Angular Style Air Gripper
Toggle Type
Series MHT2

Angular Style Air Gripper
Toggle Type
Series MHT2
Size: 32, 40, 50, 63

Ideal for gripping heavy workpiece.

The toggle mechanism holds workpiece even when pressure drops.

Auto switch is attachable.

How to Order

MHT2 — 32 D — F9BW S

Toggle type air gripper

Number of fingers

2	2 fingers

Bore size

32	32 mm
40	40 mm
50	50 mm
63	63 mm

Action

D	Double acting

Auto switch

Nil	Without auto switch (Built-in magnet)

∗ For the applicable auto switch model, refer to the table below.

Number of auto switches

Nil	2 pcs.
S	1 pc.
n	"n" pcs.

Applicable Auto Switch/Refer to page 12-13-1 for further information on auto switches.

Type	Special function	Electrical entry	Indicator light	Wiring (Output)	Load voltage DC	Load voltage AC	Rail mounting Perpendicular	Rail mounting In-line	Direct mounting Perpendicular	Direct mounting In-line	Lead wire length (m)∗ 0.5 (Nil)	3 (L)	5 (Z)	None (N)	Pre-wire connector	Applicable load	
Reed switch	—	Grommet	Yes	3-wire (NPN equi.)	5 V	—	—	**A76H**	**A96V**	**A96**	●	●	—	—	—	IC circuit	—
				2-wire	—	200 V	**A72**	**A72H**	—	—	●	●	—	—	—		Relay, PLC
					12 V	100 V	**A73**	**A73H**	—	—	●	●	●	—		—	
							—	—	**A93V**	**A93**	●	●	—	—	—		
		Connector			24 V 12 V	—	**A73C**	—	—	—	●	●	●	●	—		
	Diagnosis (2-color indication)	Grommet			—	—	**A79W**	—	—	—	●	●	—	—	—		
Solid state switch	—	Grommet	Yes	3-wire (NPN)	24 V	5 V 12 V	—	**F79**	**M9NV**	**M9N**	●	●	○	—	○	IC circuit	Relay, PLC
				3-wire (PNP)			—	**F7P**	**M9PV**	**M9P**	●	●	○	—	○		
				2-wire		12 V	—	**J79**	**M9BV**	**M9B**	●	●	○	—	○	—	
		Connector					—	—	—	—	●	●	●	●	—		
	Diagnosis (2-color indication)			3-wire (NPN)		5 V 12 V	**F7NWV**	**F79W**	**F9NWV**	**F9NW**	—	●	○	—	○	IC circuit	
				3-wire (PNP)			—	**F7PW**	**F9PWV**	**F9PW**	●	●	○	—	○		
				2-wire		12 V	**F7BWV**	**J79W**	**F9BWV**	**F9BW**	●	●	○	—	○	—	
	Water resistant (2-color indication)						—	**F7BA**	—	**F9BA**	—	●	○	—	○		
							F7BAV	—	—	—	—	●	○	—	—		
	With diagnosis output (2-color indication)			4-wire (NPN)		5 V 12 V	—	**F79F**	—	—	●	●	○	—	○	IC circuit	

∗ Lead wire length symbols: 0.5 m ····· Nil (Example) F9BW
3 m ····· L (Example) F9BWL
5 m ····· Z (Example) F9BWZ
None ····· N (Example) J79CN

∗ "○" marked solid state switches are produced upon receipt of order.

• Refer to page 12-9-7 for details, because there are other auto switches available than above models.

Made to Order Refer to page 12-13-25 for auto switch specifications.

Switch Mounting Bracket Part No.

Bore size (mm)	Bracket no.	Note	Applicable auto switch
32, 40 50, 63	BQ-2	• Switch mounting screw (M3 x 0.5 x 10ℓ) • Switch spacer • Switch mounting nut.	Reed switch D-A7/A8 D-A73C/A80C D-A7□H/A80H D-A79W Solid state switch D-F7□/J79 D-F7□V D-J79C D-F7□W/J79W D-F7□WV D-F7BAL/F78AVL D-F79F

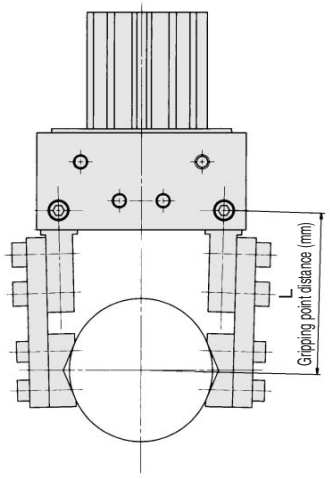
Model/Specifications

Model	MHT2-32D	MHT2-40D	MHT2-50D	MHT2-63D
Bore size (mm)	32	40	50	63
Action	Double acting			
Fluid	Air			
Operating pressure	0.1 to 0.6 MPa			
Ambient and fluid temperature	5 to 60°C			
Lubrication	Not required			
Finger opening angle (Total)	–3 to 28°	–3 to 27°	–2 to 23°	–2 to 23°
Weight (kg)	0.80	1.09	1.93	2.8
Gripping moment Note) (Effective value) (N·m)	12.4	36.0	63.0	106

Note) At the pressure of 0.5 MPa

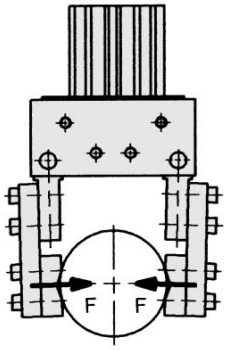
Effective Gripping Force

• Workpiece gripping point should be within the range indicated in the graph.

