

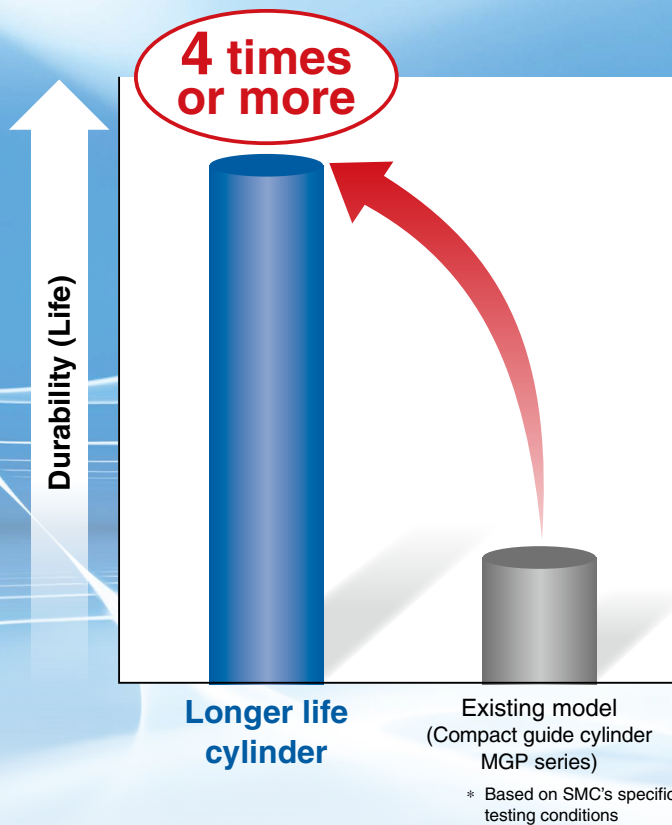
High Durability Series

Longer Life Cylinder

New

RoHS

New technology offers at least 4 times better durability



- The maintenance intervals will be extended




- Employs the same specification and mounting dimensions as the existing models, MGP Compact Guide Cylinder series

High Durability Series

High Durability Series is the series name for the "special specification" that offers superior durability and environmental resistance compared to standard products.

Series Variations

Series	Action	Model	Bearing	Bore size [mm]						Cushion	Standard stroke [mm]
				12	16	20	25	32	40		
Compact guide cylinder MGP series 	Double acting	MGP-XB24	Slide bearing	●	●	●	●	●	●	Rubber bumper on both sides	ø12, ø16: 10 to 150 ø20, ø25: 20 to 200 ø32, ø40: 25 to 200

MGP-XB24



CAT.ES20-291A

High Durability Series

Longer Life Cylinder

MGP-XB24

ø12, ø16, ø20, ø25, ø32, ø40

RoHS

How to Order

MGP M 25 [] - 30 Z - M9BW [] - XB24

Compact guide cylinder

1

2

3

4

5

6

Longer life cylinder

1 Bearing type

M	Slide bearing
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2 Bore size

12	12 mm
16	16 mm
20	20 mm
25	25 mm
32	32 mm
40	40 mm

3 Port thread type

Nil	M5 x 0.8	ø12, ø16
	Rc	
TN	NPT	ø20 to ø40
TF	G	

4 Cylinder stroke [mm]

Refer to "Standard Strokes" on page 2.

5 Auto switch

Nil	Without auto switch (Built-in magnet)
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* For applicable auto switches, refer to the table below.

6 Number of auto switches

Nil	2
S	1
n	n

Applicable Auto Switches / Refer to the Web Catalog for further information on auto switches.

