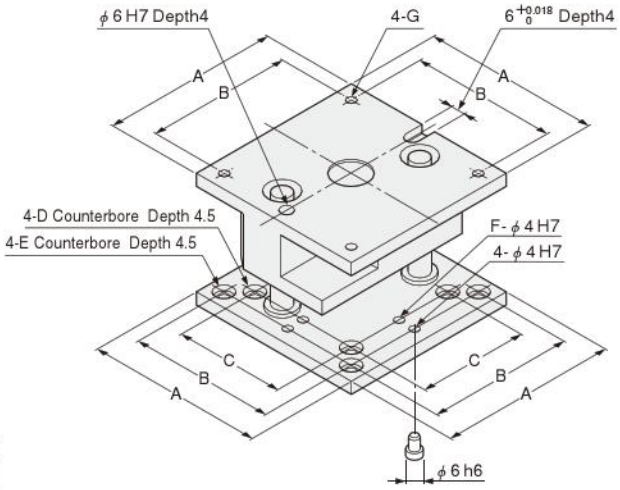
Commonality of mounting pitch

●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]	
L size	100 [3.937]	85 [3.346]	65 [2.559]		M5		M5

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.

Mounting function

Mounting modules

SHM11S
S size
(Mounting dimensions: □50mm [1.969in.])
◆**Connected shaft diameter:**
ϕ10 [0.394in.], ϕ13 [0.512in.], ϕ20 [0.787in.]

SHM11M ※1
M size
(Mounting dimensions: □65mm [2.559in.])
◆**Connected shaft diameter:**
ϕ10 [0.394in.], ϕ13 [0.512in.], ϕ20 [0.787in.]

SHM11L ※2
L size
(Mounting dimensions: □85mm [3.346in.])
◆**Connected shaft diameter:**
ϕ10 [0.394in.], ϕ13 [0.512in.], ϕ20 [0.787in.]

Rotating function

Turning modules

SHM21S
S size
(Mounting dimensions: □50mm [1.969in.])
◆**Turning angle:**
90°, 180°

SHM21M ※1
M size
(Mounting dimensions: □65mm [2.559in.])
◆**Turning angle:**
90°, 180°

SHM21L ※2
L size
(Mounting dimensions: □85mm [3.346in.])
◆**Turning angle:**
90°, 180°

Reversing modules

SHM31S
S size
(Mounting dimensions: □50mm [1.969in.])
◆**Reversing angle range:**
0°～180°

SHM31M ※1
M size
(Mounting dimensions: □65mm [2.559in.])
◆**Reversing angle range:**
0°～180°

SHM31L ※2
L size
(Mounting dimensions: □85mm [3.346in.])
◆**Reversing angle range:**
0°～180°

Linear function

Shift modules

SHM41S
S size
(Mounting dimensions: □50mm [1.969in.])
◆**Stroke:**
10mm [0.394in.]
20mm [0.787in.]

SHM41M ※1
M size
(Mounting dimensions: □65mm [2.559in.])
◆**Stroke:**
15mm [0.591in.]
30mm [1.181in.]

SHM41L ※2
L size
(Mounting dimensions: □85mm [3.346in.])
◆**Stroke:**
20mm [0.787in.]
40mm [1.575in.]

※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.])

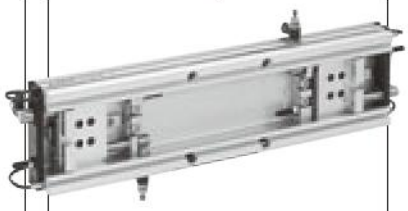
SHM61L, 62L
L size
(Mounting dimensions: □85mm [3.346in.])

