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KOGANEI

ACTUATORS GENERAL CATALOG

MINI GUIDE SLIDERS CONTENTS

MINI GUIDE SLIDERS

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Caution

Before use, be sure to read the "Safety Precautions" on p. 57.

Mini Guide Sliders

Compact, High Precision

(Shown below is the ϕ 4.5mm standard cylinder.)

Height: 10mm [0.394in.], Width: 18mm [0.709in.], Length: 43mm [1.693in.]

Accuracy and Functions are combined within the above dimensions!

(The dimensions are for the standard type slider with a bore size of 4.5mm[0.177in.].)

Bigger selection of bore sizes

Sizes ϕ 12 [0.472], ϕ 16 [0.630], and ϕ 20 [0.787] have been added, for wider selection!

Traveling parallelism

0.005mm[0.00020in.]

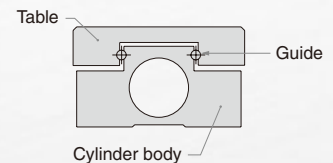
(ϕ 20=0.006mm[0.00024in.])

Mounting parallelism

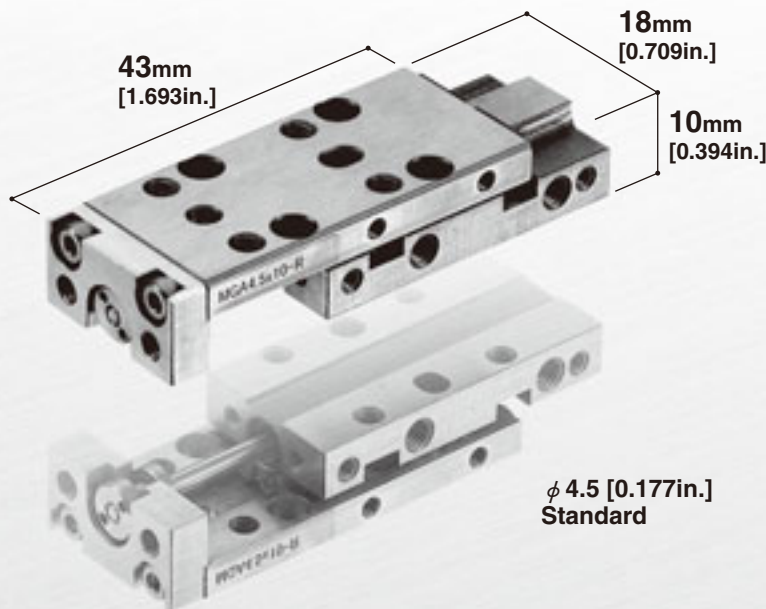
0.03mm[0.0012in.]

Integrated in one unit

Table, guide, and cylinder body are integrated in one unit to offer a compact size.



Sensor switch mountings available for all sizes.



Excellent corrosion resistance

High corrosion resistant stainless steel is used in the manufacture of the table and cylinder body.

Installation of the load

The load can be mounted on the top or front of the table.

Sensor switch is available

Eight different models of sensor switches can be mounted by using the optional sensor rail. The sensor rail can be installed in a symmetrical position.

For the 4.5mm[0.177in.] bore sized cylinder, only 1 sensor switch can be installed due to only 1 available sensor mounting groove.



4-point contact linear guide

A 4-point contact linear guide is highly resistant to fluctuating and compound loads to offer load bearing capacity.



Bore Size and Stroke

Bore size	Standard strokes									
ϕ 4.5 [0.177]	5	10	—	—	—	—	—	—	—	—
ϕ 6 [0.236]	5	10	15	—	—	—	—	—	—	—
ϕ 8 [0.315]	5	10	15	20	—	—	—	—	—	—
ϕ 10 [0.394]	5	10	15	20	30	—	—	—	—	—
NEW ϕ 12 [0.472]	—	10	—	20	30	40	50	60	—	—
NEW ϕ 16 [0.630]	—	10	—	20	30	40	50	60	—	—
NEW ϕ 20 [0.787]	—	10	—	20	30	40	50	60	70	80

mm[in.]

Product Range

- Seven bore sizes (ϕ 4.5[0.177], ϕ 6[0.236], ϕ 8[0.315], ϕ 10[0.394], ϕ 12[0.472], ϕ 16[0.630], ϕ 20[0.787])
- Total of 11 product ranges (For details, see p.597 and 598.)
- Left-right symmetry available for all types.

Numbers show the specifications page.

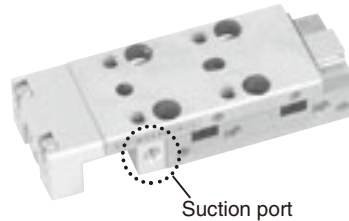
●Standard Cylinder

Page 603



●Clean system cylinder

Page 662



■Clean system cylinders in bore sizes ϕ 4.5[0.177] to ϕ 10[0.394] are at Class 5^{Note} for 0.1 μ m particle equivalent. (Bore sizes ϕ 12[0.472] to ϕ 20[0.787] are Class 6^{Note}.)

Note: For Koganei standards, see p.666.

●Cylinder with buffer

Page 604

NEW



●Extended side stroke adjusting cylinder

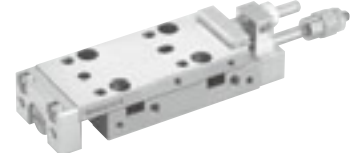
Page 603



Stroke adjusting range:
Extended side -5 to 0mm[-0.197 to 0in.]

●Extended/retracted side stroke adjusting cylinder

Page 603



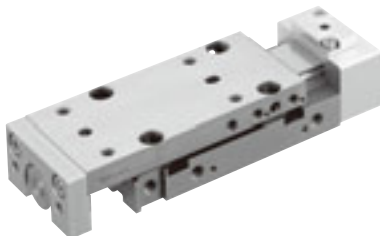
Stroke adjusting range:
Extended side -5 to 0mm[-0.197 to 0in.], retracted side -7 to 0mm[-0.276 to 0in.]

■Select from 2 types of stroke adjustment, depending on the application. Hardened metal stopper achieves repeatability on the adjustment side of $\pm 0.02\text{mm}[\pm 0.0008\text{in.}]$.

●Cylinder with end keep

Page 604

NEW



●Side-mounted cylinder

Page 603

Table left side mount (-L)



Table right side mount (-R)

■Side-mounted cylinder is suitable for short pitch mounting. A left-facing or right-facing table can be selected, depending on the application.

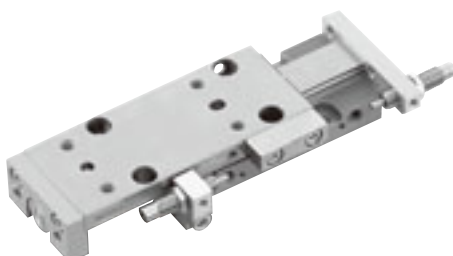


Collects wiring and piping into a single direction



●Cylinder with shock absorber

NEW



(With shock absorber, with metal stopper, or with rubber stopper)

Available for bore sizes ϕ 12[0.472], ϕ 16[0.630], and ϕ 20[0.787].



Shock absorber



Metal stopper



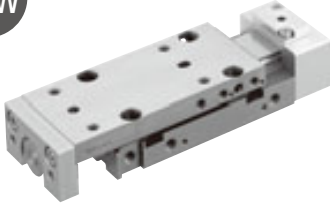
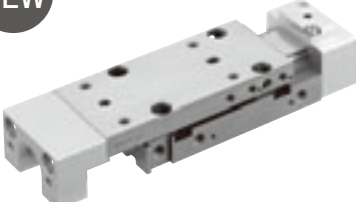
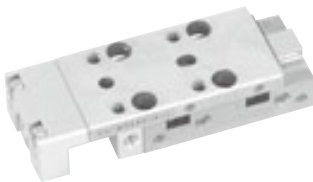
Rubber stopper

Product Range and Bore Size Table

Numbers show the dimensions pages.

Product range	Basic model	Shock absorber	Bore size ϕ						
			4.5[0.177]	6[0.236]	8[0.315]	10[0.394]	12[0.472]	16[0.630]	20[0.787]
●Standard cylinder 	MGA	—	613	619	625	631	637	645	653
		With shock absorber	—	—	—	—	638	646	654
		With metal stopper	—	—	—	—	638	646	654
		With rubber stopper	—	—	—	—	638	646	654
●Extended side stroke adjusting cylinder  Stroke adjusting range: Extended side —5 to 0mm[—0.197 to 0in.] ■ Hardened metal stopper achieves repeatability of $\pm 0.02\text{mm}$ [$\pm 0.0008\text{in.}$].	MGAP	—	614	620	626	632	—	—	—
●Extended/retracted-side stroke adjusting cylinder  Stroke adjusting range: Extended side —5 to 0mm[—0.197 to 0in.] Retracted side —7 to 0mm[—0.276 to 0in.] ■ Hardened metal stopper achieves repeatability of $\pm 0.02\text{mm}$ [$\pm 0.0008\text{in.}$].	MGAE	—	614	620	626	632	—	—	—
●Side-mounted cylinder Table left side mount (-L)  Table right side mount (-R)	MGAL	—	615	621	627	633	—	—	—
●Cylinder with buffer NEW  ■ Buffer mechanism absorbs position deviation and impact at downward end of stroke caused by inserting a workpiece.	MGAG	—	614	620	626	632	639	647	655
		With shock absorber Note	—	—	—	—	640	648	656
		With metal stopper Note	—	—	—	—	640	648	656
		With rubber stopper Note	—	—	—	—	640	648	656

Note: Only retracted side can be selected in cylinder with buffer.

Product range	Basic model	Shock absorber	Bore size ϕ						
			4.5[0.177]	6[0.236]	8[0.315]	10[0.394]	12[0.472]	16[0.630]	20[0.787]
Extended side stroke adjusting cylinder with buffer 	MGAPG	—	614	620	626	632	—	—	—
Extended/retracted-side stroke adjusting cylinder with buffer 	MGAEG	—	614	620	626	632	—	—	—
Side-mounted cylinder with buffer 	MGALG	—	617	623	629	635	—	—	—
Cylinder with end keep 	MGAK	—	—	—	—	—	641	649	657
		With shock absorber Note2	—	—	—	—	642	650	658
		With metal stopper Note2	—	—	—	—	642	650	658
		With rubber stopper Note2	—	—	—	—	642	650	658
Cylinder with buffer end keep 	MGAGK	—	—	—	—	—	643	651	659
Clean system cylinder 	CS-MGA	—	667	668	669	670	671	673	675
		With shock absorber	—	—	—	—	672	674	676
		With rubber stopper	—	—	—	—	672	674	676

■ Clean system cylinders in bore sizes ϕ 4.5[0.177] to ϕ 10[0.394] are at Class 5 Note 1 by 0.1 μ m particle equivalent.
 (Bore sizes ϕ 12[0.472] to ϕ 20[0.787] are Class 6 Note 1.)

Notes: 1. For Koganei standards, see p.666.

2. Only retracted side can be selected in cylinder with end keep.

Handling Instructions and Precautions



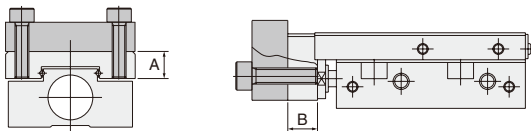
Mounting, stroke adjusting, and piping

Mounting

- While any mounting direction is allowed (excluding with-buffer type), the flatness of the mounting surface of the workpiece or base should be 0.02mm [0.0008in.] or less. Improper flatness causes looseness in the guide portion, increases the rolling resistance, and adversely affects the product operating life.
- Care should be taken that scratches or dents on the slider's mounting surface may damage its flatness.
- In applications subject to large shocks, reinforce the bolt mounting by installing a support to the cylinder body, etc.
- The table is supported with steel balls. Do not apply any strong shock or excessively large moment to the table when mounting the workpiece. Hold the table when securing the workpiece to the table. Tightening bolts with holding the cylinder gives excessively large moment to the guide, leading to deterioration of accuracy.
- Ensure adequate strength of the mounting bolts for the cylinder and the end plate. When mounting the cylinder, tighten the bolts with torque within the allowable range.
- Take measures against looseness of the bolts when shocks or vibrations might loosen the bolts.
- Do not leave scratches or dents in the areas where the piston rod and the guide rod contact. It could result in damage to the seal or in air leaks.
- Use clearance fit locating pins (optional stepped pins) for locating dowel pin holes. When a press-fit pin is used, excessive loads generated while pressing will cause a failure in the guide. Furthermore, the pin holes of the table are through holes, using pins other than the stepped pins will bump against the main body, causing a failure.

Caution: When mounting the Mini Guide Slider, avoid interference between the piping/fittings and the mounting surface because of its thinner construction.

● Mounting workpieces

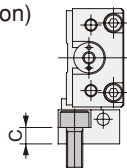


Model	Mounting bolt	Max. tightening torque N·m [in·lbf]	Max. threaded depth A mm [in.]	Max. threaded depth B mm [in.]
MGA□4.5	M3×0.5	0.63 [5.58]	4 [0.157]	4.5 [0.177]
MGA□6	M3×0.5	0.63 [5.58]	4 [0.157]	5.5 [0.217]
MGA□8	M3×0.5	0.63 [5.58]	5 [0.197]	5.5 [0.217]
MGA□10	M3×0.5	0.63 [5.58]	5 [0.197]	7 [0.276]
MGA□12	M4×0.7	1.5 [13.3]	7 [0.276]	7 [0.276]
MGA□16	M4×0.7	1.5 [13.3]	8.5 [0.335]	8 [0.315]
MGA□20	M5×0.8	3 [26.6]	10 [0.394]	9 [0.354]

Caution: The length of the workpiece mounting bolts should be below the maximum threaded depth. Long bolts will bump against the cylinder body, causing damage to the cylinder.

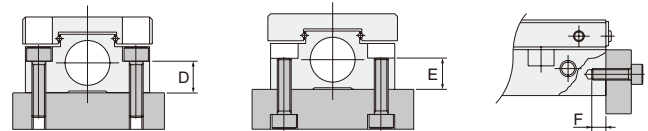
● Mounting cylinders (side-mounted specification)

Caution: Do not use washers, etc. The mounting bolt could touch the guide and damage it.



Model	Mounting bolt	Max. tightening torque N·m [in·lbf]	C mm [in.]
MGAL□4.5	M3×0.5	1.14 [10.09]	5 [0.197]
MGAL□6	M3×0.5	1.14 [10.09]	5 [0.197]
MGAL□8	M4×0.7	2.7 [23.9]	4 [0.157]
MGAL□10	M4×0.7	2.7 [23.9]	4 [0.157]

● Mounting cylinders



Model	Mounting bolt	Max. tightening torque N·m [in·lbf]	D mm [in.]
MGA□4.5	M2×0.4	0.32 [2.83]	3.5 [0.138]
MGA□6	M2.5×0.45	0.65 [5.75]	5 [0.197]
MGA□8	M2.5×0.45	0.65 [5.75]	5.5 [0.217]
MGA□10	M3×0.5	1.14 [10.09]	7 [0.276]
MGA□12	M4×0.7	2.7 [23.9]	6 [0.236]
MGA□16	M4×0.7	2.7 [23.9]	9 [0.354]
MGA□20	M5×0.8	5.4 [47.8]	12 [0.472]

Model	Mounting bolt	Max. tightening torque N·m [in·lbf]	E mm [in.]
MGA□4.5	M2.5×0.45	0.65 [5.75]	3.5 [0.138]
MGA□6	M3×0.5	1.14 [10.09]	5 [0.197]
MGA□8	M3×0.5	1.14 [10.09]	5.5 [0.217]
MGA□10	M4×0.7	2.7 [23.9]	7 [0.276]
MGA□12	M5×0.8	5.4 [47.8]	6 [0.236]
MGA□16	M5×0.8	5.4 [47.8]	9 [0.354]
MGA□20	M6×1	9.2 [81.4]	12 [0.472]

Model	Mounting bolt	Max. tightening torque N·m [in·lbf]	Max. threaded depth F mm [in.]
MGA□4.5	M2×0.4	0.32 [2.83]	2.5 [0.098]
MGA□6	M2.5×0.45	0.65 [5.75]	2.5 [0.098]
MGA□8	M3×0.5	1.14 [10.09]	3 [0.118]
MGA□10	M3×0.5	1.14 [10.09]	3 [0.118]
MGA□12	M4×0.7	2.7 [23.9]	4 [0.157]
MGA□16	M5×0.8	5.4 [47.8]	4 [0.157]
MGA□20	M5×0.8	5.4 [47.8]	5 [0.197]

Minimum mounting pitch for side-mounted specification

When using a short pitch mounting for the Mini Guide Slider's side-mounted specification, use the mounting pitches shown in the table below, or larger.

Model	A mm [in.]
MGAL□4.5	12 [0.472]
MGAL□6	14 [0.551]
MGAL□8	16 [0.630]
MGAL□10	18 [0.709]

※ Assumes that the mounting surface is flat.

Stroke adjusting

If the stroke adjusting mechanism is selected as an option for bore sizes $\phi 12$ [0.472] to $\phi 20$ [0.787], stroke adjusting can easily be performed in the range shown on p.603. For stroke adjusting on either the extended or retracted side, rotating the stopper bolt or shock absorber to the right (clockwise) shortens the stroke. After adjustment, tighten the lock nut to secure in place. When mounting the shock absorber, do not exceed the maximum tightening torque shown below for the hexagon nut. Tightening in excess of the force could cause damage.

Model	Max. tightening torque N·m [in·lbf]
KSHA4×4, CS-KSHC4×4	0.85 [7.52]
KSHA5×5, CS-KSHC5×5	2.5 [22.1]
KSHA6×8, CS-KSHC6×8	6.5 [57.5]

Recommended fittings

For piping used with the Mini Guide Sliders, the quick fitting and speed controller with quick fitting shown below are recommended.

● $\phi 4.5$ [0.177] to $\phi 10$ [0.394]

TS2-M3M (Straight), TSH2-M2M (Hexagon socket head, straight), TL2-M3M (Elbow)

Note: For details of fittings, see the separate catalog No.BKUA001.

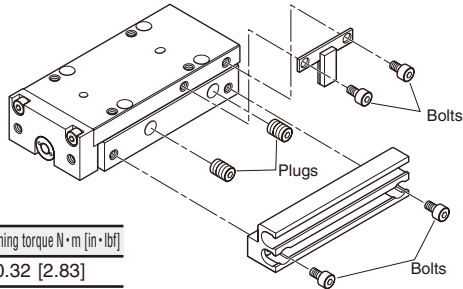
● $\phi 12$ [0.472] to $\phi 20$ [0.787]

SS4-M5MA (Straight)

Note: For details of the speed controller with quick fitting, see the General Catalog of Air Treatment, Auxiliary, Vacuum.

Mounting the sensor rail and magnet

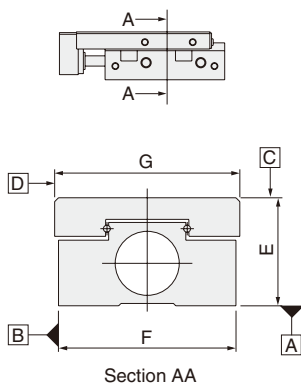
The Mini Guide Slider has sensor rails and tapped holes for magnet mounting on both sides so that the sensor rail position can be changed or attached at a later time. When mounting the bolts, tighten them at a suitable tightening torque within the allowable torque range. Always attach the plug for the piping connection port at the sensor rail side. When changing the plug position, apply sealant to the plug threads before screwing in. Install the plug at an intermediate position between the head protruding from the mounting surface and bumping against the bottom.



Mounting bolt	Max. tightening torque N·m [in·lbf]
M2×0.4	0.32 [2.83]

Accuracy

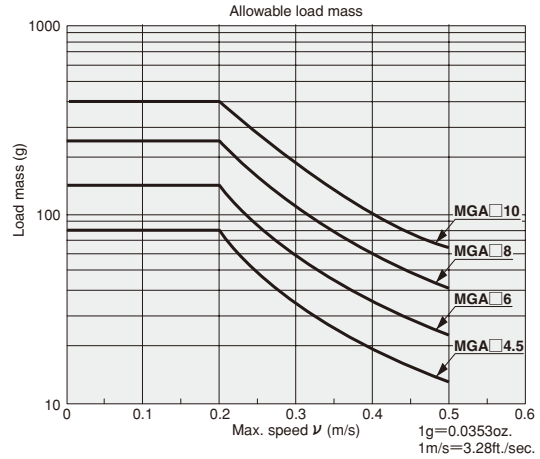
		mm [in.]	
Model		MGA□4.5~□16	MGA□20
Parallelism	Surface C against surface A	0.03 [0.0012]	
	Surface D against surface B	0.03 [0.0012]	
Traveling parallelism	Surface C against surface A	0.005 [0.00020]	0.006 [0.00024]
	Surface D against surface B	0.005 [0.00020]	0.006 [0.00024]
Dimensional tolerance of E		± 0.05 [± 0.0020]	
Dimensional tolerance of F		± 0.05 [± 0.0020]	
Dimensional tolerance of G		± 0.05 [± 0.0020]	



Allowable load mass

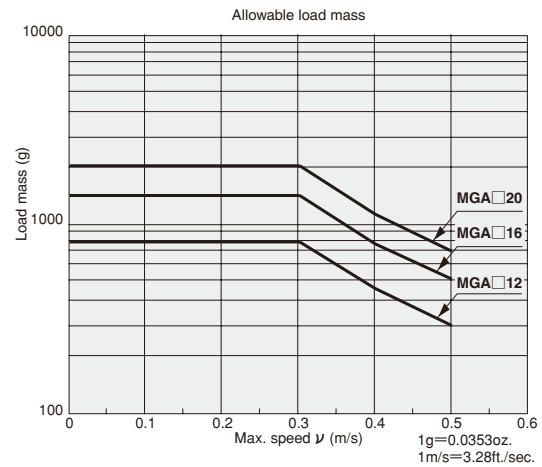
1. Standard cylinders $\phi 4.5$ [0.177]~ $\phi 10$ [0.394] (without stroke adjusting)

Model	MGA□4.5	MGA□6	MGA□8	MGA□10
Allowable kinetic energy J [ft·lbf]	1.59×10^{-3} [1.17×10^{-3}]	2.83×10^{-3} [2.09×10^{-3}]	5.02×10^{-3} [3.70×10^{-3}]	7.85×10^{-3} [5.79×10^{-3}]



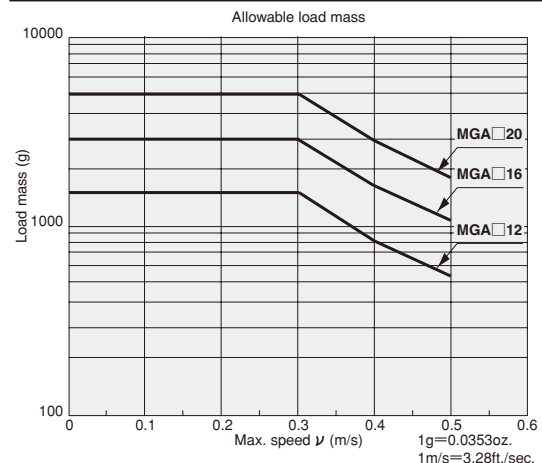
2. Standard cylinders $\phi 12$ [0.472]~ $\phi 20$ [0.787] (without stroke adjusting)

Model	MGA□12	MGA□16	MGA□20
Allowable kinetic energy J [ft·lbf]	0.036 [0.027]	0.063 [0.046]	0.090 [0.066]



3. Cylinders with shock absorber $\phi 12$ [0.472]~ $\phi 20$ [0.787]

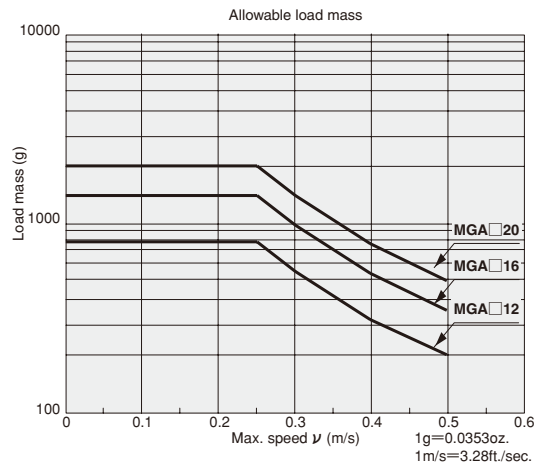
Model	MGA□12	MGA□16	MGA□20
Allowable kinetic energy J [ft·lbf]	0.067 [0.049]	0.135 [0.100]	0.225 [0.166]



Handling Instructions and Precautions

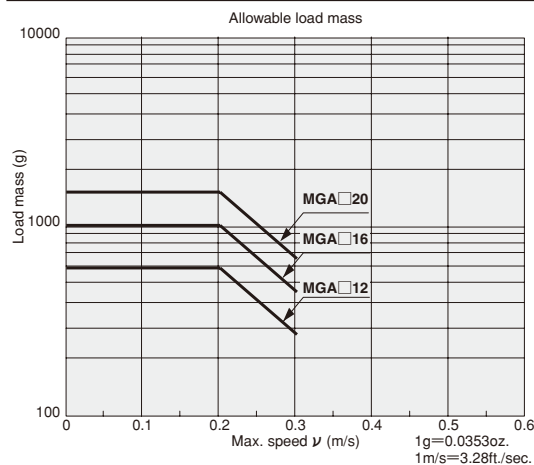
4. Cylinders with rubber stopper $\phi 12[0.472] \sim \phi 20[0.787]$

Model	MGA□12	MGA□16	MGA□20
Allowable kinetic energy J [ft·lbf]	0.025 [0.018]	0.044 [0.032]	0.063 [0.046]



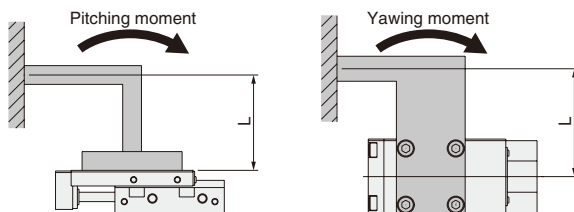
5. Cylinders with metal stopper $\phi 12 [0.472] \sim \phi 20 [0.787]$

Model	MGA□12	MGA□16	MGA□20
Allowable kinetic energy J [ft·lbf]	0.012 [0.009]	0.020 [0.015]	0.030 [0.022]

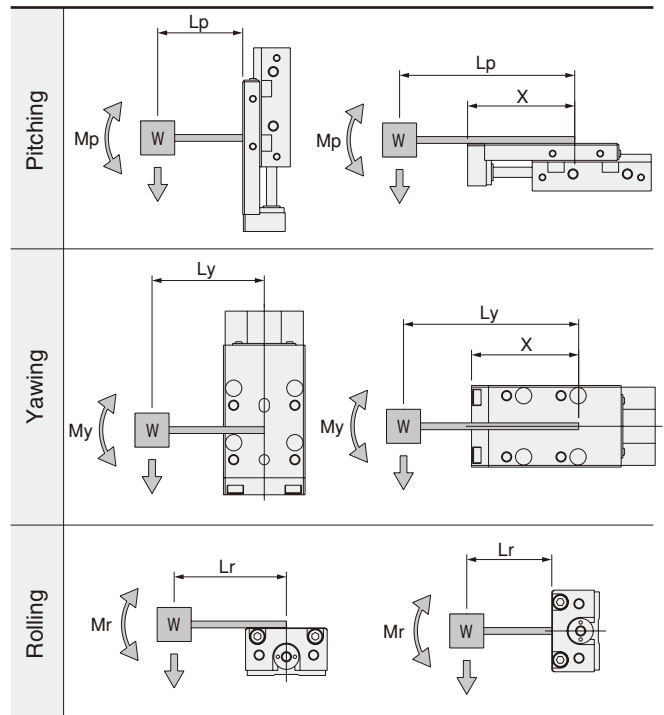


Allowable moment

The Mini Guide Sliders can be used with directly applying load. In this case, however, the load and moment should not exceed the values in the table to the right. If load is applied at the offset point from the guide portion in the stroke movement, the thrust force of the slider causes large moment.



●Direction of moment and location of the guide center X



Note: The center of moment should be measured from the guide center in the diagrams.

●Location of the guide center mm [in.]

Model	Stroke	X		
		Standard	Buffer	Clean
MGA□4.5	5	30	40	35
	10	[1.181]	[1.575]	[1.378]
MGA□6	5	31.5	41.5	36.5
	10	[1.240]	[1.634]	[1.437]
	15	36.5	46.5	41.5
		[1.437]	[1.831]	[1.634]
MGA□8	5	31.5	41.5	36.5
	10	[1.240]	[1.634]	[1.437]
	15	41.5	51.5	46.5
MGA□10	20	[1.634]	[2.028]	[1.831]
	5	34	44	39
	10	[1.339]	[1.732]	[1.535]
	15	44	54	49
	20	[1.732]	[2.126]	[1.929]
MGA□12	30	54	64	59
		[2.126]	[2.520]	[2.323]

Model	Stroke	X		
		Standard	Buffer	Clean
MGA□12	10	49	64	57
	20	[1.929]	[2.520]	[2.244]
	30	69	84	77
	40	[2.717]	[3.307]	[3.031]
	50	89	104	97
MGA□16	60	[3.504]	[4.094]	[3.819]
	10	51	65	59
	20	[2.008]	[2.559]	[2.323]
	30	71	85	79
	40	[2.795]	[3.346]	[3.110]
MGA□20	50	91	105	99
	60	[3.583]	[4.134]	[3.898]
	10	55	68	63
	20	[2.165]	[2.677]	[2.480]
	30	75	88	83
MGA□20	40	[2.953]	[3.465]	[3.268]
	50	95	108	103
	60	[3.740]	[4.252]	[4.055]
	70	115	128	123
	80	[4.528]	[5.039]	[4.843]

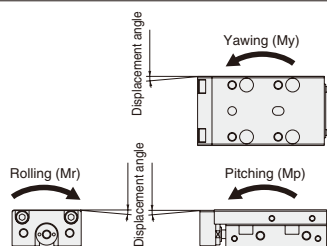
●Allowable moment

Model	N·m [in·lbf]		
	Mp	My	Mr
MGA□4.5	0.24 [2.12]	0.29 [2.57]	0.22 [1.95]
MGA□6	0.28 [2.48]	0.34 [3.01]	0.23 [2.04]
MGA□8	0.28 [2.48]	0.34 [3.01]	0.38 [3.36]
MGA□10	0.28 [2.48]	0.34 [3.01]	0.38 [3.36]
MGA□12	1.5 [13.3]	1.7 [15.0]	2.6 [23.0]
MGA□16	2.1 [18.6]	2.5 [22.1]	4.3 [38.1]
MGA□20	2.5 [22.1]	3.0 [26.6]	4.8 [42.5]

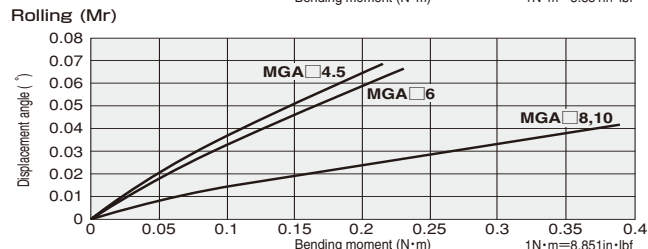
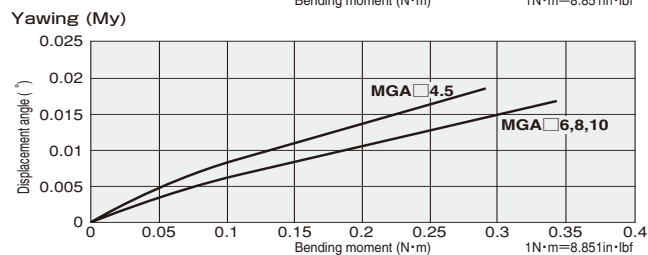
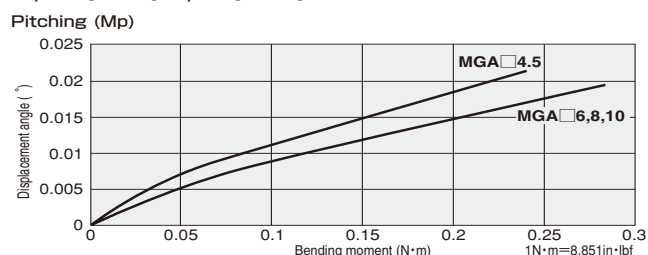
Remark: The allowable moment includes the safety factor of 10 with respect to the calculated value of the guide. However, the calculated values are not guaranteed values.

Displacement angle of the table by bending moment

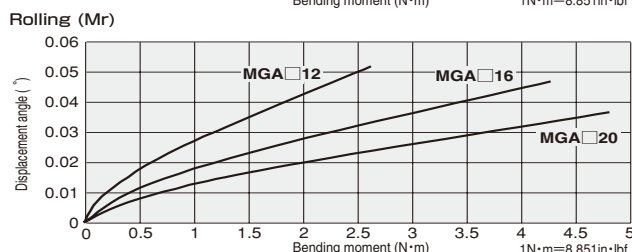
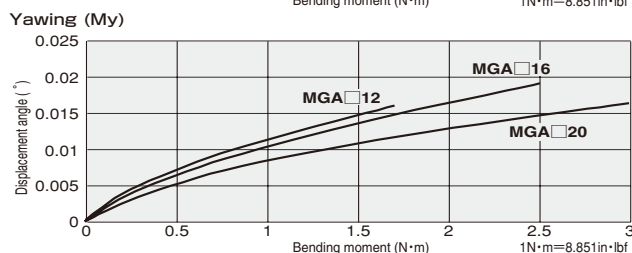
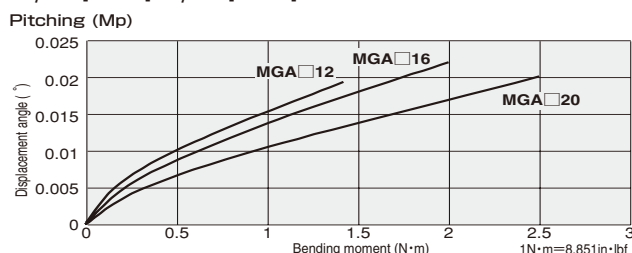
(Reference value)



● $\phi 4.5$ [0.177] ~ $\phi 10$ [0.394]



● $\phi 12$ [0.472] ~ $\phi 20$ [0.787]



Control circuit for the end keep cylinder

1. For control of the Mini Guide Slider with end keep, we recommend the use of 2-position, 4-, 5-port valves. Avoid the use of control circuit with ABR connection (exhaust center) 3-position valves that exhaust air from delivery 2 ports.
2. Always use meter-out control for speed control. Meter-in control may result in failure of the locking mechanism to release.
3. Always set the operating air pressure to 0.2MPa [29psi.] or higher.

Cautions:

1. It is dangerous to supply air to a connection port on a side with a locking mechanism while the cylinder has already been exhausted, because the piston rod may suddenly extend, etc. In addition, since the lock piston could also cause galling of the lock piston and piston rod, resulting in defective operation. Always supply air to the connection port on the opposite side of the locking mechanism to ensure applying back pressure.
2. When restarting operations after air has been exhausted from the cylinder due to completion of operations or to an emergency stop, always start by supplying air to a connection port on the opposite side of the locking mechanism.
3. Connect the valve port A (NC) to the connection port on the side with the locking mechanism.



Manual operation of end keep cylinder locking mechanism

While the locking mechanism is normally released automatically through cylinder operations, it can also be released manually. For manual release, insert an M3×0.5 screw that has 30mm [1.18in.] screw length into the manual override opening, thread it in about 3 turns into the internal lock piston, and then pull up the screw. To maintain the manual override for adjustment, etc., thread the locknut onto the screw and, with the locking mechanism in a released state, tighten the locknut against the cylinder.

Cautions:

1. It is dangerous to release the lock when load (weight) is present on the piston rod, because it may cause the unintended piston rod's extension, etc. In this case, always supply air to the connection port opposite the one adjacent to the locking mechanism before releasing the locking mechanism.
2. If the locking mechanism cannot easily be released even with manual override, it could be the result of galling of the lock piston and piston rod. In this case, supply air to the connection port opposite the one adjacent to the locking mechanism before releasing the locking mechanism.
3. Water, oil, dust, etc., intruding through the manual override opening may be a cause of defective locks or other erratic operation. If using in locations subject to dripping water, dripping oil, etc., or large amounts of dust, use a cover to protect the unit.



Cylinder with buffer

Operating conditions

1. When using a cylinder with buffer, use in the direction the buffer mechanism facing either vertically downward or horizontally. Note that the load or speed may sometimes cause the buffer to operate at the end of the stroke. In this case, adjust the load and/or speed.
2. Do not operate the buffer mechanism on the retracted side.

MINI GUIDE SLIDERS

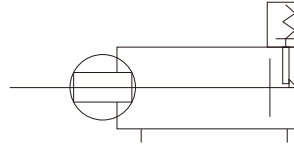
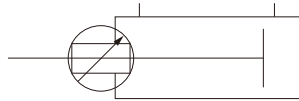
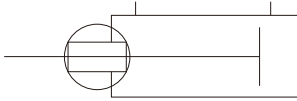
Standard, Stroke Adjusting, With Buffer,
Side-Mounted, With End Keep Cylinders

Symbols

● Standard and Side-Mounted Cylinders

● Stroke Adjusting Cylinder

● Cylinder with End Keep



Specifications

● Standard and Side-Mounted Cylinders

Item		Model	Standard	Side-mounted	Standard	Side-mounted	Standard	Side-mounted	Standard	Side-mounted	Standard		
		MGA□4.5	MGAL□4.5	MGA□6	MGAL□6	MGA□8	MGAL□8	MGA□10	MGAL□10	MGA□12	MGA□16	MGA□20	
Bore size		mm [in.]	4.5 [0.177]		6 [0.236]		8 [0.315]		10 [0.394]		12 [0.472]	16 [0.630]	20 [0.787]
Operation type			Double acting type										
Media			Air										
Operating pressure range		MPa [psi.]	0.2~0.7 [29~102]				0.15~0.7 [22~102]				0.1~0.7 [15~102]		
Proof pressure		MPa [psi.]	1.05 [152]										
Operating temperature range		°C [°F]	0~60 [32~140]										
Operating speed range		mm/s [in./sec.]	30~500 [1.2~20]								20~500 [0.8~20](Metal stopper(optional): 20~300 [0.8~12])		
Cushion	Extended side		None	Rubber bumper							Rubber bumper		
	Retracted side										Shock absorber(optional)		
Port size			M3×0.5								M5×0.8		
Lubrication	Cylinder portion		Not required (If lubrication is required, use Turbine Oil Class 1 [ISO VG32] or equivalent.) Required (CGL grease Nippon Thompson Co., Ltd. made) ^{Note 1}										
	Guide portion												
Perpendicularity of end plate		mm [in.]	0.1 [0.004]										
Stroke tolerance		mm [in.]	$+1 \begin{bmatrix} +0.039 \\ 0 \end{bmatrix}$										
Repeatability ^{Note2}		mm [in.]	—								±0.02 [±0.0008](Metal stopper, shock absorber)		
Stroke adjusting range ^{Note2}	Metal stopper extended side		—								-8~0 [-0.315~0]		
	Metal stopper retracted side		—								-10~0 [-0.394~0]		
	Rubber stopper extended side		—								-9~0 [-0.354~0]		
	Rubber stopper retracted side		—								-11~0 [-0.433~0]		
	Shock absorber extended side		—								-9~0 [-0.354~0]		
	Shock absorber retracted side		—								-11~0 [-0.433~0]		
Allowable moment N・m [in・lbf]	Mp		0.24 [2.12]		0.28 [2.48]		0.28 [2.48]		0.28 [2.48]		1.5 [13.3]	2.1 [18.6]	2.5 [22.1]
	My		0.29 [2.57]		0.34 [3.01]		0.34 [3.01]		0.34 [3.01]		1.7 [15.0]	2.5 [22.1]	3.0 [26.6]
	Mr		0.22 [1.95]		0.23 [2.04]		0.38 [3.36]		0.38 [3.36]		2.6 [23.0]	4.3 [38.1]	4.8 [42.5]
Number of available sensor switches (optional)			1		2								

Notes: 1. Apply grease on the raceway surface of the track rail in the guide portion every 6 months or 3 million operations.
2. For units with stroke adjusting mechanism.

● Stroke Adjusting Cylinders

Item		Model	Extended side stroke	Extended/retracted-side stroke	Extended side stroke	Extended/retracted-side stroke	Extended side stroke	Extended/retracted-side stroke	Extended side stroke	Extended/retracted-side stroke
		MGAP□4.5	MGAE□4.5	MGAP□6	MGAE□6	MGAP□8	MGAE□8	MGAP□10	MGAE□10	
Bore size		mm [in.]	4.5 [0.177]		6 [0.236]		8 [0.315]		10 [0.394]	
Operation type			Double acting type							
Media			Air							
Operating pressure range		MPa [psi.]	0.25~0.7 [36~102]		0.2~0.7 [29~102]		0.15~0.7 [22~102]			
Proof pressure		MPa [psi.]	1.05 [152]							
Operating temperature range		°C [°F]	0~60 [32~140]							
Operating speed range		mm/s [in./sec.]	30~500 [1.2~20]							
Cushion	Extended side		None (External metal stopper)							
	Retracted side	None	None (External metal stopper)	Rubber bumper	None (External metal stopper)	Rubber bumper	None (External metal stopper)	Rubber bumper	None (External metal stopper)	
Stroke adjusting range	Extended side		-5~0 [-0.197~0]							
	Retracted side	—	-7~0 [-0.276~0]	—	-7~0 [-0.276~0]	—	-7~0 [-0.276~0]	—	-7~0 [-0.276~0]	
Repeatability		mm [in.]	±0.02 [±0.0008] (External metal stopper)							
Port size			M3×0.5							
Lubrication	Cylinder portion		Not required (If lubrication is required, use Turbine Oil Class 1 [ISO VG32] or equivalent.)							
	Guide portion		Required (CGL grease Nippon Thompson Co., Ltd. made) ^{Note}							
Perpendicularity of end plate		mm [in.]	0.1 [0.004]							
Stroke tolerance		mm [in.]	$\begin{matrix} +1 \\ 0 \end{matrix} \left[\begin{matrix} +0.039 \\ 0 \end{matrix} \right]$							
Allowable moment N・m [in・lbf]	Mp		0.24 [2.12]		0.28 [2.48]		0.28 [2.48]		0.28 [2.48]	
	My		0.29 [2.57]		0.34 [3.01]		0.34 [3.01]		0.34 [3.01]	
	Mr		0.22 [1.95]		0.23 [2.04]		0.38 [3.36]		0.38 [3.36]	
Number of available sensor switches (optional)			1		2					

Note: Apply grease on the raceway surface of the track rail in the guide portion every 6 months or 3 million operations.