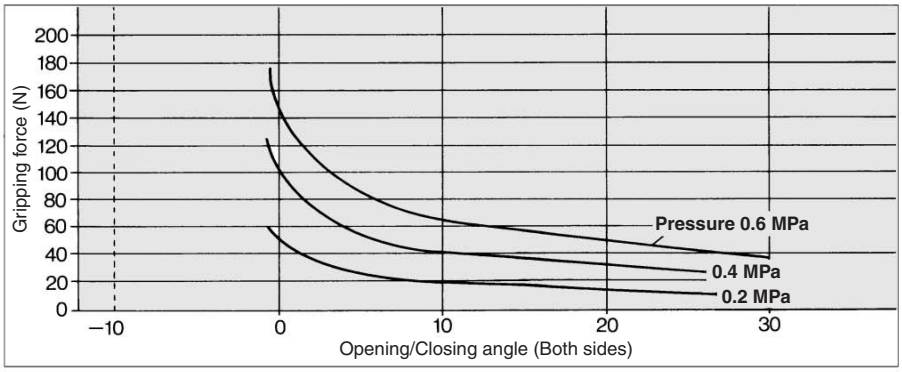


• Indication of effective gripping force

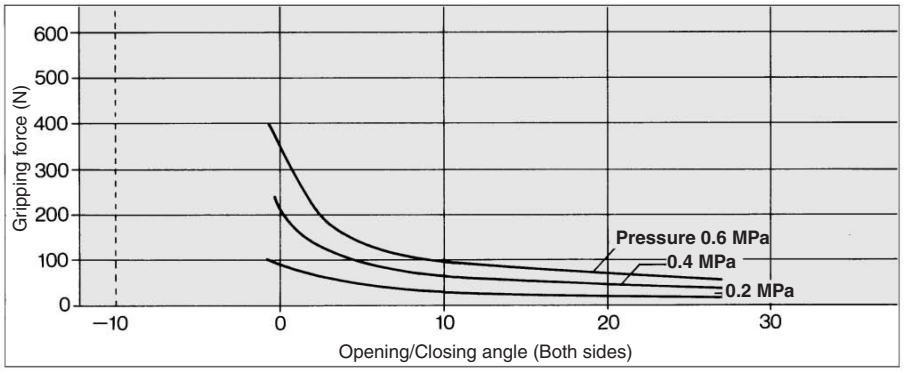
The effective gripping force shown in the graphs to the right is expressed as F, which is the thrust of one finger, when both fingers and attachments are in full contact with the workpiece as shown in the figure below.



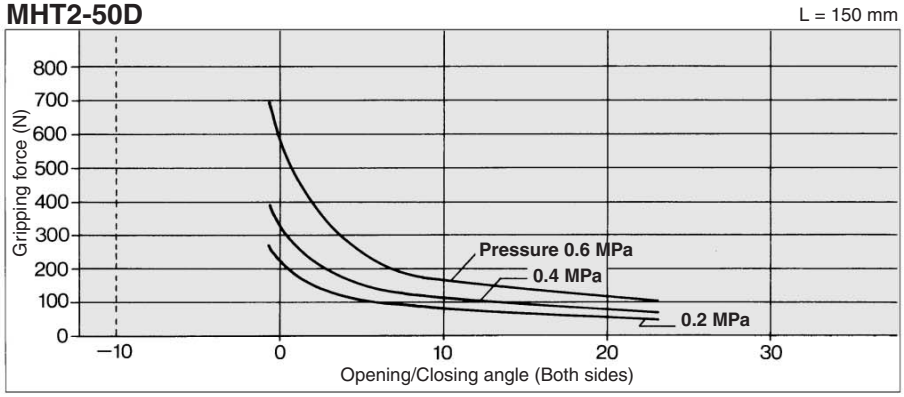
MHT2-32D L = 100 mm



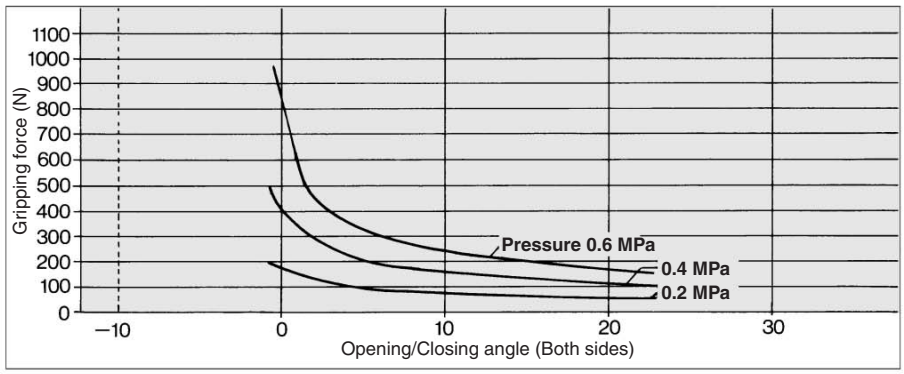
MHT2-40D L = 120 mm



MHT2-50D L = 150 mm



MHT2-63D L = 180 mm



⚠ Precautions

Be sure to read before handling. Refer to pages 12-15-3 to 12-15-4 for Safety Instructions and Common Precautions on the product mentioned in this catalog, and refer to pages 12-1-4 to 12-1-6 for Precautions on every series.