Type	Special function	Electrical entry	Indicator/light	Wiring (Output)	Load voltage		Auto switch model		Lead wire length [m]				Pre-wired connector	Applicable load		
					DC	AC	Perpendicular	In-line	0.5 (Nil)	1 (M)	3 (L)	5 (Z)		IC circuit	Relay, PLC	
Solid state auto switch	—	Grommet	Yes	3-wire (NPN)	24 V	5 V, 12 V	—	M9NV	M9N	●	●	●	○	○	IC circuit	Relay, PLC
				3-wire (PNP)				M9PV	M9P	●	●	●	○	○		
	Diagnostic indication (2-color indicator)			2-wire	5 V, 12 V	M9BV	M9B	●	●	●	○	○	—			
				3-wire (NPN)		M9NWV	M9NW	●	●	●	○	○	IC circuit			
	Water resistant (2-color indicator)			3-wire (PNP)	5 V, 12 V	M9PWV	M9PW	●	●	●	○	○	IC circuit			
				2-wire		M9BWW	M9BW	●	●	●	○	○	—			
	Magnetic field resistant (2-color indicator)			3-wire (NPN)	12 V	M9NAV*1	M9NA*1	○	○	●	○	○	IC circuit			
				3-wire (PNP)		M9PAV*1	M9PA*1	○	○	●	○	○	IC circuit			
				2-wire		M9BAV*1	M9BA*1	○	○	●	○	○	—			
	Feed auto switch			—	Grommet	No	3-wire (NPN equivalent)	24 V	5 V	100 V or less	A96V	A96	●	—	●	
2-wire		A93V*3	A93				●				●	●	●	—	—	Relay, PLC
		A90V	A90				●				—	●	—	—	—	IC circuit

*1 Water-resistant type auto switches can be mounted on the above models, but SMC cannot guarantee water resistance.

A water-resistant type cylinder is recommended for use in an environment which requires water resistance.

However, please contact SMC for water-resistant products of ø12 and ø16.

*2 The D-P3DWA□ type is only available in sizes ø25 to ø40.

*3 The 1 m lead wire is only applicable to the D-A93.

* Lead wire length symbols: 0.5 m..... Nil (Example) M9NW
 1 m..... M (Example) M9NWM
 3 m..... L (Example) M9NWL
 5 m..... Z (Example) M9NWZ

* Solid state auto switches marked with a "○" are produced upon receipt of order.

* Since there are applicable auto switches other than those listed above, refer to the Web Catalog for details.

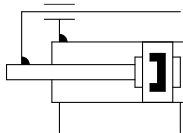
* For details on auto switches with pre-wired connectors, refer to the Web Catalog.

* Auto switches are shipped together with the product but do not come assembled.

* The installation of auto switches is equivalent to that for the MGP Compact Guide Cylinder series. For details, refer to the Web Catalog.



Symbol
Rubber bumper



The mounting pitch and shape of this product with auto switch are the same as those of the Compact Guide Cylinder MGP series with auto switch.
For details, refer to the **Web Catalog**.

- Auto Switch Proper Mounting Position (Detection at stroke end) and Mounting Height
- Min. Stroke for Auto Switch Mounting
- Operating Range
- Auto Switch Mounting Brackets/Part Nos.

⚠ Precautions

Refer to pages 5 and 6 before handling the products.

Specifications

Bore size [mm]	12	16	20	25	32	40
Action	Double acting					
Fluid	Air					
Proof pressure	1.5 MPa					
Max. operating pressure	1.0 MPa					
Min. operating pressure	0.12 MPa		0.1 MPa			
Ambient and fluid temperatures	-10 to 60°C (No freezing)					
Piston speed	50 to 500 mm/s					
Cushion	Rubber bumper on both ends					
Lubrication	Not required (Non-lube)					
Stroke length tolerance	$+1.5$ 0 mm					