Specifications

●Cylinders with buffer

Item	Model	MGAG□4.5	MGAG□6	MGAG□8	MGAG□10	MGAG□12	MGAG□16	MGAG□20
Bore size	mm [in.]	4.5 [0.177]	6 [0.236]	8 [0.315]	10 [0.394]	12 [0.472]	16 [0.630]	20 [0.787]
Buffer stroke	mm [in.]	4 [0.157] MAX.				6 [0.236] MAX.		
Spring return force N[lbf]	At zero stroke	0.3 [0.067]			0.9 [0.202]	1.0 [0.225]	1.4 [0.315]	1.4 [0.315]
	At stroke end	0.7 [0.157]			2.0 [0.450]	2.7 [0.607]	4.3 [0.967]	4.3 [0.967]
Mounting type		Vertically downward or horizontal						
Operating speed range	mm/s [in./sec.]	30~500 [1.2~20] (When used horizontally : 30~300 [1.2~12])				20~500 [0.8~20] (When used horizontally : 20~300 [0.8~12])		

Remark: With the exception of the dedicated specification items for cylinder with buffer, the standard cylinder specifications apply to other items.

●Cylinders with end keep

Item	Model	MGAK□12	MGAK□16	MGAK□20
Bore size	mm [in.]	12 [0.472]	16 [0.630]	20 [0.787]
Operating speed range	MPa [psi.]	0.2~0.7 [29~102]		
Backlash (at end keep)	mm [in.]	1 [0.039] MAX.		

Remark: With the exception of the dedicated specification items for cylinder with end keep, the standard cylinder specifications apply to other items.

Cylinder Thrust

●Standard and Side-mounted Cylinders, Cylinders with Buffer, Cylinders with End Keep

Bore size mm [in.]	Piston rod diameter mm [in.]	Operating direction	Pressure area mm ² [in. ²]	Air pressure MPa [psi.]							N [lbf.]
				0.1 [15]	0.2 [29]	0.3 [44]	0.4 [58]	0.5 [73]	0.6 [87]	0.7 [102]	
4.5 [0.177]	2 [0.079]	Push side	15.9 [0.0246]	—	3.2 [0.72]	4.8 [1.08]	6.4 [1.44]	8.0 [1.80]	9.5 [2.14]	11.1 [2.50]	
		Pull side	12.8 [0.0198]	—	2.6 [0.58]	3.8 [0.85]	5.1 [1.15]	6.4 [1.44]	7.7 [1.73]	9.0 [2.02]	
6 [0.236]	3 [0.118]	Push side	28.2 [0.0437]	—	5.6 [1.26]	8.5 [1.91]	11.3 [2.54]	14.1 [3.17]	16.9 [3.80]	19.7 [4.43]	
		Pull side	21.2 [0.0329]	—	4.2 [0.94]	6.4 [1.44]	8.5 [1.91]	10.6 [2.38]	12.7 [2.85]	14.8 [3.33]	
8 [0.315]	3 [0.118]	Push side	50.3 [0.0780]	—	10.1 [2.27]	15.1 [3.39]	20.1 [4.52]	25.2 [5.66]	30.2 [6.79]	35.2 [7.91]	
		Pull side	43.2 [0.0670]	—	8.6 [1.93]	13.0 [2.92]	17.3 [3.89]	21.6 [4.86]	25.9 [5.82]	30.2 [6.79]	
10 [0.394]	4 [0.157]	Push side	78.5 [0.1217]	—	15.7 [3.53]	23.6 [5.31]	31.4 [7.06]	39.3 [8.83]	47.1 [10.59]	55.0 [12.36]	
		Pull side	65.9 [0.1021]	—	13.2 [2.97]	19.8 [4.45]	26.4 [5.93]	33.0 [7.42]	39.5 [8.88]	46.1 [10.36]	
12 [0.472]	5 [0.197]	Push side	113.0 [0.1752]	11.3 [2.54]	22.6 [5.08]	33.9 [7.62]	45.2 [10.16]	56.5 [12.70]	67.8 [15.24]	79.1 [17.78]	
		Pull side	93.4 [0.1448]	9.3 [2.09]	18.7 [4.20]	28.0 [6.29]	37.4 [8.41]	46.7 [10.50]	56.0 [12.59]	65.4 [14.70]	
16 [0.630]	6 [0.236]	Push side	201.0 [0.3116]	20.1 [4.52]	40.2 [9.04]	60.3 [13.56]	80.4 [18.07]	100.5 [22.59]	120.6 [27.11]	140.7 [31.63]	
		Pull side	172.7 [0.2677]	17.3 [3.89]	34.5 [7.76]	51.8 [11.64]	69.1 [15.53]	86.4 [19.42]	103.6 [23.29]	120.9 [27.18]	
20 [0.787]	8 [0.315]	Push side	314.0 [0.4867]	31.4 [7.06]	62.8 [14.12]	94.2 [21.18]	125.6 [28.23]	157.0 [35.29]	188.4 [42.35]	219.8 [49.41]	
		Pull side	263.8 [0.4089]	26.4 [5.93]	52.8 [11.87]	79.1 [17.78]	105.5 [23.72]	131.9 [29.65]	158.3 [35.59]	184.6 [41.50]	

●Stroke Adjusting Cylinders

Bore size mm [in.]	Piston rod diameter mm [in.]	Operating direction	Pressure area mm ² [in. ²]	Air pressure MPa [psi.]						N [lbf.]
				0.2 [29]	0.3 [44]	0.4 [58]	0.5 [73]	0.6 [87]	0.7 [102]	
4.5 [0.177]	2 [0.079]	Push side, Pull side	12.8 [0.0198]	2.6 [0.58]	3.8 [0.85]	5.1 [1.15]	6.4 [1.44]	7.7 [1.73]	9.0 [2.02]	
6 [0.236]	3 [0.118]	Push side, Pull side	21.2 [0.0329]	4.2 [0.94]	6.4 [1.44]	8.5 [1.91]	10.6 [2.38]	12.7 [2.85]	14.8 [3.32]	
8 [0.315]	3 [0.118]	Push side, Pull side	43.2 [0.0670]	8.6 [1.93]	13.0 [2.92]	17.3 [3.89]	21.6 [4.86]	25.9 [5.82]	30.2 [6.79]	
10 [0.394]	4 [0.157]	Push side, Pull side	65.9 [0.1021]	13.2 [2.97]	19.8 [4.45]	26.4 [5.93]	33.0 [7.42]	39.5 [8.88]	46.1 [10.36]	

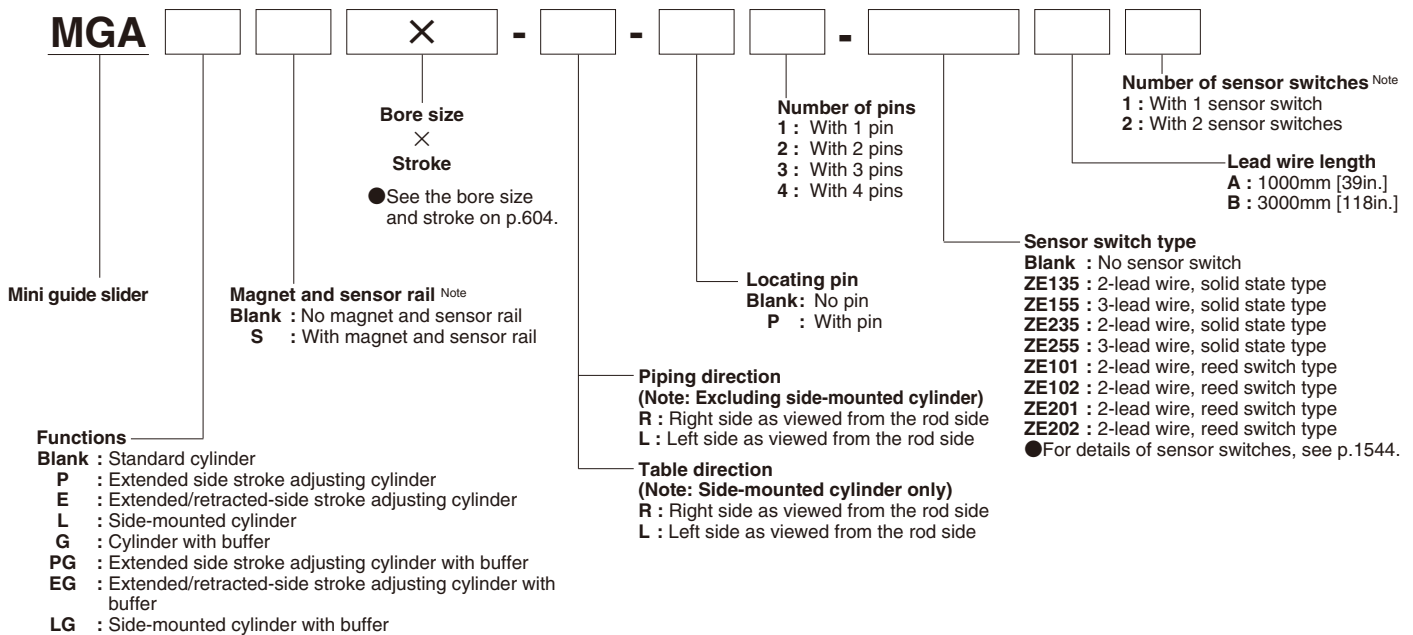
Bore Size and Stroke

Bore size	Standard strokes
4.5 [0.177]	5 ^{Note} , 10
6 [0.236]	5 ^{Note} , 10, 15
8 [0.315]	5 ^{Note} , 10, 15 ^{Note} , 20
10 [0.394]	5 ^{Note} , 10, 15 ^{Note} , 20, 30
12 [0.472]	10 ^{Note} , 20, 30 ^{Note} , 40, 50 ^{Note} , 60
16 [0.630]	10 ^{Note} , 20, 30 ^{Note} , 40, 50 ^{Note} , 60
20 [0.787]	10 ^{Note} , 20, 30 ^{Note} , 40, 50 ^{Note} , 60, 70 ^{Note} , 80

Note: The collar packed is used in these strokes.

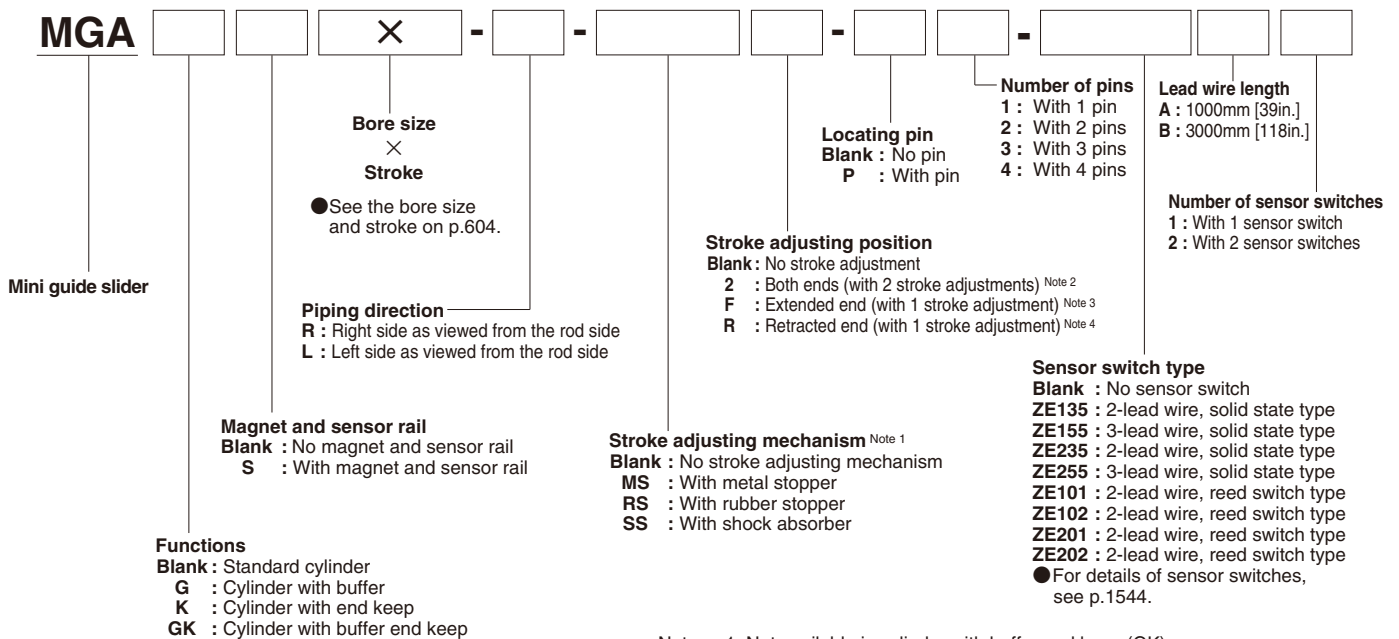
Order Codes

● ϕ 4.5 [0.177] ~ ϕ 10 [0.394]



Note: For a cylinder bore size of 4.5mm [0.177in.], the sensor rail has only 1 groove so that only 1 sensor switch can be mounted.

● ϕ 12 [0.472] ~ ϕ 20 [0.787]



Notes: 1. Not available in cylinder with buffer end keep (GK).
2. Not available in cylinder with buffer (G) or end keep (K).
3. Not available in cylinder with buffer (G).
4. Not available in cylinder with end keep (K).

● Mini Guide Sliders ϕ 12, 16, 20 [ϕ 0.472, 0.360, 0.787] Product Range and Optional Combinations

Model	Type	Metal stopper			Rubber stopper			Shock absorber		
		Extended end -MSF	Retracted end -MSR	Both ends -MS2	Extended end -RSF	Retracted end -RSR	Both ends -RS2	Extended end -SSF	Retracted end -SSR	Both ends -SS2
MGA12, 16, 20	Standard cylinder	●	●	●	●	●	●	●	●	●
MGAG12, 16, 20	Cylinder with buffer	—	●	—	—	●	—	—	●	—
MGAK12, 16, 20	Cylinder with end keep	●	—	—	●	—	—	●	—	—
MGAGK12, 16, 20	Cylinder with buffer end keep	—	—	—	—	—	—	—	—	—

Additional parts

Sensor rail

S-MGA 

Applicable cylinder bore size × stroke

- 1 : 4.5×5, 10
2 : 6×5, 10
8×5, 10
10×5, 10
3 : 6×15
4 : 8×15, 20
10×15, 20
5 : 10×30
6 : 12×10, 20
16×10, 20
20×10, 20
7 : 12×30, 40
16×30, 40
20×30, 40
8 : 12×50, 60
16×50, 60
20×50, 60
9 : 20×70, 80



S-MGA1



S-MGA2, 3, 4, 5
6, 7, 8, 9

Magnet

M-MGA 

Applicable cylinder bore size

- 1 : 4.5
2 : 6, 8, 10
12, 16, 20



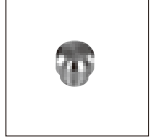
Remark: For the dimensions of the additional parts (sensor rail, magnet and locating pin), see p.661.

Locating pin

P-MGA 

Applicable cylinder bore size

- 1 : 4.5, 6, 8, 10
2 : 12, 16, 20



Stopper and shock absorber

Bore size	Metal stopper type	Rubber stopper type	Shock absorber type
12 [0.472in.]	CRK565	CRK570	KSHA4×4-BD
16 [0.630in.]	CRK566	CRK571	KSHA5×5-E
20 [0.787in.]	CRK567	CRK572	KSHA6×8-E

Remark: The set includes a mounting nut.



Metal stopper



Rubber stopper



Shock absorber

Remark: For the dimensions of the metal stopper and rubber stopper, see p.661.
Also, for the dimensions of the shock absorber unit, see the General Catalog of Air Treatment, Auxiliary, Vacuum.

Stroke adjusting bracket set ^{Note 1}

 - MGA 

Combination of bracket set

K2 : ①+②+③ ^{Note 2, 3}

KF : ①+② ^{Note 3}

KR : ①+③ ^{Note 2}

Notes: 1. These sets do not include the shock absorber and stopper bolt.
2. Cannot be mounted on the cylinder with end keep.
3. Cannot be mounted on the cylinder with buffer.
4. When using the shock absorber, do not use the set screw.

Applicable cylinder bore size and stroke

Model	Applicable cylinder bore size × stroke
1	12×10, 30, 50
2	12×20, 40, 60
3	16×10, 30, 50
4	16×20, 40, 60
5	20×10, 30, 50, 70
6	20×20, 40, 60, 80

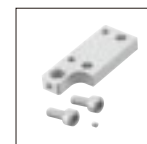
① Stopper



② Bracket A



③ Bracket B



Mass

● ϕ 4.5 [0.177] ~ ϕ 10 [0.394]

g [oz.]

Bore size mm[in.]	Stroke mm	Standard (MGA)	Extended side stroke adjustment (MGAP)	Extended/retracted-side stroke adjustment (MGAE)	Side-mounted (MGAL)	Additional mass			
		No magnet and sensor rail	No magnet and sensor rail	No magnet and sensor rail	No magnet and sensor rail	With magnet and sensor rail	With buffer	Sensor switch (1 pc.)	
								ZE□□□A	ZE□□□B
4.5 [0.177]	5	42 [1.48]	49 [1.73]	52 [1.83]	59 [2.08]	4 [0.14]	3 [0.11]	15 [0.53]	35 [1.24]
	10	42 [1.48]	49 [1.73]	52 [1.83]	59 [2.08]	4 [0.14]	3 [0.11]		
6 [0.236]	5	58 [2.05]	68 [2.40]	71 [2.50]	78 [2.75]	5 [0.18]	4 [0.14]	15 [0.53]	35 [1.24]
	10	58 [2.05]	68 [2.40]	71 [2.50]	78 [2.75]	5 [0.18]	4 [0.14]		
	15	66 [2.33]	77 [2.72]	80 [2.82]	88 [3.10]	6 [0.21]	4 [0.14]		
8 [0.315]	5	83 [2.93]	97 [3.42]	100 [3.53]	106 [3.74]	5 [0.18]	5 [0.18]	15 [0.53]	35 [1.24]
	10	83 [2.93]	97 [3.42]	100 [3.53]	106 [3.74]	5 [0.18]	5 [0.18]		
	15	104 [3.67]	120 [4.23]	123 [4.34]	132 [4.66]	6 [0.21]	5 [0.18]		
	20	104 [3.67]	120 [4.23]	123 [4.34]	132 [4.66]	6 [0.21]	5 [0.18]		
10 [0.394]	5	103 [3.63]	126 [4.44]	129 [4.55]	132 [4.66]	5 [0.18]	6 [0.21]	15 [0.53]	35 [1.24]
	10	103 [3.63]	126 [4.44]	129 [4.55]	132 [4.66]	5 [0.18]	6 [0.21]		
	15	130 [4.59]	155 [5.47]	158 [5.57]	163 [5.75]	6 [0.21]	6 [0.21]		
	20	130 [4.59]	155 [5.47]	158 [5.57]	163 [5.75]	6 [0.21]	6 [0.21]		
	30	157 [5.54]	182 [6.42]	185 [6.53]	194 [6.84]	7 [0.25]	6 [0.21]		

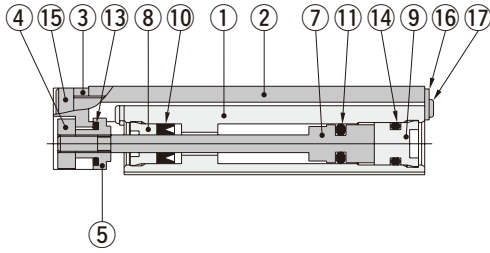
● ϕ 12 [0.472] ~ ϕ 20 [0.757]

g [oz.]

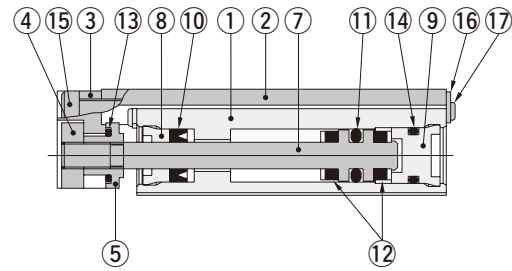
Bore size mm[in.]	Stroke mm	Body mass	Additional mass									
			With buffer	With end keep	With magnet and sensor rail	Stroke adjusting bracket			Metal or rubber stopper (1 pc.)	Shock absorber (1 pc.)	Sensor switch (1 pc.)	
						-□S2	-□SF	-□SR			ZE□□□A	ZE□□□B
12 [0.472]	10	211 [7.44]	15 [0.53]	36 [1.27]	12 [0.42]	31 [1.09]	19 [0.67]	27 [0.95]	4 [0.14]	4 [0.14]	15 [0.53]	35 [1.24]
	20	211 [7.44]	15 [0.53]	36 [1.27]	12 [0.42]	27 [0.95]	15 [0.53]	23 [0.81]				
	30	283 [9.98]	15 [0.53]	36 [1.27]	17 [0.60]	31 [1.09]	19 [0.67]	27 [0.95]				
	40	283 [9.98]	15 [0.53]	36 [1.27]	17 [0.60]	27 [0.95]	15 [0.53]	23 [0.81]				
	50	355 [12.52]	15 [0.53]	36 [1.27]	22 [0.78]	31 [1.09]	19 [0.67]	27 [0.95]				
	60	355 [12.52]	15 [0.53]	36 [1.27]	22 [0.78]	27 [0.95]	15 [0.53]	23 [0.81]				
16 [0.630]	10	328 [11.57]	20 [0.71]	50 [1.76]	12 [0.42]	60 [2.12]	35 [1.24]	52 [1.83]	8 [0.28]	7 [0.25]	15 [0.53]	35 [1.24]
	20	328 [11.57]	20 [0.71]	50 [1.76]	12 [0.42]	53 [1.87]	28 [0.99]	45 [1.59]				
	30	431 [15.20]	20 [0.71]	50 [1.76]	17 [0.60]	60 [2.12]	35 [1.24]	52 [1.83]				
	40	431 [15.20]	20 [0.71]	50 [1.76]	17 [0.60]	53 [1.87]	28 [0.99]	45 [1.59]				
	50	534 [18.84]	20 [0.71]	50 [1.76]	22 [0.78]	60 [2.12]	35 [1.24]	52 [1.83]				
	60	534 [18.84]	20 [0.71]	50 [1.76]	22 [0.78]	53 [1.87]	28 [0.99]	45 [1.59]				
20 [0.787]	10	515 [18.17]	26 [0.92]	67 [2.36]	12 [0.42]	74 [2.61]	40 [1.41]	60 [2.12]	15 [0.53]	20 [0.71]	15 [0.53]	35 [1.24]
	20	515 [18.17]	26 [0.92]	67 [2.36]	12 [0.42]	67 [2.36]	33 [1.16]	53 [1.87]				
	30	659 [23.25]	26 [0.92]	67 [2.36]	17 [0.60]	74 [2.61]	40 [1.41]	60 [2.12]				
	40	659 [23.25]	26 [0.92]	67 [2.36]	17 [0.60]	67 [2.36]	33 [1.16]	53 [1.87]				
	50	803 [28.33]	26 [0.92]	67 [2.36]	22 [0.78]	74 [2.61]	40 [1.41]	60 [2.12]				
	60	803 [28.33]	26 [0.92]	67 [2.36]	22 [0.78]	67 [2.36]	33 [1.16]	53 [1.87]				
	70	947 [33.40]	26 [0.92]	67 [2.36]	27 [0.95]	74 [2.61]	40 [1.41]	60 [2.12]				
	80	947 [33.40]	26 [0.92]	67 [2.36]	27 [0.95]	67 [2.36]	33 [1.16]	53 [1.87]				

Inner Construction (Standard Cylinder)

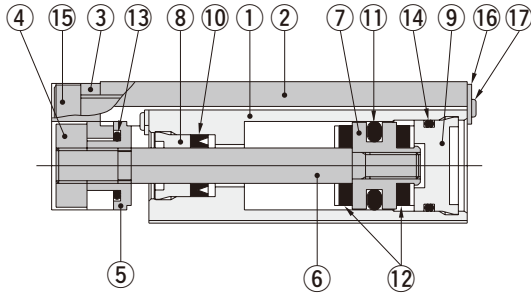
MGA□4.5



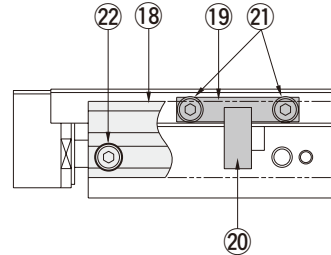
MGA□6, 8



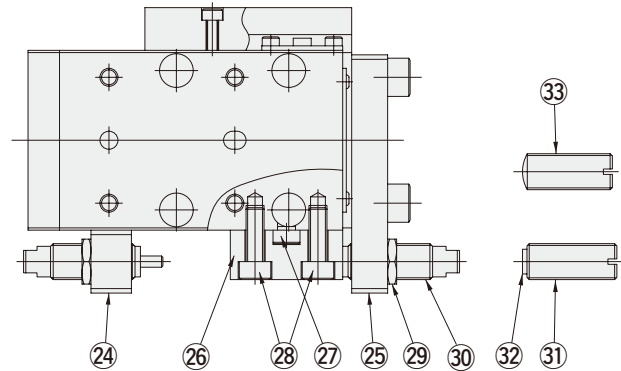
MGA□10~□20



MGAS□ (With magnet and sensor rail)



MGA□12~□20 (With shock absorber)



Locating pin



Major Parts and Materials

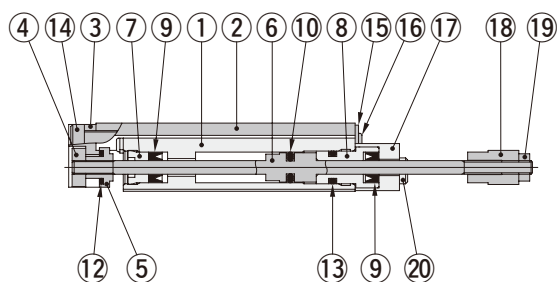
No.	Model Parts	MGA□4.5	MGA□6	MGA□8	MGA□10~□20
①	Body	Stainless steel (heat treated)			
②	Table	Stainless steel (heat treated)			
③	Plate	Aluminum alloy (special wear-resistant treatment)			
④	Nut A	Stainless steel			
⑤	Nut B	Stainless steel			
⑥	Piston rod	—			Stainless steel
⑦	Piston ^{Note}	Stainless steel			Aluminum alloy (special rust prevention treatment)
⑧	Rod cap	Oil impregnated plastic bushing (polyacetal)			
⑨	Head cap	Plastic			
⑩	Rod seal	Synthetic rubber (NBR)			
⑪	Piston seal	Synthetic rubber (NBR)			
⑫	Bumper	—	Synthetic rubber (urethane)		
⑬	O-ring	Synthetic rubber (NBR)			
⑭	O-ring	Synthetic rubber (NBR)			
⑮	Bolt	Stainless steel			
⑯	Holder plate	Stainless steel			
⑰	Screw	Stainless steel			
⑱	Sensor rail	Aluminum alloy (anodized)			
⑲	Magnet holder	Aluminum alloy (anodized)			
⑳	Magnet	Plastic magnet			
㉑	Bolt	Stainless steel			
㉒	Bolt	Stainless steel			
㉓	Locating pin	Steel (heat treated)			

No.	Model Parts	MGA□12~□20
㉔	Bracket A	Aluminum alloy (anodized)
㉕	Bracket B	Aluminum alloy (anodized)
㉖	Stopper	Steel (heat treatment and nickel plated)
㉗	Locating pin	Steel (heat treated)
㉘	Bolt	Stainless steel
㉙	Nut	Mild steel (zinc plated)
㉚	Shock absorber	—
㉛	Adjusting bolt	Steel (nickel plated)
㉜	Bumper	Synthetic rubber (NBR)
㉝	Adjusting bolt	Steel (heat treatment and nickel plated)

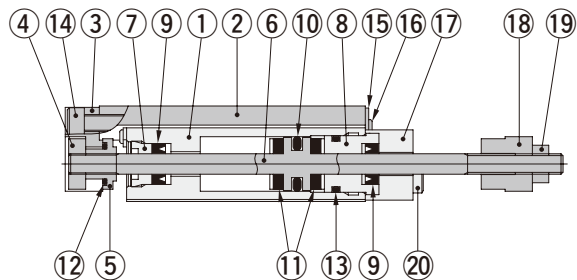
Note: In MGA□4.5, MGA□6 and MGA□8, a piston and piston rod are combined as single-piece construction.

Inner Construction (Extended Side Stroke Adjusting Cylinder)

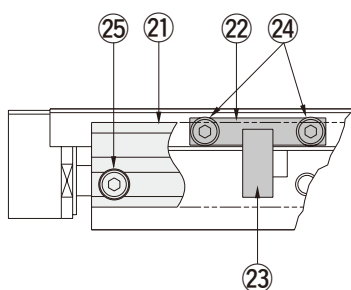
MGAP□4.5



MGAP□6, 8, 10



MGAPS□(With magnet and sensor rail)



Locating pin

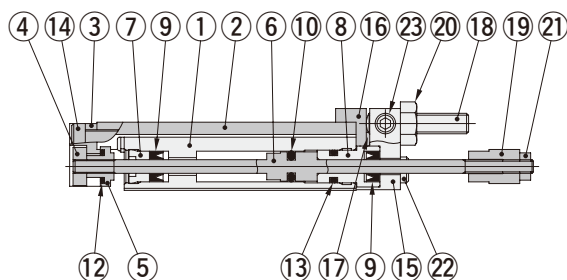


Major Parts and Materials

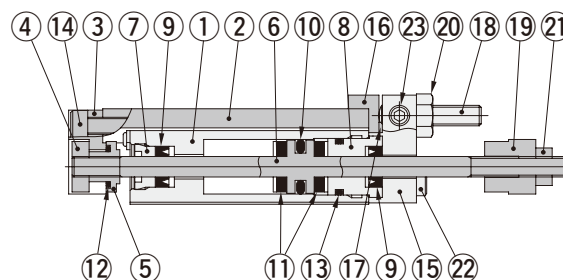
No.	Model Parts	MGAP□4.5	MGAP□6	MGAP□8	MGAP□10
①	Body	Stainless steel (heat treated)			
②	Table	Stainless steel (heat treated)			
③	Plate	Aluminum alloy (special wear-resistant treatment)			
④	Nut A	Stainless steel			
⑤	Nut B	Stainless steel			
⑥	Piston	Stainless steel			
⑦	Rod cap	Oil impregnated plastic bushing (polyacetal)			
⑧	Head cap	Aluminum alloy (special wear-resistant treatment)			
⑨	Rod seal	Synthetic rubber (NBR)			
⑩	Piston seal	Synthetic rubber (NBR)			
⑪	Bumper	—	Synthetic rubber (urethane)		
⑫	O-ring	Synthetic rubber (NBR)			
⑬	O-ring	Synthetic rubber (NBR)			
⑭	Bolt	Stainless steel			
⑮	Holder plate	Stainless steel			
⑯	Screw	Stainless steel			
⑰	Stopper	Steel (heat treatment and nickel plated)			
⑱	Adjusting nut	Steel (heat treatment and nickel plated)			
⑲	Hexagon nut	Stainless steel	Mild steel (zinc plated)		
⑳	Bolt	Stainless steel			
㉑	Sensor rail	Aluminum alloy (anodized)			
㉒	Magnet holder	Aluminum alloy (anodized)			
㉓	Magnet	Plastic magnet			
㉔	Bolt	Stainless steel			
㉕	Bolt	Stainless steel			
㉖	Locating pin	Steel (heat treated)			

Inner Construction (Extended/Retraced Side Stroke Adjusting Cylinder)

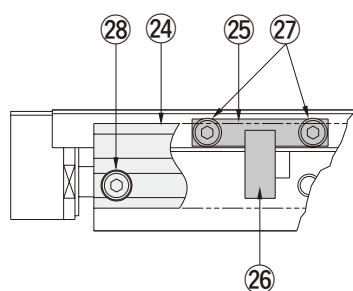
MGAE□4.5



MGAE□6, 8, 10



MGAES□(With magnet and sensor rail)



Locating pin

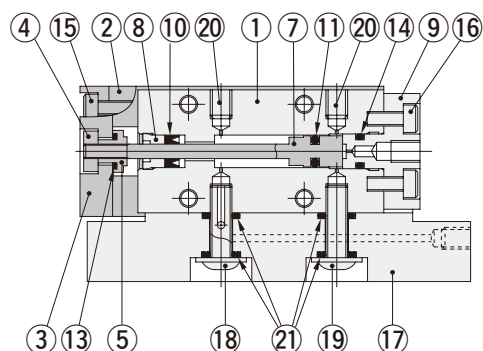


Major Parts and Materials

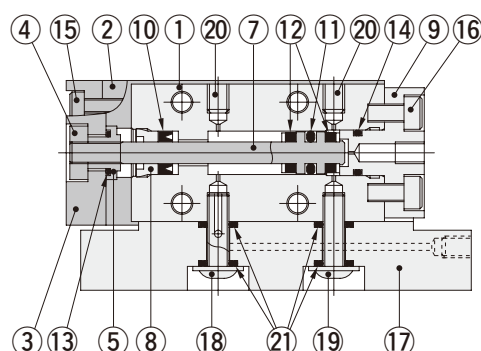
No.	Model	MGAE□4.5	MGAE□6	MGAE□8	MGAE□10
	Parts				
①	Body	Stainless steel (heat treated)			
②	Table	Stainless steel (heat treated)			
③	Plate	Aluminum alloy (special wear-resistant treatment)			
④	Nut A	Stainless steel			
⑤	Nut B	Stainless steel			
⑥	Piston	Stainless steel			
⑦	Rod cap	Oil impregnated plastic bushing (polyacetal)			
⑧	Head cap	Aluminum alloy (special wear-resistant treatment)			
⑨	Rod seal	Synthetic rubber (NBR)			
⑩	Piston seal	Synthetic rubber (NBR)			
⑪	Bumper	—	Synthetic rubber (urethane)		
⑫	O-ring	Synthetic rubber (NBR)			
⑬	O-ring	Synthetic rubber (NBR)			
⑭	Bolt	Stainless steel			
⑮	Stopper A	Steel (heat treatment and nickel plated)			
⑯	Stopper B	Steel (heat treatment and nickel plated)			
⑰	Screw	Stainless steel			
⑱	Stopper bolt	Stainless steel (heat treated)			
⑲	Adjusting nut	Steel (heat treatment and nickel plated)			
⑳	Hexagon nut	Stainless steel			
㉑	Hexagon nut	Stainless steel	Mild steel (nickel plated)		
㉒	Bolt	Stainless steel			
㉓	Screw	Stainless steel			
㉔	Sensor rail	Aluminum alloy (anodized)			
㉕	Magnet holder	Aluminum alloy (anodized)			
㉖	Magnet	Plastic magnet			
㉗	Bolt	Stainless steel			
㉘	Bolt	Stainless steel			
㉙	Locating pin	Steel (heat treated)			

Inner Construction (Side-mounted Cylinder)

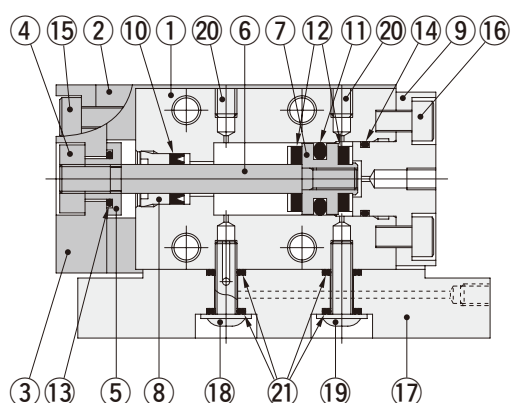
MGAL□4.5



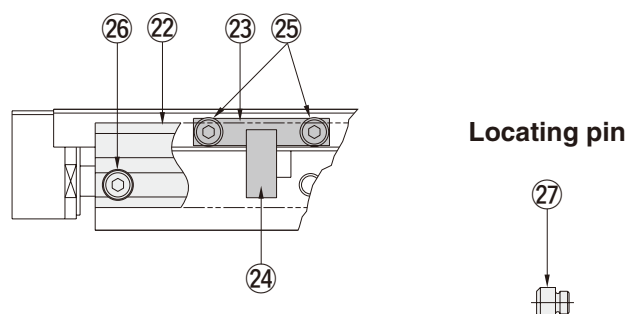
MGAL□6, 8



MGAL□10



MGAS□ (With magnet and sensor rail)



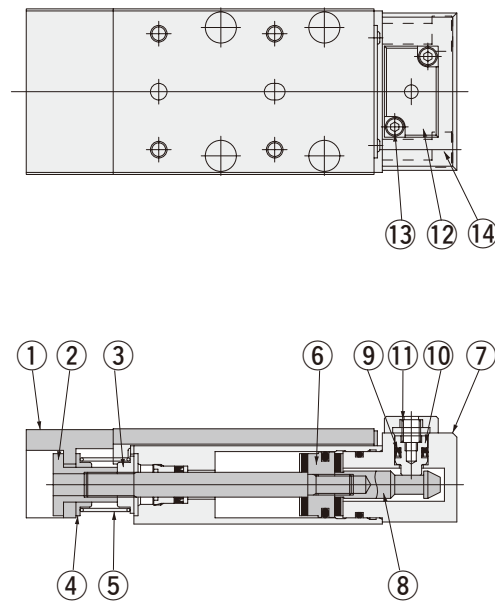
Major Parts and Materials

No.	Model Parts	MGAL□4.5	MGAL□6	MGAL□8	MGAL□10
①	Body	Stainless steel (heat treated)			
②	Table	Stainless steel (heat treated)			
③	Plate	Aluminum alloy (special wear-resistant treatment)			
④	Nut A	Stainless steel			
⑤	Nut B	Stainless steel			
⑥	Piston rod	—			Stainless steel
⑦	Piston ^{Note}	Stainless steel			Aluminum alloy (special wear-resistant treatment)
⑧	Rod cap	Oil impregnated plastic bushing (polyacetal)			
⑨	Head cover	Aluminum alloy (anodized)			
⑩	Rod seal	Synthetic rubber (NBR)			
⑪	Piston seal	Synthetic rubber (NBR)			
⑫	Bumper	—	Synthetic rubber (urethane)		
⑬	O-ring	Synthetic rubber (NBR)			
⑭	O-ring	Synthetic rubber (NBR)			
⑮	Bolt	Stainless steel			
⑯	Bolt	Stainless steel			
⑰	Base	Aluminum alloy (anodized)			
⑱	Bolt	Stainless steel			
⑲	Bolt	Stainless steel			
⑳	Screw	Stainless steel			
㉑	O-ring	Synthetic rubber (NBR)			
㉒	Sensor rail	Aluminum alloy (anodized)			
㉓	Magnet holder	Aluminum alloy (anodized)			
㉔	Magnet	Plastic magnet			
㉕	Bolt	Stainless steel			
㉖	Bolt	Stainless steel			
㉗	Locating pin	Steel (heat treated)			

Note: In **MGAL□4.5**, **MGAL□6** and **MGAL□8**, a piston and piston rod are combined as single-piece construction.

Inner Construction (Cylinder with Buffer End Keep)

Note: The diagrams show cylinder with buffer end keep.



Major Parts and Materials

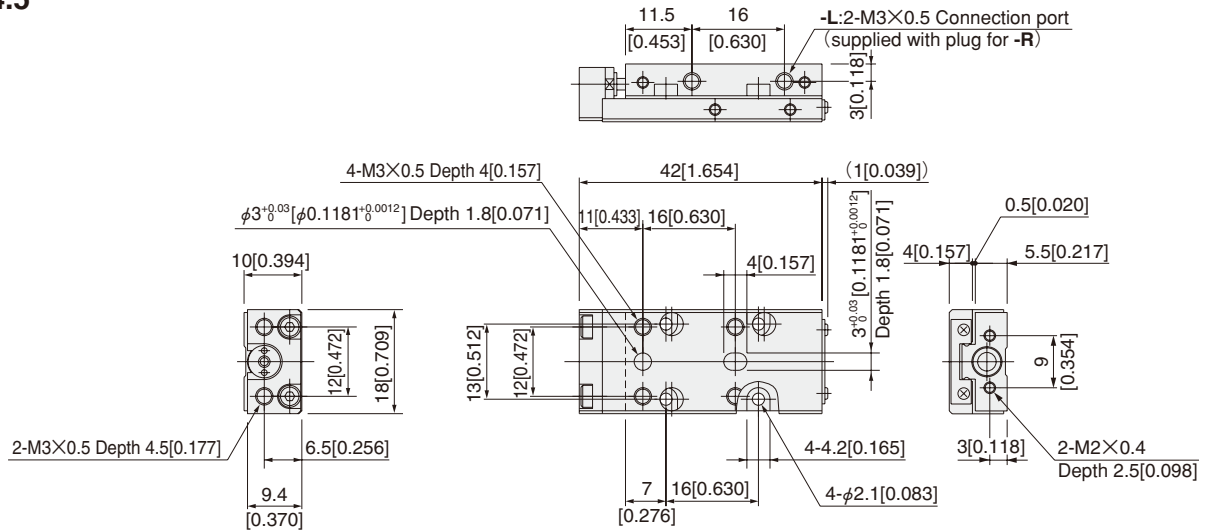
No.	Model Parts	Cylinder with buffer MGAG□4.5~□20	Cylinder with buffer end keep MGAGK□12~□20	Cylinder with end keep MGAK□12~□20
①	Plate	Aluminum alloy (special wear-resistant treatment)		—
②	Nut A	Stainless steel		—
③	Nut B	Stainless steel		—
④	Support	Copper alloy		—
⑤	Spring	Stainless steel		—
⑥	Piston	—	Aluminum alloy (special wear-resistant treatment)	
⑦	Head cover	—	Aluminum alloy (anodized)	
⑧	Lock end	—	Stainless steel	
⑨	Piston seal	—	Synthetic rubber (NBR)	
⑩	Lock piston	—	Stainless steel	
⑪	Spring	—	Stainless steel	
⑫	Cover	—	Aluminum alloy (anodized)	
⑬	Bolt	—	Stainless steel	
⑭	Bolt	—	Stainless steel	

Dimensions of Bore Size $\phi 4.5$ [0.177] mm [in.]