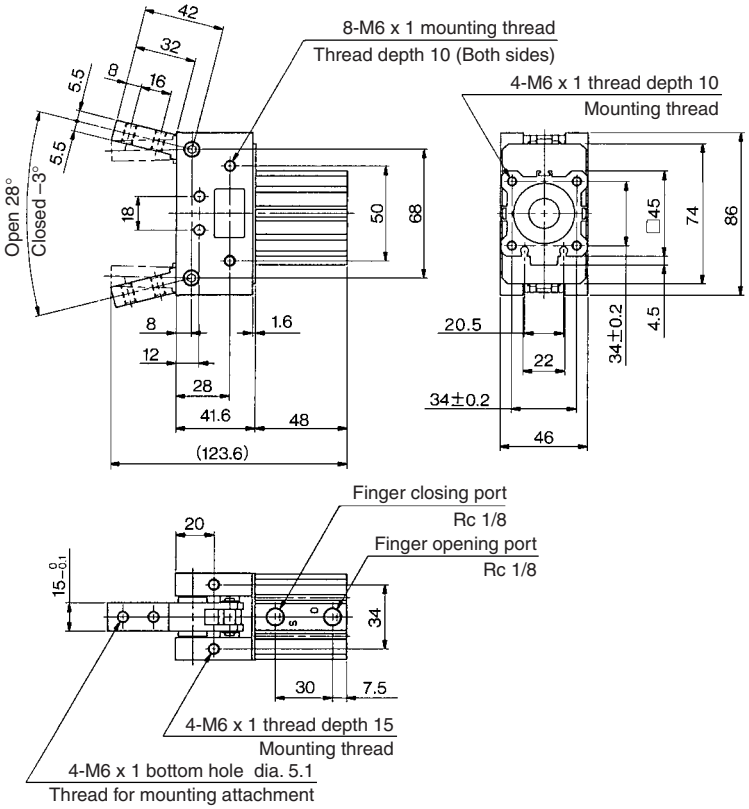
⚠ Warning

Maintenance

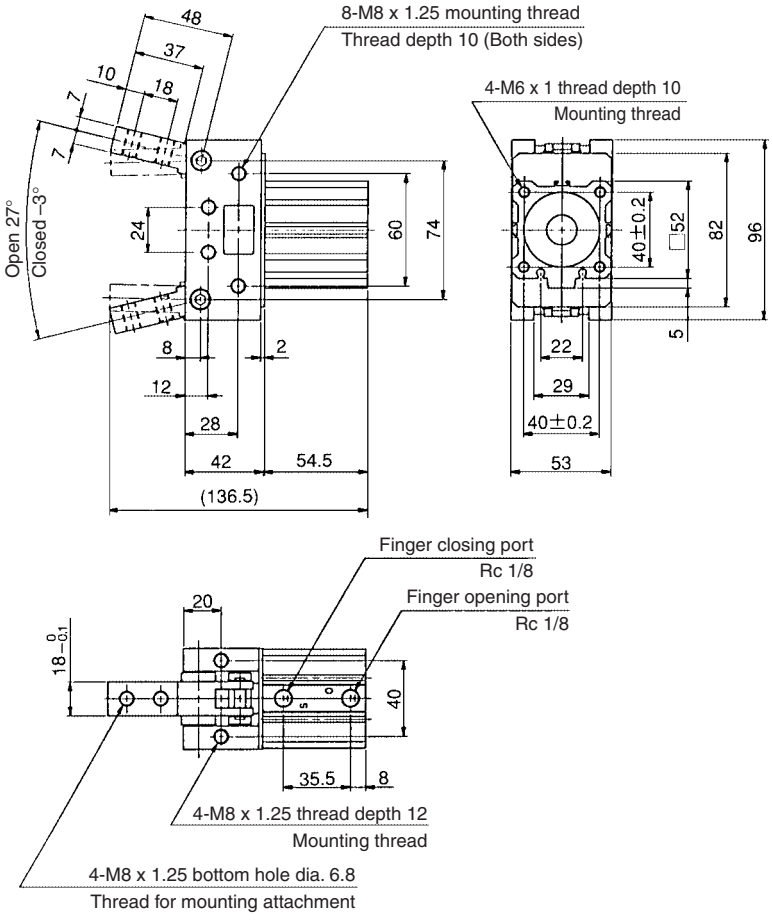
If a workpiece is to be gripped by using the toggle, make sure to periodically check that the workpiece has not shifted during the acceleration of the movement.
If the workpiece is not gripped in a stable manner, it could shift or drop and create a dangerous situation.
If the workpiece is not gripped in a stable manner, use shims on the attachment to adjust the gripped.
To verify the gripping condition or to make any adjustments, make sure to do so in an area where the air gripper or the workpiece will not fall.