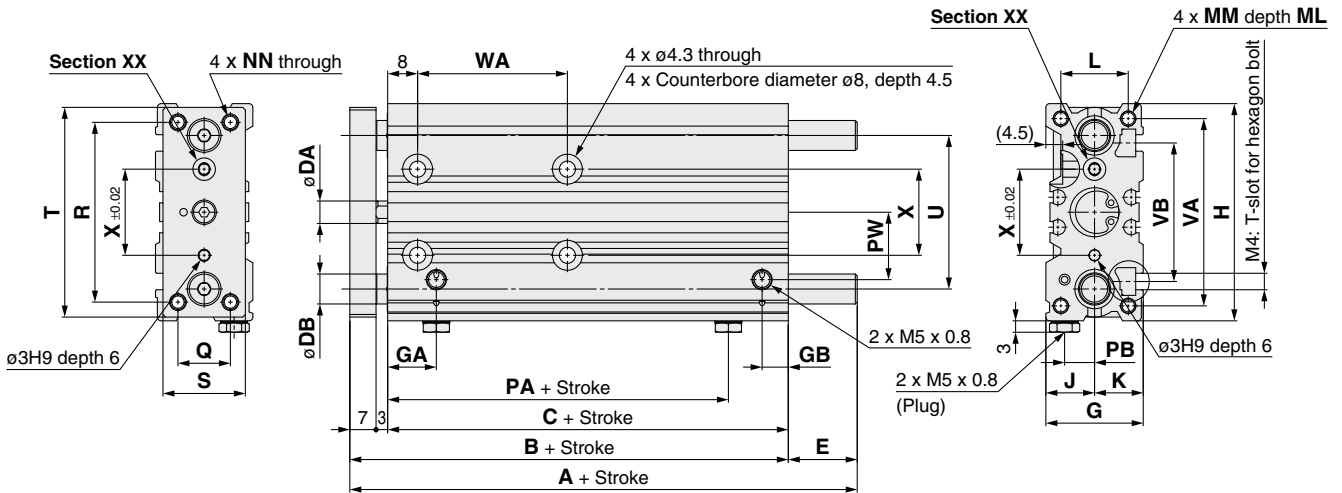
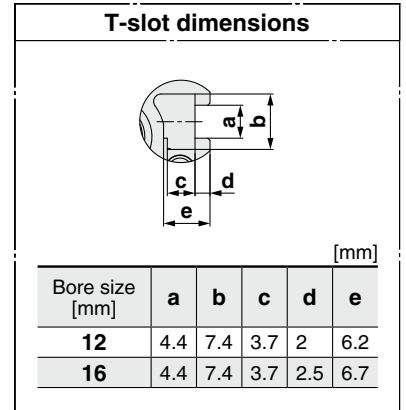
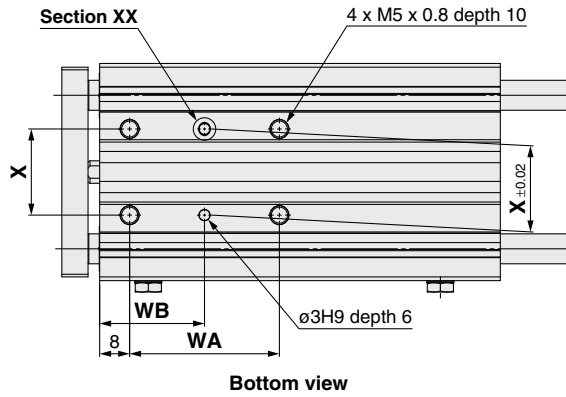
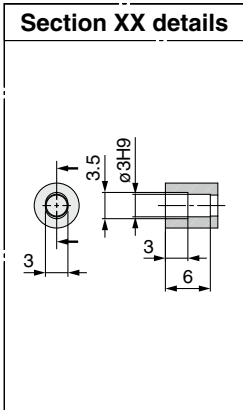
* Max. speed with no load. Depending on the operating conditions, the piston speed may not be satisfied. Make a model selection, considering a load according to the **Web Catalog**.

Standard Strokes

Bore size	Standard stroke [mm]
12, 16	10, 20, 30, 40, 50, 75, 100, 125, 150
20, 25	20, 30, 40, 50, 75, 100, 125, 150, 175, 200
32, 40	25, 50, 75, 100, 125, 150, 175, 200

The allowable rotational torque of the plate, non-rotating accuracy of the plate, theoretical output, and weight are equivalent to those of the Compact Guide Cylinder MGP series. For details, refer to the **Web Catalog**.