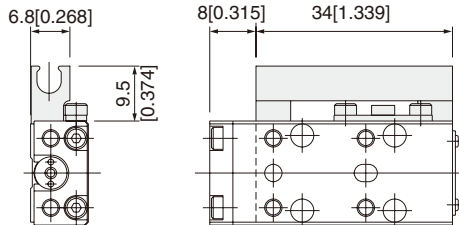
● Standard cylinder



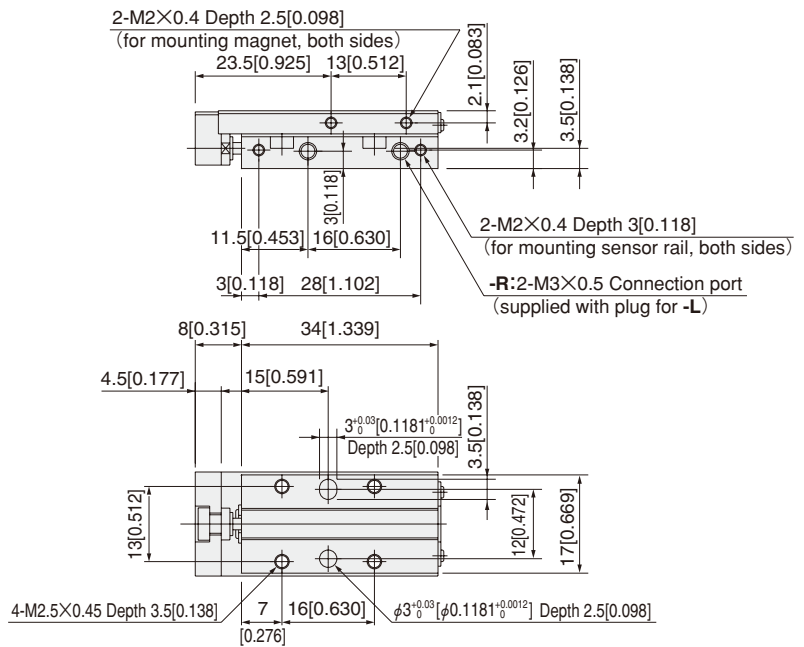
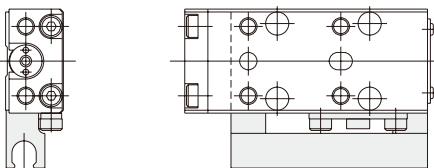
MGA□4.5



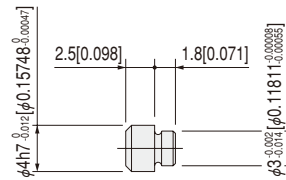
In the case of magnet and sensor rail installed
(Piping direction:-R)

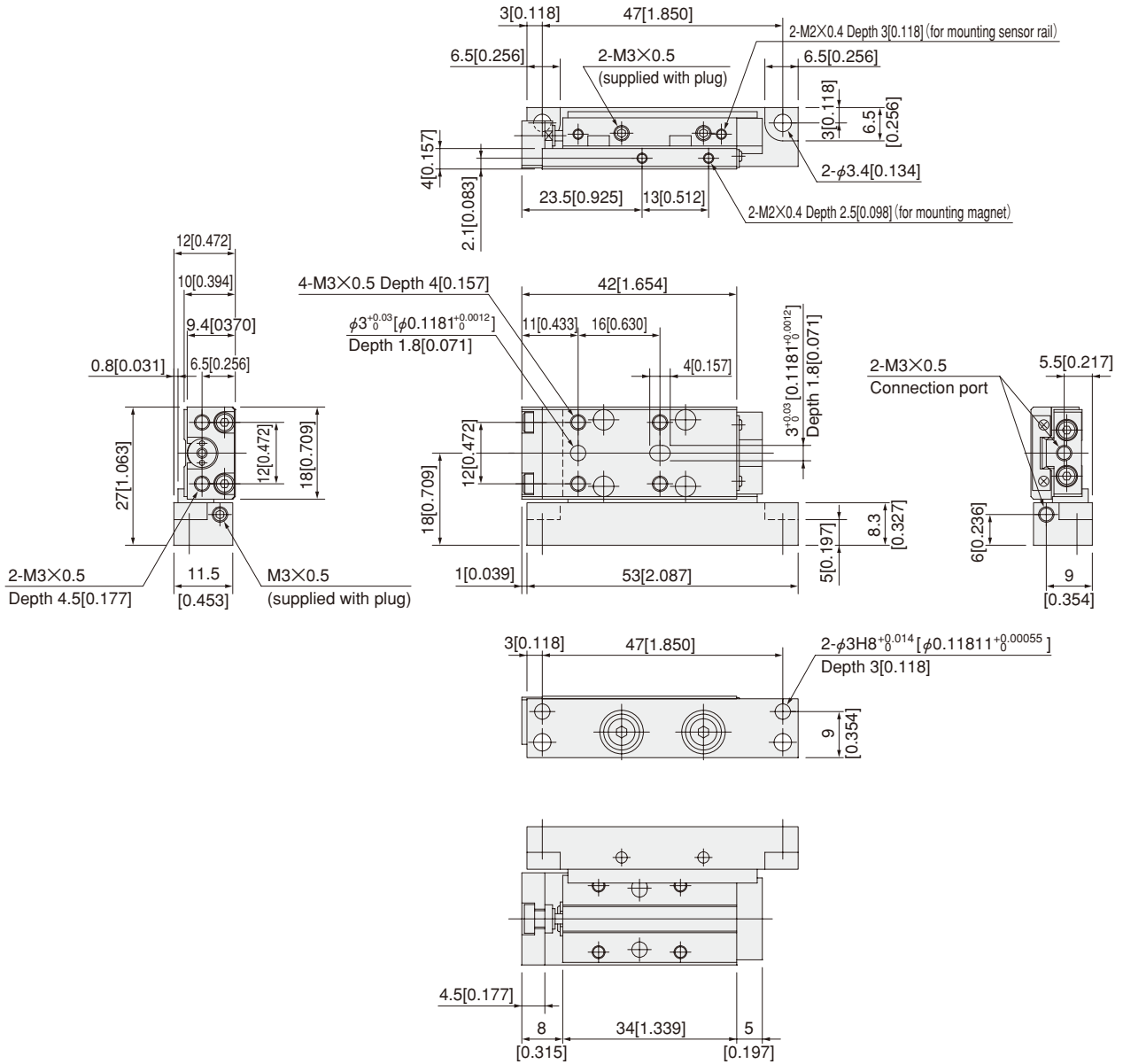


In the case of magnet and sensor rail installed
(Piping direction:-L)

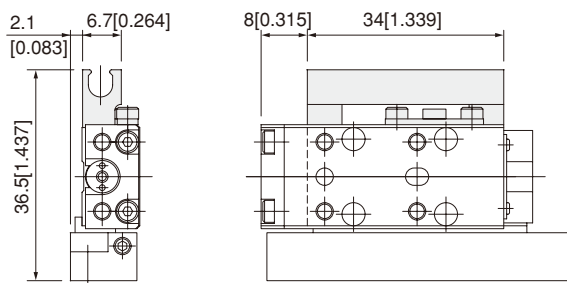


Locating pin: -P (P-MGA1)

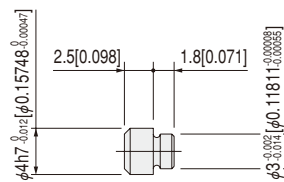


MGAL $\square$ 4.5 $\times$ Stroke -R

In the case of magnet and sensor rail installed



Locating pin: -P (P-MGA1)

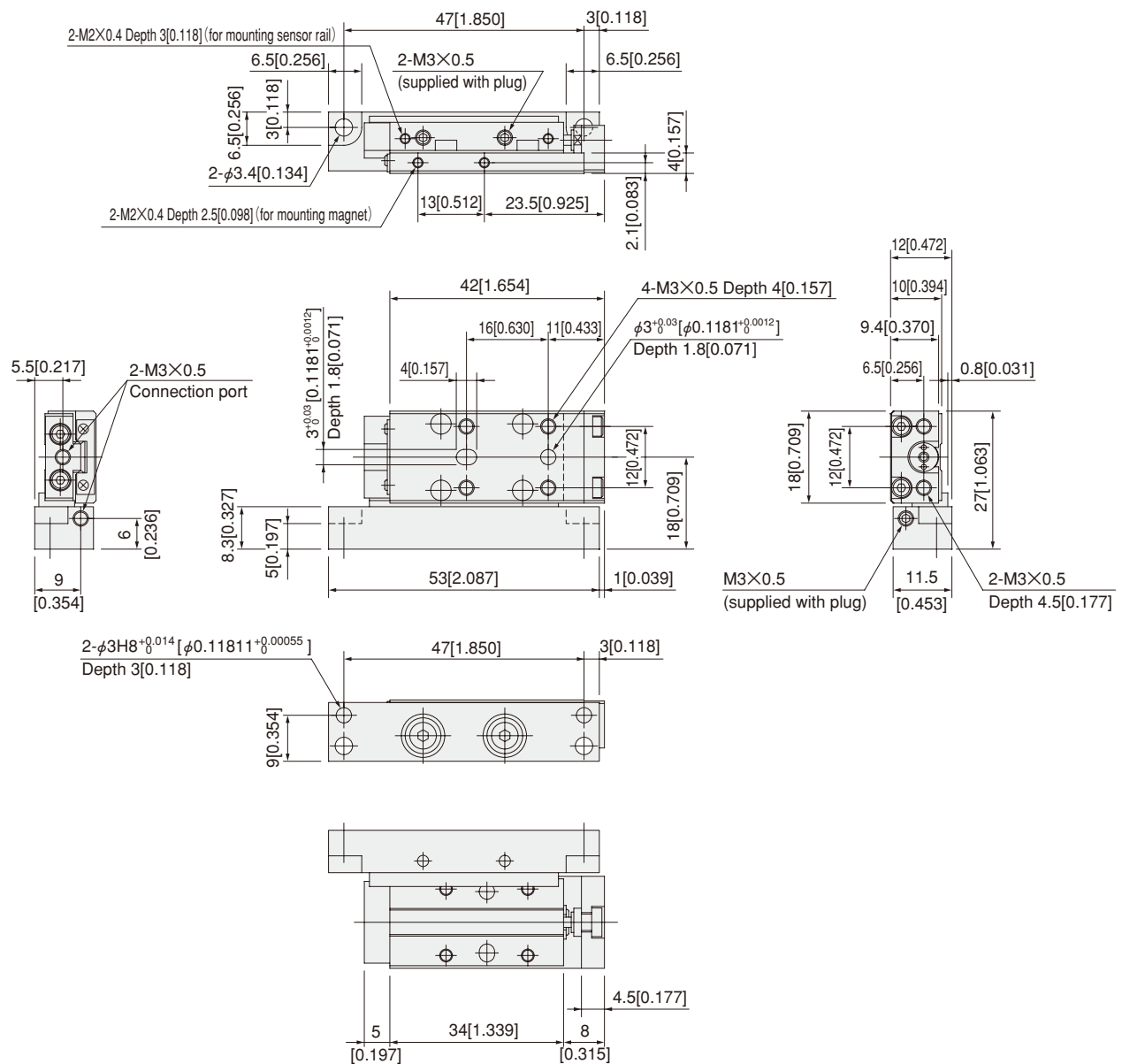


Dimensions of Bore Size $\phi 4.5$ [0.177] mm [in.]

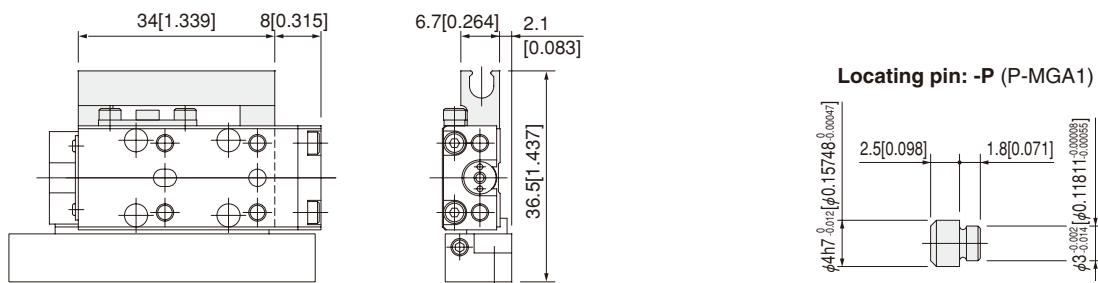
● Side-mounted cylinder (left side)

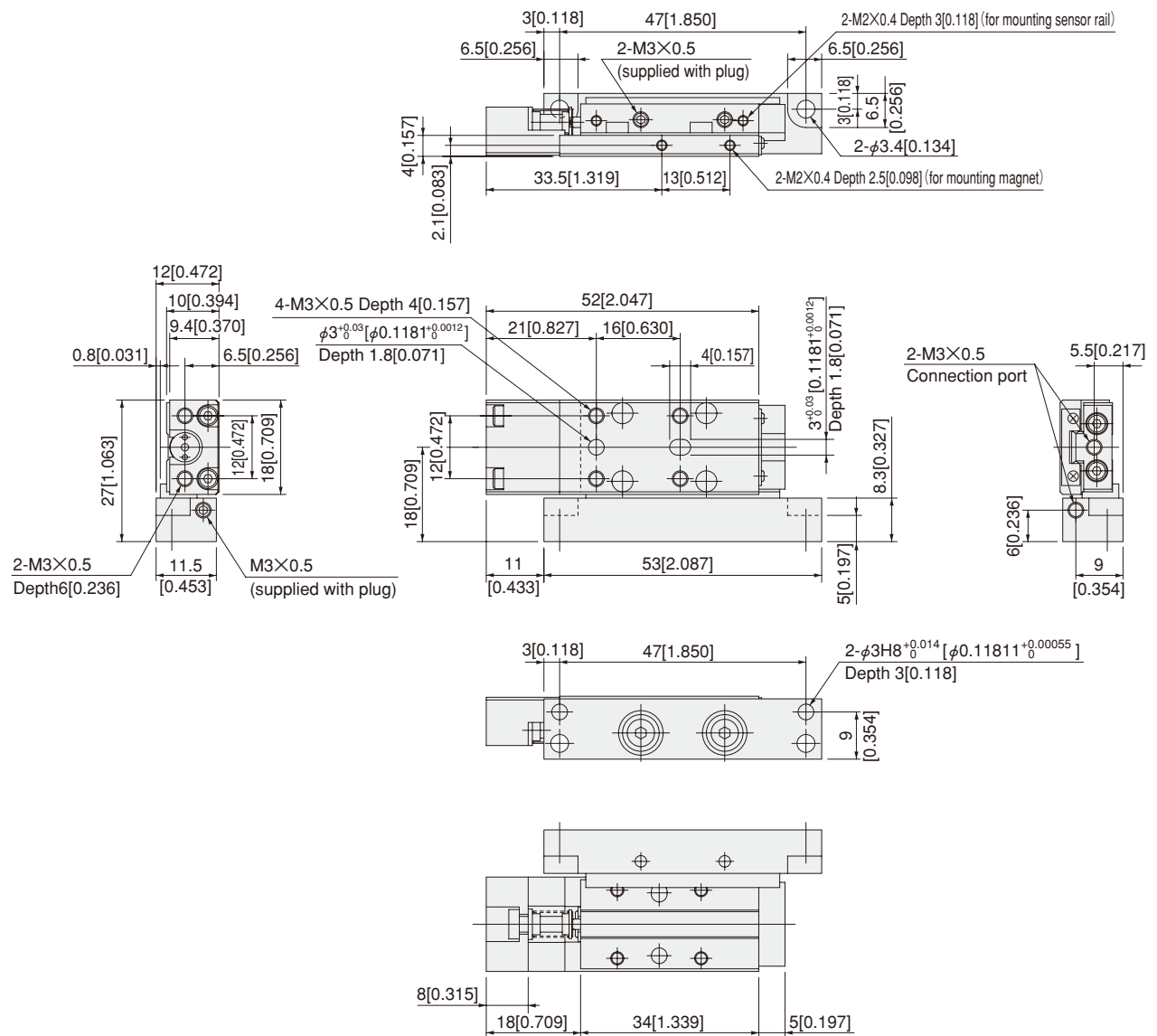


MGAL $\square 4.5 \times \text{Stroke}$ -L

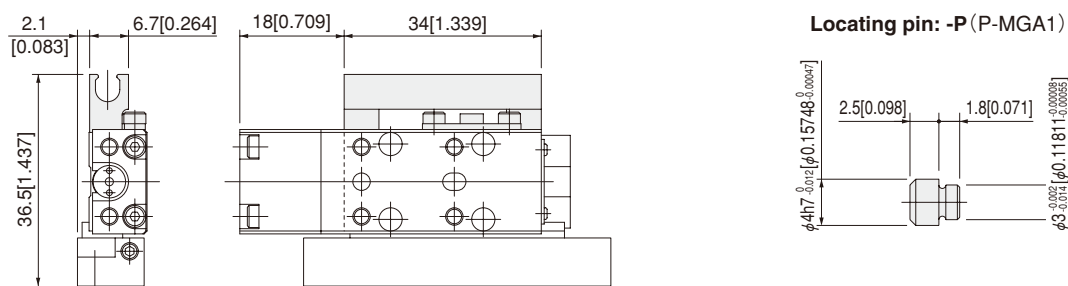


In the case of magnet and sensor rail installed



MGALG $\square 4.5 \times \square \text{Stroke} - R$ 

In the case of magnet and sensor rail installed



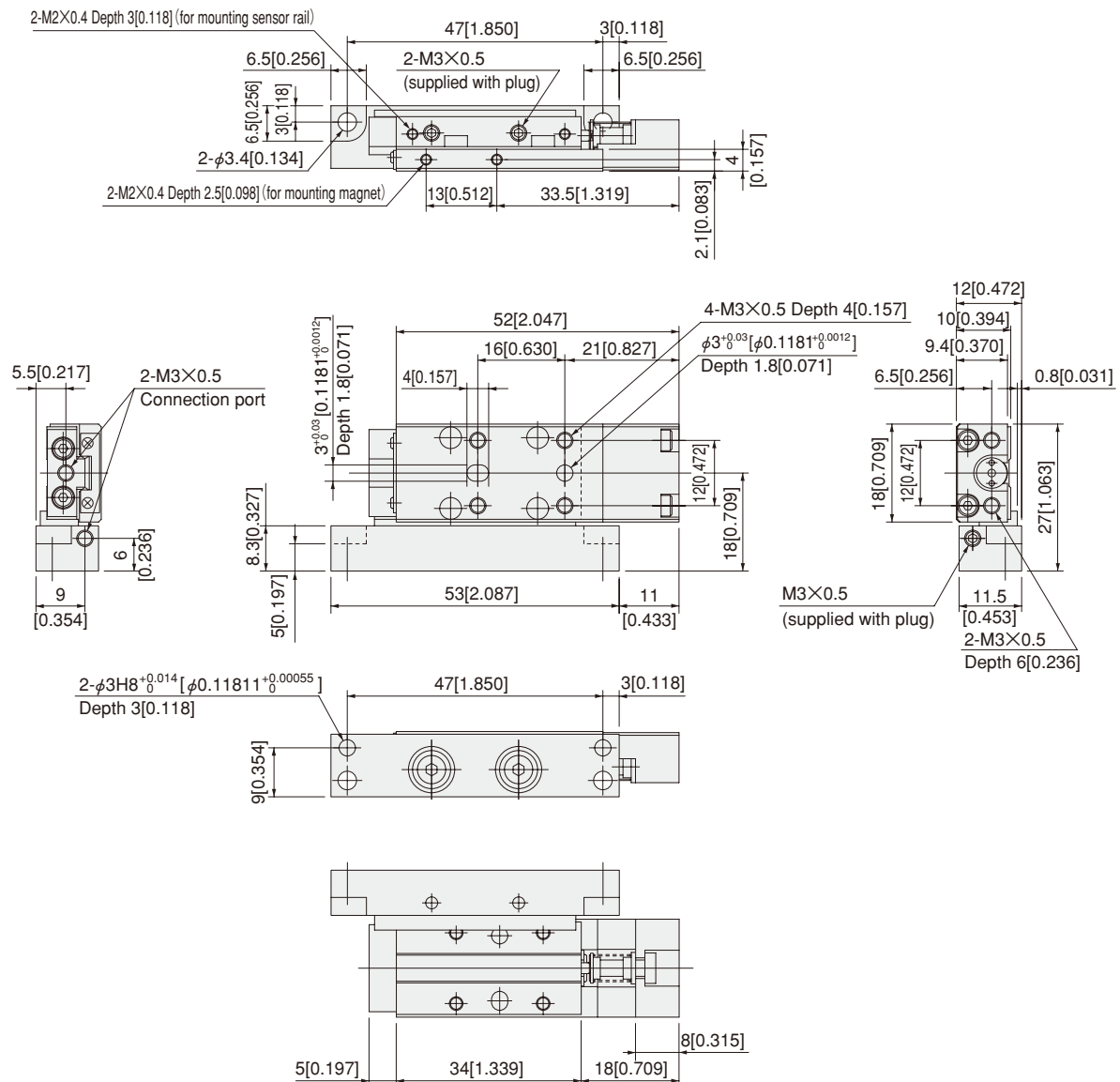
Remark: The buffer stroke of $\phi 4.5$ [0.177] cylinder with buffer is a maximum of 4mm [0.157in.].

Dimensions of Bore Size $\phi 4.5$ [0.177] mm [in.]

● Side-mounted cylinder with buffer (left side)

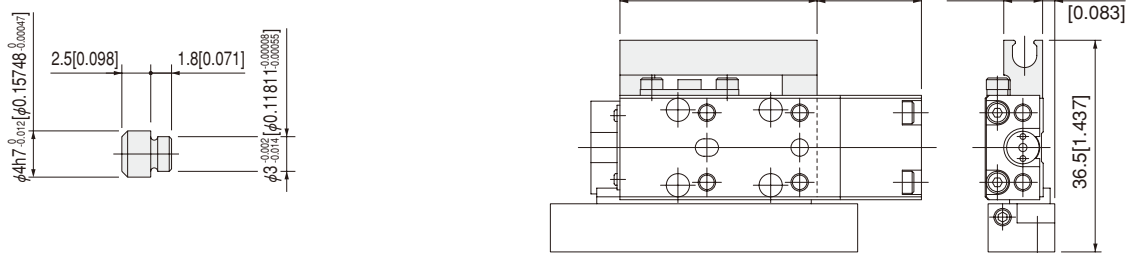


MGALG $\square 4.5 \times$ **Stroke** -L



In the case of magnet and sensor rail installed

Locating pin: -P (P-MGA1)



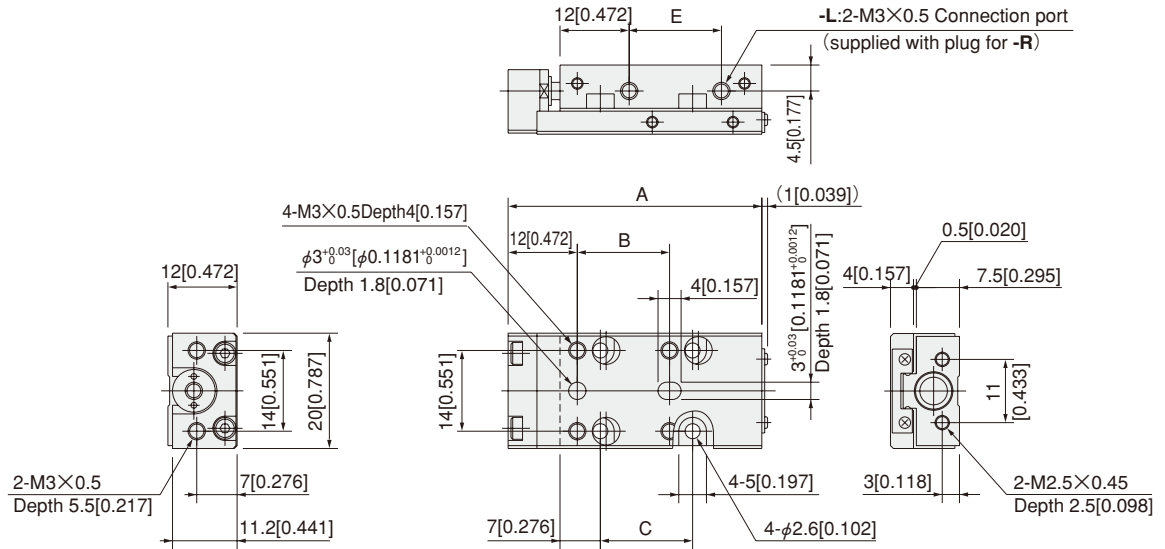
Remark: The buffer stroke of $\phi 4.5$ [0.177] cylinder with buffer is a maximum of 4mm [0.157in.].

Dimensions of Bore Size $\phi 6$ [0.236] mm [in.]

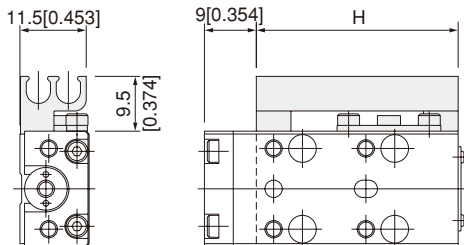
Standard cylinder



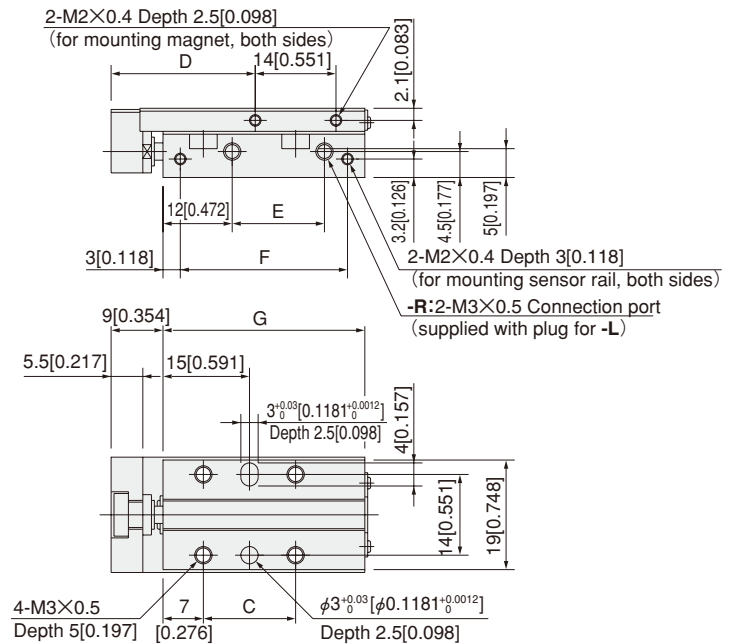
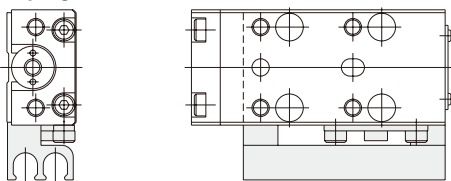
MGA□6



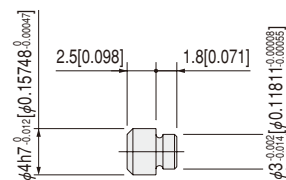
In the case of magnet and sensor rail installed
(Piping direction:-R)



In the case of magnet and sensor rail installed
(Piping direction:-L)



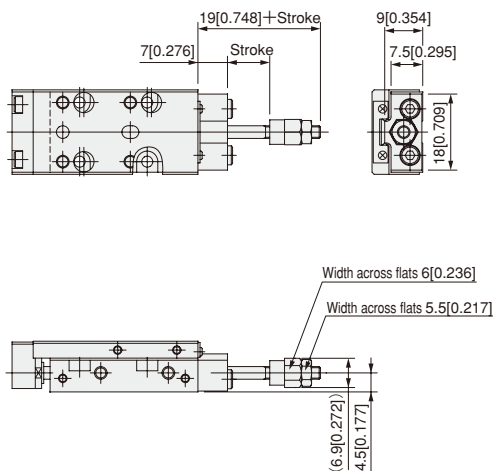
Locating pin: -P (P-MGA1)



Stroke	A	B	C	D	E	F	G	H
5	44 [1.732]	16 [0.630]	16 [0.630]	25 [0.984]	16 [0.630]	29 [1.142]	35 [1.378]	35 [1.378]
10	44 [1.732]	16 [0.630]	16 [0.630]	25 [0.984]	16 [0.630]	29 [1.142]	35 [1.378]	35 [1.378]
15	49 [1.929]	21 [0.827]	21 [0.827]	30 [1.181]	21 [0.827]	34 [1.339]	40 [1.575]	40 [1.575]

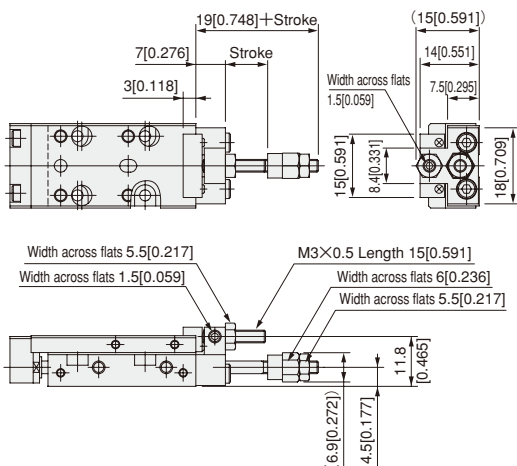
● Extended side stroke adjusting cylinder

MGAP□6



● Extended/retracted-side stroke adjusting cylinder

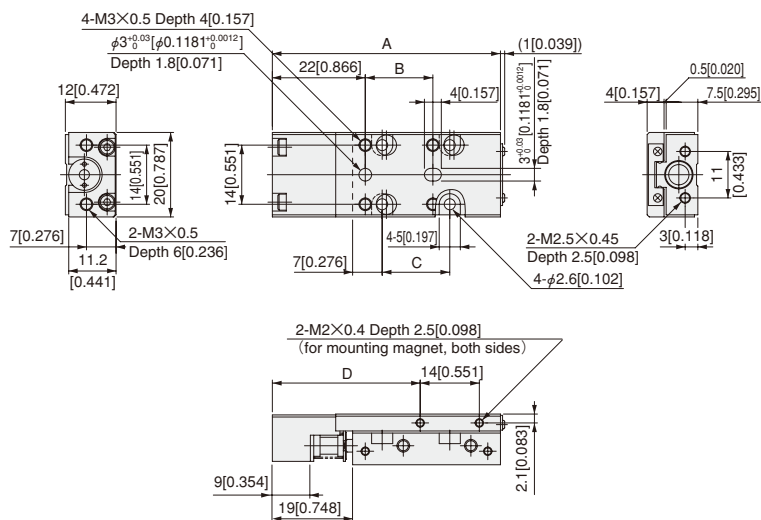
MGAE□6



Note: For dimensions not shown in the above, see p.619.

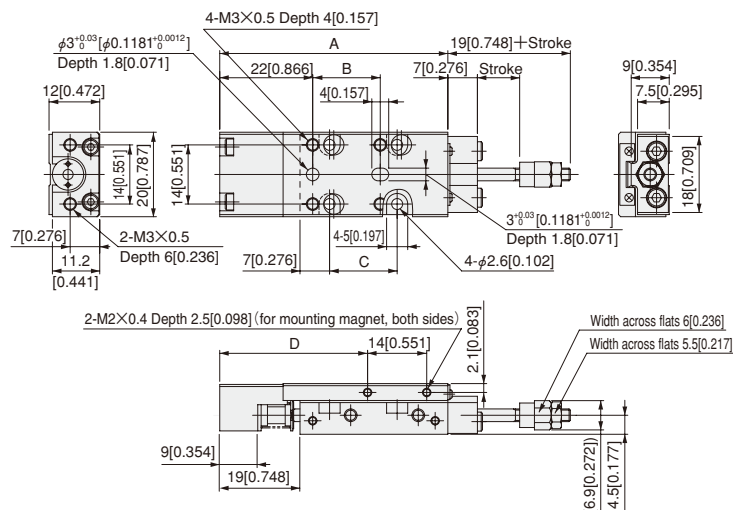
● Cylinder with buffer

MGAG□6



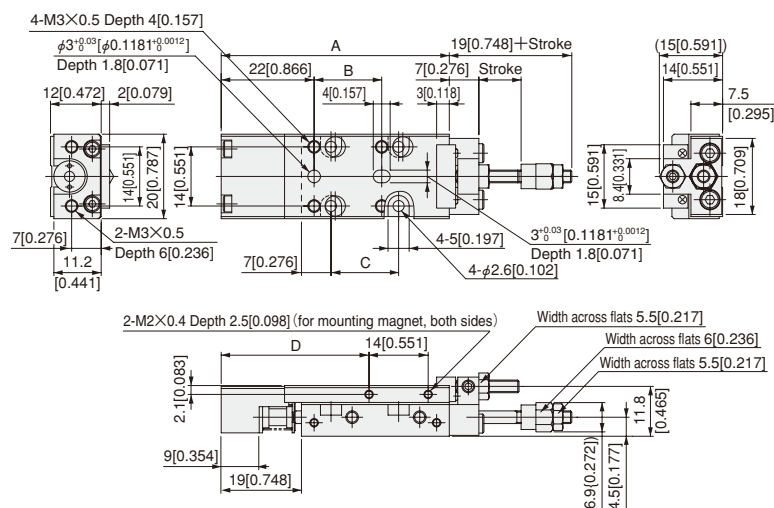
● Extended side stroke adjusting cylinder with buffer

MGAPG□6



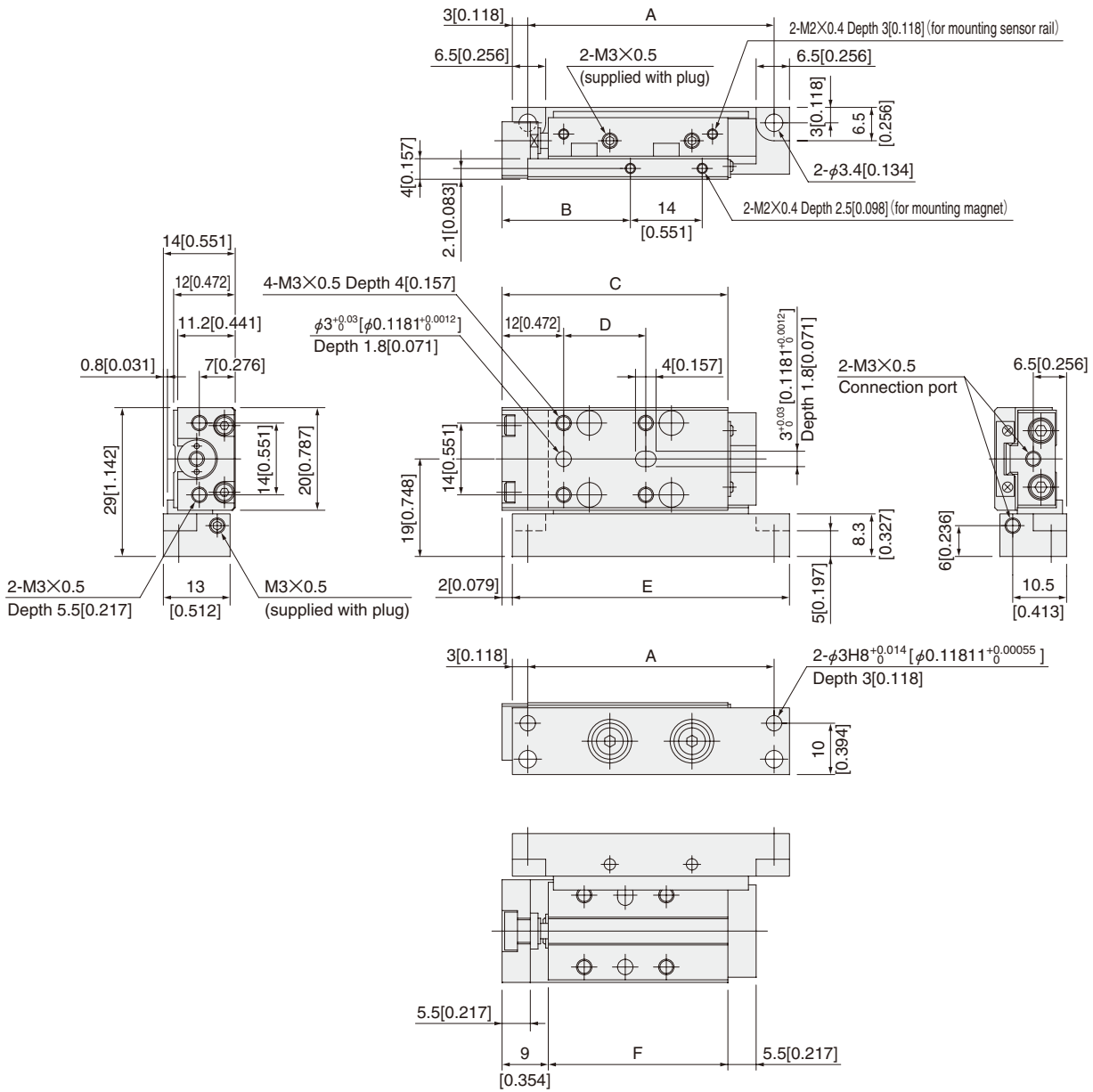
● Extended/retracted-side stroke adjusting cylinder with buffer

MGAEG□6

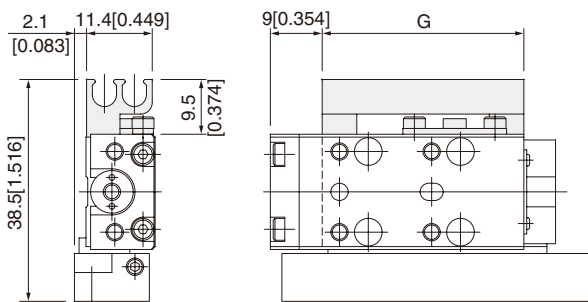


Stroke	A	B	C	D
5	54 [2.126]	16 [0.630]	16 [0.630]	35 [1.378]
10	54 [2.126]	16 [0.630]	16 [0.630]	35 [1.378]
15	59 [2.323]	21 [0.827]	21 [0.827]	40 [1.575]

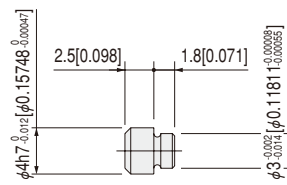
Remark: The buffer stroke of $\phi 6$ [0.236] cylinder with buffer is a maximum of 4mm [0.157in.].

MGAL $\square$ 6 $\times$ Stroke -R

In the case of magnet and sensor rail installed



Locating pin: -P (P-MGA1)



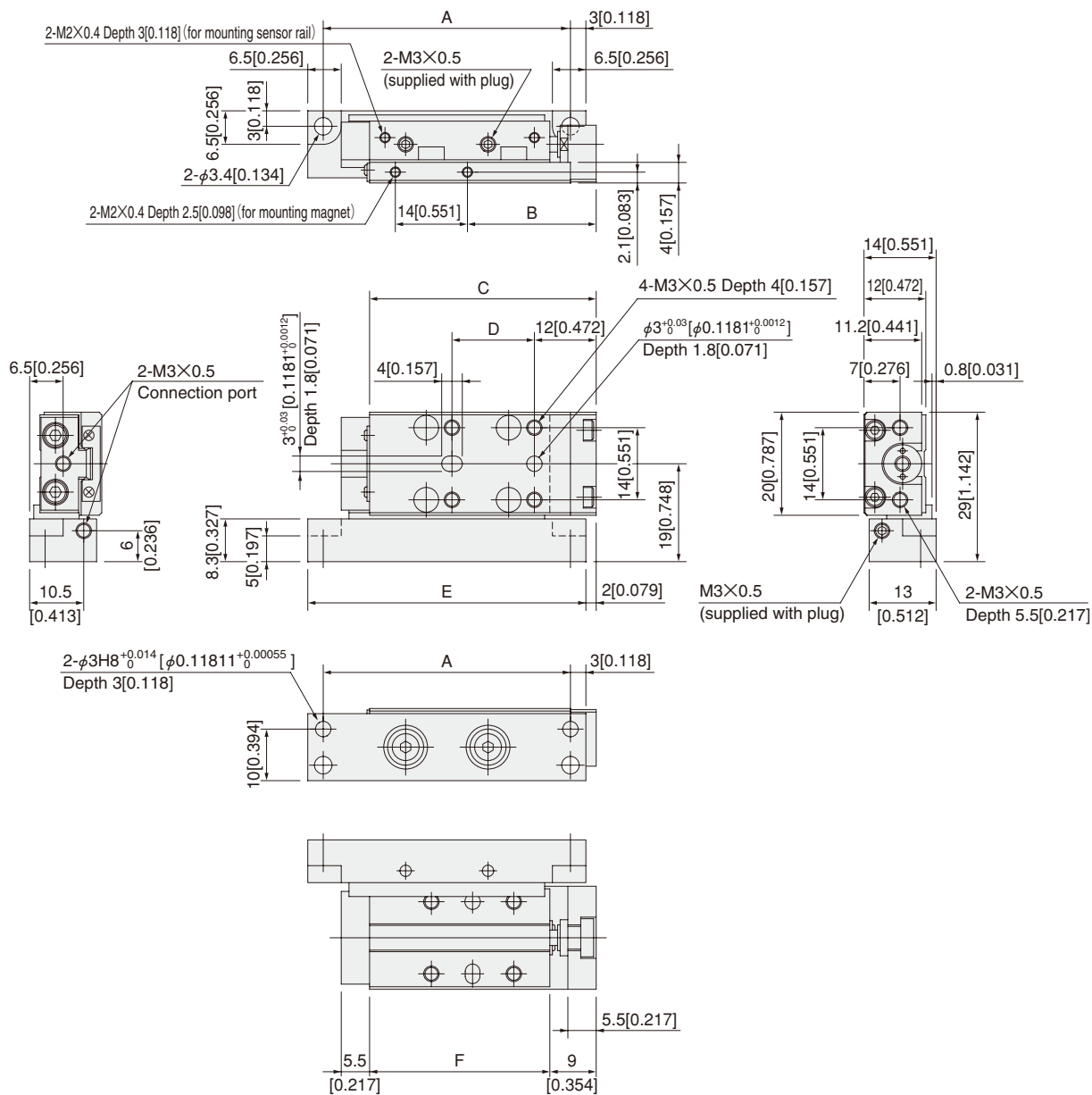
Stroke	A	B	C	D	E	F	G
5	48 [1.890]	25 [0.984]	44 [1.732]	16 [0.630]	54 [2.126]	35 [1.378]	35 [1.378]
10	48 [1.890]	25 [0.984]	44 [1.732]	16 [0.630]	54 [2.126]	35 [1.378]	35 [1.378]
15	53 [2.087]	30 [1.181]	49 [1.929]	21 [0.827]	59 [2.323]	40 [1.575]	40 [1.575]

Dimensions of Bore Size $\phi 6$ [0.236] mm [in.]