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

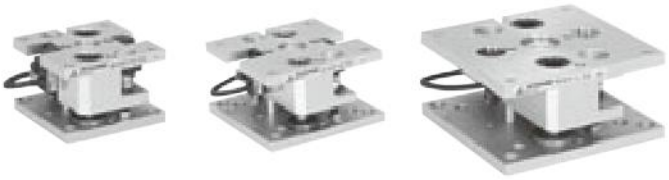
SHM72S
S size
(Mounting dimensions: □50mm [1.969in.])
◆**Gripping width:**
140, 240, 340mm
[5.51, 9.45, 13.39in.]

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.

CUSHION MODULES

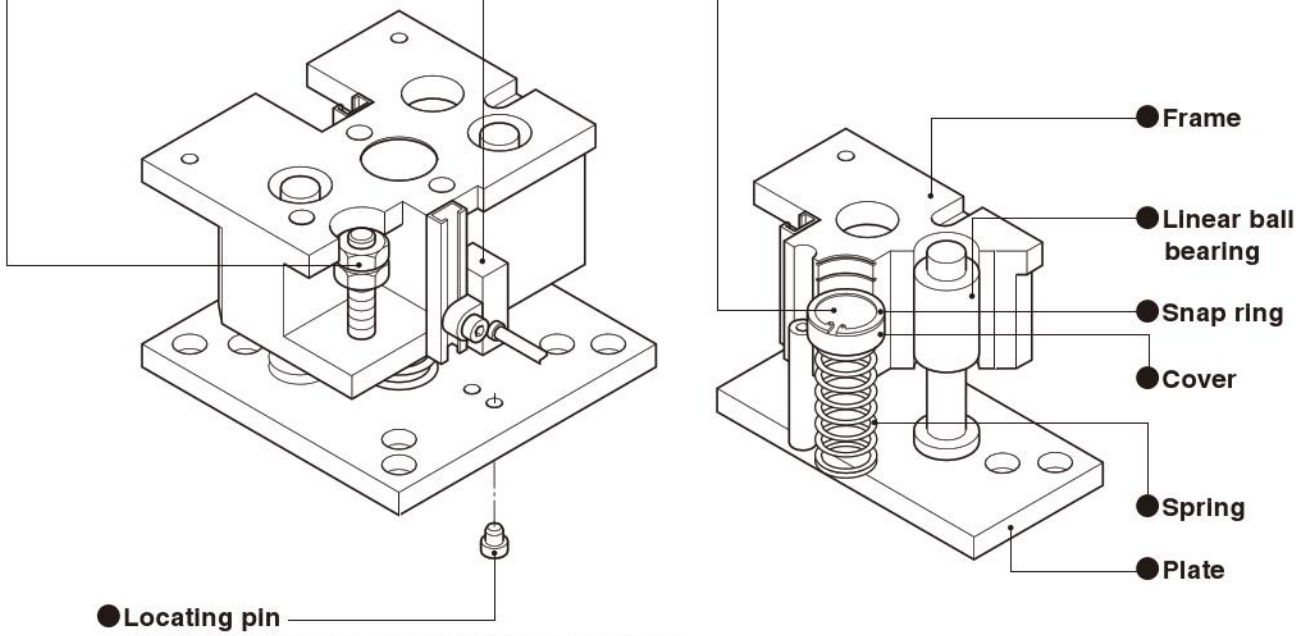


The module for protecting the workpieces. Can use an adjustable spring force for snap insertions.

●Stroke adjusting screw
Can adjust the extended side stroke, and uses a rubber bumper to absorb shocks at the end of the stroke.

●Sensor switch
Can detect the operating position by a built-in magnet.

●Cushion force adjusting mechanism
By detatching the snap ring and changing the cover position, the cushioning force can be adjusted in 4 levels.