MGPM: Ø12, Ø16

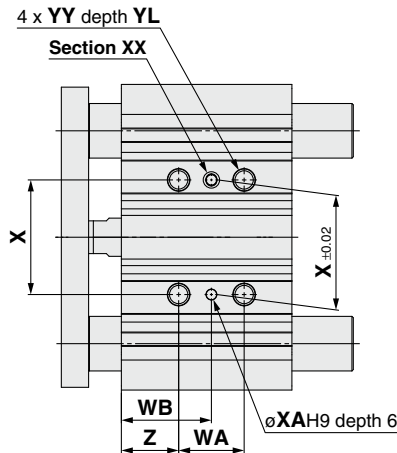
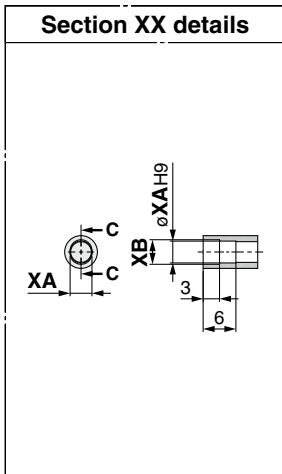


Bore size [mm]	Standard stroke [mm]	A							E			G	GA	GB	H	J
		10 to 50 st	75, 100 st	125, 150 st	B	C	DA	DB	10 to 50 st	75, 100 st	125, 150 st					
12	10, 20, 30, 40, 50,	42	60.5	82.5	42	32	6	8	0	18.5	40.5	26	13	7	58	13
16	75, 100, 125, 150	46	64.5	92.5	46	36	8	10	0	18.5	46.5	30	13.5	7.5	64	15

Bore size [mm]	K	L	MM	ML	NN	PA	PB	PW	Q	R	S	T	U	VA	VB	WA		
																10 to 30 st	40 to 100 st	125, 150 st
12	13	18	M4 x 0.7	10	M4 x 0.7	16	8	18	14	48	22	56	41	50	37	20	40	110
16	15	22	M5 x 0.8	12	M5 x 0.8	17.5	10	19	16	54	25	62	46	56	38	24	44	110

Bore size [mm]	WB			X
	10 to 30 st	40 to 100 st	125, 150 st	
12	18	28	63	23
16	20	30	63	24

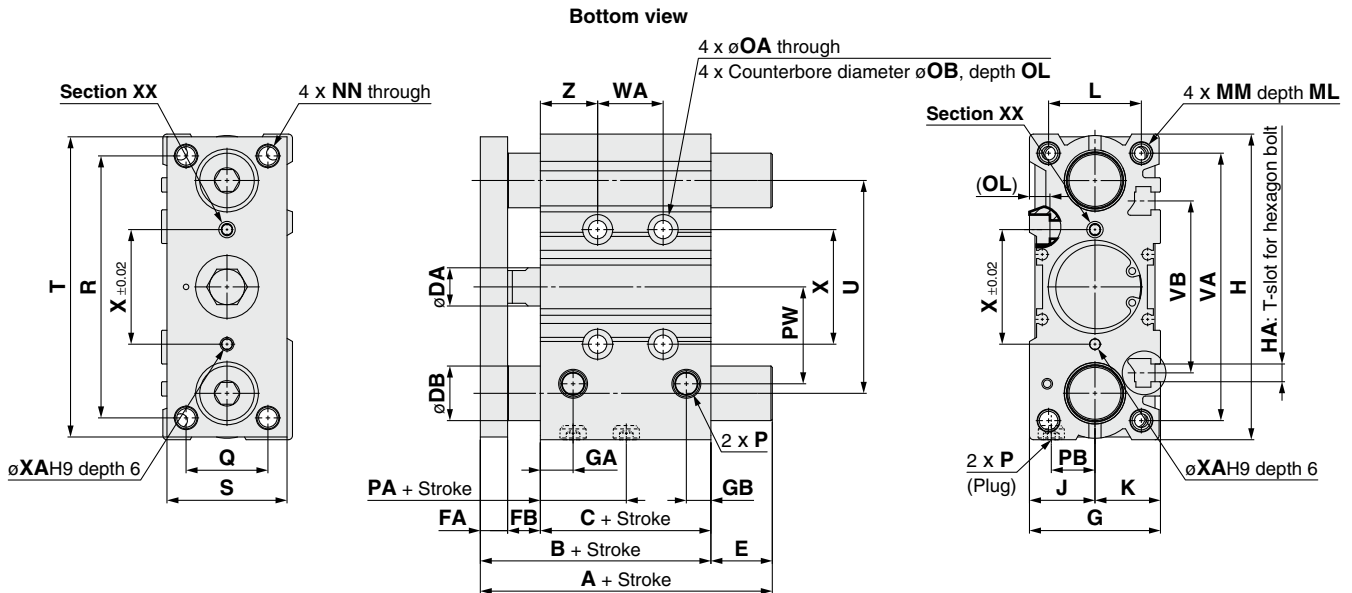
MGPM: $\varnothing 20$ to $\varnothing 40$