Dimensions

MHT2-32D

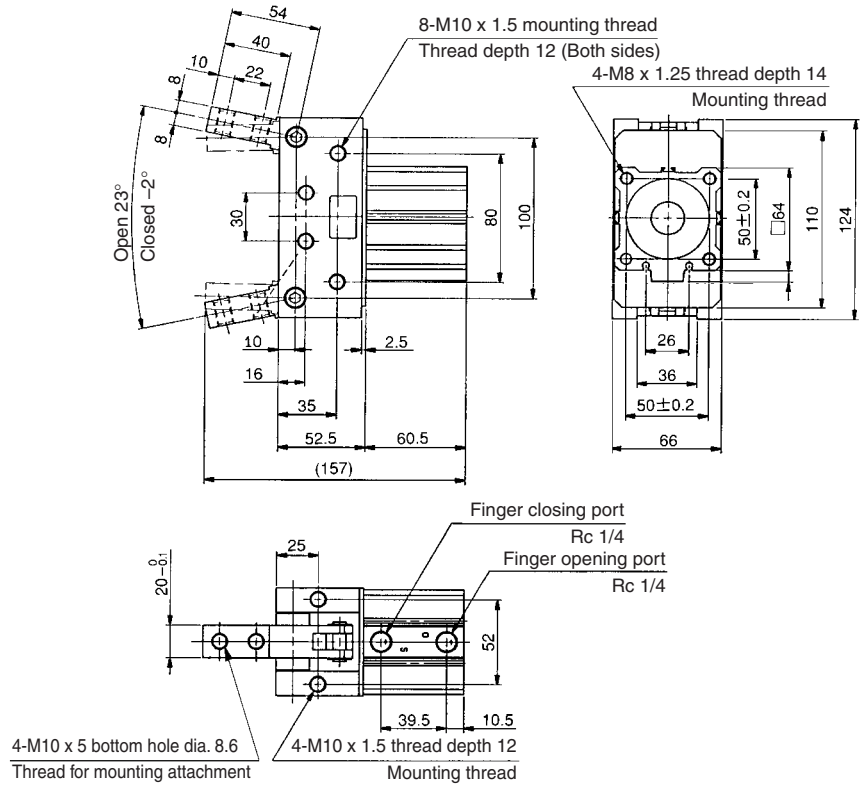


MHT2-40D

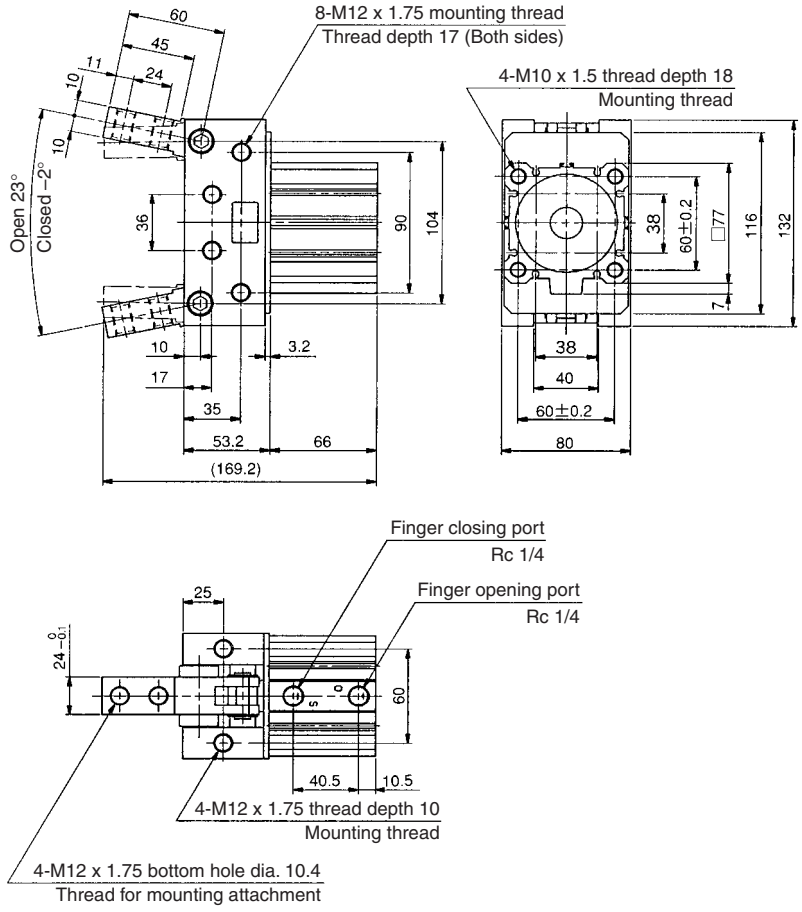


Dimensions

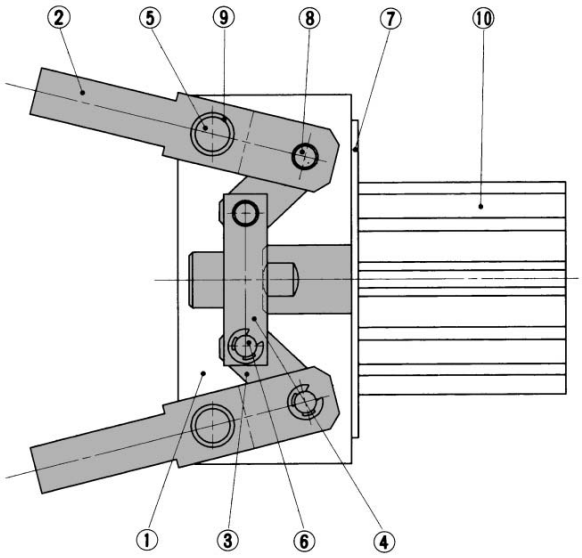
MHT2-50D



MHT2-63D



Construction



Component Parts

No.	Description	Material	Note
①	Side plate	Aluminum alloy	Hard anodized
②	Finger	Carbon steel	Black zinc chromated
③	Lever	Carbon steel	Black zinc chromated
④	Joint	Carbon steel	Black zinc chromated
⑤	Shaft	Stainless steel	
⑥	Joint pin	Stainless steel	
⑦	Cylinder plate	Soft steel	Black zinc chromated
⑧	Lever pin	Stainless steel	
⑨	Bearing		Steel lined oil imfilled acetal resin bearing
⑩	Cylinder		Compact cylinder

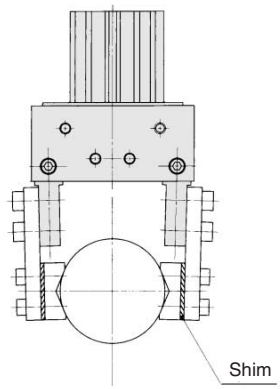
Replacement Parts

Description	**MHT2-32D**	**MHT2-40D**	**MHT2-50D**	**MHT2-63D**	Main parts
Finger assembly	MH-TA3201	MH-TA4001	MH-TA5001	MH-TA6301	②⑨
Lever assembly	MH-TA3202	MH-TA4002	MH-TA5002	MH-TA6302	③
Link parts assembly	MH-TA3203	MH-TA4003	MH-TA5003	MH-TA6303	<ø32, ø40> ②③④⑥⑧⑨ <ø50, ø63> ②③④⑧⑨
Compact cylinder	CDQ2A32-15D	CDQ2A40-15D	CDQ2A50-20D	CDQ2A63-20D	⑩

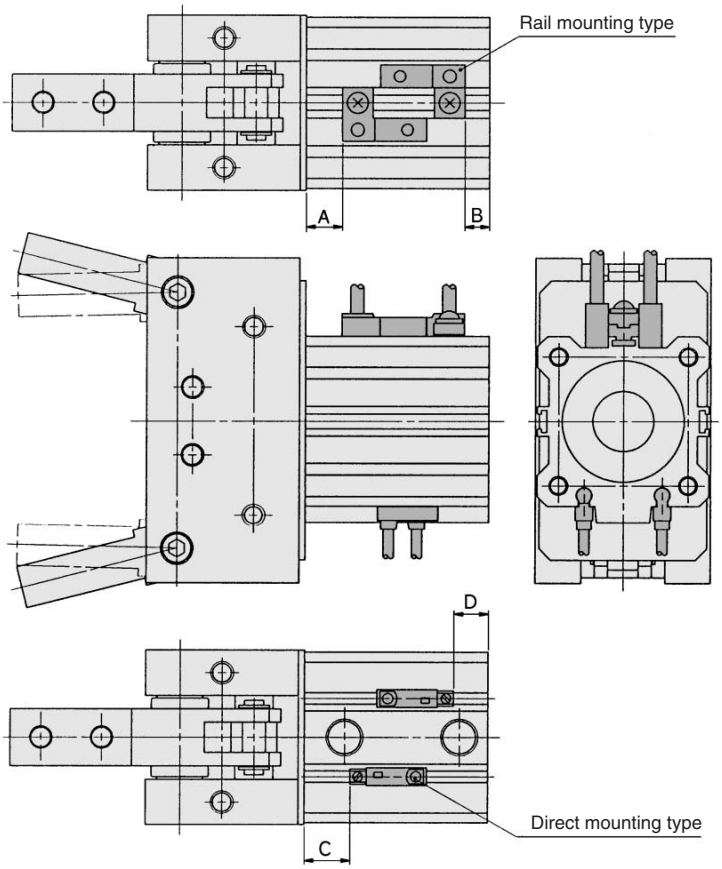
∗ For finger assembly, lever assembly, order 2 pieces per one unit.

Attachment Design

Use shims for fine adjustment of the attachment.