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

Specifications

Item \ Model		SHM51S		SHM51M		SHM51L	
		SS	MS	SS	MS	SS	MS
Mounting specification	Mounting surface	S		M		L	
	Mounted surface	S		M or S[Note1]		L or M[Note2]	
Stroke mm [in.]		5 [0.197]	10 [0.394]	8 [0.315]	15 [0.591]	10 [0.394]	20 [0.787]
Operating temperature range °C [°F]		0～60 [32～140]					
Operation type and mechanism		Spring return, linear ball bearing, with stroke adjusting mechanism (bumper)					
Lubrication		Not required					
Cylinder thrust N [lbf.]	Extended side	3～12 [0.7～2.7]		4～16 [0.9～3.6]		4～16 [0.9～3.6]	
	Retracted side	—		—		—	
Allowable moment N·cm [in·lbf]		30 [2.7]		40 [3.5]		80 [7.1]	
Repeatability mm [in.]		±0.05 [±0.0020]					
Sensor switches		Operation detection ×2					
Mass g [oz.]		250 [8.8]	280 [9.9]	380 [13.4]	430 [15.2]	720 [25.4]	810 [28.6]

Notes 1: Both M and S sizes can be mounted on SHM51M.
2: Both L and M sizes can be mounted on SHM51L.

Order Codes

SHM 51 □ – □ – □ □ □

Alpha series systematic handling module

Module
Cushion module

Mounting specification
S : Mounting pitch 50mm [1.969in.]
M : Mounting pitch 65mm [2.559in.]
L : Mounting pitch 85mm [3.346in.]

Stroke mm

Mounting spec.	S	M	L
SS	5	8	10
MS	10	15	20

Sensor switch
CS9H : Solid state type 3-lead wire with indicator lamp DC4～28V
ZB430 : Solid state type 2-lead wire with indicator lamp DC10～28V

Lead wire length
A : 1000mm [39in.]
B : 3000mm [118in.]

Number of sensor switches
1 : With 1 sensor switch
2 : With 2 sensor switches

※ Two locating pins are included.

Order codes for sensor switches only (with holder)

□ □ – SHM51

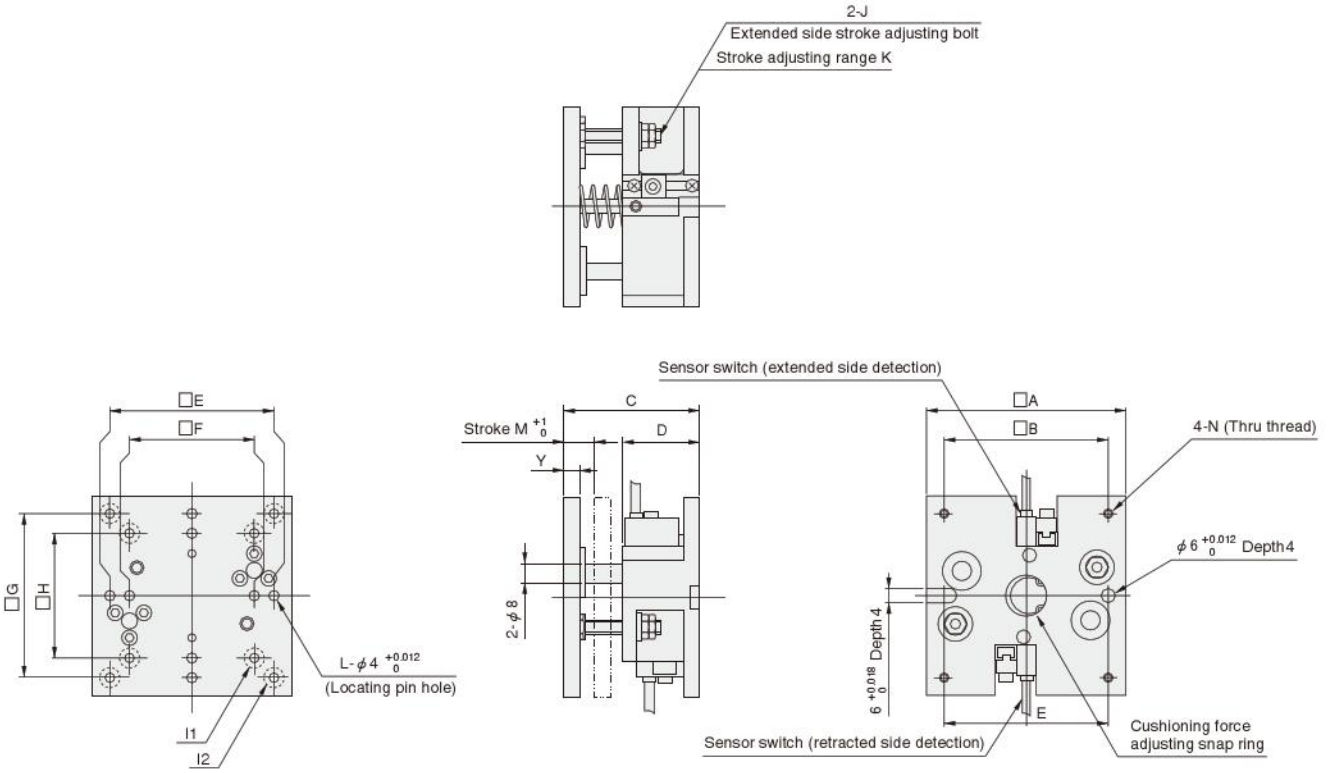
Lead wire length
A : 1000mm [39in.]
B : 3000mm [118in.]