●Side-mounted cylinder (left side)

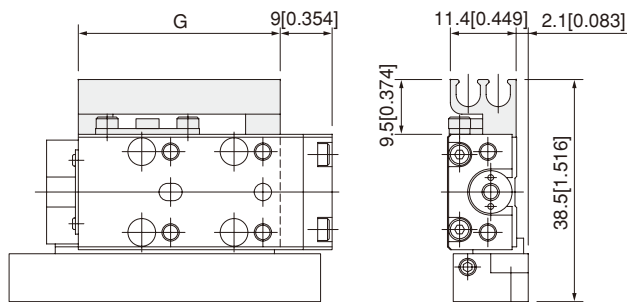


MGAL□6×Stroke-L

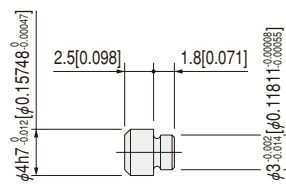


MINI GUIDE SLIDERS

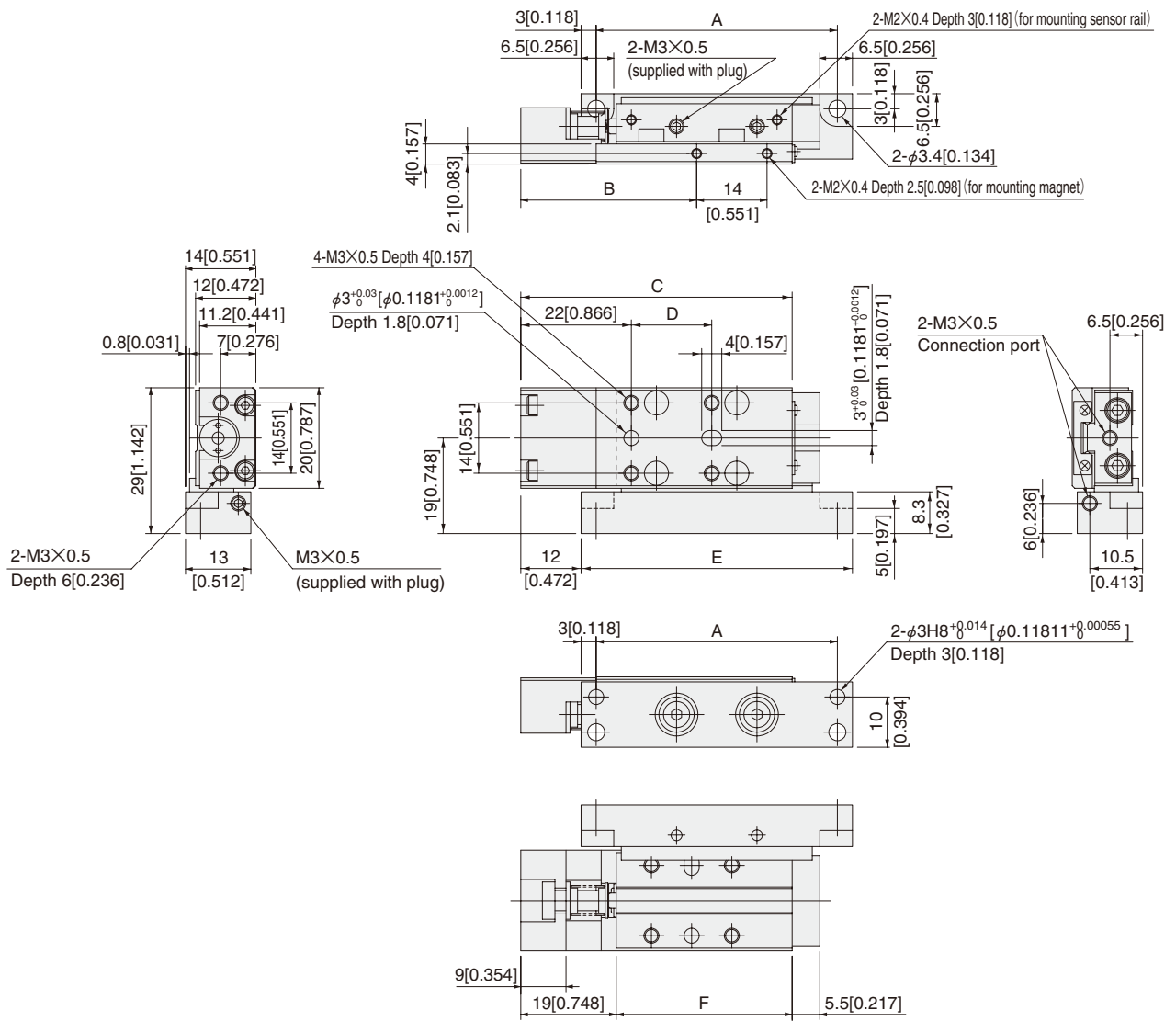
In the case of magnet and sensor rail installed



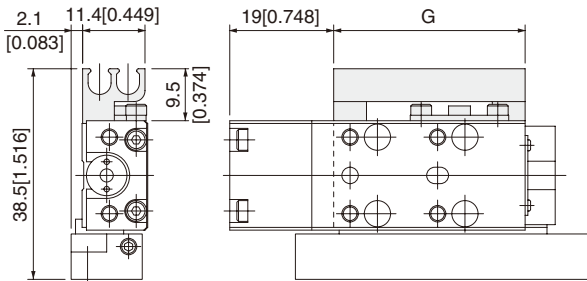
Locating pin: -P (P-MGA1)



Stroke	A	B	C	D	E	F	G
5	48 [1.890]	25 [0.984]	44 [1.732]	16 [0.630]	54 [2.126]	35 [1.378]	35 [1.378]
10	48 [1.890]	25 [0.984]	44 [1.732]	16 [0.630]	54 [2.126]	35 [1.378]	35 [1.378]
15	53 [2.087]	30 [1.181]	49 [1.929]	21 [0.827]	59 [2.323]	40 [1.575]	40 [1.575]

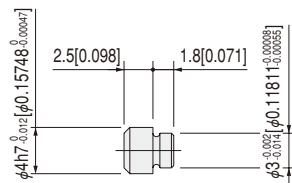
MGALG□6×Stroke-R

In the case of magnet and sensor rail installed



Locating pin: -P (P-MGA1)

Stroke	A	B	C	D	E	F	G
5	48 [1.890]	35 [1.378]	54 [2.126]	16 [0.630]	54 [2.126]	35 [1.378]	35 [1.378]
10	48 [1.890]	35 [1.378]	54 [2.126]	16 [0.630]	54 [2.126]	35 [1.378]	35 [1.378]
15	53 [2.087]	40 [1.575]	59 [2.323]	21 [0.827]	59 [2.323]	40 [1.575]	40 [1.575]

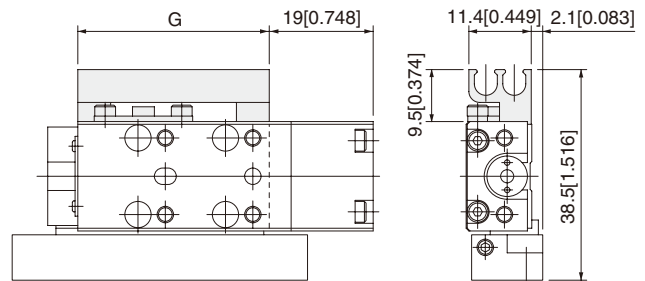
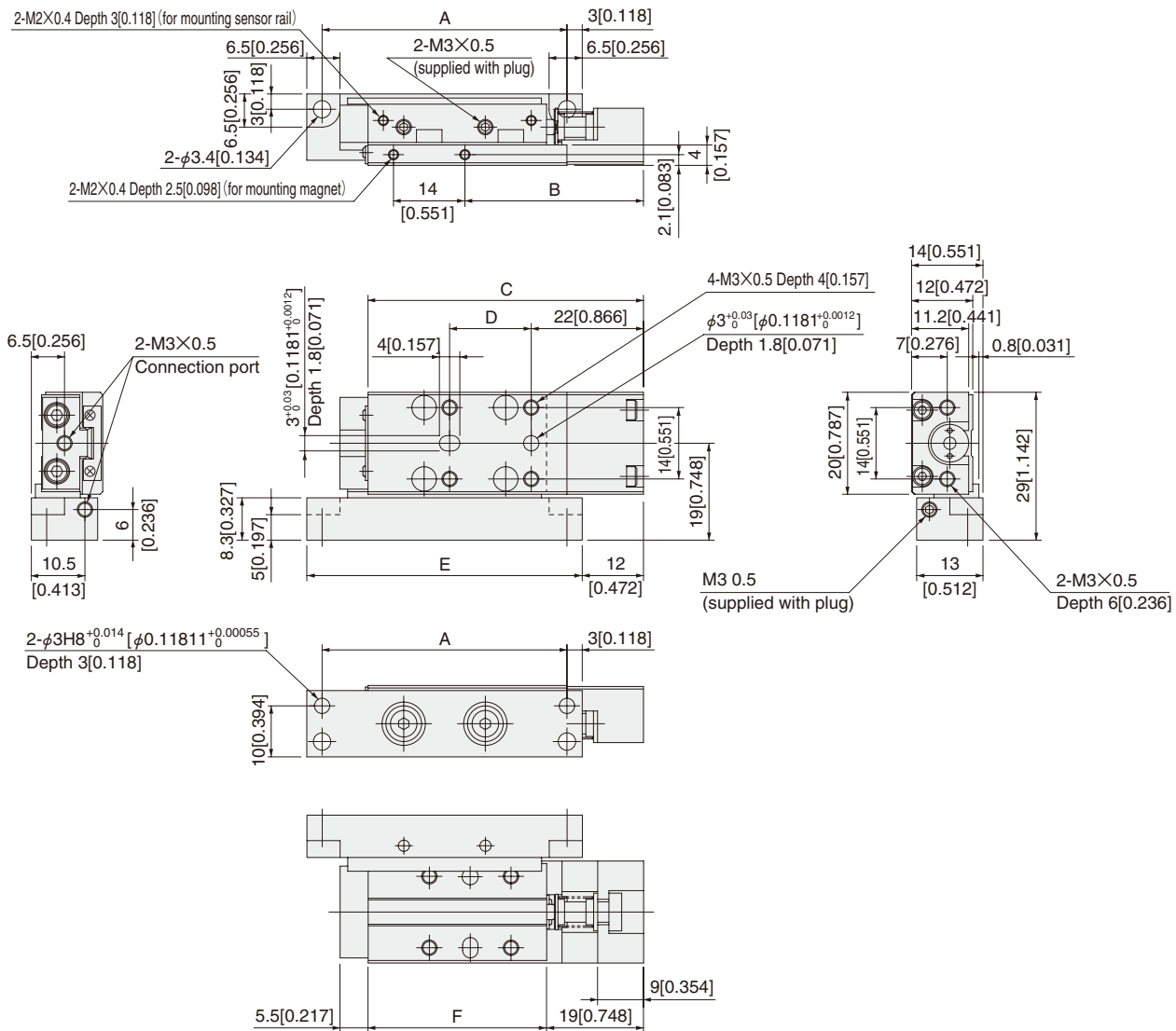


Remark: The buffer stroke of $\phi 6$ [0.236] cylinder with buffer is a maximum of 4mm [0.157in.].

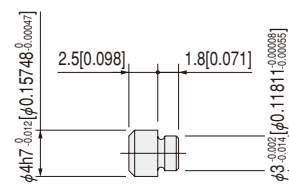
●Side-mounted cylinder with buffer (left side)



MGALG $\square 6 \times$ **Stroke** -L



Locating pin: -P (P-MGA1)



Stroke	A	B	C	D	E	F	G
5	48 [1.890]	35 [1.378]	54 [2.126]	16 [0.630]	54 [2.126]	35 [1.378]	35 [1.378]
10	48 [1.890]	35 [1.378]	54 [2.126]	16 [0.630]	54 [2.126]	35 [1.378]	35 [1.378]
15	53 [2.087]	40 [1.575]	59 [2.323]	21 [0.827]	59 [2.323]	40 [1.575]	40 [1.575]

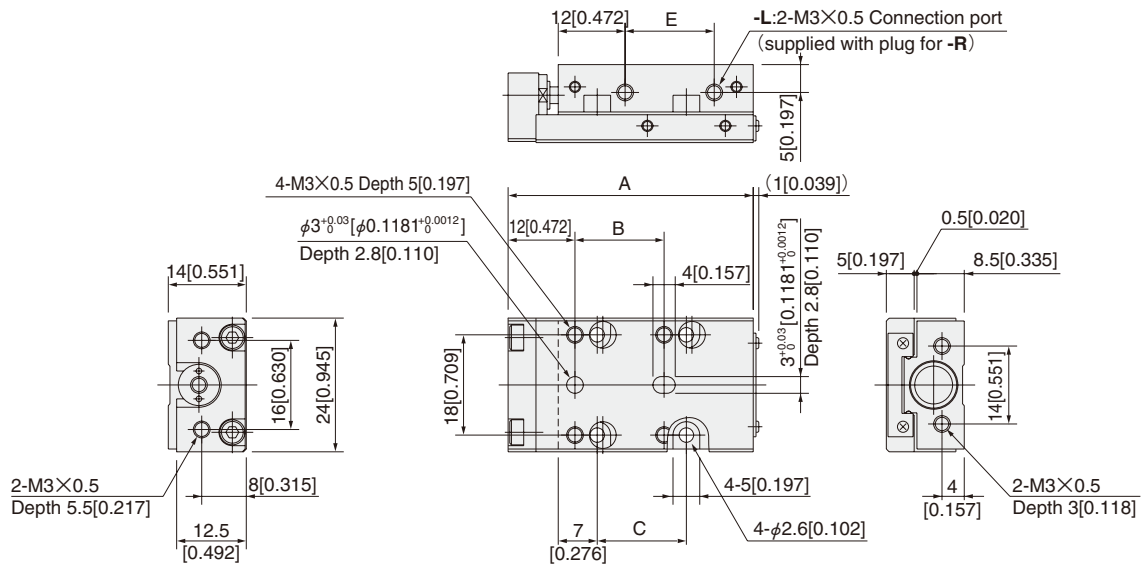
Remark: The buffer stroke of $\phi 6$ [0.236] cylinder with buffer is a maximum of 4mm [0.157in.].

Dimensions of Bore Size $\phi 8$ [0.315] mm [in.]

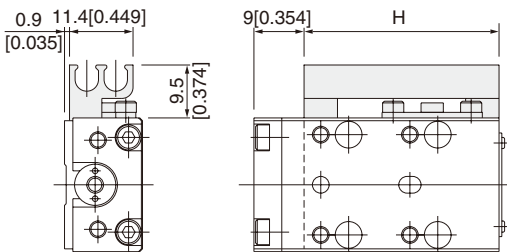
● Standard cylinder



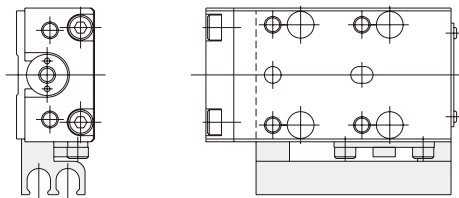
MGA□8



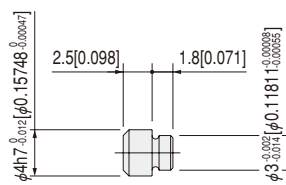
In the case of magnet and sensor rail installed
(Piping direction:-R)



In the case of magnet and sensor rail installed
(Piping direction:-L)



Locating pin: -P (P-MGA1)



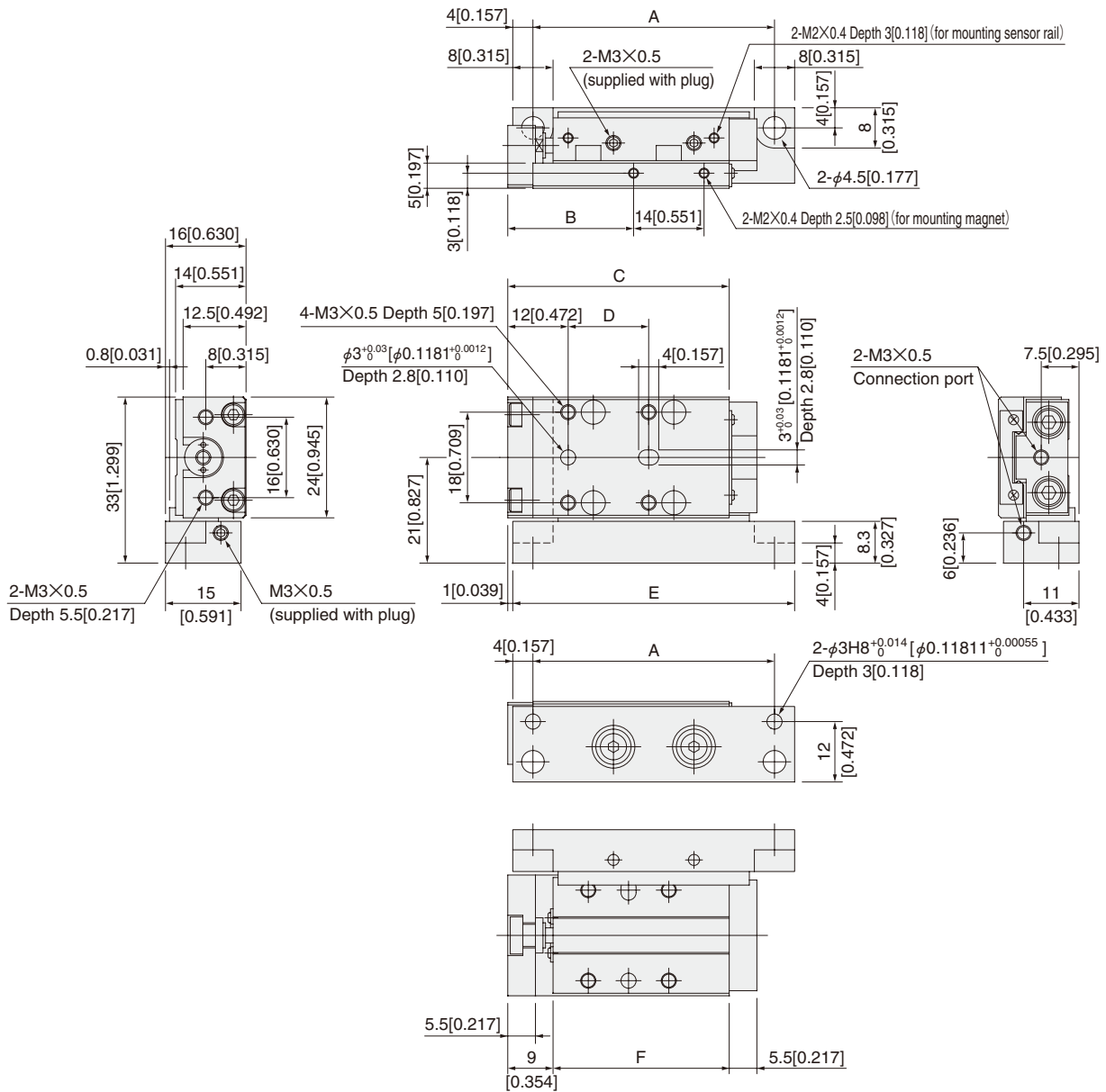
Stroke	A	B	C	D	E	F	G	H
5	44 [1.732]	16 [0.630]	16 [0.630]	25 [0.984]	16 [0.630]	29 [1.142]	35 [1.378]	35 [1.378]
10	44 [1.732]	16 [0.630]	16 [0.630]	25 [0.984]	16 [0.630]	29 [1.142]	35 [1.378]	35 [1.378]
15	54 [2.126]	26 [1.024]	26 [1.024]	35 [1.378]	26 [1.024]	39 [1.535]	45 [1.772]	45 [1.772]
20	54 [2.126]	26 [1.024]	26 [1.024]	35 [1.378]	26 [1.024]	39 [1.535]	45 [1.772]	45 [1.772]

Dimensions of Bore Size $\phi 8$ [0.315] mm [in.]

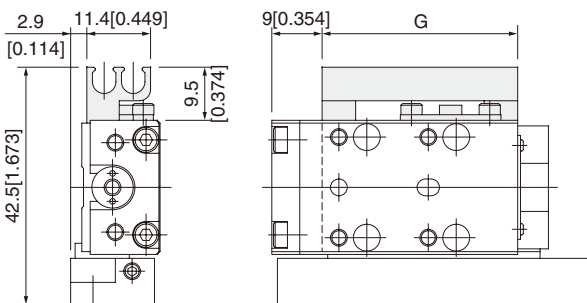
● Side-mounted cylinder (right side)



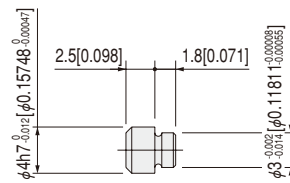
MGAL□8×**Stroke**-R



In the case of magnet and sensor rail installed

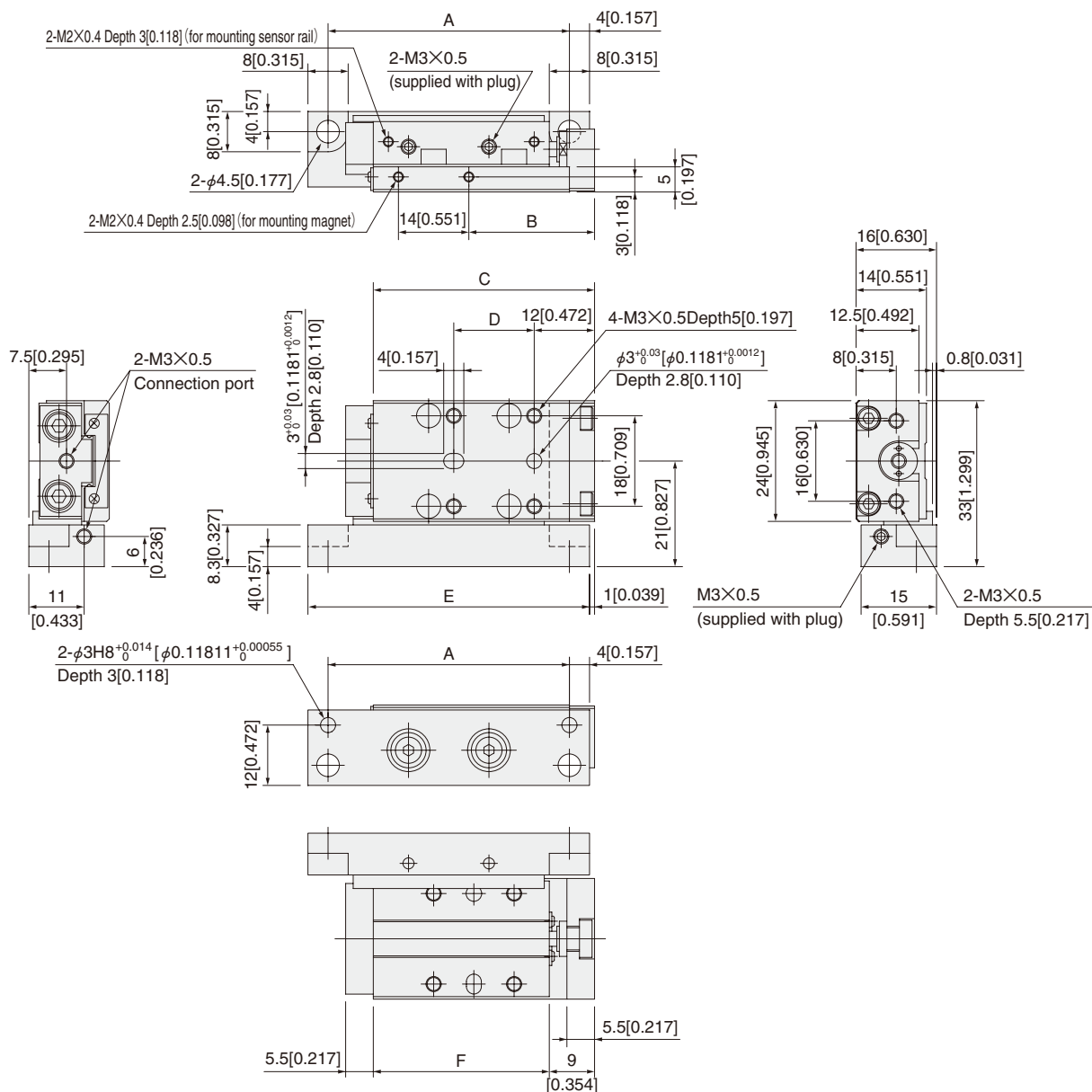


Locating pin: -P (P-MGA1)

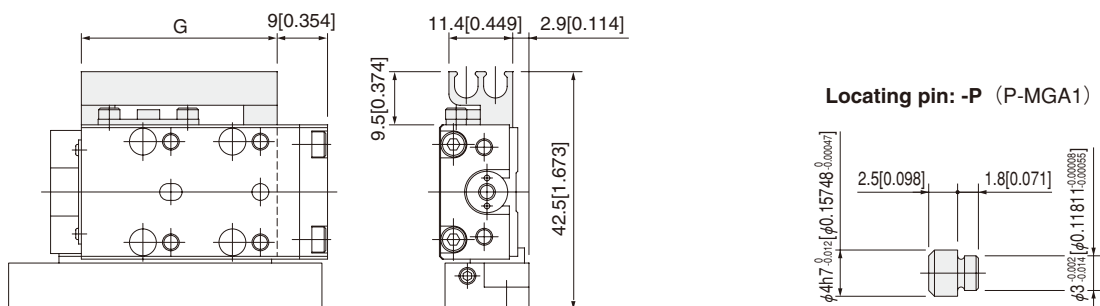


Stroke	A	B	C	D	E	F	G
5	48 [1.890]	25 [0.984]	44 [1.732]	16 [0.630]	56 [2.205]	35 [1.378]	35 [1.378]
10	48 [1.890]	25 [0.984]	44 [1.732]	16 [0.630]	56 [2.205]	35 [1.378]	35 [1.378]
15	58 [2.283]	35 [1.378]	54 [2.126]	26 [1.024]	66 [2.598]	45 [1.772]	45 [1.772]
20	58 [2.283]	35 [1.378]	54 [2.126]	26 [1.024]	66 [2.598]	45 [1.772]	45 [1.772]

CAD



250 251 252 253 254 255 256 257 258 259 260 261 262 263 264 265 266 267 268 269 270 271 272 273 274 275 276 277 278 279 280 281 282 283 284 285 286 287 288 289 290 291 292 293 294 295 296 297 298 299 300 301 302 303 304 305 306 307 308 309 310 311 312 313 314 315 316 317 318 319 320 321 322 323 324 325 326 327 328 329 330 331 332 333 334 335 336 337 338 339 340 341 342 343 344 345 346 347 348 349 350 351 352 353 354 355 356 357 358 359 360 361 362 363 364 365 366 367 368 369 370 371 372 373 374 375 376 377 378 379 380 381 382 383 384 385 386 387 388 389 390 391 392 393 394 395 396 397 398 399 400 401 402 403 404 405 406 407 408 409 410 411 412 413 414 415 416 417 418 419 420 421 422 423 424 425 426 427 428 429 430 431 432 433 434 435 436 437 438 439 440 441 442 443 444 445 446 447 448 449 450 451 452 453 454 455 456 457 458 459 460 461 462 463 464 465 466 467 468 469 470 471 472 473 474 475 476 477 478 479 480 481 482 483 484 485 486 487 488 489 490 491 492 493 494 495 496 497 498 499 500 501 502 503 504 505 506 507 508 509 510 511 512 513 514 515 516 517 518 519 520 521 522 523 524 525 526 527 528 529 530 531 532 533 534 535 536 537 538 539 540 541 542 543 544 545 546 547 548 549 550 551 552 553 554 555 556 557 558 559 560 561 562 563 564 565 566 567 568 569 570 571 572 573 574 575 576 577 578 579 580 581 582 583 584 585 586 587 588 589 590 591 592 593 594 595 596 597 598 599 600 601 602 603 604 605 606 607 608 609 610 611 612 613 614 615 616 617 618 619 620 621 622 623 624 625 626 627 628 629 630 631 632 633 634 635 636 637 638 639 640 641 642 643 644 645 646 647 648 649 650 651 652 653 654 655 656 657 658 659 660 661 662 663 664 665 666 667 668 669 670 671 672 673 674 675 676 677 678 679 680 681 682 683 684 685 686 687 688 689 690 691 692 693 694 695 696 697 698 699 700 701 702 703 704 705 706 707 708 709 710 711 712 713 714 715 716 717 718 719 720 721 722 723 724 725 726 727 728 729 730 731 732 733 734 735 736 737 738 739 740 741 742 743 744 745 746 747 748 749 750 751 752 753 754 755 756 757 758 759 760 761 762 763 764 765 766 767 768 769 770 771 772 773 774 775 776 777 778 779 780 781 782 783 784 785 786 787 788 789 790 791 792 793 794 795 796 797 798 799 800 801 802 803 804 805 806 807 808 809 810 811 812 813 814 815 816 817 818 819 820 821 822 823 824 825 826 827 828 829 830 831 832 833 834 835 836 837 838 839 840 841 842 843 844 845 846 847 848 849 850 851 852 853 854 855 856 857 858 859 860 861 862 863 864 865 866 867 868 869 870 871 872 873 874 875 876 877 878 879 880 881 882 883 884 885 886 887 888 889 890 891 892 893 894 895 896 897 898 899 900 901 902 903 904 905 906 907 908 909 910 911 912 913 914 915 916 917 918 919 920 921 922 923 924 925 926 927 928 929 930 931 932 933 934 935 936 937 938 939 940 941 942 943 944 945 946 947 948 949 950 951 952 953 954 955 956 957 958 959 960 961 962 963 964 965 966 967 968 969 970 971 972 973 974 975 976 977 978 979 980 981 982 983 984 985 986 987 988 989 990 991 992 993 994 995 996 997 998 999 1000



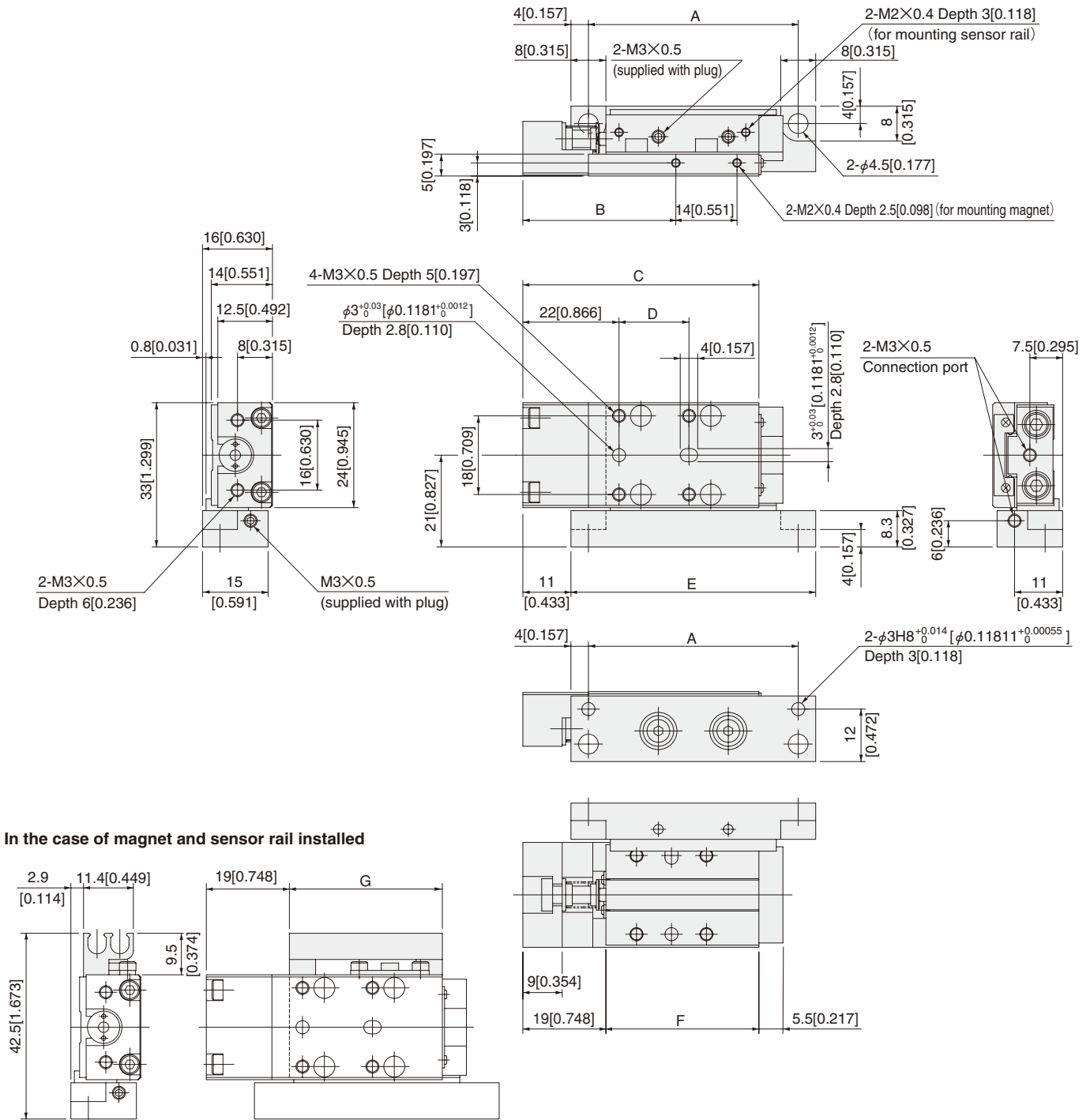
Stroke	A	B	C	D	E	F	G
5	48 [1.890]	25 [0.984]	44 [1.732]	16 [0.630]	56 [2.205]	35 [1.378]	35 [1.378]
10	48 [1.890]	25 [0.984]	44 [1.732]	16 [0.630]	56 [2.205]	35 [1.378]	35 [1.378]
15	58 [2.283]	35 [1.378]	54 [2.126]	26 [1.024]	66 [2.598]	45 [1.772]	45 [1.772]
20	58 [2.283]	35 [1.378]	54 [2.126]	26 [1.024]	66 [2.598]	45 [1.772]	45 [1.772]

Dimensions of Bore Size $\phi 8$ [0.315] mm [in.]

● Side-mounted cylinder with buffer (right side)

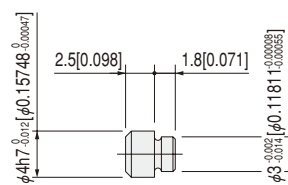


MGALG $\square 8 \times$ **Stroke** -R



Locating pin: -P (P-MGA1)

Stroke	A	B	C	D	E	F	G
5	48 [1.890]	35 [1.378]	54 [2.126]	16 [0.630]	56 [2.205]	35 [1.378]	35 [1.378]
10	48 [1.890]	35 [1.378]	54 [2.126]	16 [0.630]	56 [2.205]	35 [1.378]	35 [1.378]
15	58 [2.283]	45 [1.772]	64 [2.520]	26 [1.024]	66 [2.598]	45 [1.772]	45 [1.772]
20	58 [2.283]	45 [1.772]	64 [2.520]	26 [1.024]	66 [2.598]	45 [1.772]	45 [1.772]



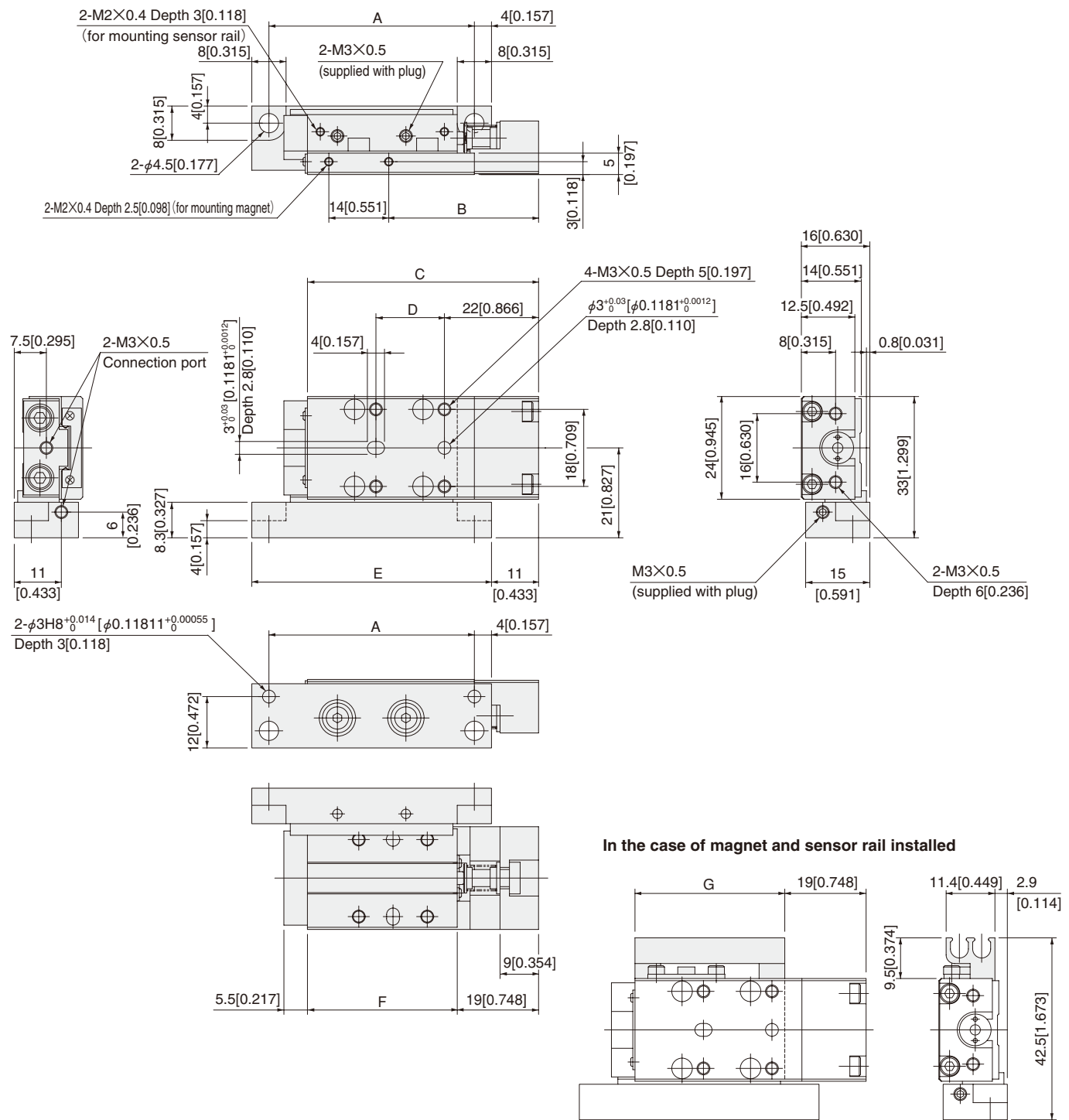
Remark: The buffer stroke of $\phi 8$ [0.315] cylinder with buffer is a maximum of 4mm [0.157in.].

Dimensions of Bore Size $\phi 8$ [0.315] mm [in.]