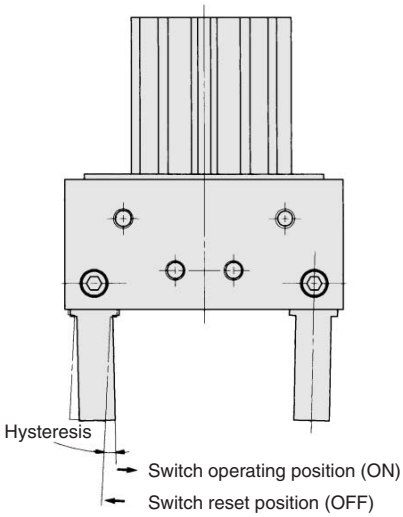


Mounting of Auto Switch



D-A7, D-A8: Rail mounting type
D-M9□V: Direct mounting type are shown above.

Auto Switch Hysteresis



Model	Hysteresis (Max.) angle
MHT2-32D	3
MHT2-40D	3
MHT2-50D	3
MHT2-63D	3

Bore size (mm)	Rail mounting						Direct mounting					
	D-A7□/A80		**D-A7□H/A80H D-A73C/A80C D-F7BAL/F7BAVL D-F7□/J79 D-F7□V/J79C D-F7□W/F79F D-F7□WV D-J79W**		**D-A79W**		**D-A9□ D-A9□V**		**D-M9□ D-M9□V D-F9□W D-F9□WV**		**D-F9BA**	
	A	**B**	**A**	**B**	**A**	**B**	**C**	**D**	**C**	**D**	**C**	**D**
32	9	6	9.5	6.5	6.5	3.5	8	5	12	9	11	8
40	13	8.5	13.5	9	10.5	6	12	7.5	16	11.5	15	10.5
50	11	11.5	11.5	12	8.5	9	10	10.5	14	14.5	13	13.5
63	13.5	14.5	14	15	11	12	12.5	13.5	16.5	17.5	15.5	16.5

Refer to page 12-13-1 for further information on other auto switches.

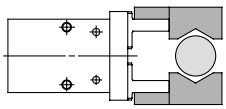
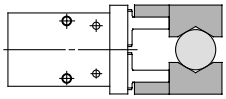
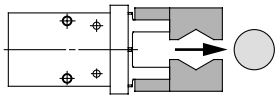
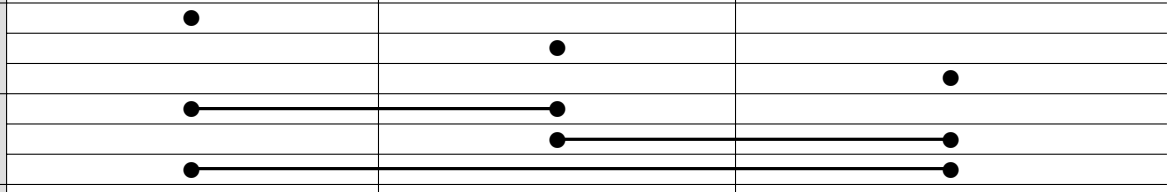
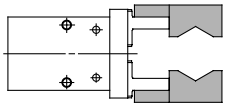
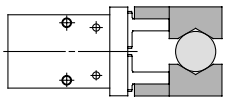
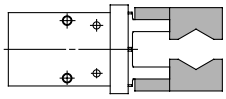
Type	Model	Electrical entry (direction)	Features
Reed switch	D-A80	Grommet (Perpendicular)	Without indicator light
	D-A80H	Grommet (In-line)	
	D-A80C	Connector (Perpendicular)	
	D-A90	Grommet (In-line)	
	D-A90V	Grommet (Perpendicular)	

∗ For details, refer to Best Pneumatics Vol. 7/8/9/10, because there are other types of normally closed (NC = b contact) solid state switches. (D-F9G/F9H)

Auto Switch Installation Example and Mounting Position

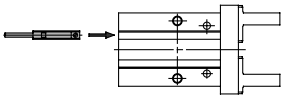
Various auto switch applications are possible through different combinations of auto switch quantities and detecting positions.

1) Detection when Gripping Exterior of Workpiece

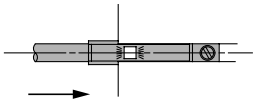
Detection example	1. Confirmation of fingers in reset position	2. Confirmation of workpiece held	3. Confirmation of workpiece released
Position to be detected	Position of fingers fully opened 	Position when gripping workpiece 	Position of fingers fully closed 
Operation of auto switch	Switch turned on when fingers return. (Light ON)	Switch turned on when gripping a workpiece. (Light ON)	When a workpiece is held (Normal operation): Switch to turn OFF (Light not illuminating) When a workpiece is not held (Abnormal operation): Switch to turn ON (Light illuminating)
Detection combinations: One auto switch			
Detection combinations: Two auto switches			
How to determine auto switch installation position	**Step 1)** Fully open the fingers. 	**Step 1)** Position fingers for gripping a workpiece. 	**Step 1)** Fully close the fingers. 

At no pressure or low pressure, connect the switch to a power supply, and follow the directions.

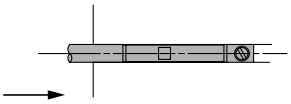
Step 2) Insert the auto switch into the switch installation groove in the direction shown in the following drawing.



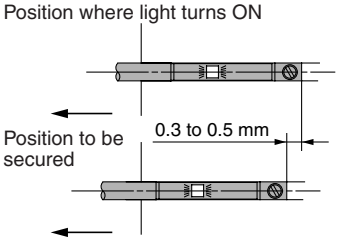
Step 3) Slide the auto switch in the direction of the arrow until the indicator light illuminates.



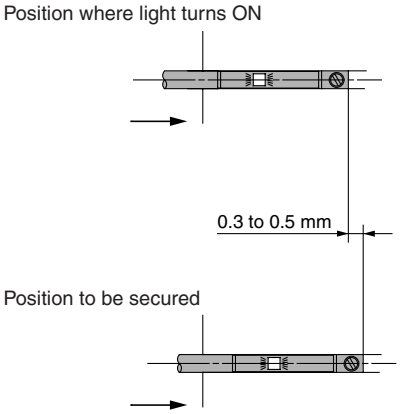
Step 4) Slide the auto switch further in the direction of the arrow until the indicator light goes out.



Step 5) Move the auto switch in the opposite direction and fasten it at a position 0.3 to 0.5 mm beyond the position where the indicator light illuminates.