Sensor switch
CS9H : Solid state type 3-lead wire with indicator lamp DC4～28V
ZB430 : Solid state type 2-lead wire with indicator lamp DC10～28V

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

Dimensions of SHM51S, M, L (mm)

CAD SHM51 | Mounting specification | Stroke



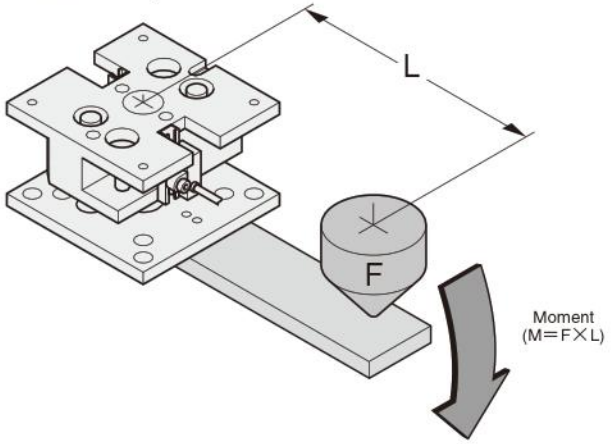
Remarks: 1. Tolerance of the contact surface parallelism between mounting surface and mounted surface = S : 0.04, M : 0.05, L : 0.06
2. Coaxiality tolerance with the rotating center, as restricted by the locating pin = S : φ0.04, M : φ0.05, L : φ0.06

Model \ Code	A	B	C	D	E	F	G	H	I1	I2	J	K Note	L	M	N	X Extended side	X Retracted side	Y
SHM51S-SS	60	50	40	27	50±0.03	—	50	—	—	4-φ4.5 4-φ8 Counterbore Depth 4.4 (from the back side)	M4	5	4	5	M4	1	3	6
SHM51S-MS			45	27								10		10		3	4	
SHM51M-SS	80	65	45	28	65±0.03	50±0.03	65	50	4-φ4.5 4-φ8 Counterbore Depth 4.4		M5	8	8	8		4	1	6
SHM51M-MS			55	31								15		15		7	5	
SHM51L-SS	100	85	50	31	85±0.05	65±0.03	85	65		4-φ5.5 4-φ9.5 Counterbore Depth 5.4 (from the back side)	M5	10	8	10	M5	5	2	7
SHM51L-MS			70	41								20		20		15	7	

Note: The sensor moving range, however, is Xmm.