T-slot dimensions

Bore size [mm]	a	b	c	d	e
20	5.4	8.4	4.5	2.8	7.8
25	5.4	8.4	4.5	3	8.2
32	6.5	10.5	5.5	3.5	9.5
40	6.5	10.5	5.5	4	11

[mm]



Bore size [mm]	Standard stroke [mm]	A		B	C	DA	DB	E		FA	FB	G	GA	GB	H	HA	J	K	L
		Up to 50 st	75 to 200 st					Up to 50 st	75 to 200 st										
20	20, 30, 40, 50, 75, 100,	53	83	53	37	10	12	0	30	8	8	36	11.5	9	83	M5	18	18	24
	125, 150, 175, 200	53.5	83.5	53.5	37.5	10	16	0	30	9	7	42	11.5	10	93	M5	21	21	30
32	25, 50, 75, 100,	82	100.5	59.5	37.5	14	20	22.5	41	10	12	48	12	9	112	M6	24	24	34
	125, 150, 175, 200	82	100.5	66	44	16	20	16	34.5	10	12	54	15	12	120	M6	27	27	40

Bore size [mm]	MM	ML	NN	OA	OB	OL	P			PA	PB	PW	Q	R	S	T	U	VA	VB
							Nil	TN	TF										
20	M5 x 0.8	13	M5 x 0.8	5.4	9.5	5.5	Rc1/8	NPT1/8	G1/8	13.5	10.5	25	18	70	30	81	54	72	44
25	M6 x 1	15	M6 x 1	5.4	9.5	5.5	Rc1/8	NPT1/8	G1/8	12.5	13.5	30	26	78	38	91	64	82	50
32	M8 x 1.25	20	M8 x 1.25	6.7	11	7.5	Rc1/8	NPT1/8	G1/8	6.5	16	35.5	30	96	44	110	78	98	63
40	M8 x 1.25	20	M8 x 1.25	6.7	11	7.5	Rc1/8	NPT1/8	G1/8	13	18	39.5	30	104	44	118	86	106	72

Bore size [mm]	WA					WB					X	XA	XB	YY	YL	Z
	20, 30 st	40 to 100 st	25 st	50 to 100 st	125 to 200 st	20, 30 st	40 to 100 st	25 st	50 to 100 st	125 to 200 st						
20	24	44	—	—	120	29	39	—	—	77	28	3	3.5	M6 x 1	12	17
25	24	44	—	—	120	29	39	—	—	77	34	4	4.5	M6 x 1	12	17
32	—	—	24	48	124	—	—	33	45	83	42	4	4.5	M8 x 1.25	16	21
40	—	—	24	48	124	—	—	34	46	84	50	4	4.5	M8 x 1.25	16	22