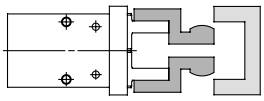
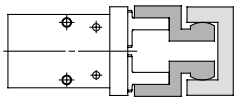
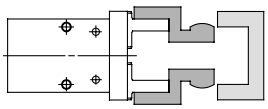
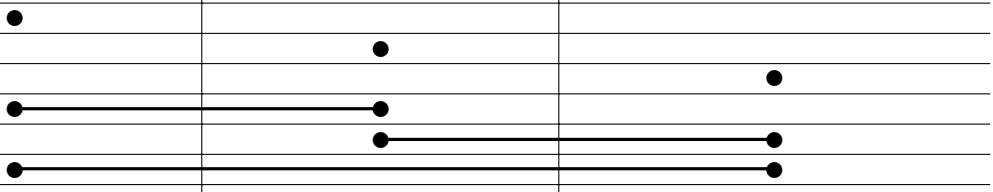
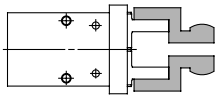
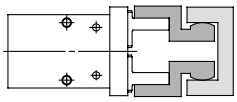
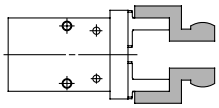
Step 3) Slide the auto switch in the direction of the arrow until the light illuminates and fasten it at a position 0.3 to 0.5 mm in the direction of the arrow beyond the position where the indicator light illuminates.



Note 1) It is recommended that gripping of a workpiece be performed close to the center of the finger stroke.
Note 2) When holding a workpiece close at the end of open/close stroke of fingers, detecting performance of the combinations listed in the above table may be limited, depending on the hysteresis of an auto switch, etc.

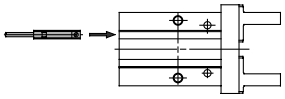
Various auto switch applications are possible through different combinations of auto switch quantities and detecting positions.

2) Detection when Gripping Interior of Workpiece

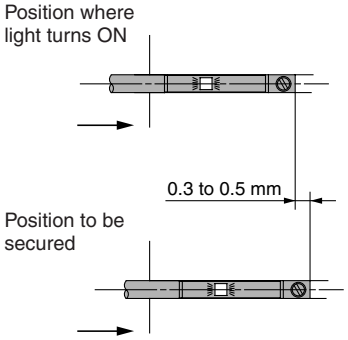
Detection example	1. Confirmation of fingers in reset position	2. Confirmation of workpiece held	3. Confirmation of workpiece released
Position to be detected	Position of fingers fully closed 	Position when gripping 	Position of fingers fully opened 
Operation of auto switch	Switch turned ON when fingers return. (Light ON)	Switch turned ON when gripping a workpiece. (Light ON)	When a workpiece is held (Normal operation): Switch to turn OFF (Light not illuminating) When a workpiece is not held (Abnormal operation): Switch to turn ON (Light illuminating)
Detection combinations — **One auto switch**			
Detection combinations — **Two auto switches**			
How to determine auto switch installation position	**Step 1)** Fully close the fingers. 	**Step 1)** Position fingers for gripping a workpiece. 	**Step 1)** Fully open the fingers. 

At no pressure or low pressure, connect the switch to a power supply, and follow the directions.

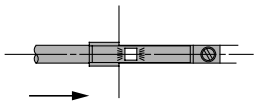
Step 2) Insert the auto switch into the switch installation groove in the direction shown in the following drawing.



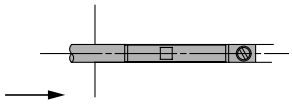
Step 3) Move the auto switch in the direction of the arrow and fasten it at a position 0.3 to 0.5 mm beyond the position where the indicator light illuminates.



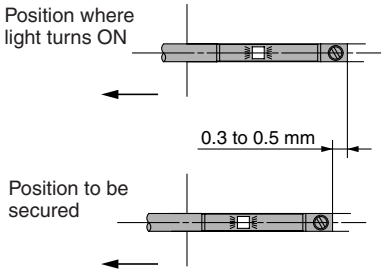
Step 3) Slide the auto switch in the direction of the arrow until the indicator light illuminates.



Step 4) Slide the auto switch further in the direction of the arrow until the indicator light goes out.



Step 5) Move the auto switch in the opposite direction 0.3 to 0.5 mm in the direction indicated by the arrow from its location when the indicator light comes on again.



Note 1) It is recommended that gripping of a workpiece be performed close to the center of the finger stroke.
Note 2) When holding a workpiece close at the end of open/close stroke of fingers, detecting performance of the combinations listed in the above table may be limited, depending on the hysteresis of an auto switch, etc.

Safety Instructions

These safety instructions are intended to prevent a hazardous situation and/or equipment damage. These instructions indicate the level of potential hazard by labels of **"Caution", "Warning"** or **"Danger"**. To ensure safety, be sure to observe ISO 4414 Note 1), JIS B 8370 Note 2) and other safety practices.

⚠ **Caution :** Operator error could result in injury or equipment damage.

⚠ **Warning :** Operator error could result in serious injury or loss of life.

⚠ **Danger :** In extreme conditions, there is a possible result of serious injury or loss of life.

Note 1) ISO 4414: Pneumatic fluid power--General rules relating to systems.
Note 2) JIS B 8370: General Rules for Pneumatic Equipment

⚠ Warning

1. The compatibility of pneumatic equipment is the responsibility of the person who designs the pneumatic system or decides its specifications.

Since the products specified here are used in various operating conditions, their compatibility for the specific pneumatic system must be based on specifications or after analysis and/or tests to meet your specific requirements. The expected performance and safety assurance will be the responsibility of the person who has determined the compatibility of the system. This person should continuously review the suitability of all items specified, referring to the latest catalog information with a view to giving due consideration to any possibility of equipment failure when configuring a system.

2. Only trained personnel should operate pneumatically operated machinery and equipment.

Compressed air can be dangerous if an operator is unfamiliar with it. Assembly, handling or repair of pneumatic systems should be performed by trained and experienced operators.

3. Do not service machinery/equipment or attempt to remove components until safety is confirmed.

1. Inspection and maintenance of machinery/equipment should only be performed once measures to prevent falling or runaway of the driver objects have been confirmed.
2. When equipment is to be removed, confirm the safety process as mentioned above. Cut the supply pressure for this equipment and exhaust all residual compressed air in the system.
3. Before machinery/equipment is restarted, take measures to prevent shooting-out of cylinder piston rod, etc.

4. Contact SMC if the product is to be used in any of the following conditions:

1. Conditions and environments beyond the given specifications, or if product is used outdoors.
2. Installation on equipment in conjunction with atomic energy, railway, air navigation, vehicles, medical equipment, food and beverages, recreation equipment, emergency stop circuits, clutch and brake circuits in press applications, or safety equipment.
3. An application which has the possibility of having negative effects on people, property, or animals, requiring special safety analysis.