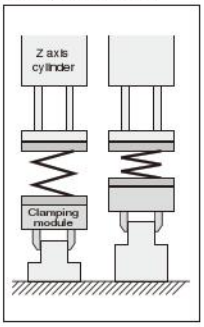
Allowable Moment

Do not apply the moment (M=F×L) exceeding the allowable values listed on p.1517.



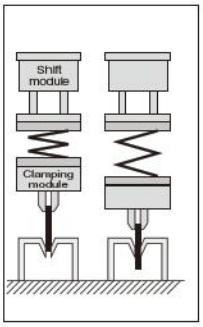
Application Examples

Positioning error correction during clamping of irregularly shaped workpiece



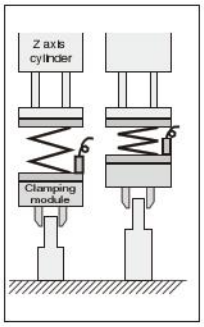
Protects the robot by correcting errors in the height.

Constant force insertion of plastic workpieces, etc. (snap insertion)



The cylinder inserts the workpiece up to a certain point, after which the spring force provides constant force insertion.

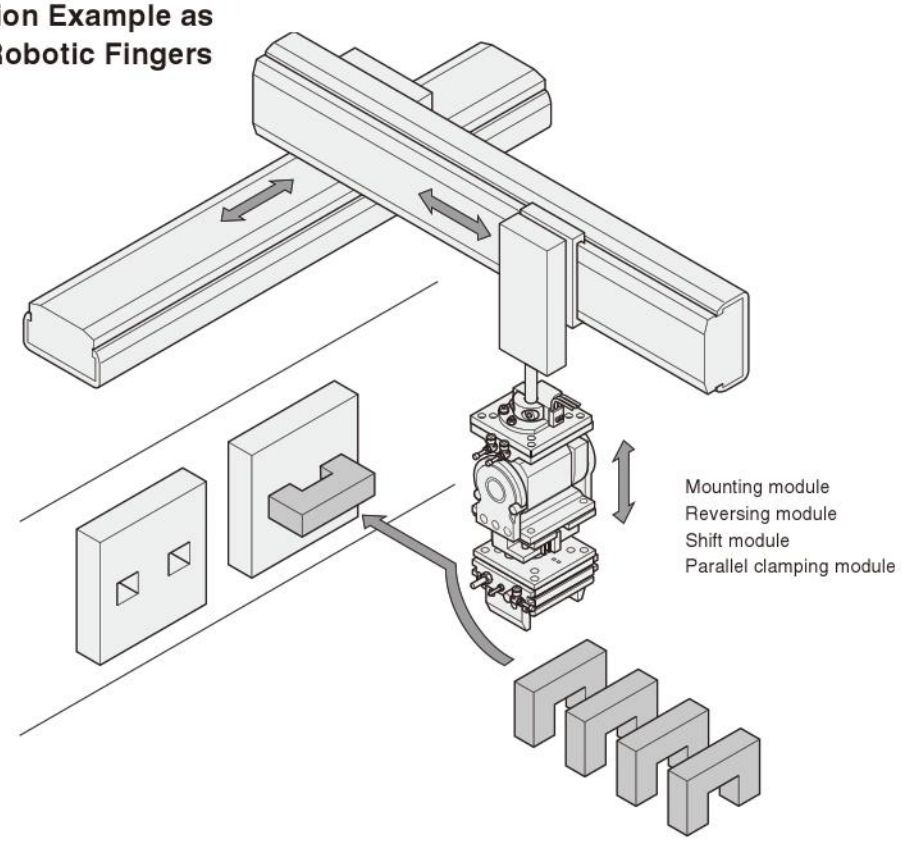
Detection of abnormalities of workpiece shape



Uses sensor to detect abnormalities in the height, and removes abnormal workpieces only.

Either single use or various combinations are possible.

●Application Example as Robotic Fingers



●Application Example for Conveyer Line