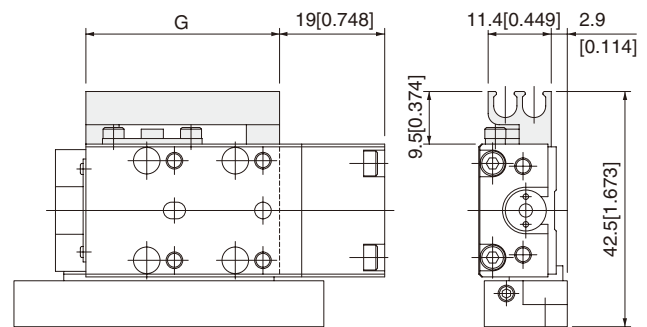
● Side-mounted cylinder with buffer (left side)



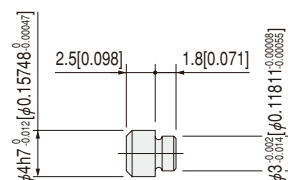
MGALG $\square 8 \times$ **Stroke** -L



In the case of magnet and sensor rail installed



Locating pin: -P (P-MGA1)



Stroke	A	B	C	D	E	F	G
5	48 [1.890]	35 [1.378]	54 [2.126]	16 [0.630]	56 [2.205]	35 [1.378]	35 [1.378]
10	48 [1.890]	35 [1.378]	54 [2.126]	16 [0.630]	56 [2.205]	35 [1.378]	35 [1.378]
15	58 [2.283]	45 [1.772]	64 [2.520]	26 [1.024]	66 [2.598]	45 [1.772]	45 [1.772]
20	58 [2.283]	45 [1.772]	64 [2.520]	26 [1.024]	66 [2.598]	45 [1.772]	45 [1.772]

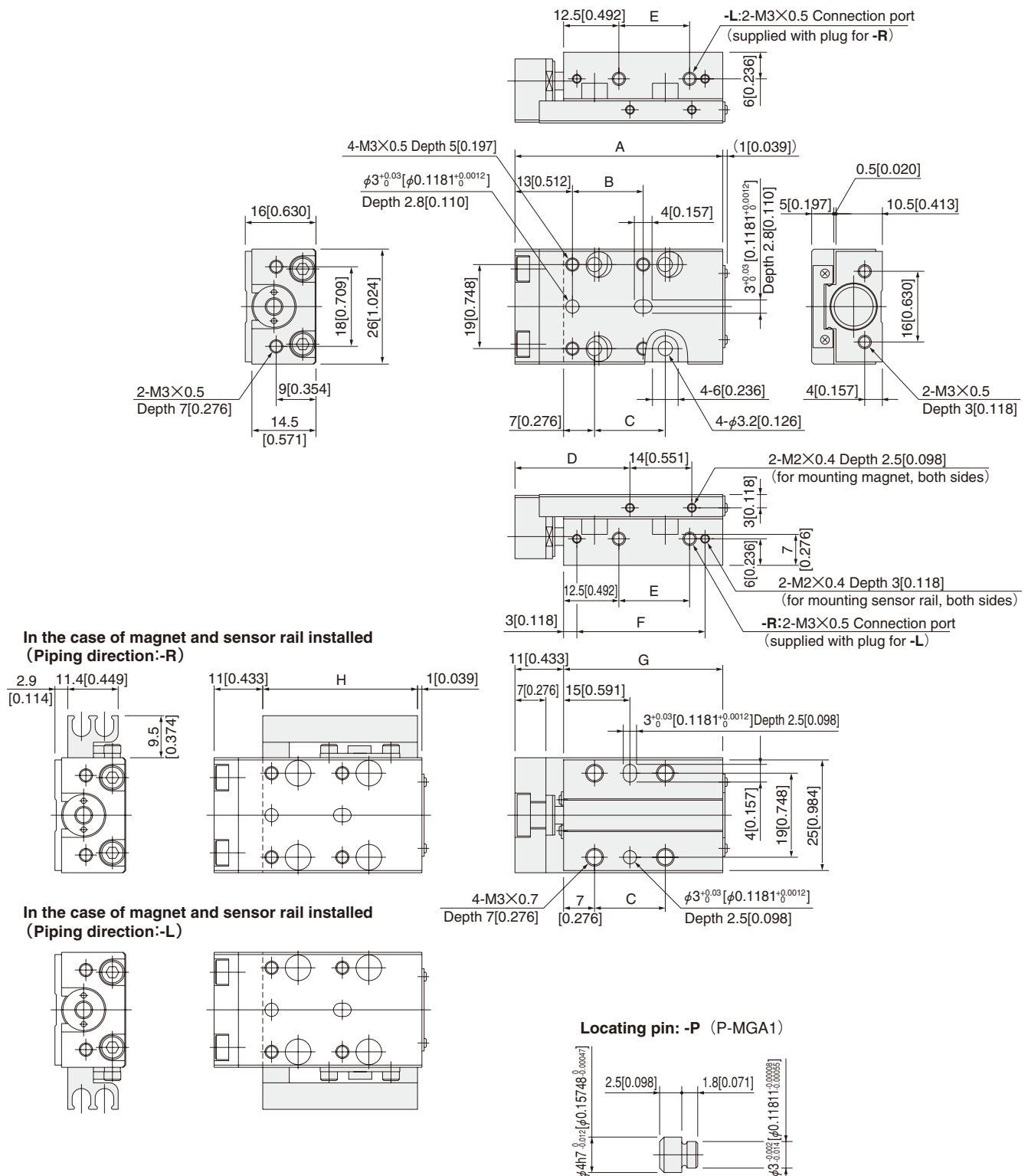
Remark : The buffer stroke of $\phi 8$ [0.315] cylinder with buffer is a maximum of 4mm [0.157in.].

Dimensions of Bore Size $\phi 10$ [0.394] mm [in.]

●Standard cylinder



MGA□10



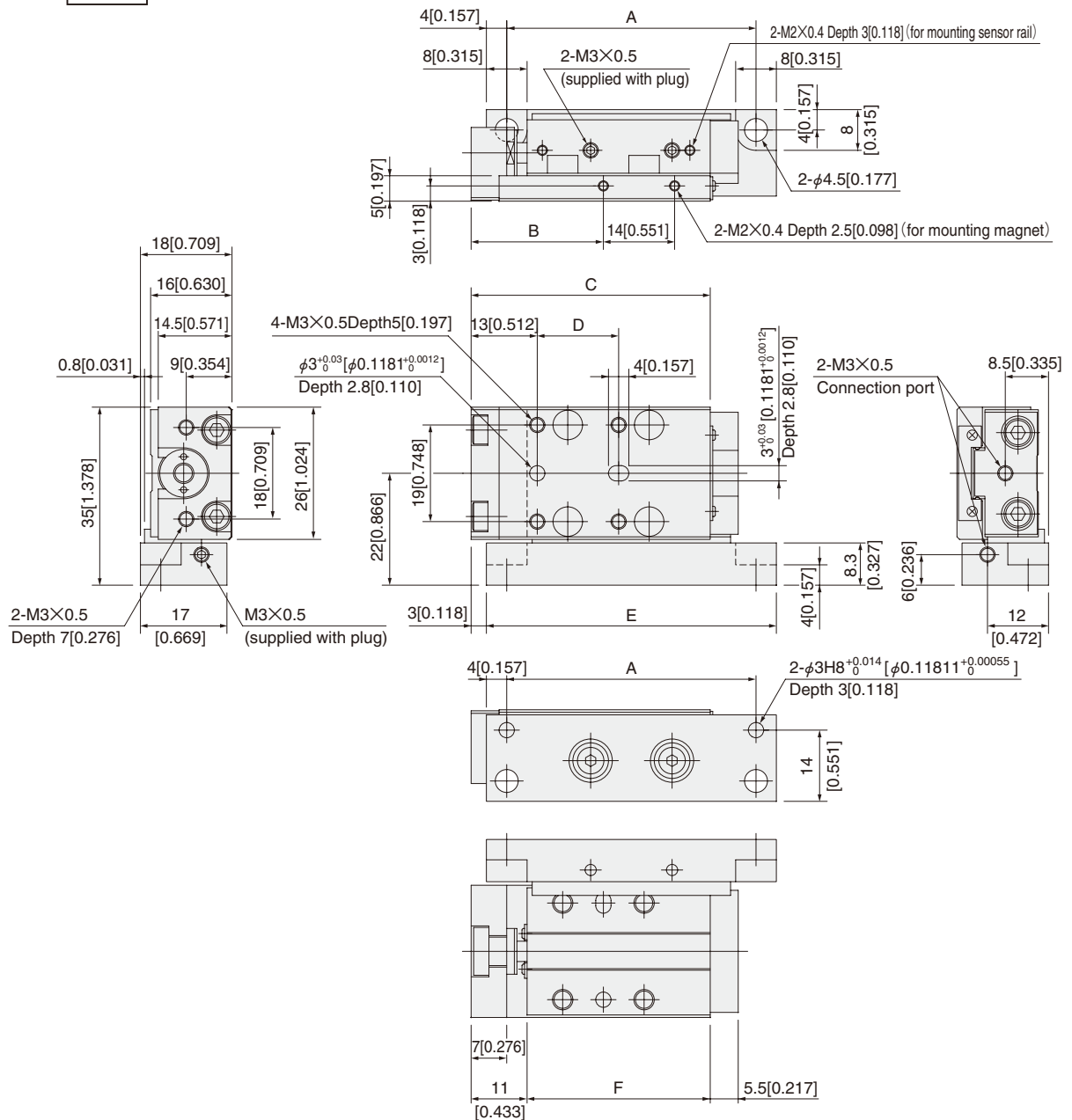
Stroke	A	B	C	D	E	F	G	H
5	47 [1.850]	16 [0.630]	16 [0.630]	26 [1.024]	16 [0.630]	29 [1.142]	36 [1.417]	35 [1.378]
10	47 [1.850]	16 [0.630]	16 [0.630]	26 [1.024]	16 [0.630]	29 [1.142]	36 [1.417]	35 [1.378]
15	57 [2.244]	26 [1.024]	26 [1.024]	36 [1.417]	26 [1.024]	39 [1.535]	46 [1.811]	45 [1.772]
20	57 [2.244]	26 [1.024]	26 [1.024]	36 [1.417]	26 [1.024]	39 [1.535]	46 [1.811]	45 [1.772]
30	67 [2.638]	36 [1.417]	36 [1.417]	46 [1.811]	36 [1.417]	49 [1.929]	56 [2.205]	55 [2.165]

Dimensions of Bore Size $\phi 10$ [0.394] mm [in.]

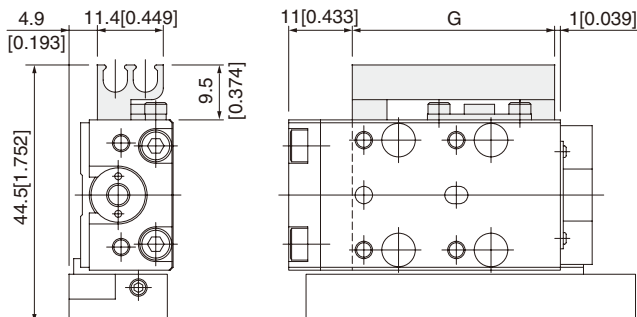
●Side-mounted cylinder (right side)



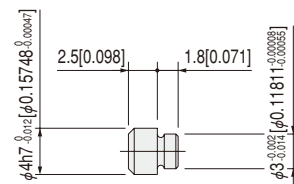
MGAL□10×**Stroke**-R



In the case of magnet and sensor rail installed



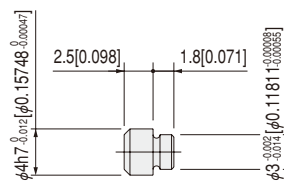
Locating pin: -P (P-MGA1)



Stroke	A	B	C	D	E	F	G
5	49 [1.929]	26 [1.024]	47 [1.850]	16 [0.630]	57 [2.244]	36 [1.417]	35 [1.378]
10	49 [1.929]	26 [1.024]	47 [1.850]	16 [0.630]	57 [2.244]	36 [1.417]	35 [1.378]
15	59 [2.323]	36 [1.417]	57 [2.244]	26 [1.024]	67 [2.638]	46 [1.811]	45 [1.772]
20	59 [2.323]	36 [1.417]	57 [2.244]	26 [1.024]	67 [2.638]	46 [1.811]	45 [1.772]
30	69 [2.717]	46 [1.811]	67 [2.638]	36 [1.417]	77 [3.031]	56 [2.205]	55 [2.165]

MGAL□10×Stroke-L

In the case of magnet and sensor rail installed

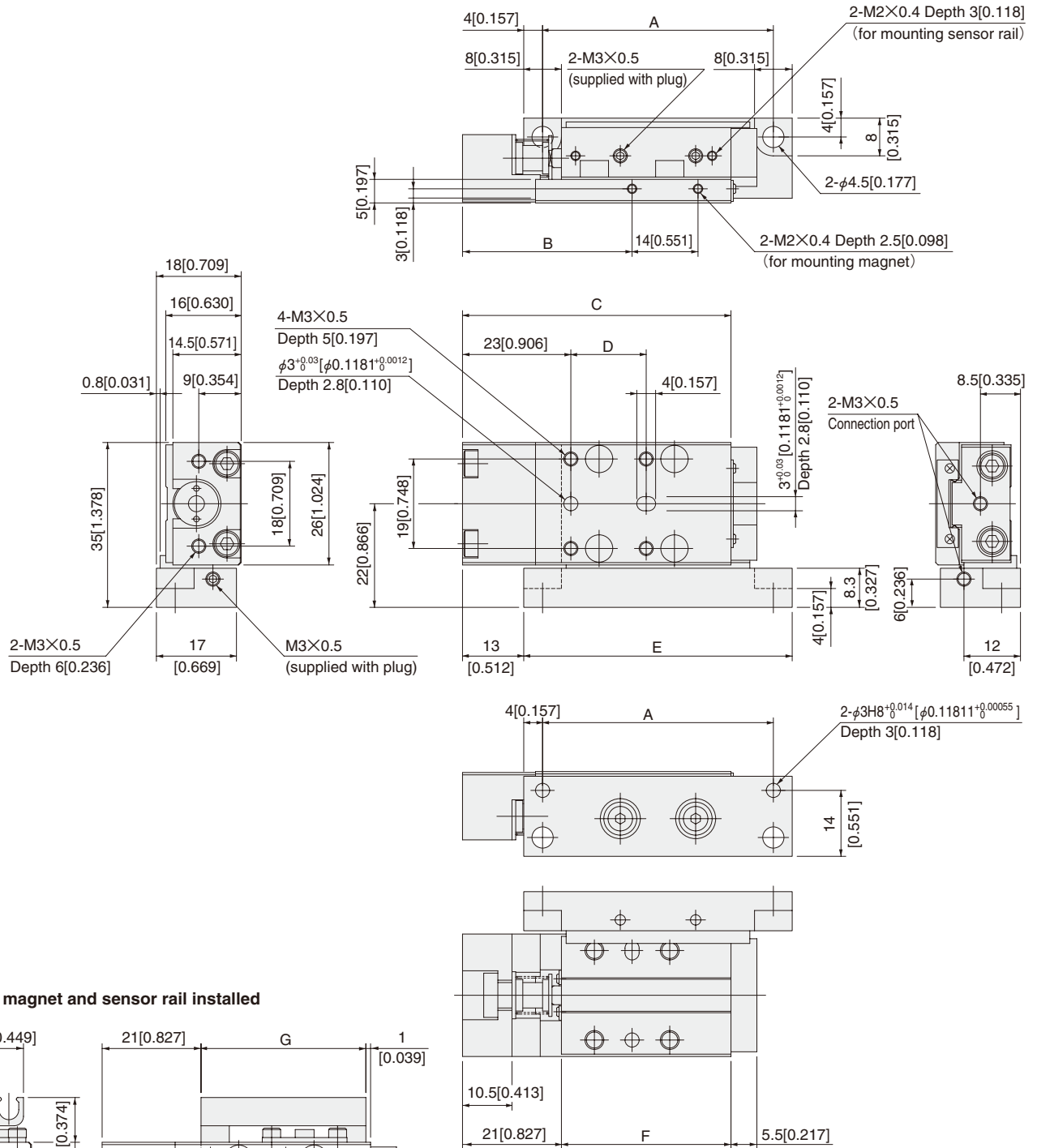
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Dimensions of Bore Size $\phi 10$ [0.394] mm [in.]

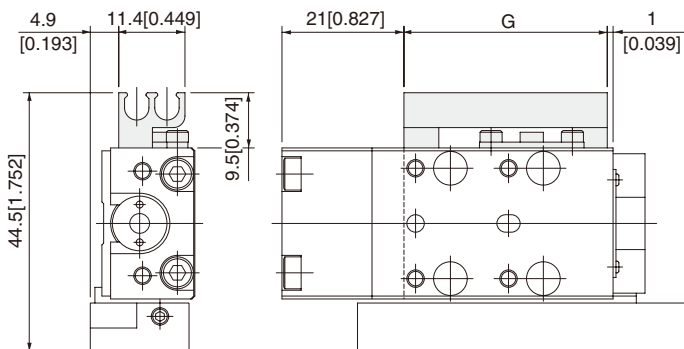
Side-mounted cylinder with buffer (right side)



MGALG□10×**Stroke**-R

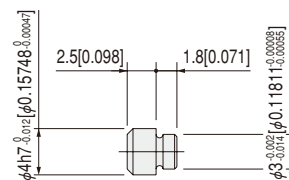


In the case of magnet and sensor rail installed



Stroke	A	B	C	D	E	F	G
5	49 [1.929]	36 [1.417]	57 [2.244]	16 [0.630]	57 [2.244]	36 [1.417]	35 [1.378]
10	49 [1.929]	36 [1.417]	57 [2.244]	16 [0.630]	57 [2.244]	36 [1.417]	35 [1.378]
15	59 [2.323]	46 [1.811]	67 [2.638]	26 [1.024]	67 [2.638]	46 [1.811]	45 [1.772]
20	59 [2.323]	46 [1.811]	67 [2.638]	26 [1.024]	67 [2.638]	46 [1.811]	45 [1.772]
30	69 [2.717]	56 [2.205]	77 [3.031]	36 [1.417]	77 [3.031]	56 [2.205]	55 [2.165]

Locating pin: -P (P-MGA1)



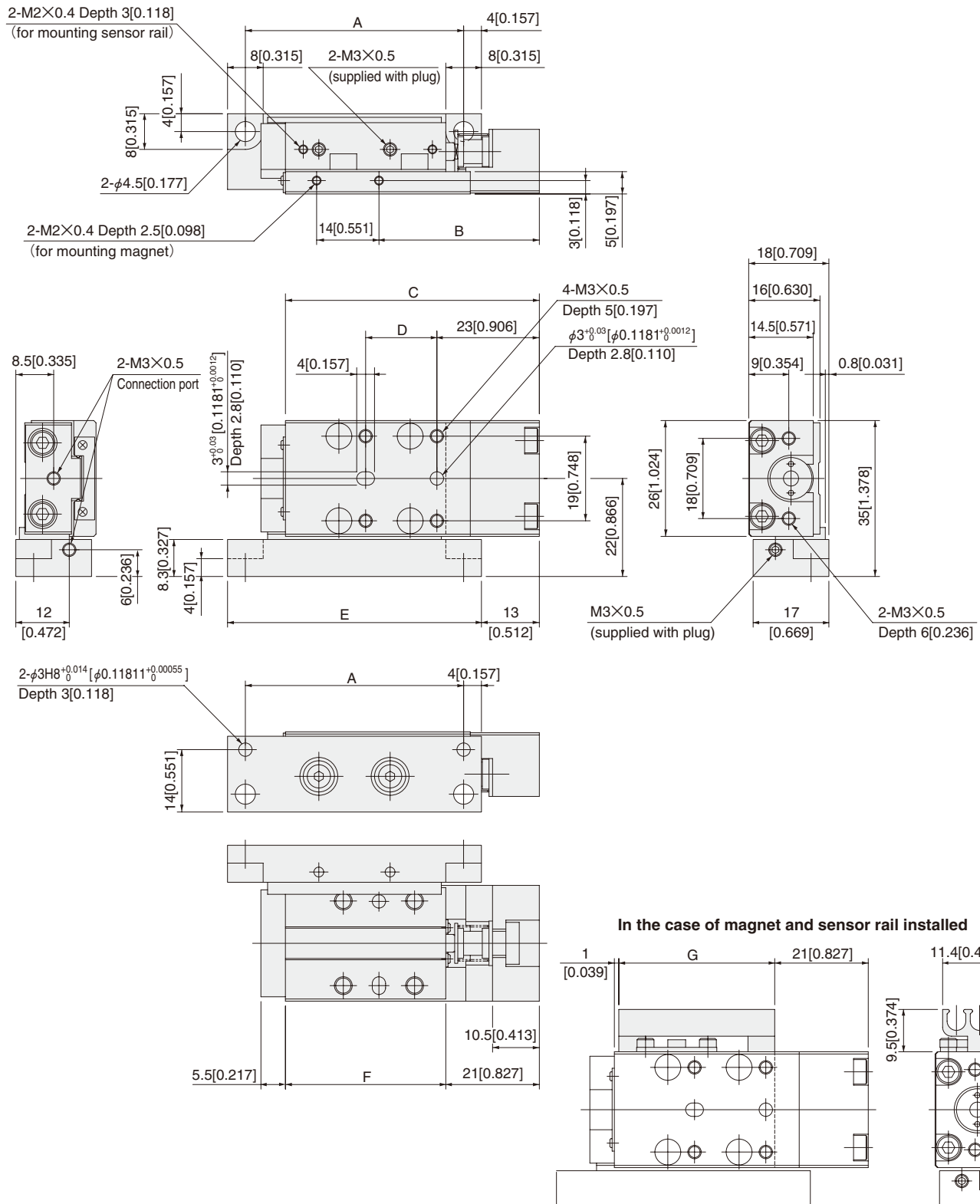
Remark: The buffer stroke of $\phi 10$ [0.394] cylinder with buffer is a maximum of 4mm [0.157in.].

Dimensions of Bore Size $\phi 10$ [0.394] mm [in.]

● Side-mounted cylinder with buffer (left side)



MGALG $\square 10 \times$ Stroke -L



Stroke	A	B	C	D	E	F	G
5	49 [1.929]	36 [1.417]	57 [2.244]	16 [0.630]	57 [2.244]	36 [1.417]	35 [1.378]
10	49 [1.929]	36 [1.417]	57 [2.244]	16 [0.630]	57 [2.244]	36 [1.417]	35 [1.378]
15	59 [2.323]	46 [1.811]	67 [2.638]	26 [1.024]	67 [2.638]	46 [1.811]	45 [1.772]
20	59 [2.323]	46 [1.811]	67 [2.638]	26 [1.024]	67 [2.638]	46 [1.811]	45 [1.772]
30	69 [2.717]	56 [2.205]	77 [3.031]	36 [1.417]	77 [3.031]	56 [2.205]	55 [2.165]

Remark: The buffer stroke of $\phi 10$ [0.394] cylinder with buffer is a maximum of 4mm [0.157in.].

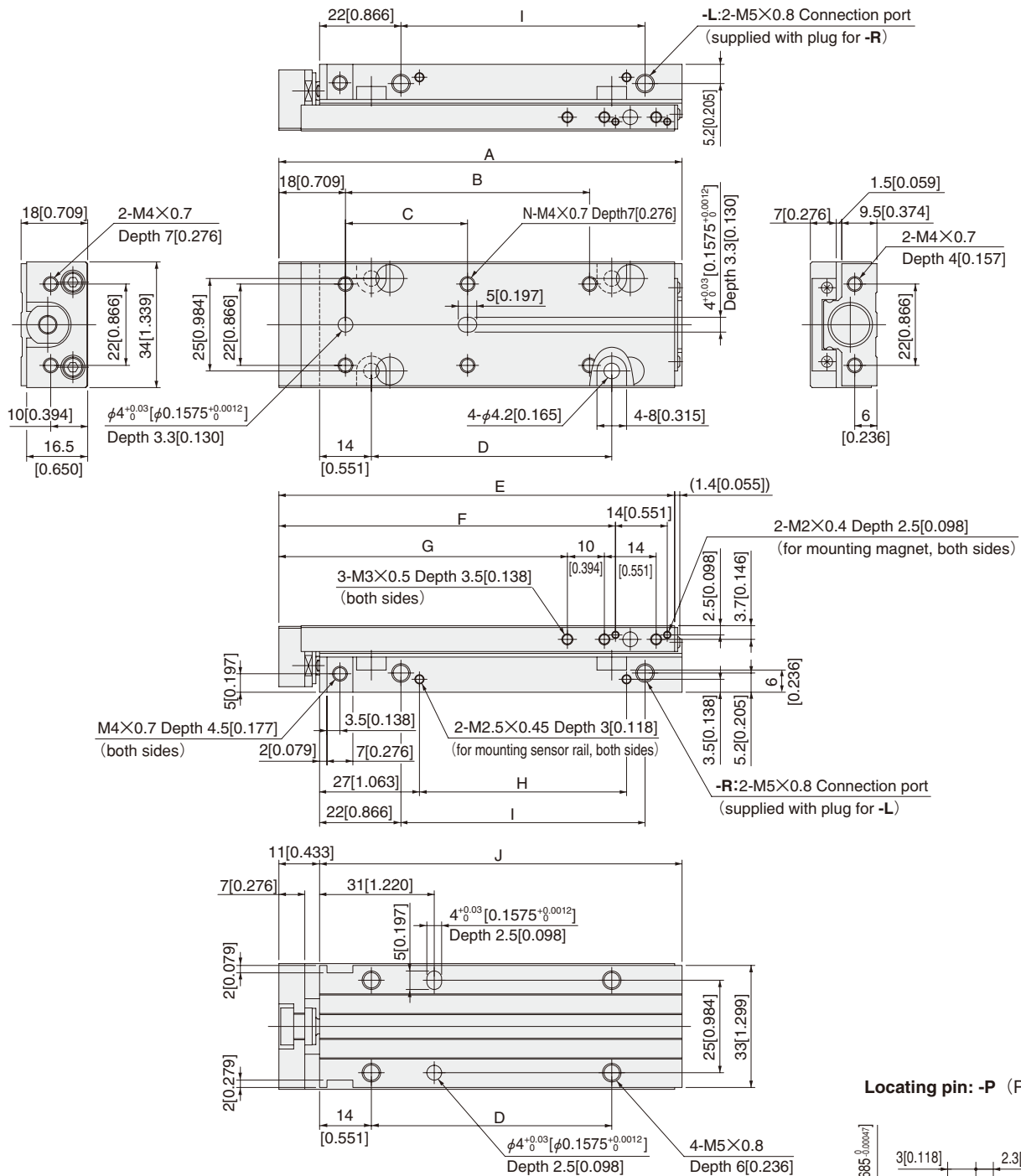
Dimensions of Bore Size $\phi 12$ [0.472] mm [in.]

● Standard cylinder

Remark: For cylinder with magnet sensor rail, see p.638.



MGA12



Stroke	A	B	C	D	E	F	G	H	I	J	K	N
10	69 [2.717]	—	26 [1.024]	25 [0.984]	67 [2.638]	51 [2.008]	38 [1.496]	16 [0.630]	26 [1.024]	58 [2.283]	46 [1.811]	4
20	69 [2.717]	—	26 [1.024]	25 [0.984]	67 [2.638]	51 [2.008]	38 [1.496]	16 [0.630]	26 [1.024]	58 [2.283]	46 [1.811]	4
30	89 [3.504]	—	46 [1.811]	45 [1.772]	87 [3.425]	71 [2.795]	58 [2.283]	36 [1.417]	46 [1.811]	78 [3.071]	66 [2.598]	4
40	89 [3.504]	—	46 [1.811]	45 [1.772]	87 [3.425]	71 [2.795]	58 [2.283]	36 [1.417]	46 [1.811]	78 [3.071]	66 [2.598]	4
50	109 [4.291]	66 [2.598]	33 [1.299]	65 [2.559]	107 [4.213]	91 [3.583]	78 [3.071]	56 [2.205]	66 [2.598]	98 [3.858]	86 [3.386]	6
60	109 [4.291]	66 [2.598]	33 [1.299]	65 [2.559]	107 [4.213]	91 [3.583]	78 [3.071]	56 [2.205]	66 [2.598]	98 [3.858]	86 [3.386]	6

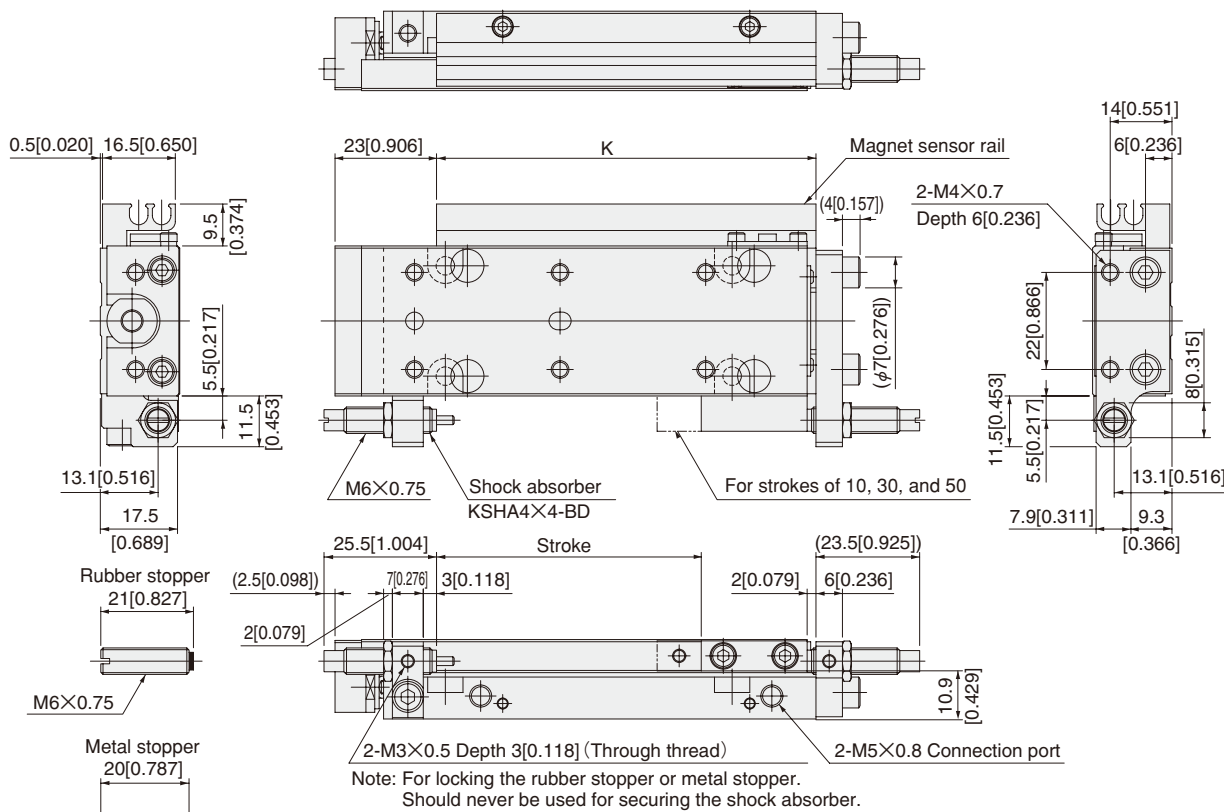
Dimensions of Bore Size $\phi 12$ [0.472] mm [in.]

●Cylinder with magnet sensor rail **MGAS12**

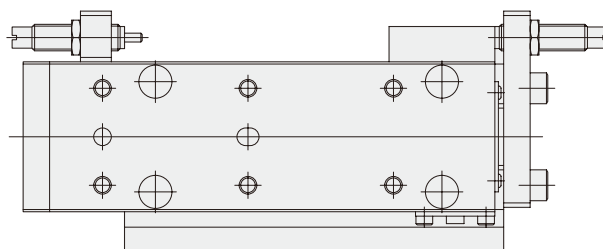
●Cylinder with shock absorber **MGA** $\square$ 12-SS $\square$



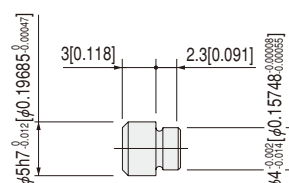
Piping direction: -R

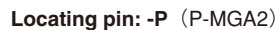


Piping direction: -L



Locating pin: -P (P-MGA2)





Remark: The buffer stroke of $\phi 12$ [0.472] cylinder with buffer is a maximum of 6mm [0.236in.].

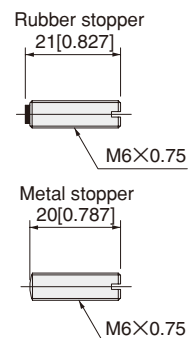
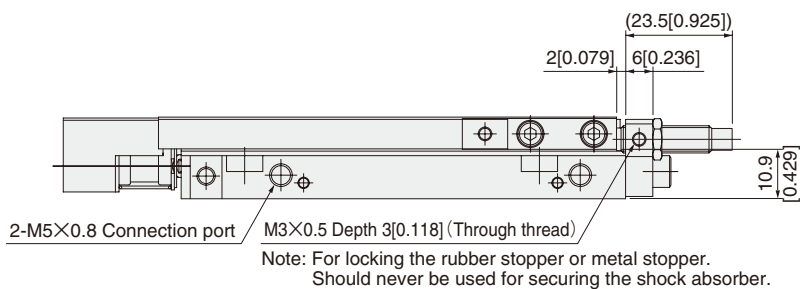
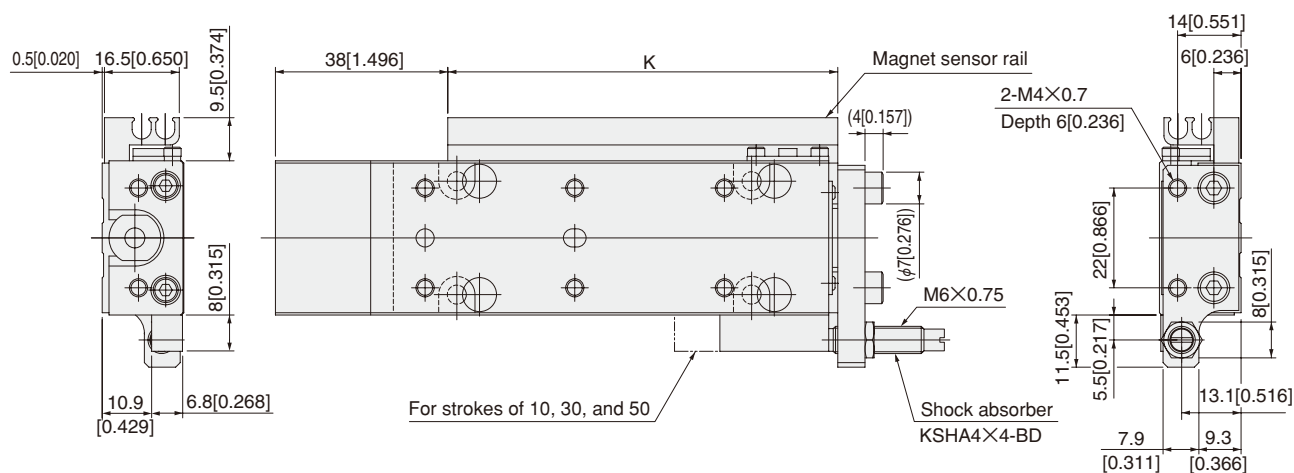
Dimensions of Bore Size $\phi 12$ [0.472] mm [in.]

●Cylinder with buffer and magnet sensor rail **MGAGS12**

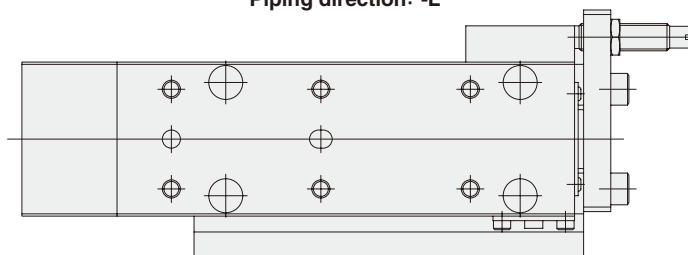
●Cylinder with buffer and shock absorber **MGAG□12-SSR**



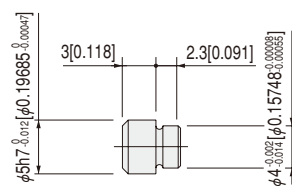
Piping direction: -R



Piping direction: -L



Locating pin: -P (P-MGA2)



Remark: The buffer stroke of $\phi 12$ [0.472] cylinder with buffer is a maximum of 6mm [0.236in.].

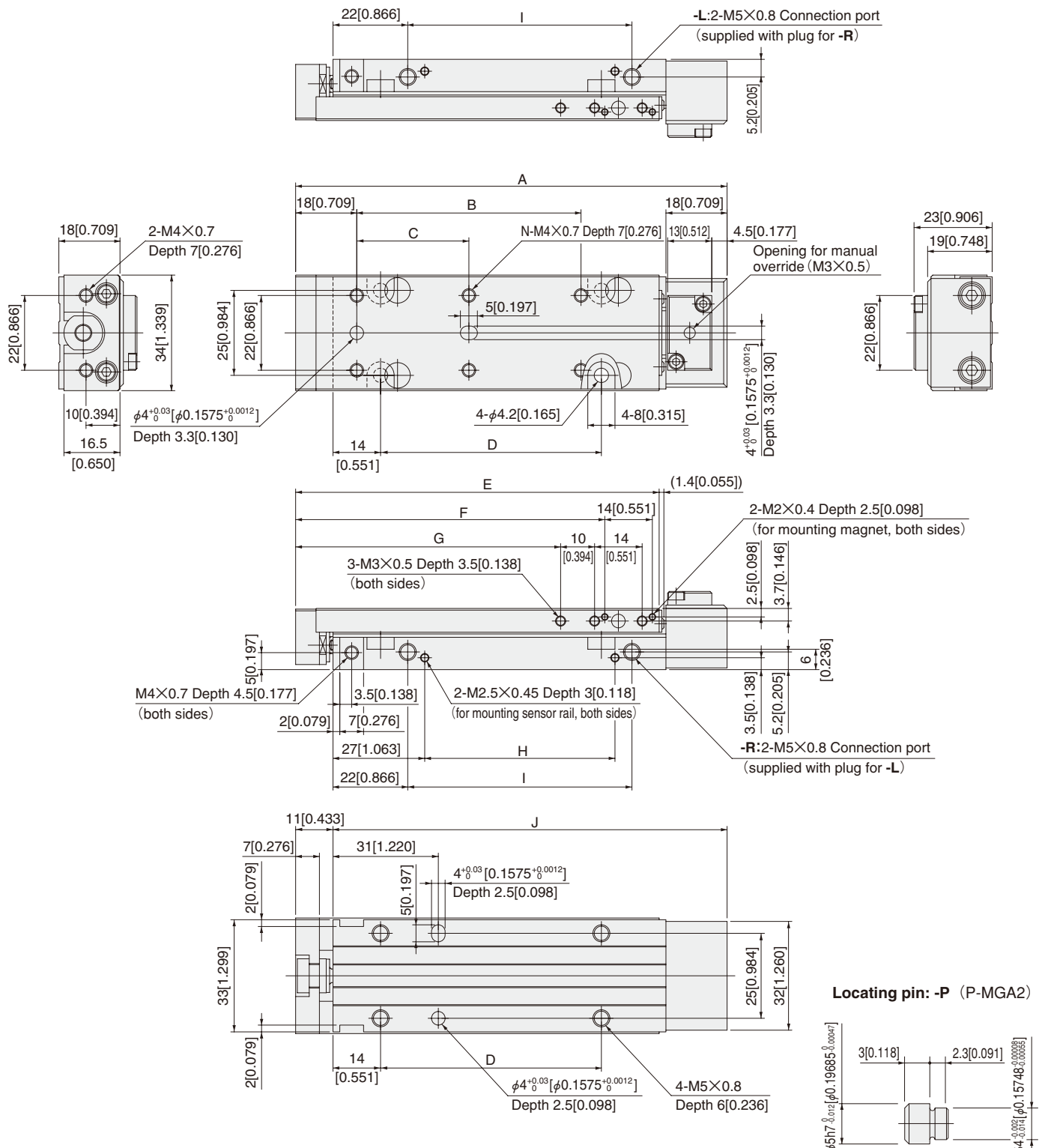
Dimensions of Bore Size $\phi 12$ [0.472] mm [in.]

●Cylinder with end keep

Remark: For cylinder with magnet sensor rail, see p.642.



MGAK12

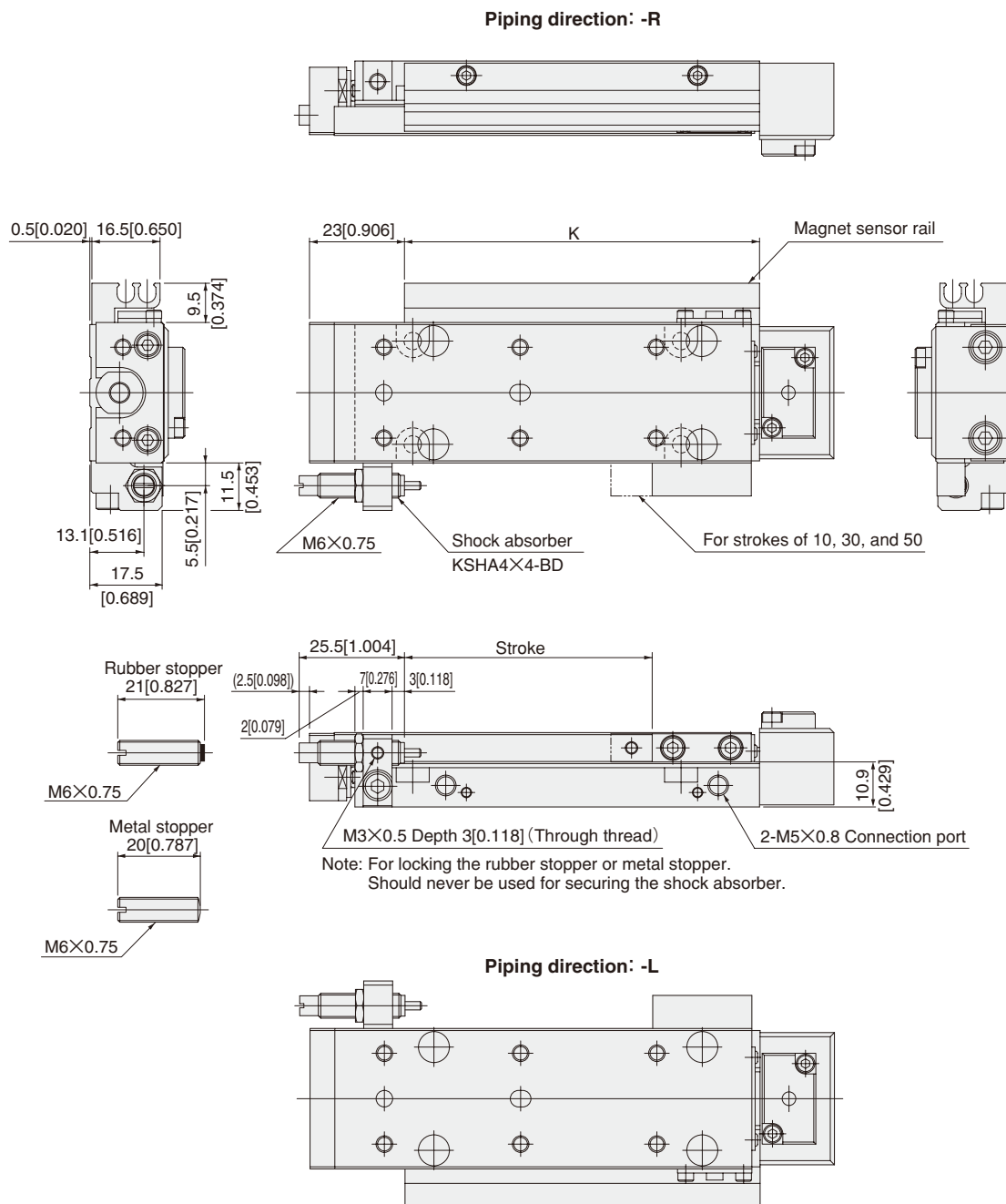


Stroke	A	B	C	D	E	F	G	H	I	J	K	N
10	87 [3.425]	—	26 [1.024]	25 [0.984]	67 [2.638]	51 [2.008]	38 [1.496]	16 [0.630]	26 [1.024]	76 [2.992]	46 [1.811]	4
20	87 [3.425]	—	26 [1.024]	25 [0.984]	67 [2.638]	51 [2.008]	38 [1.496]	16 [0.630]	26 [1.024]	76 [2.992]	46 [1.811]	4
30	107 [4.213]	—	46 [1.811]	45 [1.772]	87 [3.425]	71 [2.795]	58 [2.283]	36 [1.417]	46 [1.811]	96 [3.780]	66 [2.598]	4
40	107 [4.213]	—	46 [1.811]	45 [1.772]	87 [3.425]	71 [2.795]	58 [2.283]	36 [1.417]	46 [1.811]	96 [3.780]	66 [2.598]	4
50	127 [5.000]	66 [2.598]	33 [1.299]	65 [2.559]	107 [4.213]	91 [3.583]	78 [3.071]	56 [2.205]	66 [2.598]	116 [4.567]	86 [3.386]	6
60	127 [5.000]	66 [2.598]	33 [1.299]	65 [2.559]	107 [4.213]	91 [3.583]	78 [3.071]	56 [2.205]	66 [2.598]	116 [4.567]	86 [3.386]	6

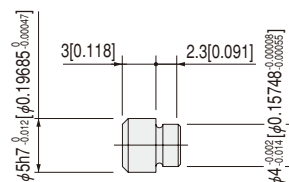
Dimensions of Bore Size $\phi 12$ [0.472] mm [in.]