Common Precautions

Be sure to read before handling.
For detailed precautions on every series, refer to main text.

Selection

⚠ Warning

1. Confirm the specifications.

Products represented in this catalog are designed for use in compressed air appllications only (including vacuum), unless otherwise indicated.
Do not use the product outside their design parameters.
Please contact SMC when using the products in applications other than compressed air (including vacuum).

Mounting

⚠ Warning

1. Instruction manual

Install the products and operate them only after reading the instruction manual carefully and understanding its contents. Also keep the manual where it can be referred to as necessary.

2. Securing the space for maintenance

When installing the products, please allow access for maintenance.

3. Tightening torque

When installing the products, please follow the listed torque specifications.

Piping

⚠ Caution

1. Before piping

Make sure that all debris, cutting oil, dust, etc, are removed from the piping.

2. Wrapping of pipe tape

When screwing piping or fittings into ports, ensure that chips from the pipe threads or sealing material do not get inside the piping. Also, when the pipe tape is used, leave 1.5 to 2 thread ridges exposed at the end of the threads.

Air Supply

⚠ Warning

1. Operating fluid

Please consult with SMC when using the product in applications other than compressed air (including vacuum).
Regarding products for general fluid, please ask SMC about applicable fluids.

2. Install an air dryer, aftercooler, etc.

Excessive condensate in a compressed air system may cause valves and other pneumatic equipment to malfunction.
Installation of an air dryer, after cooler etc. is recommended.

3. Drain flushing

If condensate in the drain bowl is not emptied on a regular basis, the bowl will over flow and allow the condensate to enter the compressed air lines.
If the drain bowl is difficult to check and remove, it is recommended that a drain bowl with the auto-drain option be installed.
For compressed air quality, refer to “Air Preparation Equipment” catalog.

4. Use clean air

If the compressed air supply is contaminated with chemicals, cynthetic materials, corrosive gas, etc., it may lead to break down or malfunction.

Operating Environment

⚠ Warning

1. Do not use in environments where the product is directly exposed to corrosive gases, chemicals, salt water, water or steam.

2. Do not expose the product to direct sunlight for an extended period of time.

3. Do not use in a place subject to heavy vibrations and/or shocks.

4. Do not mount the product in locations where it is exposed to radiant heat.

Maintenance

⚠ Warning

1. Maintenance procedures are outlined in the operation manual.

Not following proper procedures could cause the product to malfunction and could lead to damage to the equipment or machine.

2. Maintenance work

If handled improperly, compressed air can be dangerous.
Assembly, handling and repair of pneumatic systems should be performed by qualified personnel only.

3. Drain flushing

Remove drainage from air filters regularly. (Refer to the specifications.)

4. Shut-down before maintenance

Before attempting any kind of maintenance make sure the supply pressure is shut of and all residual air pressure is released from the system to be worked on.

5. Start-up after maintenance and inspection

Apply operating pressure and power to the equipment and check for proper operation and possible air leaks. If operation is abnormal, please verify product set-up parameters.

6. Do not make any modifications to be product.

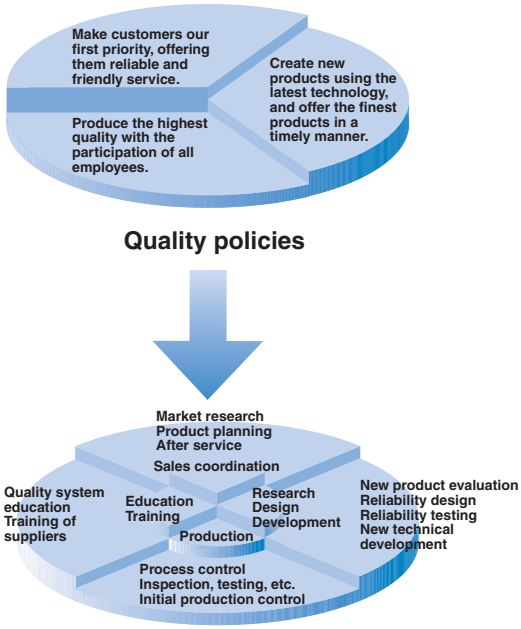
Do not take the product apart.

Quality Assurance Information (ISO 9001, ISO 14001)

Reliable quality of products in the global market

To enable our customers throughout the world to use our products with even greater confidence, SMC has obtained certification for international standards “ISO 9001” and “ISO 14001”, and created a complete structure for quality assurance and environmental controls. SMC products pursue to meet its customers’ expectations while also considering company’s contribution in society.

SMC’s quality control system



Quality management system

ISO 9001

This is an international standard for quality control and quality assurance. SMC has obtained a large number of certifications in Japan and overseas, providing assurance to our customers throughout the world.

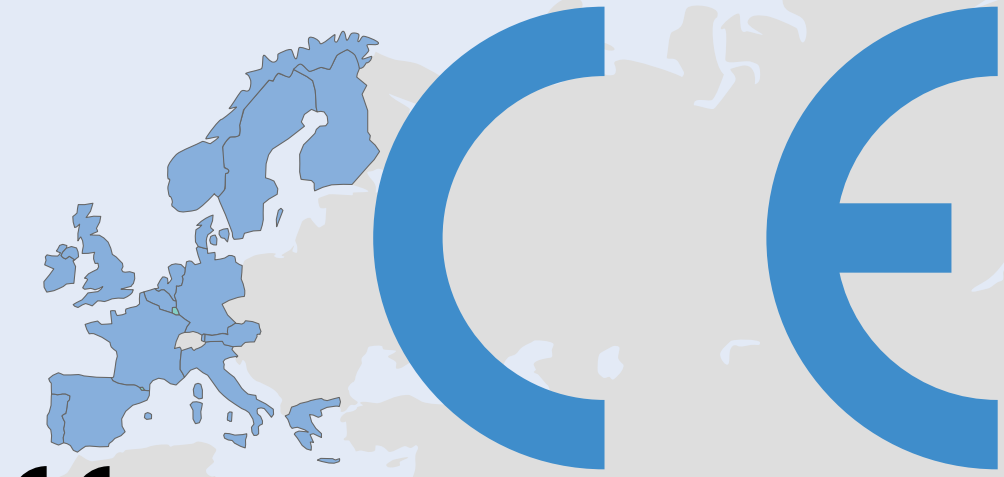
Environmental management system

ISO 14001

This is an international standard related to environmental management systems and environmental inspections. While promoting environmentally friendly automation technology, SMC is also making diligent efforts to preserve the environment.