Specific Product Precautions 1



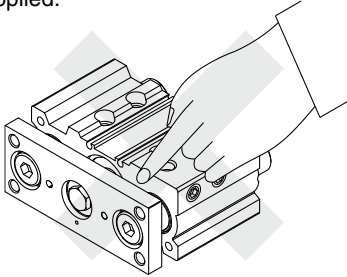
Be sure to read this before handling the products. Refer to the back cover for safety instructions. For actuator and auto switch precautions, refer to the "Handling Precautions for SMC Products," the "Operation Manual," and the compact guide cylinder MGP series specific product precautions on the SMC website: <https://www.smcworld.com>

Mounting

Warning

1. Never place your hands or fingers between the plate and the body.

Be very careful to prevent your hands or fingers from getting caught in the gap between the cylinder body and the plate when air is applied.



Caution

1. Use cylinders within the piston speed range.

An orifice is set for this cylinder, but the piston speed may exceed the operating range if the speed controller is not used. If the cylinder is used outside the operating speed range, it may cause damage to the cylinder and shorten the service life. Adjust the speed by installing the speed controller and use the cylinder within the limited range.

2. Pay attention to the operating speed when the product is mounted vertically.

When using the product in the vertical direction, if the load factor is large, the operating speed can be faster than the control speed of the speed controller (i.e. quick extension). In such cases, it is recommended to use a dual speed controller.

3. When used near the lower limit of the operating piston speed, stick-slip may occur depending on the operating conditions. To counter this, it is recommended to use an operating pressure with margin.

4. Do not use the product if an air leak occurs.

If an air leak does occur, this may result in the speed being increased beyond the speed controller's adjustment capability, which may further lead to the products speed becoming impossible to control.

If the speed is increased excessively, internal components and guide sections may be damaged.

5. Do not scratch or gouge the sliding portion of the piston rod and the guide rod.

Damaged seals, etc., will result in leakage or malfunction.

6. Do not dent or scratch the mounting surface of the body and the plate.

This may cause a decrease in the flatness of the mounting surface, which will cause an increase in sliding resistance.

7. Make sure that the cylinder mounting surface has a flatness of 0.05 mm or less.

If the flatness of the workpieces and brackets mounted on the plate is not appropriate, sliding resistance may increase. If it is difficult to maintain a flatness of 0.05 mm or less, put a thin shim ring (provided by the customer) between the plate and the workpiece mounting surface to prevent the sliding resistance from increasing.

Caution

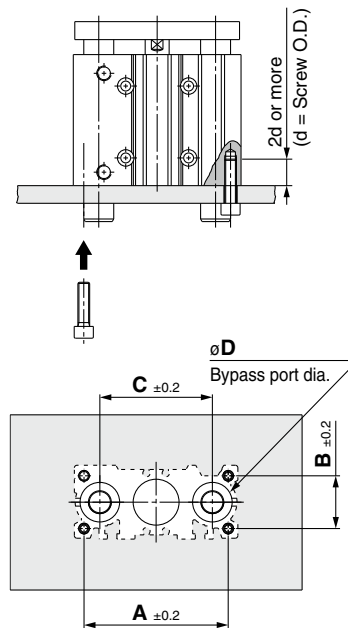
8. Be sure that the piston rods are retracted when mounting workpieces on the plate.

If workpieces are mounted on the plate when the piston rods are extended, it can lead to distortion of the guide unit, resulting in a malfunction.

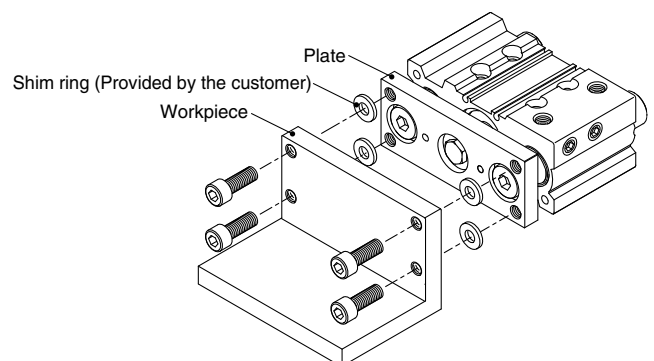
9. Bottom of cylinder

The guide rods protrude from the bottom of the cylinder at the end of the retracting stroke, and therefore, in cases where the cylinder is to be bottom mounted, it is necessary to provide bypass ports in the mounting surface for the guide rods, as well as holes for the hexagon socket head cap screws which are used for mounting.