●Cylinder with end keep and magnet sensor rail **MGAKS12**

●Cylinder with end keep and shock absorber **MGAK□12-SSF**



Locating pin: -P (P-MGA2)

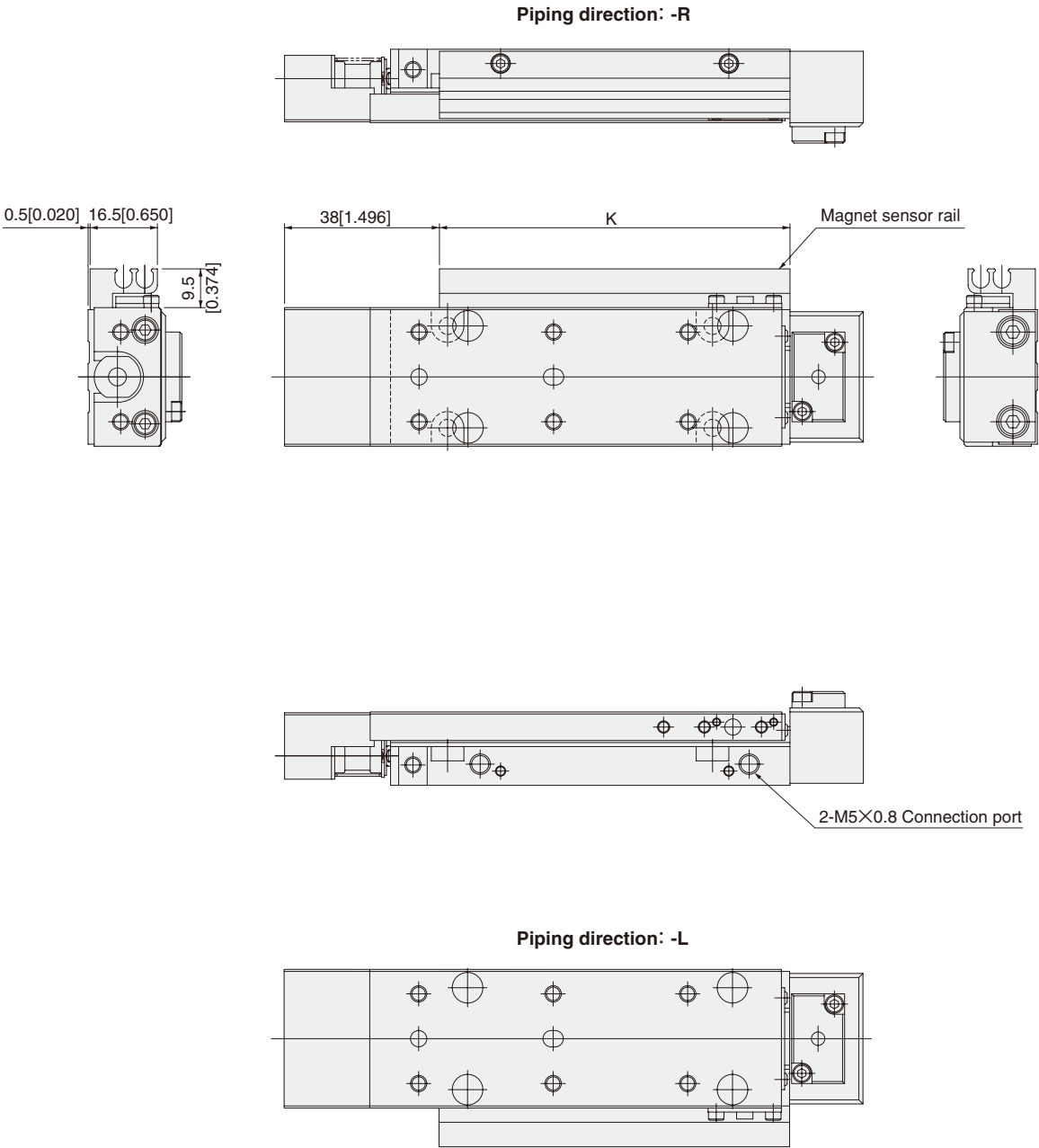




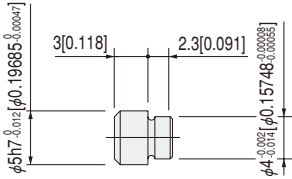
1998, 1999, 2000, 2001, 2002, 2003, 2004, 2005, 2006, 2007, 2008, 2009, 2010, 2011, 2012, 2013, 2014, 2015, 2016, 2017, 2018, 2019, 2020, 2021, 2022, 2023, 2024, 2025, 2026, 2027, 2028, 2029, 2030, 2031, 2032, 2033, 2034, 2035, 2036, 2037, 2038, 2039, 2040, 2041, 2042, 2043, 2044, 2045, 2046, 2047, 2048, 2049, 2050, 2051, 2052, 2053, 2054, 2055, 2056, 2057, 2058, 2059, 2060, 2061, 2062, 2063, 2064, 2065, 2066, 2067, 2068, 2069, 2070, 2071, 2072, 2073, 2074, 2075, 2076, 2077, 2078, 2079, 2080, 2081, 2082, 2083, 2084, 2085, 2086, 2087, 2088, 2089, 2090, 2091, 2092, 2093, 2094, 2095, 2096, 2097, 2098, 2099, 2100, 2101, 2102, 2103, 2104, 2105, 2106, 2107, 2108, 2109, 2110, 2111, 2112, 2113, 2114, 2115, 2116, 2117, 2118, 2119, 2120, 2121, 2122, 2123, 2124, 2125, 2126, 2127, 2128, 2129, 2130, 2131, 2132, 2133, 2134, 2135, 2136, 2137, 2138, 2139, 2140, 2141, 2142, 2143, 2144, 2145, 2146, 2147, 2148, 2149, 2150, 2151, 2152, 2153, 2154, 2155, 2156, 2157, 2158, 2159, 2160, 2161, 2162, 2163, 2164, 2165, 2166, 2167, 2168, 2169, 2170, 2171, 2172, 2173, 2174, 2175, 2176, 2177, 2178, 2179, 2180, 2181, 2182, 2183, 2184, 2185, 2186, 2187, 2188, 2189, 2190, 2191, 2192, 2193, 2194, 2195, 2196, 2197, 2198, 2199, 2200, 2201, 2202, 2203, 2204, 2205, 2206, 2207, 2208, 2209, 2210, 2211, 2212, 2213, 2214, 2215, 2216, 2217, 2218, 2219, 2220, 2221, 2222, 2223, 2224, 2225, 2226, 2227, 2228, 2229, 2230, 2231, 2232, 2233, 2234, 2235, 2236, 2237, 2238, 2239, 2240, 2241, 2242, 2243, 2244, 2245, 2246, 2247, 2248, 2249, 2250, 2251, 2252, 2253, 2254, 2255, 2256, 2257, 2258, 2259, 2260, 2261, 2262, 2263, 2264, 2265, 2266, 2267, 2268, 2269, 2270, 2271, 2272, 2273, 2274, 2275, 2276, 2277, 2278, 2279, 2280, 2281, 2282, 2283, 2284, 2285, 2286, 2287, 2288, 2289, 2290, 2291, 2292, 2293, 2294, 2295, 2296, 2297, 2298, 2299, 2300, 2301, 2302, 2303, 2304, 2305, 2306, 2307, 2308, 2309, 2310, 2311, 2312, 2313, 2314, 2315, 2316, 2317, 2318, 2319, 2320, 2321, 2322, 2323, 2324, 2325, 2326, 2327, 2328, 2329, 2330, 2331, 2332, 2333, 2334, 2335, 2336, 2337, 2338, 2339, 2340, 2341, 2342, 2343, 2344, 2345, 2346, 2347, 2348, 2349, 2350, 2351, 2352, 2353, 2354, 2355, 2356, 2357, 2358, 2359, 2360, 2361, 2362, 2363, 2364, 2365, 2366, 2367, 2368, 2369, 2370, 2371, 2372, 2373, 2374, 2375, 2376, 2377, 2378, 2379, 2380, 2381, 2382, 2383, 2384, 2385, 2386, 2387, 2388, 2389, 2390, 2391, 2392, 2393, 2394, 2395, 2396, 2397, 2398, 2399, 2400, 2401, 2402, 2403, 2404, 2405, 2406, 2407, 2408, 2409, 2410, 2411, 2412, 2413, 2414, 2415, 2416, 2417, 2418, 2419, 2420, 2421, 2422, 2423, 2424, 2425, 2426, 2427, 2428, 2429, 2430, 2431, 2432, 2433, 2434, 2435, 2436, 2437, 2438, 2439, 2440, 2441, 2442, 2443, 2444, 2445, 2446, 2447, 2448, 2449, 2450, 2451, 2452, 2453, 2454, 2455, 2456, 2457, 2458, 2459, 2460, 2461, 2462, 2463, 2464, 2465, 2466, 2467, 2468, 2469, 2470, 2471, 2472, 2473, 2474, 2475, 2476, 2477, 2478, 2479, 2480, 2481, 2482, 2483, 2484, 2485, 2486, 2487, 2488, 2489, 2490, 2491, 2492, 2493, 2494, 2495, 2496, 2497, 2498, 2499, 2500, 2501, 2502, 2503, 2504, 2505, 2506, 2507, 2508, 2509, 2510, 2511, 2512, 2513, 2514, 2515, 2516, 2517, 2518, 2519, 2520, 2521, 2522, 2523, 2524, 2525, 2526, 2527, 2528, 2529, 2530, 2531, 2532, 2533, 2534, 2535, 2536, 2537, 2538, 2539, 2540, 2541, 2542, 2543, 2544, 2545, 2546, 2547, 2548, 2549, 2550, 2551, 2552, 2553, 2554, 2555, 2556, 2557, 2558, 2559, 2560, 2561, 2562, 2563, 2564, 2565, 2566, 2567, 2568, 2569, 2570, 2571, 2572, 2573, 2574, 2575, 2576, 2577, 2578, 2579, 2580, 2581, 2582, 2583, 2584, 2585, 2586, 2587, 2588, 2589, 2590, 2591, 2592, 2593, 2594, 2595, 2596, 2597, 2598, 2599, 2600, 2601, 2602, 2603, 2604, 2605, 2606, 2607, 2608, 2609, 2610, 2611, 2612, 2613, 2614, 2615, 2616, 2617, 2618, 2619, 2620, 2621, 2622, 2623, 2624, 2625, 2626, 2627, 2628, 2629, 2630, 2631, 2632, 2633, 2634, 2635, 2636, 2637, 2638, 2639, 2640, 2641, 2642, 2643, 2644, 2645, 2646, 2647, 2648, 2649, 2650, 2651, 2652, 2653, 2654, 2655, 2656, 2657, 2658, 2659, 2660, 2661, 2662, 2663, 2664, 2665, 2666, 2667, 2668, 2669, 2670, 2671, 2672, 2673, 2674, 2675, 2676, 2677, 2678, 2679, 26

Dimensions of Bore Size $\phi 12$ [0.472] mm [in.]

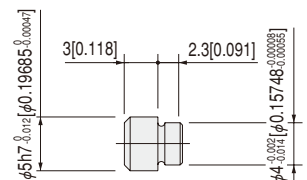
●Cylinder with buffer end keep and magnet sensor rail MGAGKS12



Locating pin: -P (P-MGA2)

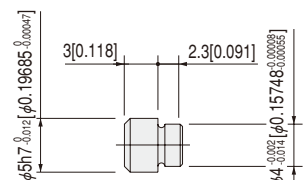


Remark: The buffer stroke of $\phi 12$ [0.472] cylinder with buffer is a maximum of 6mm [0.236in.].

[illegible]

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MINI GUIDE SLIDERS



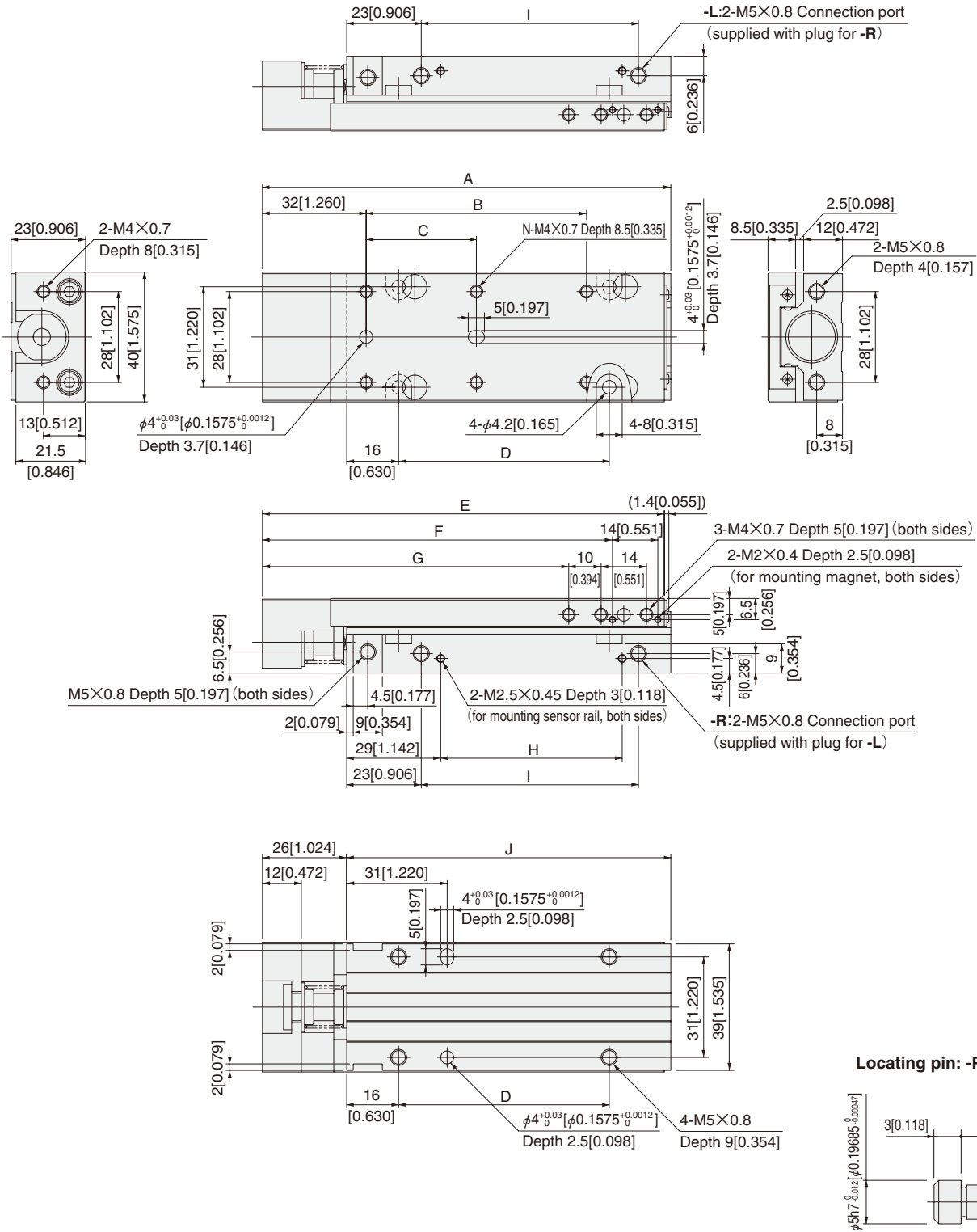
Dimensions of Bore Size $\phi 16$ [0.630] mm [in.]

●Cylinder with buffer

Remark: For cylinder with magnet sensor rail, see p.648.



MGAG16



Stroke	A	B	C	D	E	F	G	H	I	J	K	N
10	86 [3.386]	—	28 [1.102]	25 [0.984]	84 [3.307]	68 [2.677]	54.5 [2.146]	16 [0.630]	27 [1.063]	60 [2.362]	46 [1.811]	4
20	86 [3.386]	—	28 [1.102]	25 [0.984]	84 [3.307]	68 [2.677]	54.5 [2.146]	16 [0.630]	27 [1.063]	60 [2.362]	46 [1.811]	4
30	106 [4.173]	—	48 [1.890]	45 [1.772]	104 [4.094]	88 [3.465]	74.5 [2.933]	36 [1.417]	47 [1.850]	80 [3.150]	66 [2.598]	4
40	106 [4.173]	—	48 [1.890]	45 [1.772]	104 [4.094]	88 [3.465]	74.5 [2.933]	36 [1.417]	47 [1.850]	80 [3.150]	66 [2.598]	4
50	126 [4.961]	68 [2.677]	34 [1.339]	65 [2.559]	124 [4.882]	108 [4.252]	94.5 [3.720]	56 [2.205]	67 [2.638]	100 [3.937]	86 [3.386]	6
60	126 [4.961]	68 [2.677]	34 [1.339]	65 [2.559]	124 [4.882]	108 [4.252]	94.5 [3.720]	56 [2.205]	67 [2.638]	100 [3.937]	86 [3.386]	6

Remark: The buffer stroke of $\phi 16$ [0.630] cylinder with buffer is a maximum of 6mm [0.236in.].

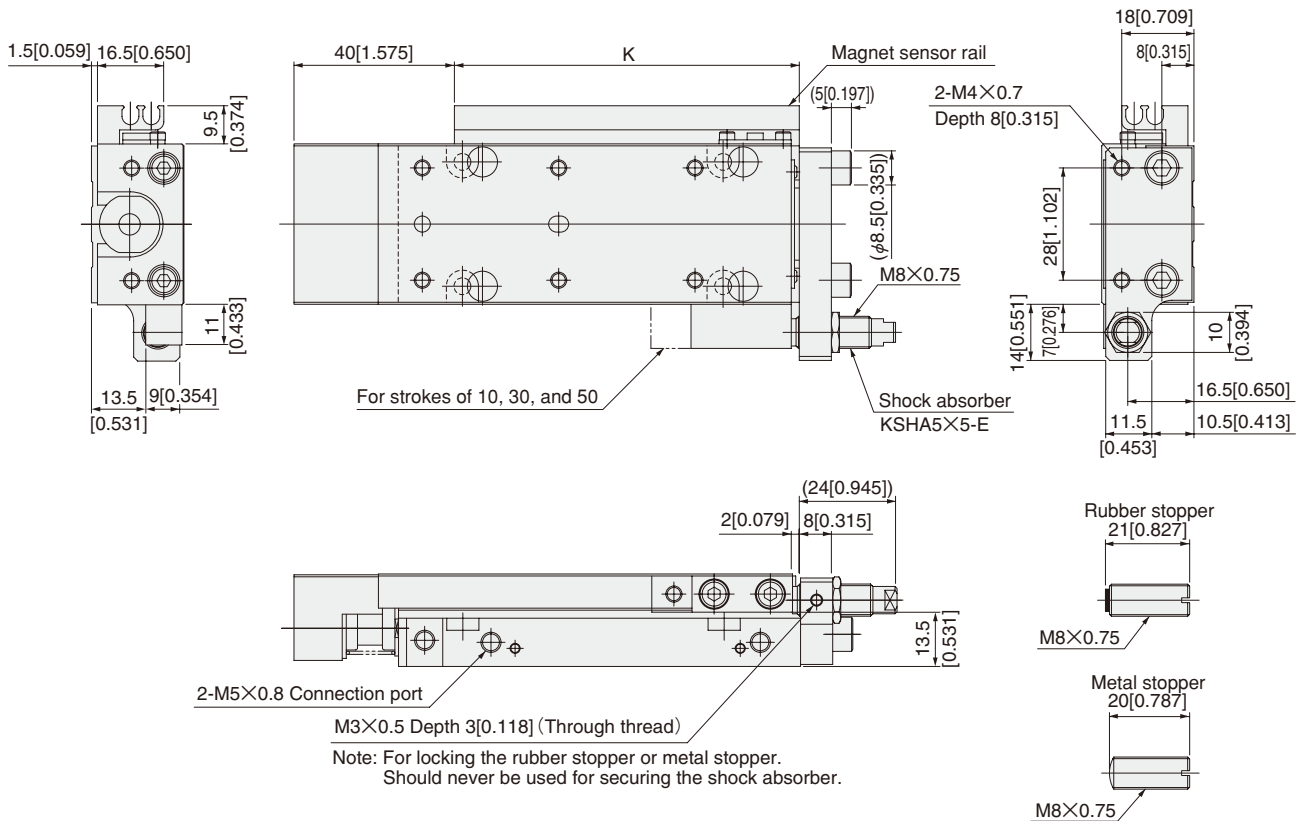
Dimensions of Bore Size $\phi 16$ [0.630] mm [in.]

●Cylinder with buffer and magnet sensor rail **MGAGS16**

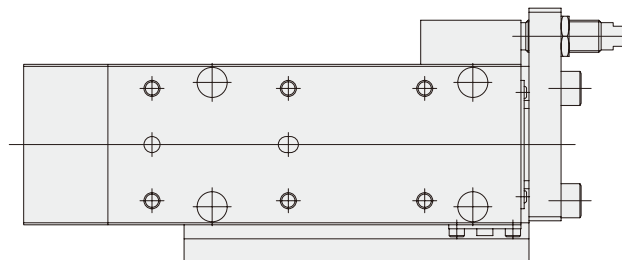
●Cylinder with buffer and shock absorber **MGAG□16-SSR**



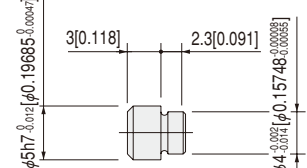
Piping direction: -R



Piping direction: -L



Locating pin: -P (P-MGA2)



Remark: The buffer stroke of $\phi 16$ [0.630] cylinder with buffer is a maximum of 6mm [0.236in.].

-L: 2-M5X0.8 Connection port
(supplied with plug for -R)

2-M4X0.7
Depth 8[0.315]

N-M4X0.7 Depth 8.5[0.335]

Opening for manual override (M3X0.5)

M5X0.8 Depth 5[0.197] (both sides)

2-M2X0.4 Depth 2.5[0.098]
(for mounting magnet, both sides)

2-M2.5X0.45 Depth 3[0.118]
(for mounting sensor rail, both sides)

-R: 2-M5X0.8 Connection port
(supplied with plug for -L)

Locating pin: -P

Dimensions are provided in millimeters [inches].

Stroke	A	B	C	D	E	F	G	H	I	J	K	N
10	90 [3.543]	—	28 [1.102]	25 [0.984]	70 [2.756]	54 [2.126]	40.5 [1.594]	16 [0.630]	27 [1.063]	78 [3.071]	46 [1.811]	4
20	90 [3.543]	—	28 [1.102]	25 [0.984]	70 [2.756]	54 [2.126]	40.5 [1.594]	16 [0.630]	27 [1.063]	78 [3.071]	46 [1.811]	4
30	110 [4.331]	—	48 [1.890]	45 [1.772]	90 [3.543]	74 [2.913]	60.5 [2.382]	36 [1.417]	47 [1.850]	98 [3.858]	66 [2.598]	4
40	110 [4.331]	—	48 [1.890]	45 [1.772]	90 [3.543]	74 [2.913]	60.5 [2.382]	36 [1.417]	47 [1.850]	98 [3.858]	66 [2.598]	4
50	130 [5.118]	68 [2.677]	34 [1.339]	65 [2.559]	110 [4.331]	94 [3.701]	80.5 [3.169]	56 [2.205]	67 [2.638]	118 [4.646]	86 [3.386]	6
60	130 [5.118]	68 [2.677]	34 [1.339]	65 [2.559]	110 [4.331]	94 [3.701]	80.5 [3.169]	56 [2.205]	67 [2.638]	118 [4.646]	86 [3.386]	6

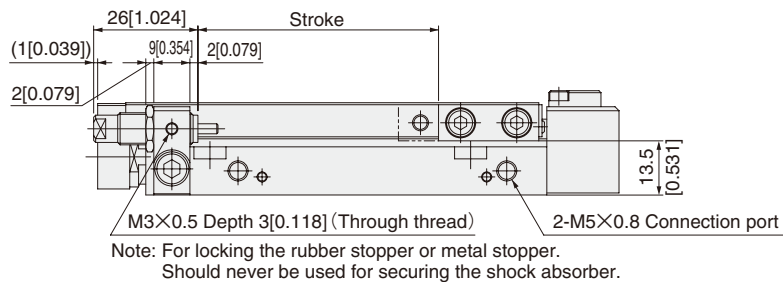
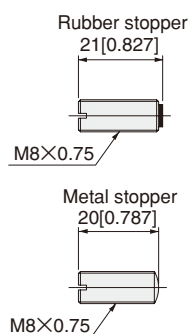
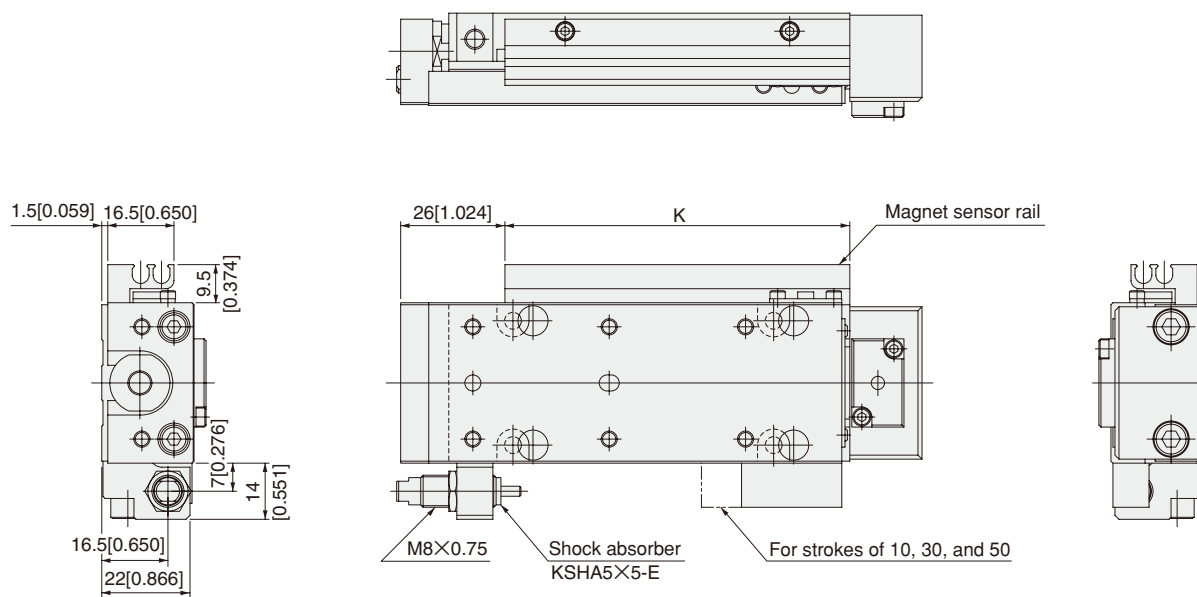
Dimensions of Bore Size $\phi 16$ [0.630] mm [in.]

●Cylinder with end keep and magnet sensor rail **MGAKS16**

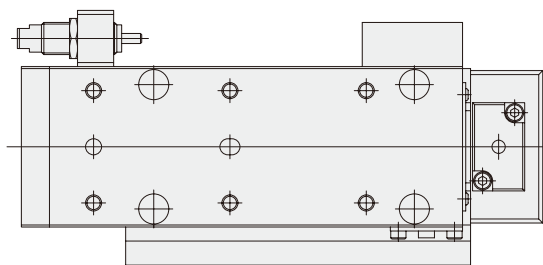
●Cylinder with end keep and shock absorber **MGAK□16-SSF**



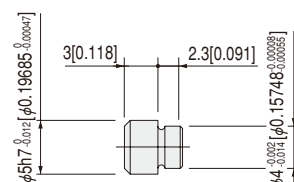
Piping direction: -R



Piping direction: -L



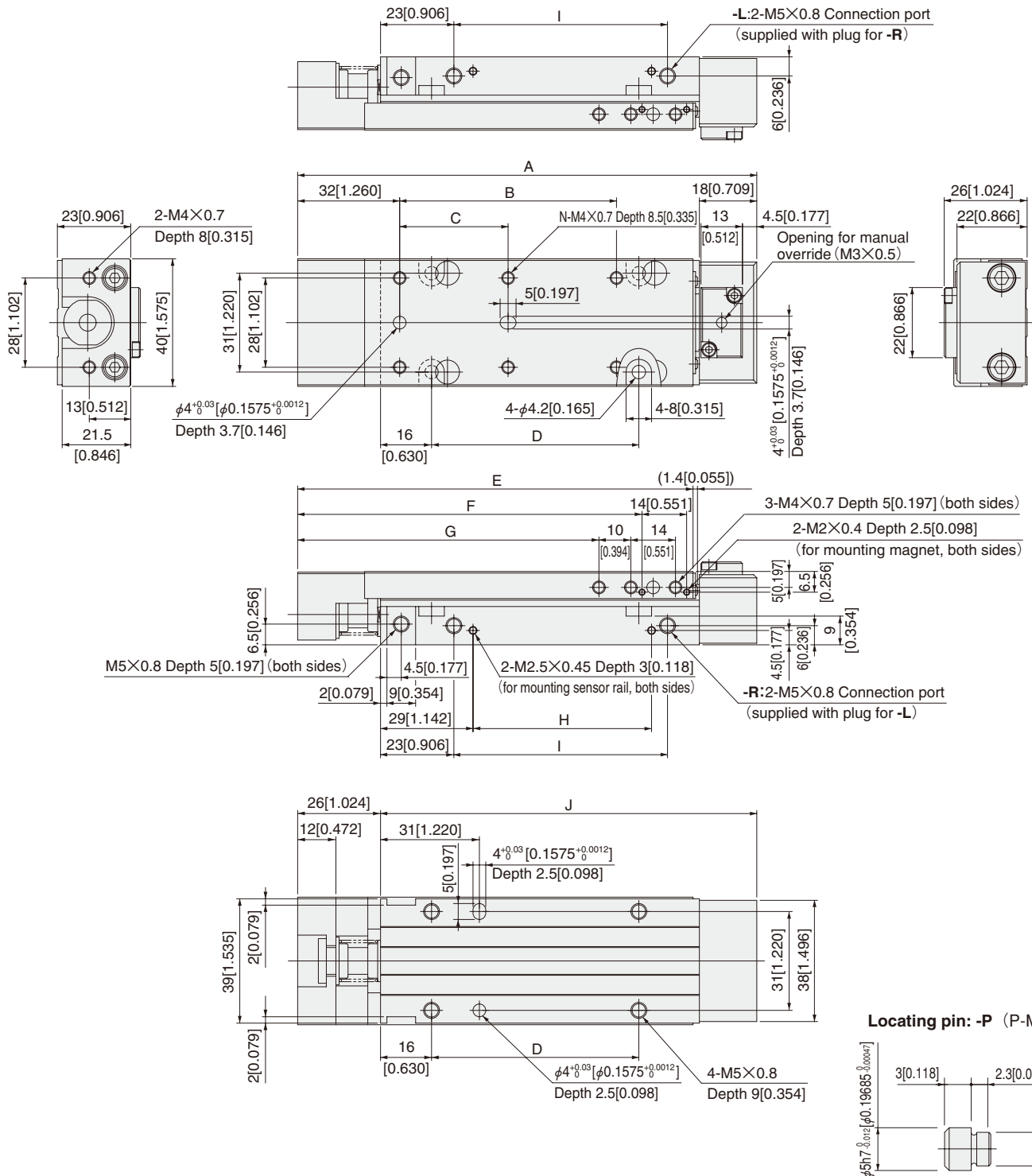
Locating pin: -P (P-MGA2)



Dimensions of Bore Size $\phi 16$ [0.630] mm [in.]

●Cylinder with buffer end keep MGAGK16

Remark: For cylinder with magnet sensor rail, see p.652.



Stroke	A	B	C	D	E	F	G	H	I	J	K	N
10	104 [4.094]	—	28 [1.102]	25 [0.984]	84 [3.307]	68 [2.677]	54.5 [2.146]	16 [0.630]	27 [1.063]	78 [3.071]	46 [1.811]	4
20	104 [4.094]	—	28 [1.102]	25 [0.984]	84 [3.307]	68 [2.677]	54.5 [2.146]	16 [0.630]	27 [1.063]	78 [3.071]	46 [1.811]	4
30	124 [4.882]	—	48 [1.890]	45 [1.772]	104 [4.094]	88 [3.465]	74.5 [2.933]	36 [1.417]	47 [1.850]	98 [3.858]	66 [2.598]	4
40	124 [4.882]	—	48 [1.890]	45 [1.772]	104 [4.094]	88 [3.465]	74.5 [2.933]	36 [1.417]	47 [1.850]	98 [3.858]	66 [2.598]	4
50	144 [5.669]	68 [2.677]	34 [1.339]	65 [2.559]	124 [4.882]	108 [4.252]	94.5 [3.720]	56 [2.205]	67 [2.638]	118 [4.646]	86 [3.386]	6
60	144 [5.669]	68 [2.677]	34 [1.339]	65 [2.559]	124 [4.882]	108 [4.252]	94.5 [3.720]	56 [2.205]	67 [2.638]	118 [4.646]	86 [3.386]	6

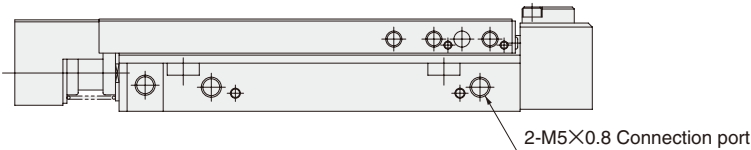
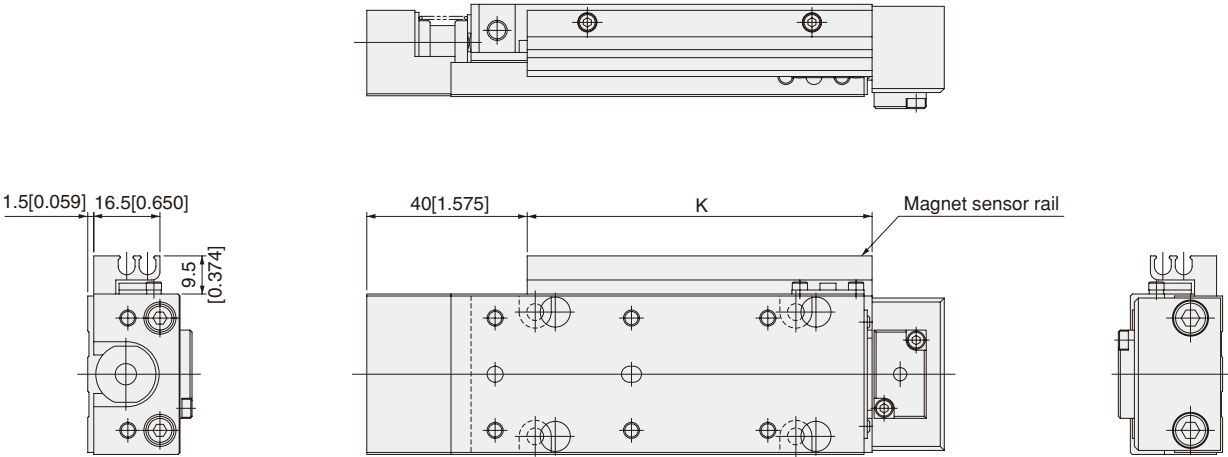
Remark: The buffer stroke of $\phi 16$ [0.630] cylinder with buffer is a maximum of 6mm [0.236in.].

Dimensions of Bore Size $\phi 16$ [0.630] mm [in.]

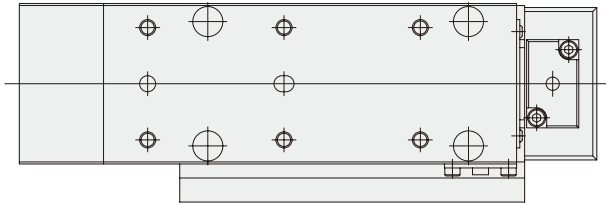
●Cylinder with buffer end keep and magnet sensor rail MGAGKS16



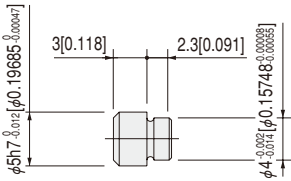
Piping direction: -R



Piping direction: -L



Locating pin: -P (P-MGA2)



Remark: The buffer stroke of $\phi 16$ [0.630] cylinder with buffer is a maximum of 6mm [0.236in.].

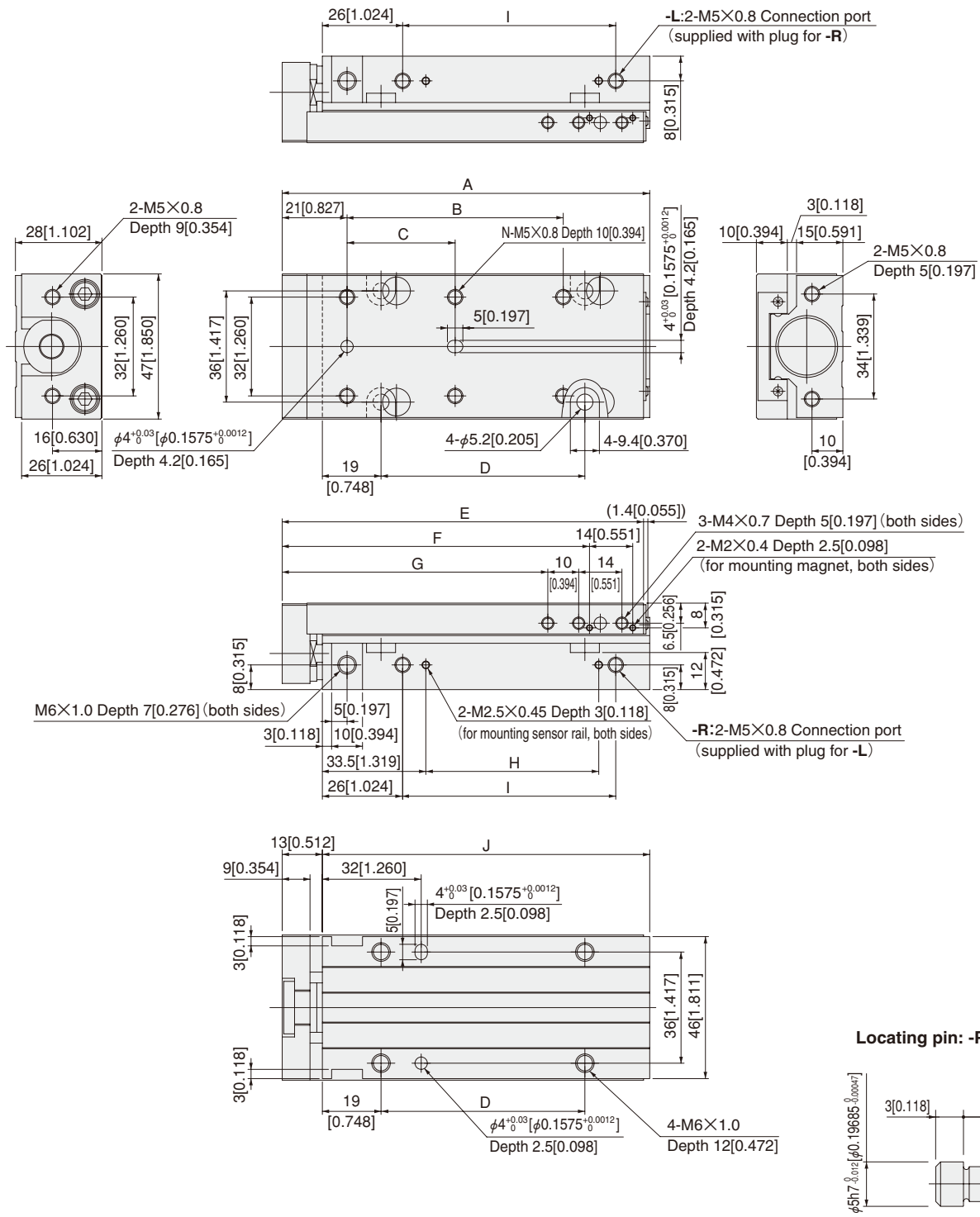
Dimensions of Bore Size $\phi 20$ [0.787] mm [in.]

● Standard cylinder

Remark: For cylinder with magnet sensor rail, see p.654.