SMC Product Conforming to Inter

SMC products complying with EN/ISO, CSA/UL standards are supporting



CE Mark

The CE mark indicates that machines and components meet essential requirements of all the EC Directives applied.
It has been obligatory to apply CE marks indicating conformity with EC Directives when machines and components are exported to the member Nations of the EU.
Once “A manufacturer himself” declares a product to be safe by means of CE marking (declaration of conformity by manufacturer), free distribution inside the member Nations of the EU is permissible.

■ CE Mark

SMC provides CE marking to products to which EMC and Low Voltage Directives have been applied, in accordance with CETOP (European hydraulics and pneumatics committee) guide lines.

■ As of February 1998, the following 18 countries will be obliged to conform to CE mark legislation

Iceland, Ireland, United Kingdom, Italy, Austria, Netherlands, Greece, Liechtenstein, Sweden, Spain, Denmark, Germany, Norway, Finland, France, Belgium, Portugal, Luxembourg

■ EC Directives and Pneumatic Components

• Machinery Directive

The Machinery Directive contains essential health and safety requirements for machinery, as applied to industrial machines e.g. machine tools, injection molding machines and automatic machines. Pneumatic equipment is not specified in Machinery Directive. However, the use of SMC products that are certified as conforming to EN Standards, allows customers to simplify preparation work of the Technical Construction File required for a Declaration of Conformity.

• Electromagnetic Compatibility (EMC) Directive

The EMC Directive specifies electromagnetic compatibility. Equipment which may generate electromagnetic interference or whose function may be compromised by electromagnetic interference is required to be immune to electromagnetic affects (EMS/immunity) without emitting excessive electromagnetic affects (EMI/emission).

• Low Voltage Directive

This directive is applied to products, which operate above 50 VAC to 1000 VAC and 75 VDC to 1500 VDC operating voltage, and require electrical safety measures to be introduced.

• Simple Pressure Vessels Directive

This directive is applied to welded vessels whose maximum operating pressure (PS) and volume of vessel (V) exceed 50 bar/L. Such vessels require EC type examination and then CE marking.

national Standards

you to comply with EC directives and CSA/UL standards.

Mark of compliance for CSA/UL

Mark of compliance for CSA

NRTL /C

■ CSA Standards & UL Standards

UL and CSA standards have been applied in North America (U.S.A. and Canada) symbolizing safety of electric products, and are defined to mainly prevent danger from electric shock or fire, resulting from trouble with electric products. Both UL and CSA standards are acknowledged in North America as the first class certifying body. They have a long experience and ability for issuing product safety certificate. Products approved by CSA or UL standards are accepted in most states and governments beyond question.
Since CSA is a test certifying body as the National Recognized Testing Laboratory (NRTL) within the jurisdiction of Occupational Safety and Health Administration (OSHA), SMC was tested for compliance with CSA Standards and UL Standards at the same time and was approved for compliance with the two Standards. The above CSA NRTL/C logo is described on a product label in order to indicate that the product is approved by CSA and UL Standards.

■ TSSA (MCCR) Registration Products

TSSA is the regulation in Ontario State, Canada. The products that the operating pressure is more than 5 psi (0.03 MPa) and the piping size is bigger than 1 inch. fall into the scope of TSSA regulation.

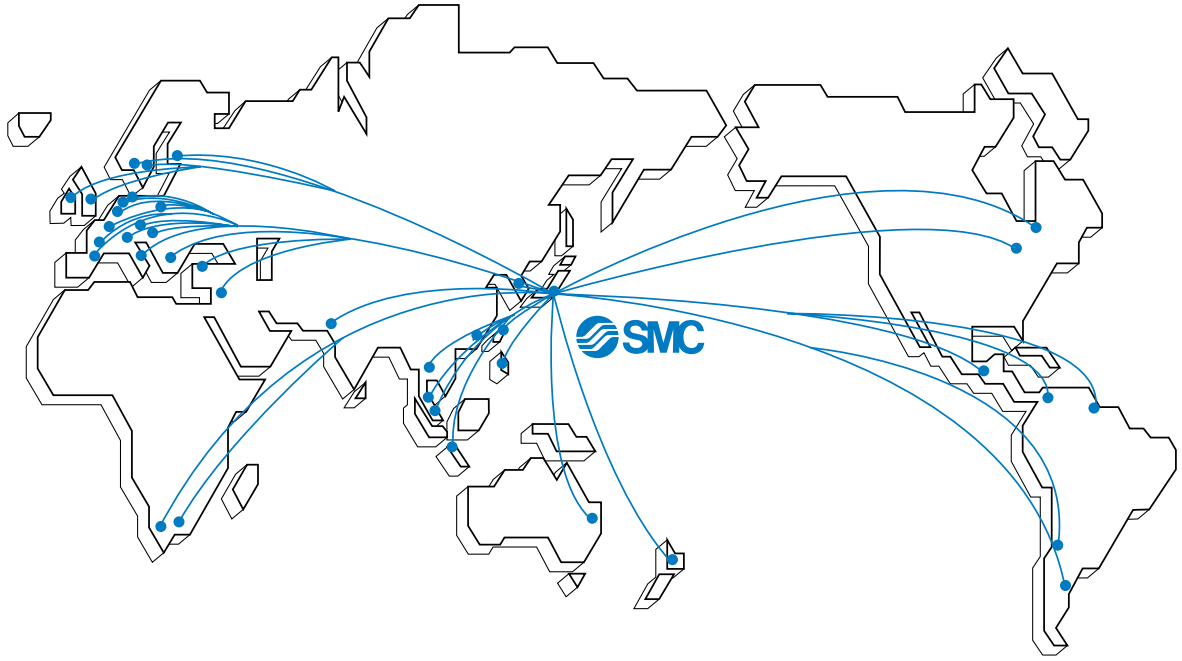
Products conforming to CE Standard

CE **With CE symbol for simple visual recognition**

In this catalog each accredited product series is indicated with a CE mark symbol. However, in some cases, every available models may not meet CE compliance. Please visit our web site for the latest selection of available models with CE mark.

http://www.smcworld.com

SMC's Global Service Network



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