Moreover, in applications where impact occurs from a stopper, etc., the mounting screws should be inserted to a depth of 2d or more.



Bore size [mm]	A [mm]	B [mm]	C [mm]	D [mm]		Hexagon socket head cap screw
				MGPM	MGPL	
12	50	18	41	10	8	M4 x 0.7
16	56	22	46	12	10	M5 x 0.8
20	72	24	54	14	12	M5 x 0.8
25	82	30	64	18	15	M6 x 1.0
32	98	34	78	22	18	M8 x 1.25
40	106	40	86	22	18	M8 x 1.25



Specific Product Precautions 2



Be sure to read this before handling the products. Refer to the back cover for safety instructions. For actuator and auto switch precautions, refer to the "Handling Precautions for SMC Products," the "Operation Manual," and compact guide cylinder MGP series specific product precautions on the SMC website: <https://www.smcworld.com>

Piping

Caution

Depending on the operating condition, change the position of plugs for the piping port.

1. M5

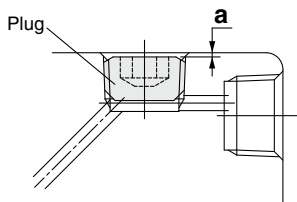
After tightening by hand, tighten an additional 1/6 to 1/4 turn with a tightening tool.

2. Tapered thread for Rc port (MGP) and NPT port (MGP□□TN)

Tighten with proper tightening torque below. Use sealing tape on the plug and make sure that the sealing tape does not protrude below the plug. With regard to the sunk dimension of a plug ("a" dimension in the drawing), use the stipulated figures as a guide and confirm the air leakage before operation.

* If plugs on the top mounting port are tightened with more than the proper tightening torque, they will be screwed too deeply and the air passage will be constricted, resulting in limited cylinder speed.

Connection thread (plug) size	Proper tightening torque [N·m]	a dimension
1/8	7 to 9	0.5 mm or less



3. Parallel pipe thread for G port (MGP□□TF)

Screw in the plug to the surface of the body ("a" dimension in the drawing) by checking visually instead of using the tightening torque shown in the table.

Lubrication

Caution

- This product should be used without lubrication. The use of lubrication can cause a reduction in the products lifetime.

Durability of The Cylinder


The durability of a longer life cylinder has been evaluated by comparison with the existing cylinders under SMC's test conditions.


The durability of a cylinder depends on the customer's operating conditions and operating environment.


Therefore, durability of four times or longer will not be guaranteed under all conditions.

Safety Instructions

These safety instructions are intended to prevent hazardous situations and/or equipment damage. These instructions indicate the level of potential hazard with the labels of “**Caution**,” “**Warning**” or “**Danger**.” They are all important notes for safety and must be followed in addition to International Standards (ISO/IEC)*1), and other safety regulations.

 **Caution:** **Caution** indicates a hazard with a low level of risk which, if not avoided, could result in minor or moderate injury.

 **Warning:** **Warning** indicates a hazard with a medium level of risk which, if not avoided, could result in death or serious injury.

 **Danger :** **Danger** indicates a hazard with a high level of risk which, if not avoided, will result in death or serious injury.

*1) ISO 4414: Pneumatic fluid power – General rules relating to systems.
ISO 4413: Hydraulic fluid power – General rules relating to systems.
IEC 60204-1: Safety of machinery – Electrical equipment of machines.
(Part 1: General requirements)
ISO 10218-1: Manipulating industrial robots – Safety.
etc.