MGA20



Stroke	A	B	C	D	E	F	G	H	I	J	K	N
10	79 [3.110]	—	30 [1.181]	26 [1.024]	77 [3.031]	59.5 [2.343]	46 [1.811]	16 [0.630]	29 [1.142]	66 [2.598]	46 [1.811]	4
20	79 [3.110]	—	30 [1.181]	26 [1.024]	77 [3.031]	59.5 [2.343]	46 [1.811]	16 [0.630]	29 [1.142]	66 [2.598]	46 [1.811]	4
30	99 [3.898]	—	50 [1.969]	46 [1.811]	97 [3.819]	79.5 [3.130]	66 [2.598]	36 [1.417]	49 [1.929]	86 [3.386]	66 [2.598]	4
40	99 [3.898]	—	50 [1.969]	46 [1.811]	97 [3.819]	79.5 [3.130]	66 [2.598]	36 [1.417]	49 [1.929]	86 [3.386]	66 [2.598]	4
50	119 [4.685]	70 [2.756]	35 [1.378]	66 [2.598]	117 [4.606]	99.5 [3.917]	86 [3.386]	56 [2.205]	69 [2.717]	106 [4.173]	86 [3.386]	6
60	119 [4.685]	70 [2.756]	35 [1.378]	66 [2.598]	117 [4.606]	99.5 [3.917]	86 [3.386]	56 [2.205]	69 [2.717]	106 [4.173]	86 [3.386]	6
70	139 [5.472]	90 [3.543]	45 [1.772]	86 [3.386]	137 [5.394]	119.5 [4.705]	106 [4.173]	76 [2.992]	89 [3.504]	126 [4.961]	106 [4.173]	6
80	139 [5.472]	90 [3.543]	45 [1.772]	86 [3.386]	137 [5.394]	119.5 [4.705]	106 [4.173]	76 [2.992]	89 [3.504]	126 [4.961]	106 [4.173]	6

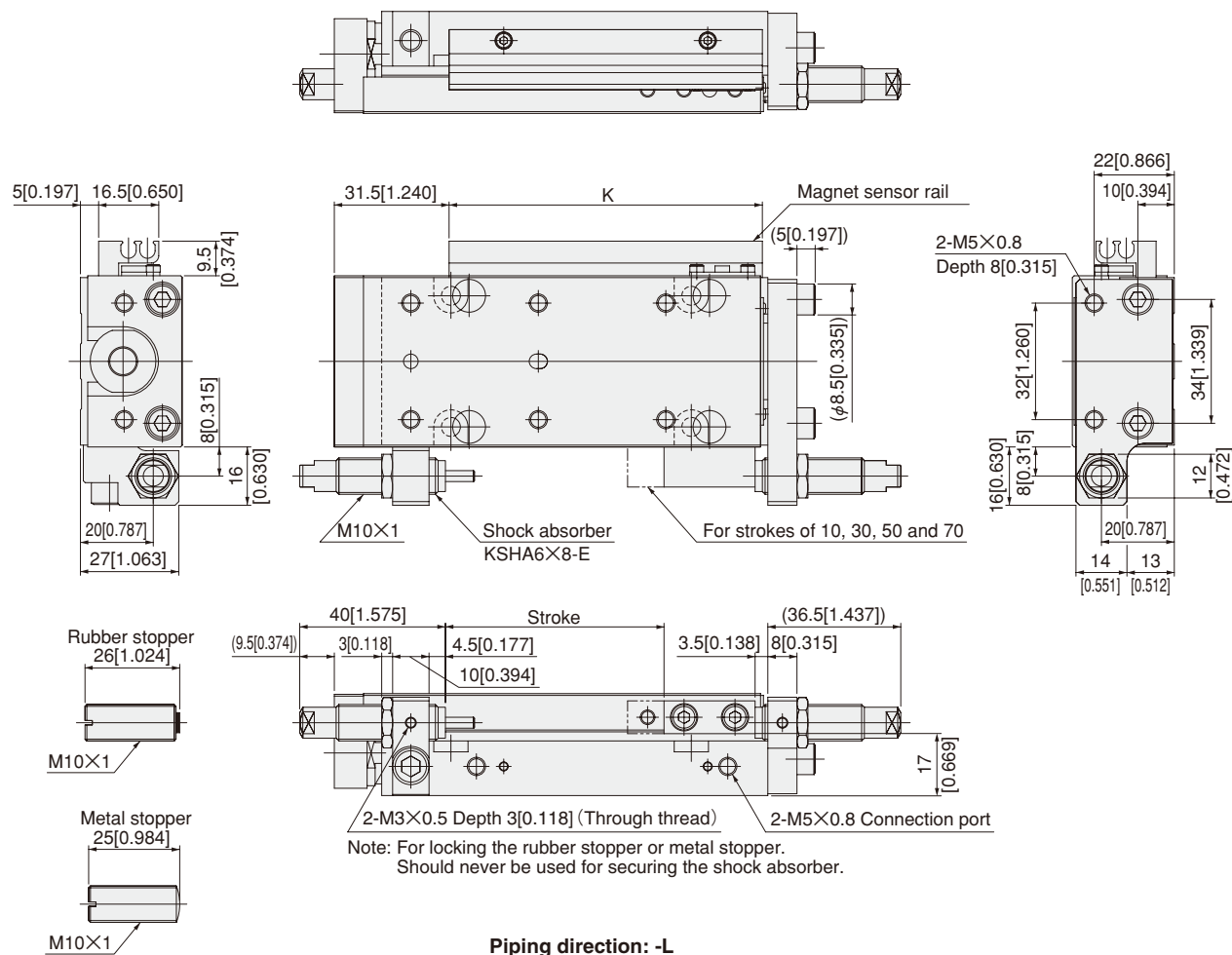
Dimensions of Bore Size $\phi 20$ [0.787] mm [in.]

●Cylinder with magnet sensor rail **MGAS20**

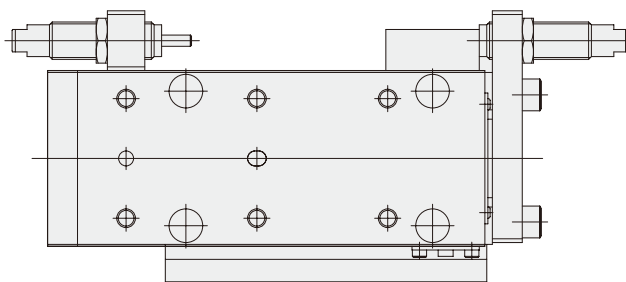
●Cylinder with shock absorber **MGA** ☐ 20-SS ☐



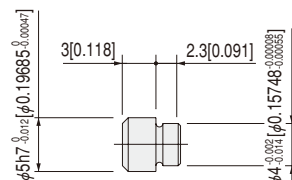
Piping direction: -R



Piping direction: -L



Locating pin: -P (P-MGA2)



MGAG ☐ 20

Remark: The buffer stroke of $\phi 20$ [0.787] cylinder with buffer is a maximum of 6mm [0.236in.].

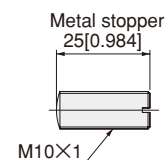
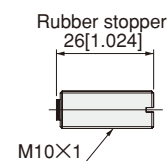
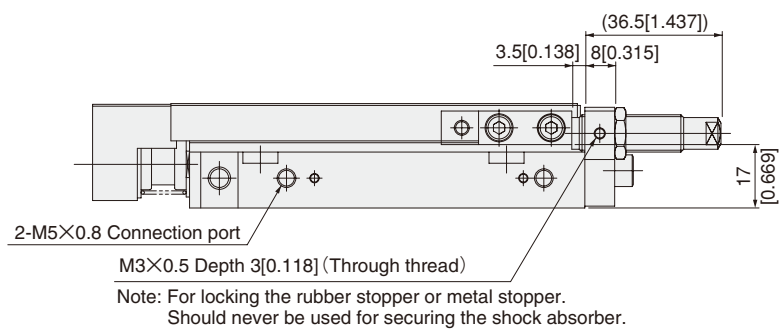
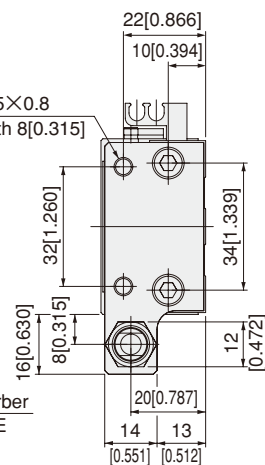
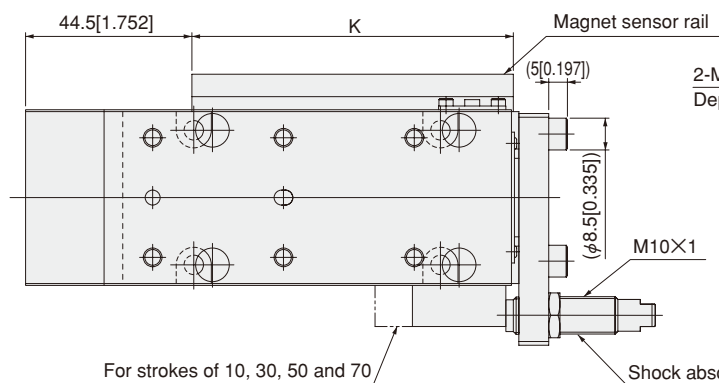
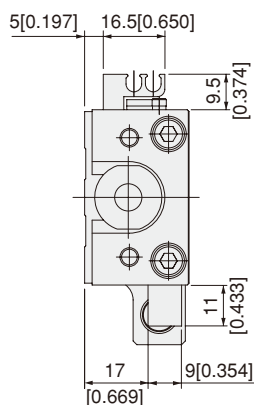
Dimensions of Bore Size $\phi 20$ [0.787] mm [in.]

●Cylinder with buffer and magnet sensor rail **MGAGS20**

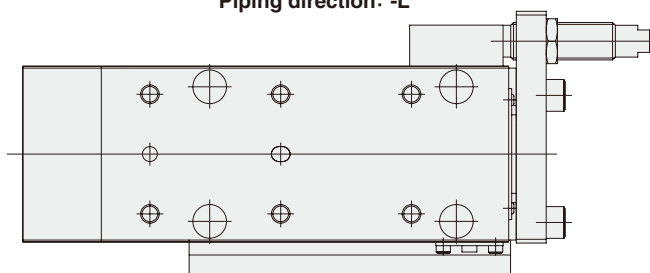
●Cylinder with buffer and shock absorber **MGAG□20-SSR**



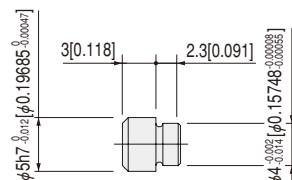
Piping direction: -R



Piping direction: -L



Locating pin: -P (P-MGA2)

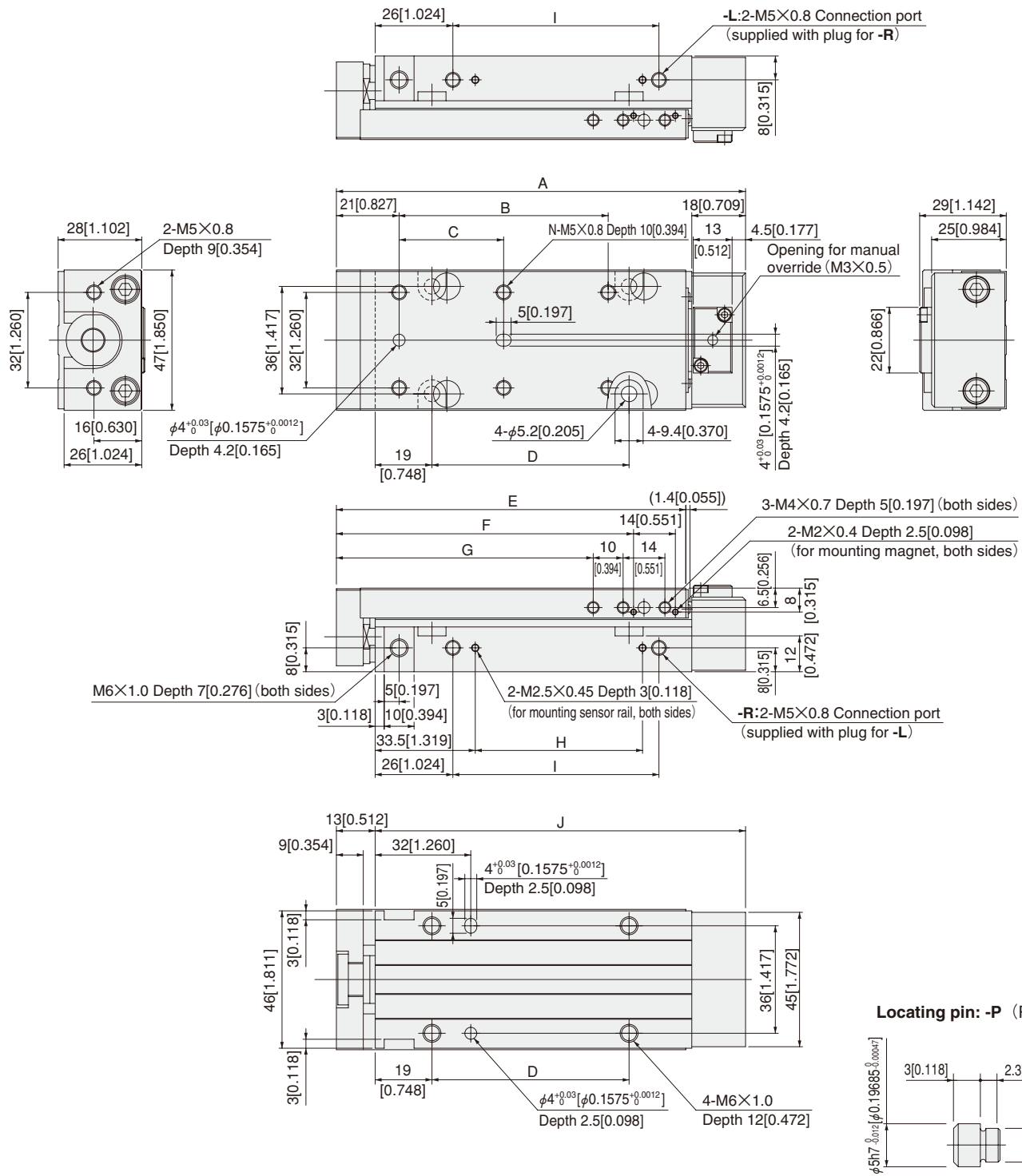


Remark: The buffer stroke of $\phi 20$ [0.787] cylinder with buffer is a maximum of 6mm [0.236in.].

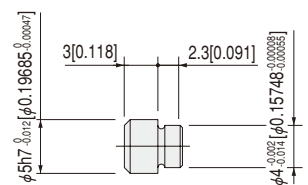
Dimensions of Bore Size $\phi 20$ [0.787] mm [in.]

●Cylinder with end keep MGA20

Remark: For cylinder with magnet sensor rail, see p.658.



Locating pin: -P (P-MGA2)



Stroke	A	B	C	D	E	F	G	H	I	J	K	N
10	97 [3.819]	—	30 [1.181]	26 [1.024]	77 [3.031]	59.5 [2.343]	46 [1.811]	16 [0.630]	29 [1.142]	84 [3.307]	46 [1.811]	4
20	97 [3.819]	—	30 [1.181]	26 [1.024]	77 [3.031]	59.5 [2.343]	46 [1.811]	16 [0.630]	29 [1.142]	84 [3.307]	46 [1.811]	4
30	117 [4.606]	—	50 [1.969]	46 [1.811]	97 [3.819]	79.5 [3.130]	66 [2.598]	36 [1.417]	49 [1.929]	104 [4.094]	66 [2.598]	4
40	117 [4.606]	—	50 [1.969]	46 [1.811]	97 [3.819]	79.5 [3.130]	66 [2.598]	36 [1.417]	49 [1.929]	104 [4.094]	66 [2.598]	4
50	137 [5.394]	70 [2.756]	35 [1.378]	66 [2.598]	117 [4.606]	99.5 [3.917]	86 [3.386]	56 [2.205]	69 [2.717]	124 [4.882]	86 [3.386]	6
60	137 [5.394]	70 [2.756]	35 [1.378]	66 [2.598]	117 [4.606]	99.5 [3.917]	86 [3.386]	56 [2.205]	69 [2.717]	124 [4.882]	86 [3.386]	6
70	157 [6.181]	90 [3.543]	45 [1.772]	86 [3.386]	137 [5.394]	119.5 [4.705]	106 [4.173]	76 [2.992]	89 [3.504]	144 [5.669]	106 [4.173]	6
80	157 [6.181]	90 [3.543]	45 [1.772]	86 [3.386]	137 [5.394]	119.5 [4.705]	106 [4.173]	76 [2.992]	89 [3.504]	144 [5.669]	106 [4.173]	6

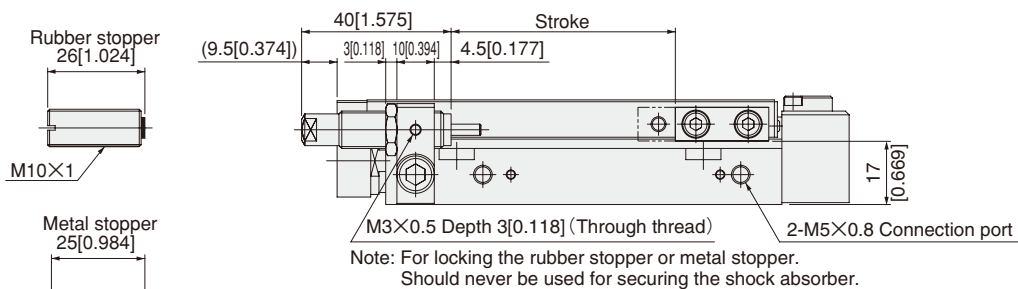
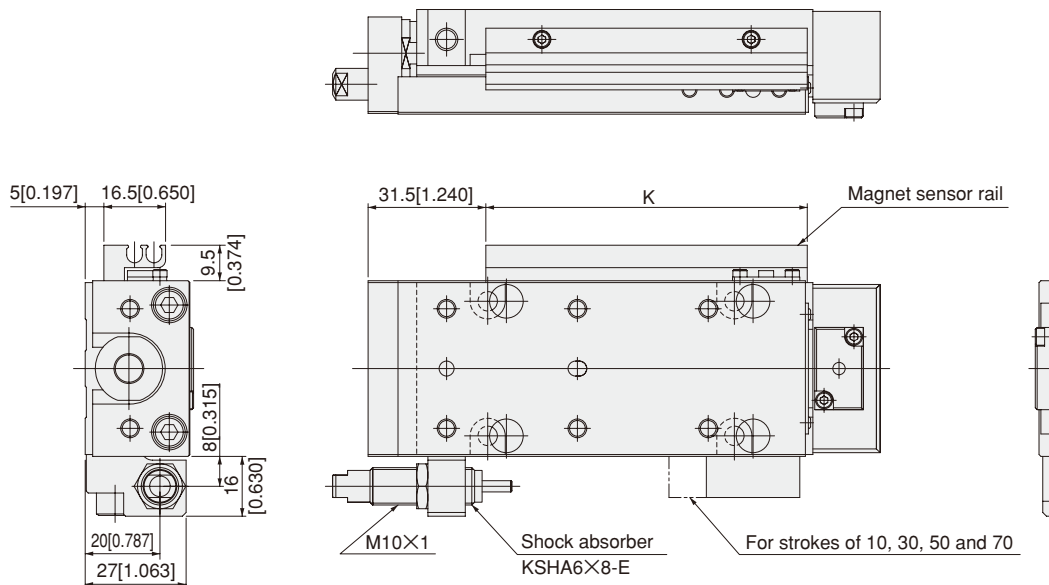
Dimensions of Bore Size $\phi 20$ [0.787] mm [in.]

●Cylinder with end keep and magnet sensor rail **MGAKS20**

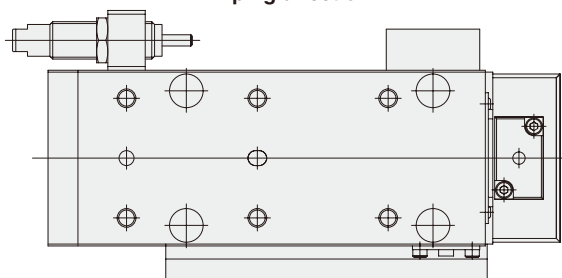
●Cylinder with end keep and shock absorber **MGAK□20-SSF**



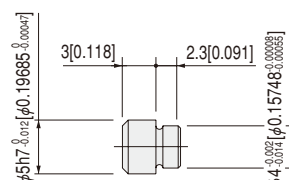
Piping direction: -R



Piping direction: -L



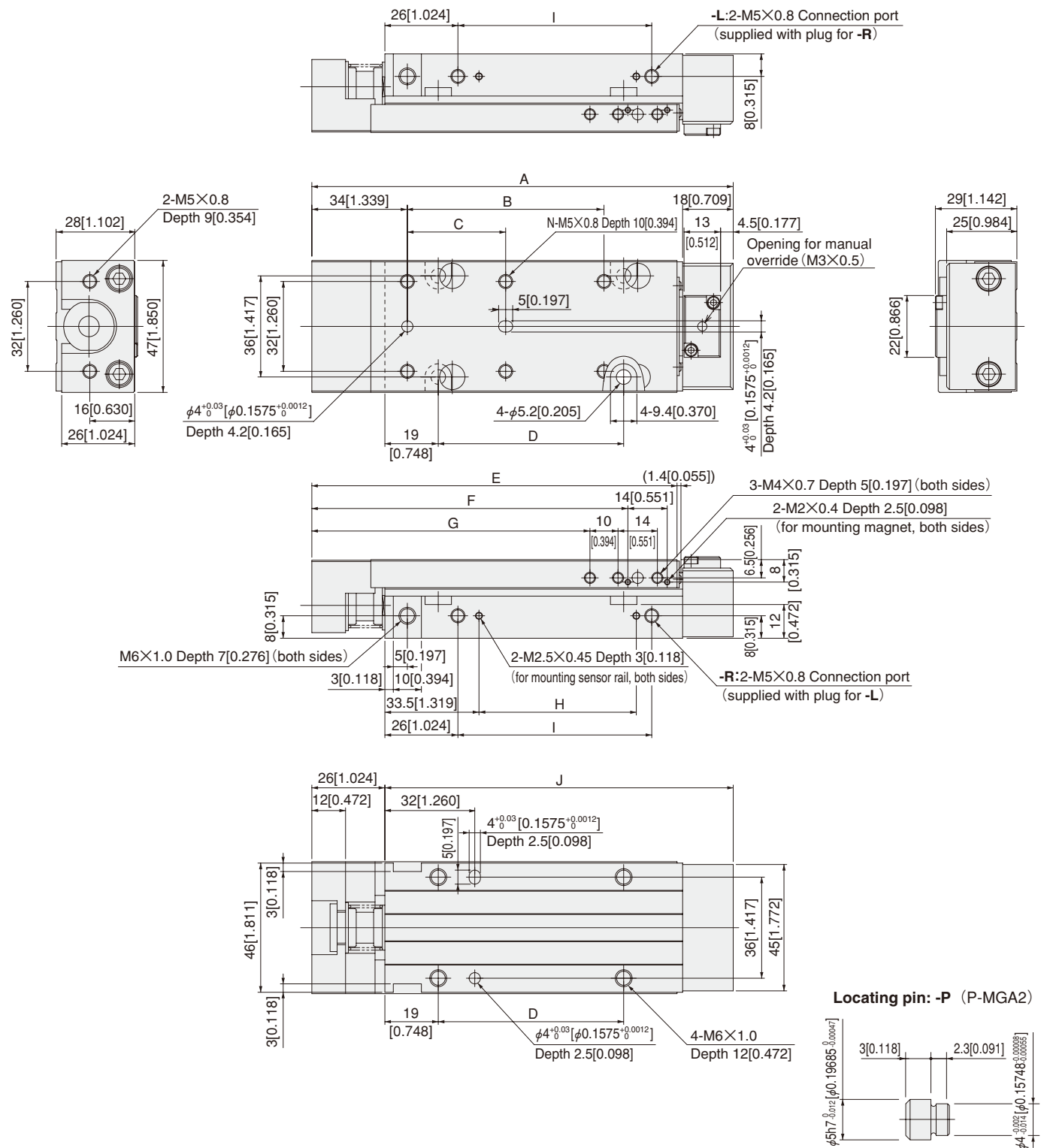
Locating pin: -P (P-MGA2)



Dimensions of Bore Size $\phi 20$ [0.787] mm [in.]

●Cylinder with buffer end keep **MGAGK20**

Remark: For cylinder with magnet sensor rail, see p.660.



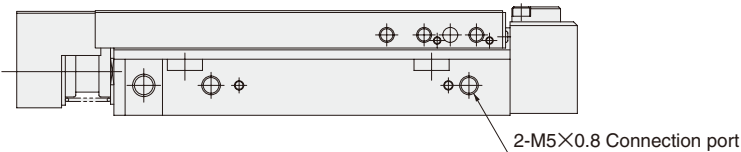
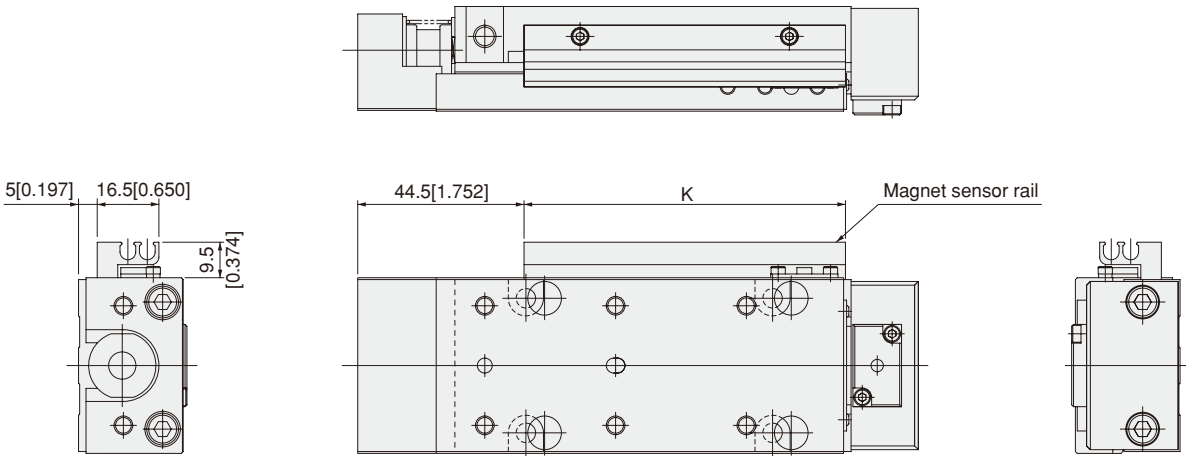
Stroke	A	B	C	D	E	F	G	H	I	J	K	N
10	110 [4.331]	—	30 [1.181]	26 [1.024]	90 [3.543]	72.5 [2.854]	59 [2.323]	16 [0.630]	29 [1.142]	84 [3.307]	46 [1.811]	4
20	110 [4.331]	—	30 [1.181]	26 [1.024]	90 [3.543]	72.5 [2.854]	59 [2.323]	16 [0.630]	29 [1.142]	84 [3.307]	46 [1.811]	4
30	130 [5.118]	—	50 [1.969]	46 [1.811]	110 [4.331]	92.5 [3.642]	79 [3.110]	36 [1.417]	49 [1.929]	104 [4.094]	66 [2.598]	4
40	130 [5.118]	—	50 [1.969]	46 [1.811]	110 [4.331]	92.5 [3.642]	79 [3.110]	36 [1.417]	49 [1.929]	104 [4.094]	66 [2.598]	4
50	150 [5.906]	70 [2.756]	35 [1.378]	66 [2.598]	130 [5.118]	112.5 [4.429]	99 [3.898]	56 [2.205]	69 [2.717]	124 [4.882]	86 [3.386]	6
60	150 [5.906]	70 [2.756]	35 [1.378]	66 [2.598]	130 [5.118]	112.5 [4.429]	99 [3.898]	56 [2.205]	69 [2.717]	124 [4.882]	86 [3.386]	6
70	170 [6.693]	90 [3.543]	45 [1.772]	86 [3.386]	150 [5.906]	132.5 [5.217]	119 [4.685]	76 [2.992]	89 [3.504]	144 [5.669]	106 [4.173]	6
80	170 [6.693]	90 [3.543]	45 [1.772]	86 [3.386]	150 [5.906]	132.5 [5.217]	119 [4.685]	76 [2.992]	89 [3.504]	144 [5.669]	106 [4.173]	6

Remark: The buffer stroke of $\phi 20$ [0.787] cylinder with buffer is a maximum of 6mm [0.236in.].

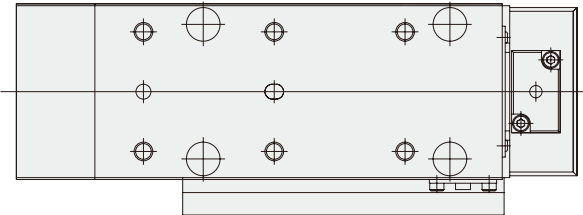
●Cylinder with buffer end keep and magnet sensor rail MGAGKS20-SS



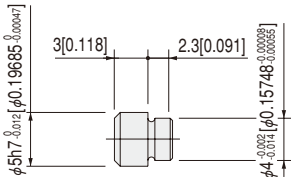
Piping direction: -R



Piping direction: -L



Locating pin: -P (P-MGA2)

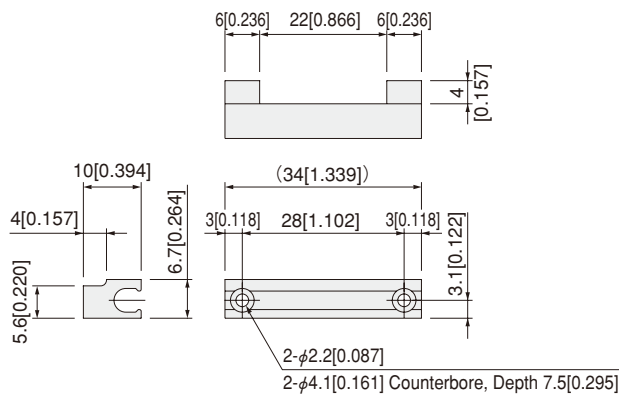


Remark: The buffer stroke of $\phi 20$ [0.787] cylinder with buffer is a maximum of 6mm [0.236in.].

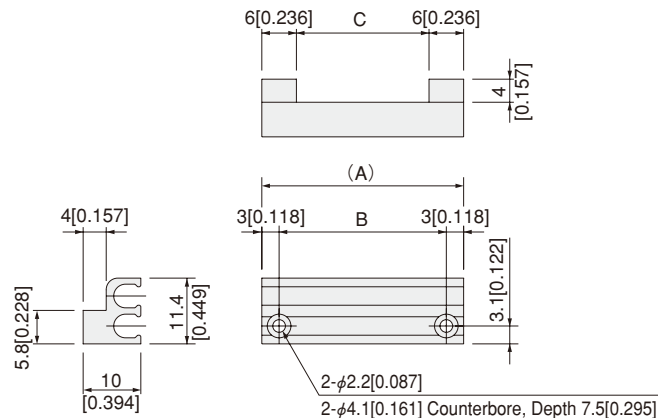
Sensor rail



S-MGA1

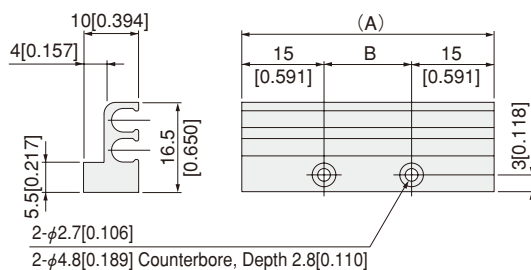


S-MGA2, 3, 4, 5



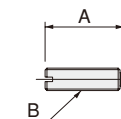
Model	A	B	C
S-MGA2	35 [1.378]	29 [1.142]	23 [0.906]
S-MGA3	40 [1.575]	34 [1.339]	28 [1.102]
S-MGA4	45 [1.772]	39 [1.535]	33 [1.299]
S-MGA5	55 [2.165]	49 [1.929]	43 [1.693]

S-MGA6, 7, 8, 9



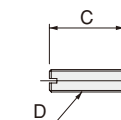
Model	A	B
S-MGA6	46 [1.811]	16 [0.630]
S-MGA7	66 [2.598]	36 [1.417]
S-MGA8	86 [3.386]	56 [2.205]
S-MGA9	106 [4.173]	76 [2.992]

Rubber stopper



Model	A	B
CRK570	21 [0.827]	M6×0.75
CRK571	21 [0.827]	M8×0.75
CRK572	26 [1.024]	M10×1

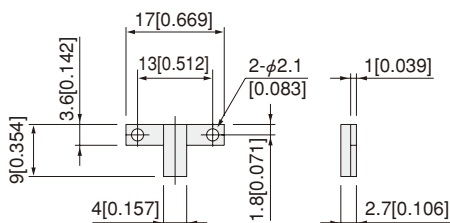
Metal stopper



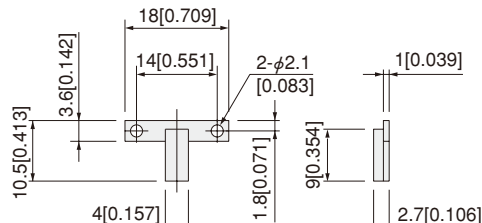
Model	C	D
CRK565	20 [0.787]	M6×0.75
CRK566	20 [0.787]	M8×0.75
CRK567	25 [0.984]	M10×1

Magnet

M-MGA1

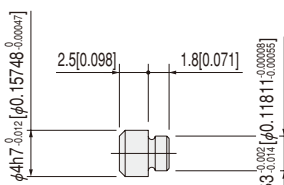


M-MGA2

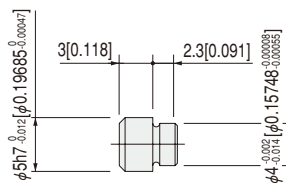


Locating pin

P-MGA1

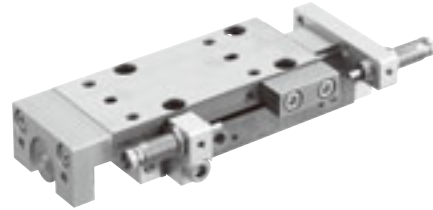


P-MGA2

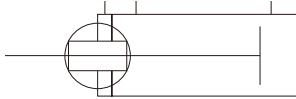


MINI GUIDE SLIDERS

Clean System Cylinders (cleanroom specification)



Symbol



Specifications

Item	Model	CS-MGA□4.5	CS-MGA□6	CS-MGA□8	CS-MGA□10	CS-MGA□12	CS-MGA□16	CS-MGA□20
Bore size	mm [in.]	4.5 [0.177]	6 [0.236]	8 [0.315]	10 [0.394]	12 [0.472]	16 [0.630]	20 [0.787]
Operation type		Double acting type						
Media		Air						
Operating pressure range	MPa [psi.]	0.2~0.7 [29~102]		0.15~0.7 [22~102]		0.1~0.7 [15~102]		
Proof pressure	MPa [psi.]	1.05 [152]						
Operating temperature range	°C [°F]	0~60 [32~140]						
Operating speed range	mm/s [in./sec.]	30~300 [1.2~12]				20~300 [0.8~12]		
Cushion	Standard	None	Rubber bumper					
	Optional	—				Shock absorber		
Port size		M3×0.5				M5×0.8		
Lubrication	Cylinder portion	Prohibited						
	Guide portion	Required (CGL grease Nippon Thompson Co., Ltd. made) ^{Note 1}						
Perpendicularity of end plate	mm [in.]	0.1 [0.004]						
Stroke tolerance	mm [in.]	$+1 \left[\begin{matrix} +0.039 \\ 0 \end{matrix} \right]$						
Repeatability ^{Note 2}	mm [in.]	—				±0.02 [±0.0008](Shock absorber)		
Stroke adjusting range ^{Note 2}	Rubber stopper extended side	—				−9~0 [−0.354~0]	−8~0 [−0.315~0]	−8~0 [−0.315~0]
	Rubber stopper retracted side	—				−11~0 [−0.433~0]	−9~0 [−0.354~0]	−11~0 [−0.433~0]
	Shock absorber extended side	—				−12~0 [−0.472~0]	−13~0 [−0.512~0]	−22~0 [−0.866~0]
	Shock absorber retracted side	—				−14~0 [−0.551~0]	−14~0 [−0.551~0]	−25~0 [−0.984~0]
Allowable moment N・m[in・lbf]	Mp	0.24 [2.12]	0.28 [2.48]	0.28 [2.48]	0.28 [2.48]	1.5 [13.3]	2.1 [18.6]	2.5 [22.1]
	My	0.29 [2.57]	0.34 [3.01]	0.34 [3.01]	0.34 [3.01]	1.7 [15.0]	2.5 [22.1]	3.0 [26.6]
	Mr	0.22 [1.95]	0.23 [2.04]	0.38 [3.36]	0.38 [3.36]	2.6 [23.0]	4.3 [38.1]	4.8 [42.5]
Cleanliness ^{Note 4}		Class 5 or equivalent				Class 6 or equivalent ^{Note 3}		
Number of available sensor switches (optional)		1pc.	2pcs.					

Notes: 1. Apply grease on the raceway surface of the track rail in the guide portion every 6 months or 3 million operations.
2. For units with stroke adjusting mechanism.
3. With shock absorber type included.
4. Koganei standards

Cylinder Thrust

● Cylinder thrust is exactly the same as the standard cylinder. See p.604.

Bore Size and Stroke

Bore size	Standard strokes
4.5 [0.177]	5 ^{Note, 10}
6 [0.236]	5 ^{Note, 10, 15}
8 [0.315]	5 ^{Note, 10, 15} ^{Note, 20}
10 [0.395]	5 ^{Note, 10, 15} ^{Note, 20, 30}
12 [0.472]	10 ^{Note, 20, 30} ^{Note, 40, 50} ^{Note, 60}
16 [0.630]	10 ^{Note, 20, 30} ^{Note, 40, 50} ^{Note, 60}
20 [0.787]	10 ^{Note, 20, 30} ^{Note, 40, 50} ^{Note, 60, 70} ^{Note, 80}

Note: The collar packed is used in these strokes.

Order Codes

● ϕ 4.5 [0.177] ~ ϕ 10 [0.394]

CS - MGA [] [X] - [] - [] [] - [] [] []

Mini guide slider

Bore size
X
Stroke
● See the bore size and stroke on p.662.

Piping direction
R : Right side as viewed from the rod side
L : Left side as viewed from the rod side

Locating pin
Blank : No pin
P : With pin

Number of pins
1 : With 1 pin
2 : With 2 pins
3 : With 3 pins
4 : With 4 pins

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

Sensor switch type
Blank : No sensor switch
ZE135 : 2-lead wire, solid state type
ZE155 : 3-lead wire, solid state type
ZE235 : 2-lead wire, solid state type
ZE255 : 3-lead wire, solid state type
ZE101 : 2-lead wire, reed switch type
ZE102 : 2-lead wire, reed switch type
ZE201 : 2-lead wire, reed switch type
ZE202 : 2-lead wire, reed switch type
● For details of sensor switches, see p.1544.

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

Magnet and sensor rail Note
Blank : No magnet and sensor rail
S : With magnet and sensor rail

Clean system product

Note: For a cylinder bore size of 4.5mm [0.177in.], the sensor rail has only 1 groove so that only 1 sensor switch can be mounted.

● ϕ 12 [0.472] ~ ϕ 20 [0.787]

CS - MGA [] [X] - [] - [] [] - [] [] - [] [] []

Mini guide slider

Bore size
X
Stroke
● See the bore size and stroke on p.662.

Piping direction
R : Right side as viewed from the rod side
L : Left side as viewed from the rod side

Locating pin
Blank : No pin
P : With pin

Stroke adjusting position
Blank : No stroke adjustment
2 : Both ends (with 2 stroke adjustments)
F : Extended end (with 1 stroke adjustment)
R : Retracted end (with 1 stroke adjustment)

Stroke adjusting mechanism
Blank : No stroke adjusting mechanism
RS : With rubber stopper
SS : With shock absorber

Number of pins
1 : With 1 pin
2 : With 2 pins
3 : With 3 pins
4 : With 4 pins

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

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

Sensor switch type
Blank : No sensor switch
ZE135 : 2-lead wire, solid state type
ZE155 : 3-lead wire, solid state type
ZE235 : 2-lead wire, solid state type
ZE255 : 3-lead wire, solid state type
ZE101 : 2-lead wire, reed switch type
ZE102 : 2-lead wire, reed switch type
ZE201 : 2-lead wire, reed switch type
ZE202 : 2-lead wire, reed switch type
● For details of sensor switches, see p.1544.

Magnet and sensor rail
Blank : No magnet and sensor rail
S : With magnet and sensor rail

Clean system product

● Mini Guide Sliders ϕ 12, 16, 20 [ϕ 0.472, 0.630, 0.787] Product Range and Optional Combinations

Model	Type	Rubber stopper			Shock absorber		
		Extended end -RSF	Retracted end -RSR	Both ends -RS2	Extended end -SSF	Retracted end -SSR	Both ends -SS2
CS-MGA12, 16, 20	Clean system cylinder	●	●	●	●	●	●

■ Additional Parts

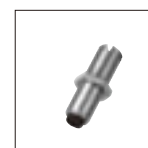
● The sensor rail, magnet, and locating pin are the same as the standard cylinder. See p.606.

Remark: For the dimensions of additional parts, see p.661. Also, for the dimensions of the shock absorber unit, see the General Catalog of Air Treatment, Auxiliary, Vacuum.

● Stopper and shock absorber

Bore size	Rubber stopper type	Shock absorber model
12 [0.472in.]	CRK570	CS-KSHC4×4-BD
16 [0.630in.]	CRK571	CS-KSHC5×5-DE
20 [0.787in.]	CRK572	CS-KSHC6×8-DE

Remark: The set includes a mounting nut.



Rubber stopper



Shock absorber

Mass

● $\phi 4.5$ [0.177] ~ $\phi 10$ [0.394]

g [oz.]

Model	Stroke mm	No magnet and sensor rail	With magnet and sensor rail	Additional mass	
				Sensor switch (1 pc.)	
				ZE□□□A	ZE□□□B
CS-MGA□4.5	5	45 [1.59]	49 [1.73]	15 [0.53]	35 [1.23]
	10	45 [1.59]	49 [1.73]		
CS-MGA□6	5	61 [2.15]	66 [2.33]	15 [0.53]	35 [1.23]
	10	61 [2.15]	66 [2.33]		
	15	69 [2.43]	75 [2.65]		
CS-MGA□8	5	87 [3.07]	92 [3.25]	15 [0.53]	35 [1.23]
	10	87 [3.07]	92 [3.25]		
	15	108 [3.81]	114 [4.02]		
	20	108 [3.81]	114 [4.02]		
CS-MGA□10	5	109 [3.84]	114 [4.02]	15 [0.53]	35 [1.23]
	10	109 [3.84]	114 [4.02]		
	15	136 [4.80]	142 [5.01]		
	20	136 [4.80]	142 [5.01]		
	30	163 [5.75]	170 [6.00]		

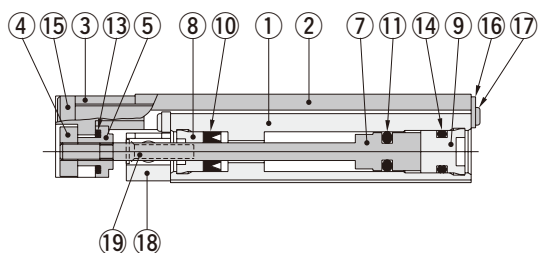
● $\phi 12$ [0.472] ~ $\phi 20$ [0.787]

g [oz.]