Warning

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

Since the product specified here is used under various operating conditions, its compatibility with specific equipment must be decided by the person who designs the equipment or decides its specifications based on necessary analysis and test results. The expected performance and safety assurance of the equipment will be the responsibility of the person who has determined its compatibility with the product. This person should also continuously review all specifications of the product referring to its latest catalog information, with a view to giving due consideration to any possibility of equipment failure when configuring the equipment.

2. Only personnel with appropriate training should operate machinery and equipment.

The product specified here may become unsafe if handled incorrectly. The assembly, operation and maintenance of machines or equipment including our products must be performed by an operator who is appropriately trained and experienced.

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

1. The inspection and maintenance of machinery/equipment should only be performed after measures to prevent falling or runaway of the driven objects have been confirmed.
2. When the product is to be removed, confirm that the safety measures as mentioned above are implemented and the power from any appropriate source is cut, and read and understand the specific product precautions of all relevant products carefully.
3. Before machinery/equipment is restarted, take measures to prevent unexpected operation and malfunction.

4. Contact SMC beforehand and take special consideration of safety measures if the product is to be used in any of the following conditions.

1. Conditions and environments outside of the given specifications, or use outdoors or in a place exposed to direct sunlight.
2. Installation on equipment in conjunction with atomic energy, railways, air navigation, space, shipping, vehicles, military, medical treatment, combustion and recreation, or equipment in contact with food and beverages, emergency stop circuits, clutch and brake circuits in press applications, safety equipment or other applications unsuitable for the standard specifications described in the product catalog.
3. An application which could have negative effects on people, property, or animals requiring special safety analysis.
4. Use in an interlock circuit, which requires the provision of double interlock for possible failure by using a mechanical protective function, and periodical checks to confirm proper operation.

Caution

1. The product is provided for use in manufacturing industries.

The product herein described is basically provided for peaceful use in manufacturing industries.
If considering using the product in other industries, consult SMC beforehand and exchange specifications or a contract if necessary.
If anything is unclear, contact your nearest sales branch.

Limited warranty and Disclaimer/ Compliance Requirements

The product used is subject to the following “Limited warranty and Disclaimer” and “Compliance Requirements”.

Read and accept them before using the product.

Limited warranty and Disclaimer

1. The warranty period of the product is 1 year in service or 1.5 years after the product is delivered, whichever is first.*2)
Also, the product may have specified durability, running distance or replacement parts. Please consult your nearest sales branch.
2. For any failure or damage reported within the warranty period which is clearly our responsibility, a replacement product or necessary parts will be provided.
This limited warranty applies only to our product independently, and not to any other damage incurred due to the failure of the product.
3. Prior to using SMC products, please read and understand the warranty terms and disclaimers noted in the specified catalog for the particular products.

*2) Vacuum pads are excluded from this 1 year warranty.

A vacuum pad is a consumable part, so it is warranted for a year after it is delivered.
Also, even within the warranty period, the wear of a product due to the use of the vacuum pad or failure due to the deterioration of rubber material are not covered by the limited warranty.


Compliance Requirements

1. The use of SMC products with production equipment for the manufacture of weapons of mass destruction (WMD) or any other weapon is strictly prohibited.
2. The exports of SMC products or technology from one country to another are governed by the relevant security laws and regulations of the countries involved in the transaction. Prior to the shipment of a SMC product to another country, assure that all local rules governing that export are known and followed.

Caution

SMC products are not intended for use as instruments for legal metrology.

Measurement instruments that SMC manufactures or sells have not been qualified by type approval tests relevant to the metrology (measurement) laws of each country. Therefore, SMC products cannot be used for business or certification ordained by the metrology (measurement) laws of each country.

 **Safety Instructions** Be sure to read the “Handling Precautions for SMC Products” (M-E03-3) and “Operation Manual” before use.

SMC Corporation

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Specifications are subject to change without prior notice
and any obligation on the part of the manufacturer.

D-G