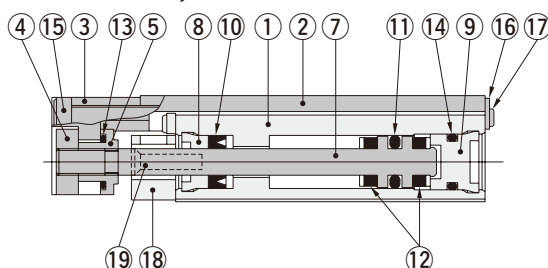
Model	Stroke mm	Body mass	Additional mass							
			With magnet and sensor rail	Stroke adjusting bracket			Rubber stopper (1 pc.)	Shock absorber (1 pc.)	Sensor switch (1 pc.)	
				-□S2	-□SF	-□SR			ZE□□□A	ZE□□□B
CS-MGA□12	10	224 [7.90]	12 [0.42]	31 [1.09]	19 [0.67]	27 [0.95]	4 [0.14]	5 [0.18]	15 [0.53]	35 [1.23]
	20	224 [7.90]	12 [0.42]	27 [0.95]	15 [0.53]	23 [0.81]				
	30	296 [10.44]	17 [0.60]	31 [1.09]	19 [0.67]	27 [0.95]				
	40	296 [10.44]	17 [0.60]	27 [0.95]	15 [0.53]	23 [0.81]				
	50	368 [12.98]	22 [0.78]	31 [1.09]	19 [0.67]	27 [0.95]				
	60	368 [12.98]	22 [0.78]	27 [0.95]	15 [0.53]	23 [0.81]				
CS-MGA□16	10	347 [12.24]	12 [0.42]	60 [2.12]	35 [1.23]	52 [1.83]	8 [0.28]	10 [0.35]	15 [0.53]	35 [1.23]
	20	347 [12.24]	12 [0.42]	53 [1.87]	28 [0.99]	45 [1.59]				
	30	450 [15.87]	17 [0.60]	60 [2.12]	35 [1.23]	52 [1.83]				
	40	450 [15.87]	17 [0.60]	53 [1.87]	28 [0.99]	45 [1.59]				
	50	553 [19.51]	22 [0.78]	60 [2.12]	35 [1.23]	52 [1.83]				
	60	553 [19.51]	22 [0.78]	53 [1.87]	28 [0.99]	45 [1.59]				
CS-MGA□20	10	542 [19.12]	12 [0.42]	74 [2.61]	40 [1.41]	60 [2.12]	15 [0.53]	21 [0.74]	15 [0.53]	35 [1.23]
	20	542 [19.12]	12 [0.42]	67 [2.36]	33 [1.16]	53 [1.87]				
	30	686 [24.20]	17 [0.60]	74 [2.61]	40 [1.41]	60 [2.12]				
	40	686 [24.20]	17 [0.60]	67 [2.36]	33 [1.16]	53 [1.87]				
	50	830 [29.28]	22 [0.78]	74 [2.61]	40 [1.41]	60 [2.12]				
	60	830 [29.28]	22 [0.78]	67 [2.36]	33 [1.16]	53 [1.87]				
	70	974 [34.36]	27 [0.95]	74 [2.61]	40 [1.41]	60 [2.12]				
	80	974 [34.36]	27 [0.95]	67 [2.36]	33 [1.16]	53 [1.87]				

Inner Construction

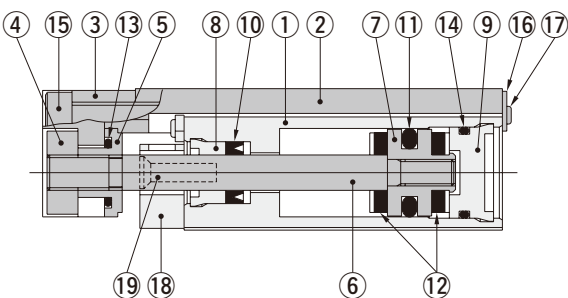
CS-MGA□4.5



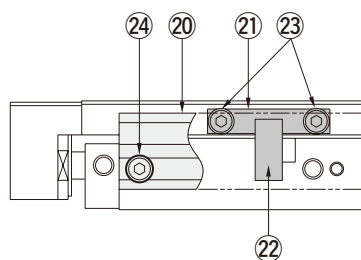
CS-MGA□6, 8



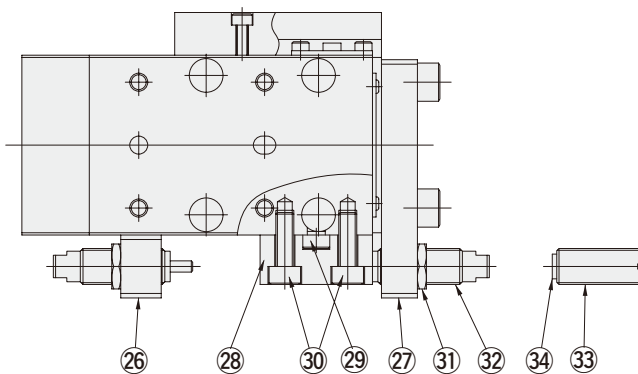
CS-MGA□10~□20



CS-MGAS□(With magnet and sensor rail)



CS-MGA□12~□20 (With shock absorber)



Locating pin



Major Parts and Materials

No.	Model Parts	CS-MGA□4.5	CS-MGA□6	CS-MGA□8	CS-MGA□10~□20
①	Body	Stainless steel (heat treated)			
②	Table	Stainless steel (heat treated)			
③	Plate	Aluminum alloy (special wear-resistant treatment)			
④	Nut A	Stainless steel			
⑤	Nut B	Stainless steel			
⑥	Piston rod	—			Stainless steel
⑦	Piston Note	Stainless steel			Al alloy (special rust prevention treatment)
⑧	Rod cap	Oil impregnated plastic bushing (polyacetal)			
⑨	Head cap	Plastic			
⑩	Rod seal	Synthetic rubber (NBR)			
⑪	Piston seal	Synthetic rubber (NBR)			
⑫	Bumper	—	Synthetic rubber (urethane)		
⑬	O-ring	Synthetic rubber (NBR)			
⑭	O-ring	Synthetic rubber (NBR)			
⑮	Bolt	Stainless steel			
⑯	Holder plate	Stainless steel			
⑰	Screw	Stainless steel			
⑱	Dust collection block	Aluminum alloy (anodized)			
⑲	Screw	Stainless steel			
⑳	Sensor rail	Aluminum alloy (anodized)			
㉑	Magnet holder	Aluminum alloy (anodized)			
㉒	Magnet	Plastic magnet			
㉓	Bolt	Stainless steel			
㉔	Bolt	Stainless steel			
㉕	Locating pin	Steel (heat treated)			

No.	Model Parts	CS-MGA□12~□20
㉖	Bracket A	Aluminum alloy (anodized)
㉗	Bracket B	Aluminum alloy (anodized)
㉘	Stopper	Steel (heat treatment and nickel plated)
㉙	Locating pin	Steel (heat treated)
㉚	Bolt	Stainless steel
㉛	Nut	Mild steel (nickel plated)
㉜	Shock absorber	—
㉝	Adjusting bolt	Steel (nickel plated)
㉞	Bumper	Synthetic rubber (NBR)

Note: In **CS-MGA□4.5**, **CS-MGA□6** and **CS-MGA□8**, a piston and piston rod are combined as single-piece construction.

Evaluations of Cleanliness

There is currently no standard in JIS or elsewhere for methods of evaluating cleanliness for pneumatic equipment in the cleanroom specification. Koganei has therefore independently established our in-house measurement methods, to conduct the cleanliness evaluation.

The number of particles generated by the Mini Guide Slider Cleanroom Specification is measured as shown in the method below.

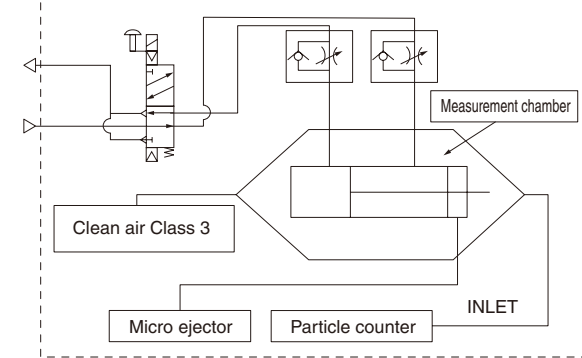
1. Measurement sample

- ①CS-MGA10×10(no load) ②CS-MGA20×60-SS2 (load: 2.5kg[5.5lb.f.])

2. Measurement conditions

2-1 Test circuit : with suction from dust collection port

Cleanroom Class 7 equivalent (Corresponds to FED-STD209E Class 10000)



2-2 Operating conditions of the tested cylinder

Operating frequency: CS-MGA10/1Hz, CS-MGA20/0.5Hz

Average speed: 300mm/s [12in./sec.]

Applied pressure: 0.5MPa [73psi.]

Suction condition: Microejector ME05, Primary side 0.5MPa [73psi.] applied, Tube ϕ 6 [0.236in.]

Mounting direction: CS-MGA10/Vertical, CS-MGA20/Horizontal

Chamber volume: 8.3 ℓ [0.293ft.³]

3. Particle counter

Manufacturer/model: RION/KM20

Suction flow rate: 28.3 ℓ /min [1ft.³/min.]

Particle diameter: 0.1 μ m, 0.2 μ m, 0.3 μ m, 0.5 μ m, 0.7 μ m, 1.0 μ m

4. Measurement method

4-1 Confirmation of number of particles in the measurement system

Under the conditions in the above 1 and 2, using a particle counter to measure the sample for 9 minutes without operating the measurement sample, and confirmed the measured number of particle is 1 piece or less.

4-2 Measurement under operation

Under the conditions in the above 1 and 2, operating the measurement sample for 36 minutes, and measured the total values in the latter half of 18 minutes test.

4-3 Reconfirmation

Performed the measurement in 4-1 again, to reconfirm the number of particles in the measurement system.

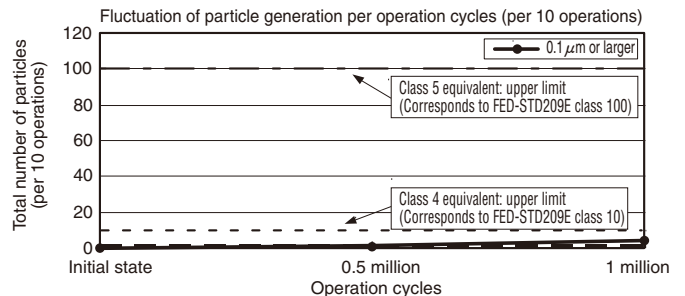
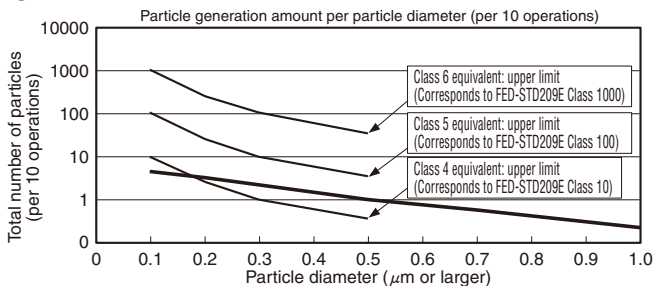
4-4 Measurement value conversion

Total value of last 18 minutes of 4-2 converted into number per 10 cylinder operations.

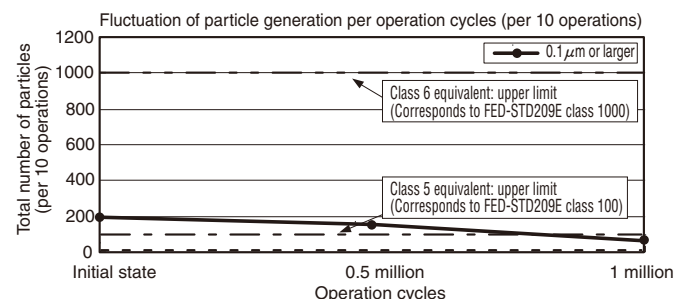
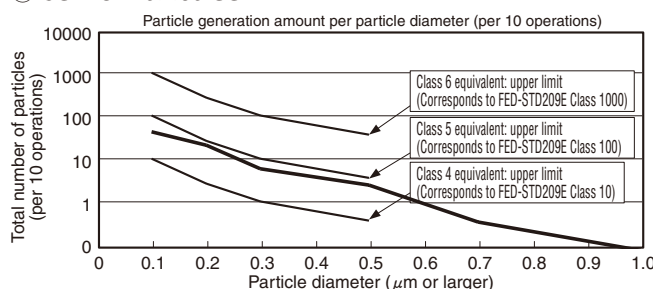
5. Measurement results Note

●With suction from dust collection port

① CS-MGA10×10

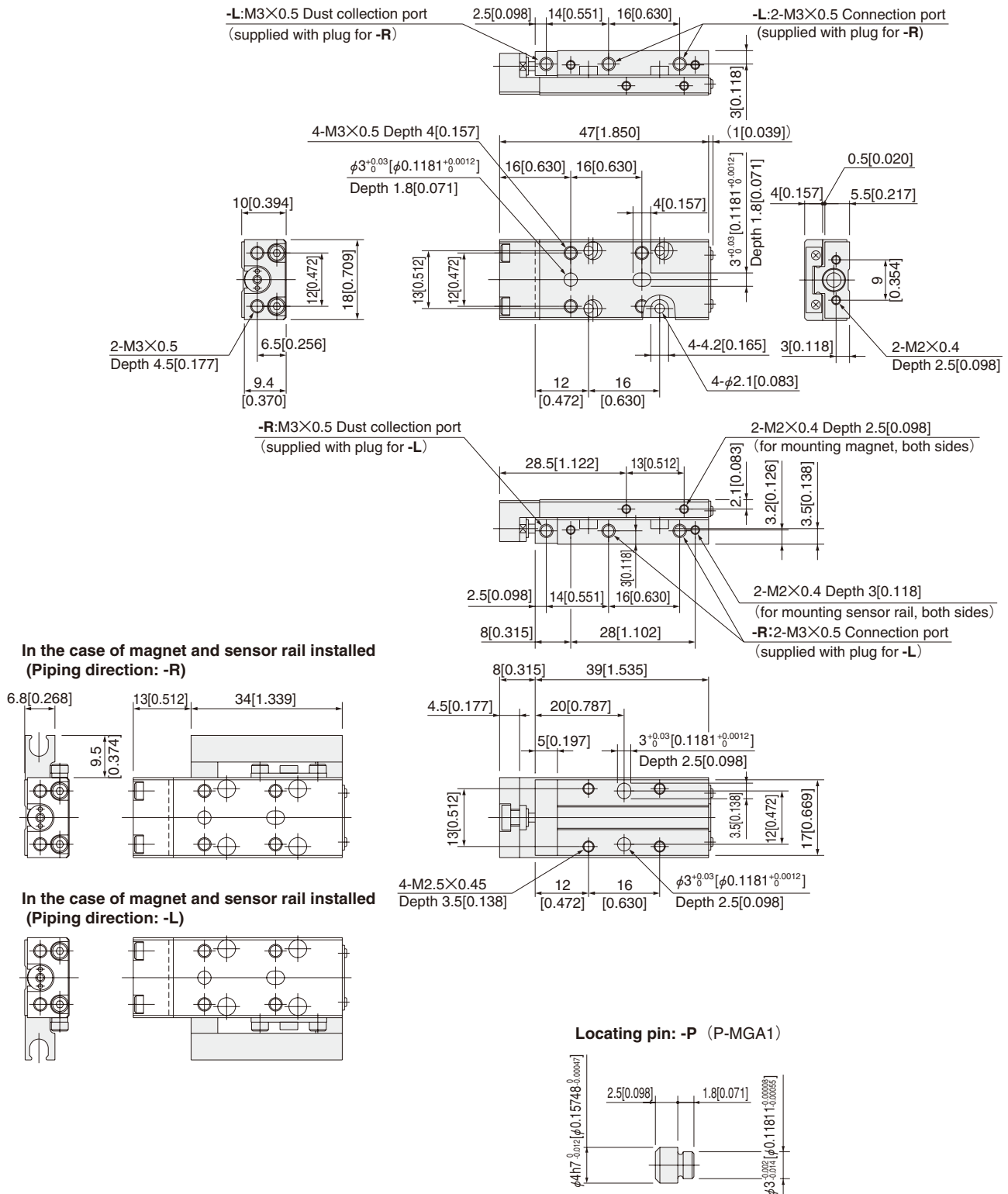


② CS-MGA20×60-SS2

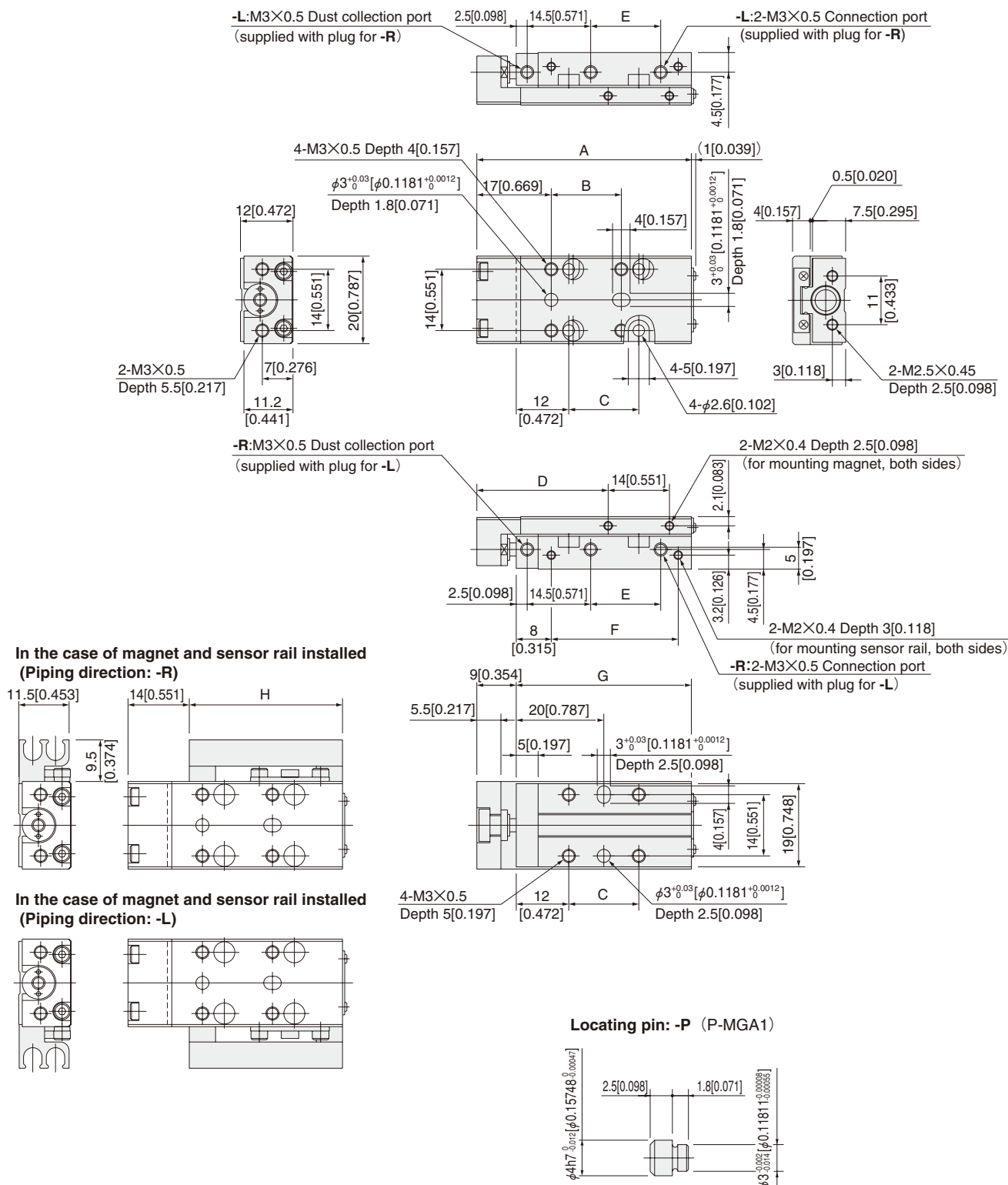


Note: The graphs by particle diameter are based on measurements after 1 million operations of products.

CS-MGA□4.5

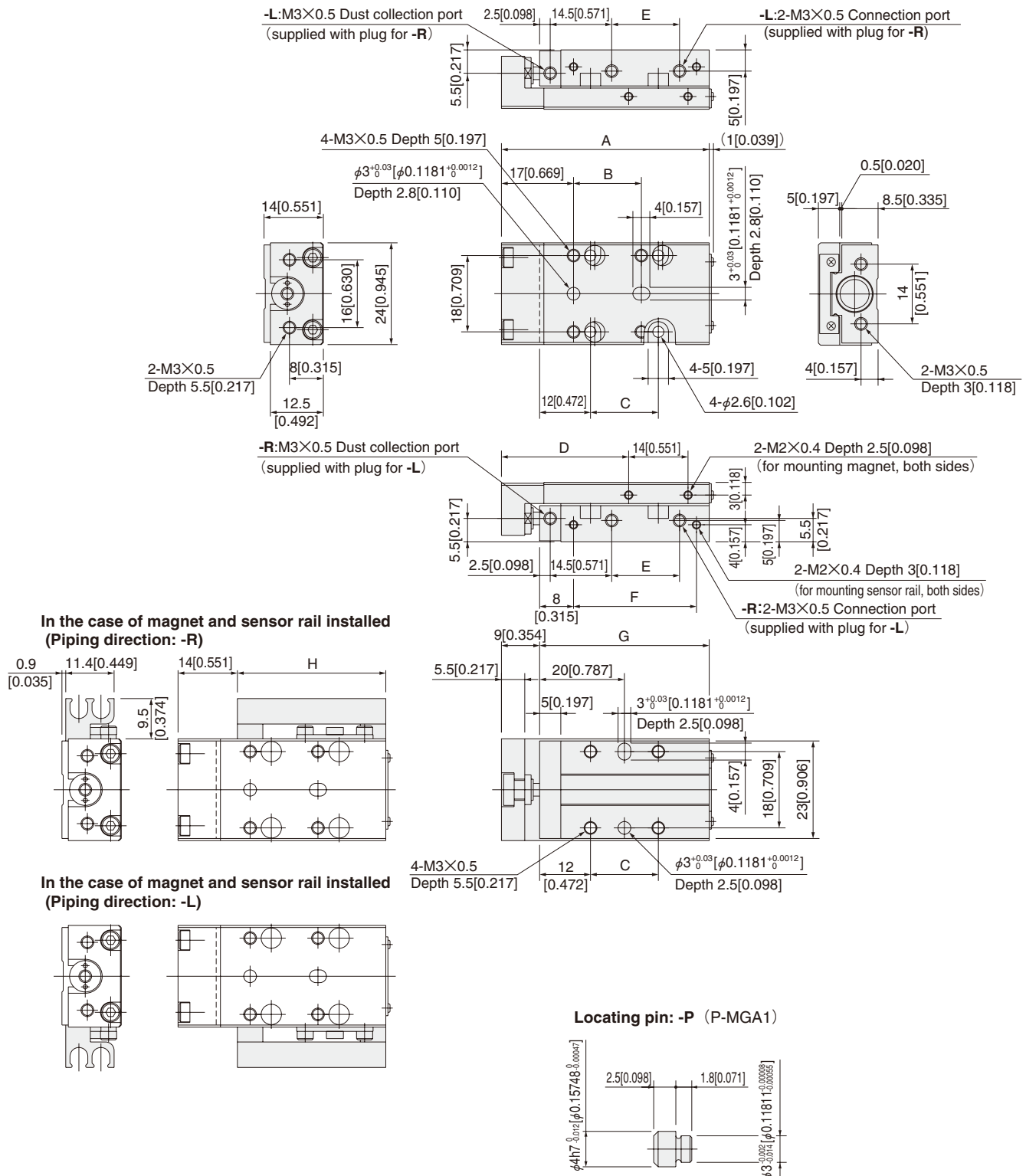


CS-MGA□6



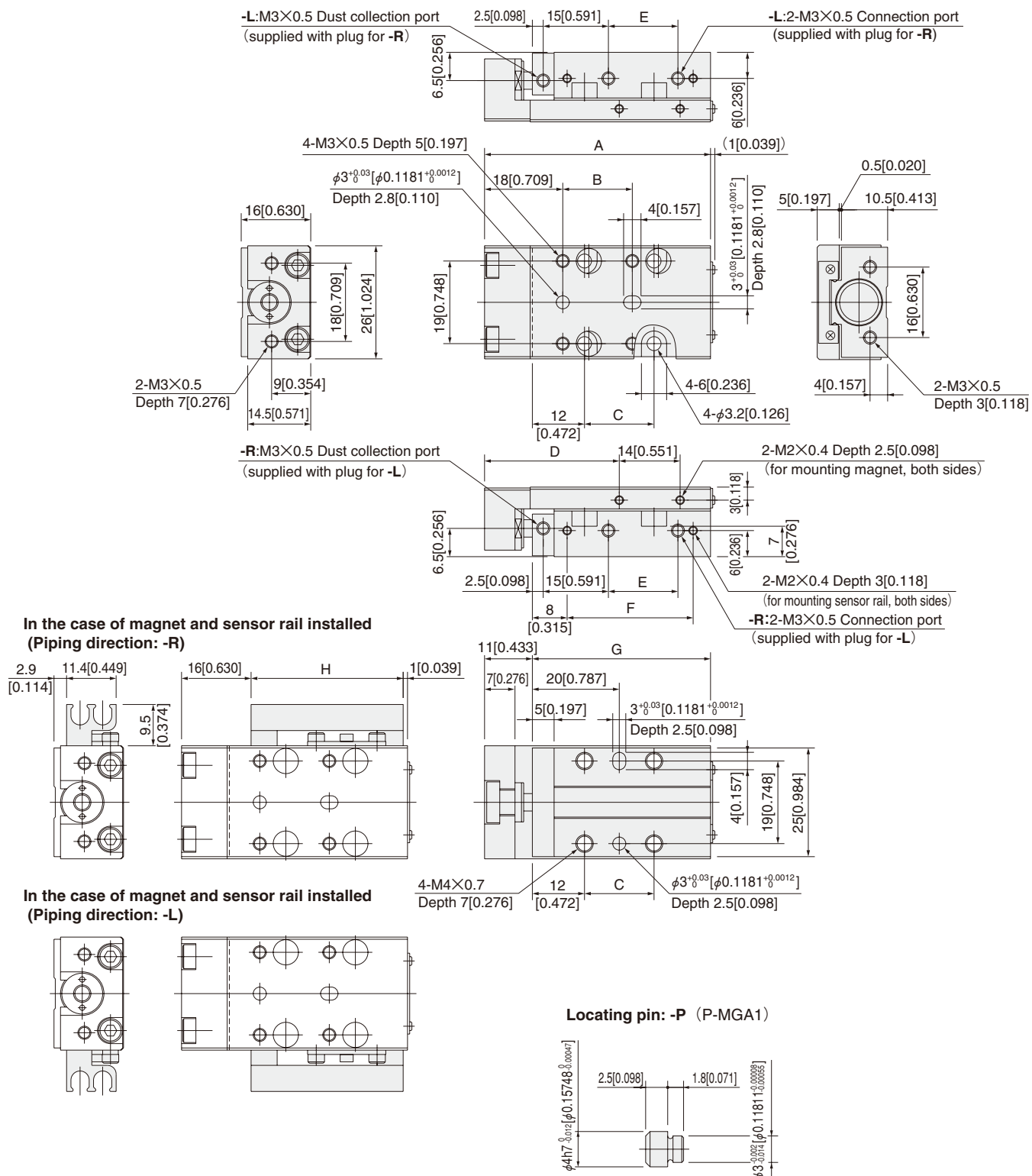
Stroke	A	B	C	D	E	F	G	H
5	49 [1.929]	16 [0.630]	16 [0.630]	30 [1.181]	16 [0.630]	29 [1.142]	40 [1.575]	35 [1.378]
10	49 [1.929]	16 [0.630]	16 [0.630]	30 [1.181]	16 [0.630]	29 [1.142]	40 [1.575]	35 [1.378]
15	54 [2.126]	21 [0.827]	21 [0.827]	35 [1.378]	21 [0.827]	34 [1.339]	45 [1.772]	40 [1.575]

CS-MGA□8



Stroke	A	B	C	D	E	F	G	H
5	49 [1.929]	16 [0.630]	16 [0.630]	30 [1.181]	16 [0.630]	29 [1.142]	40 [1.575]	35 [1.378]
10	49 [1.929]	16 [0.630]	16 [0.630]	30 [1.181]	16 [0.630]	29 [1.142]	40 [1.575]	35 [1.378]
15	59 [2.323]	26 [1.024]	26 [1.024]	40 [1.575]	26 [1.024]	39 [1.535]	50 [1.969]	45 [1.772]
20	59 [2.323]	26 [1.024]	26 [1.024]	40 [1.575]	26 [1.024]	39 [1.535]	50 [1.969]	45 [1.772]

CS-MGA□10

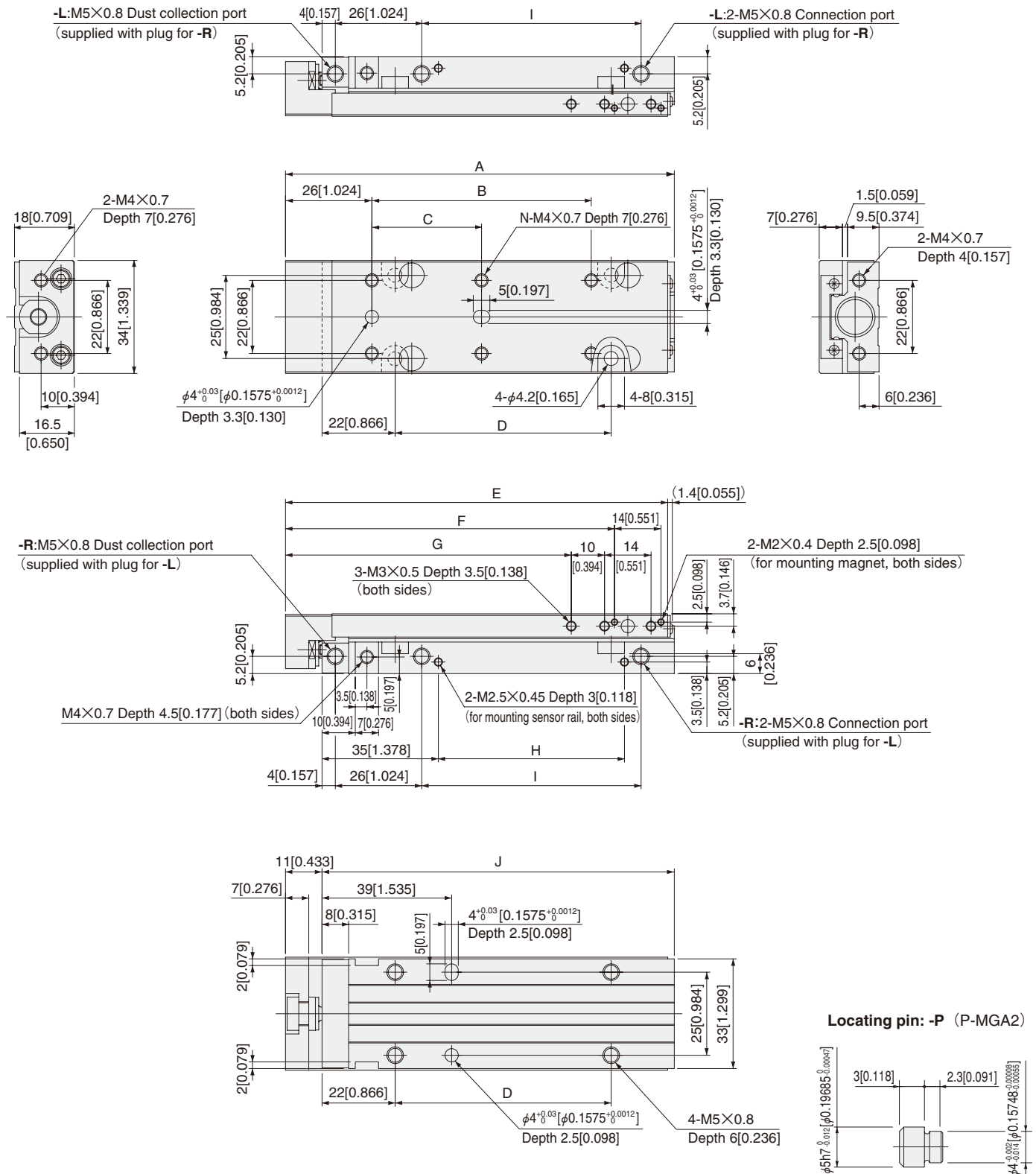


Stroke	A	B	C	D	E	F	G	H
5	52 [2.047]	16 [0.630]	16 [0.630]	31 [1.220]	16 [0.630]	29 [1.142]	41 [1.614]	35 [1.378]
10	52 [2.047]	16 [0.630]	16 [0.630]	31 [1.220]	16 [0.630]	29 [1.142]	41 [1.614]	35 [1.378]
15	62 [2.441]	26 [1.024]	26 [1.024]	41 [1.614]	26 [1.024]	39 [1.535]	51 [2.008]	45 [1.772]
20	62 [2.441]	26 [1.024]	26 [1.024]	41 [1.614]	26 [1.024]	39 [1.535]	51 [2.008]	45 [1.772]
30	72 [2.835]	36 [1.417]	36 [1.417]	51 [2.008]	36 [1.417]	49 [1.929]	61 [2.402]	55 [2.165]

Remark: For cylinder with magnet sensor rail, see p.672.



CS-MGA12



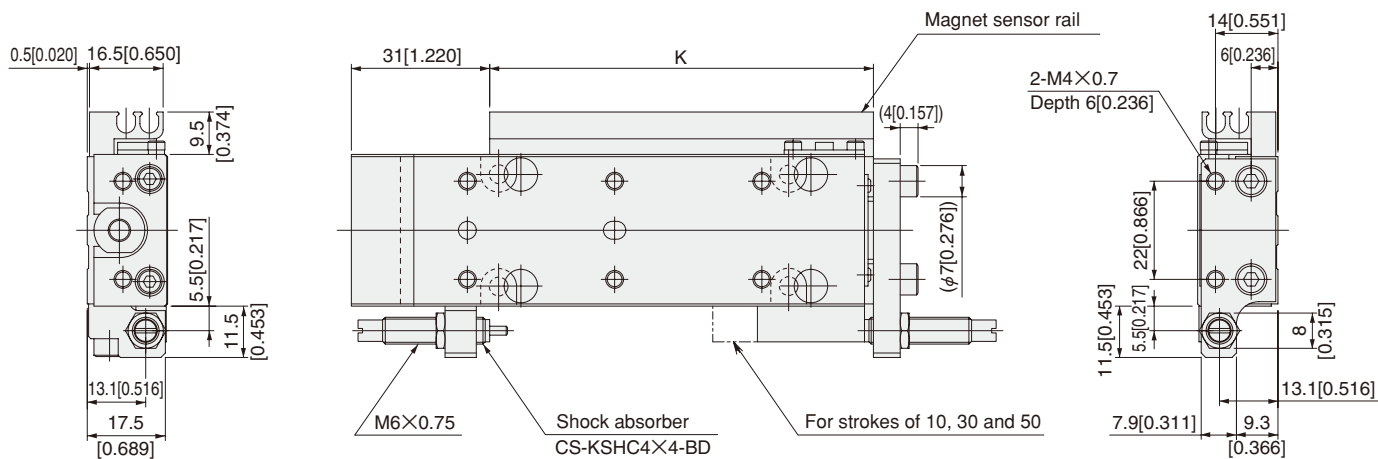
Stroke	A	B	C	D	E	F	G	H	I	J	K	N
10	77 [3.031]	—	26 [1.024]	25 [0.984]	75 [2.953]	59 [2.323]	46 [1.811]	16 [0.630]	26 [1.024]	66 [2.598]	46 [1.811]	4
20	77 [3.031]	—	26 [1.024]	25 [0.984]	75 [2.953]	59 [2.323]	46 [1.811]	16 [0.630]	26 [1.024]	66 [2.598]	46 [1.811]	4
30	97 [3.819]	—	46 [1.811]	45 [1.772]	95 [3.740]	79 [3.110]	66 [2.598]	36 [1.417]	46 [1.811]	86 [3.386]	66 [2.598]	4
40	97 [3.819]	—	46 [1.811]	45 [1.772]	95 [3.740]	79 [3.110]	66 [2.598]	36 [1.417]	46 [1.811]	86 [3.386]	66 [2.598]	4
50	117 [4.606]	66 [2.598]	33 [1.299]	65 [2.559]	115 [4.528]	99 [3.898]	86 [3.386]	56 [2.205]	66 [2.598]	106 [4.173]	86 [3.386]	6
60	117 [4.606]	66 [2.598]	33 [1.299]	65 [2.559]	115 [4.528]	99 [3.898]	86 [3.386]	56 [2.205]	66 [2.598]	106 [4.173]	86 [3.386]	6

●Cylinder with magnet sensor rail CS-MGAS12

●Cylinder with shock absorber CS-MGA□12-SS□

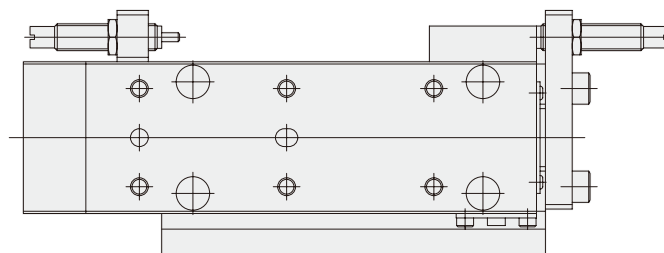


Piping direction: -R

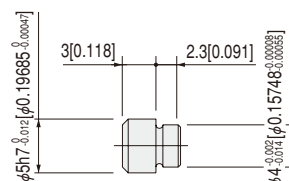


Note: For locking the rubber stopper or metal stopper.
Should never be used for securing the shock absorber.

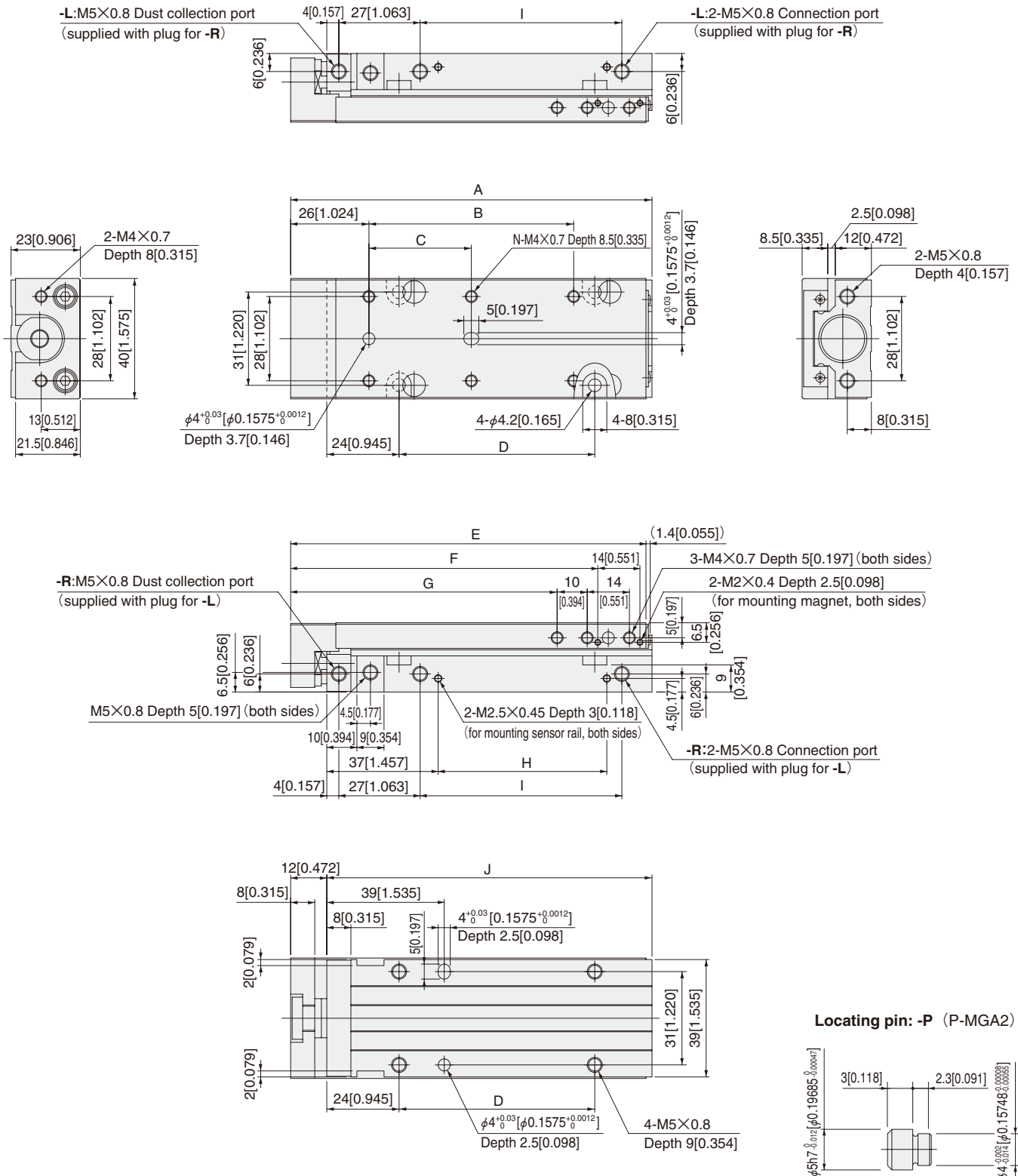
Piping direction: -L



Locating pin: -P (P-MGA2)



CS-MGA16



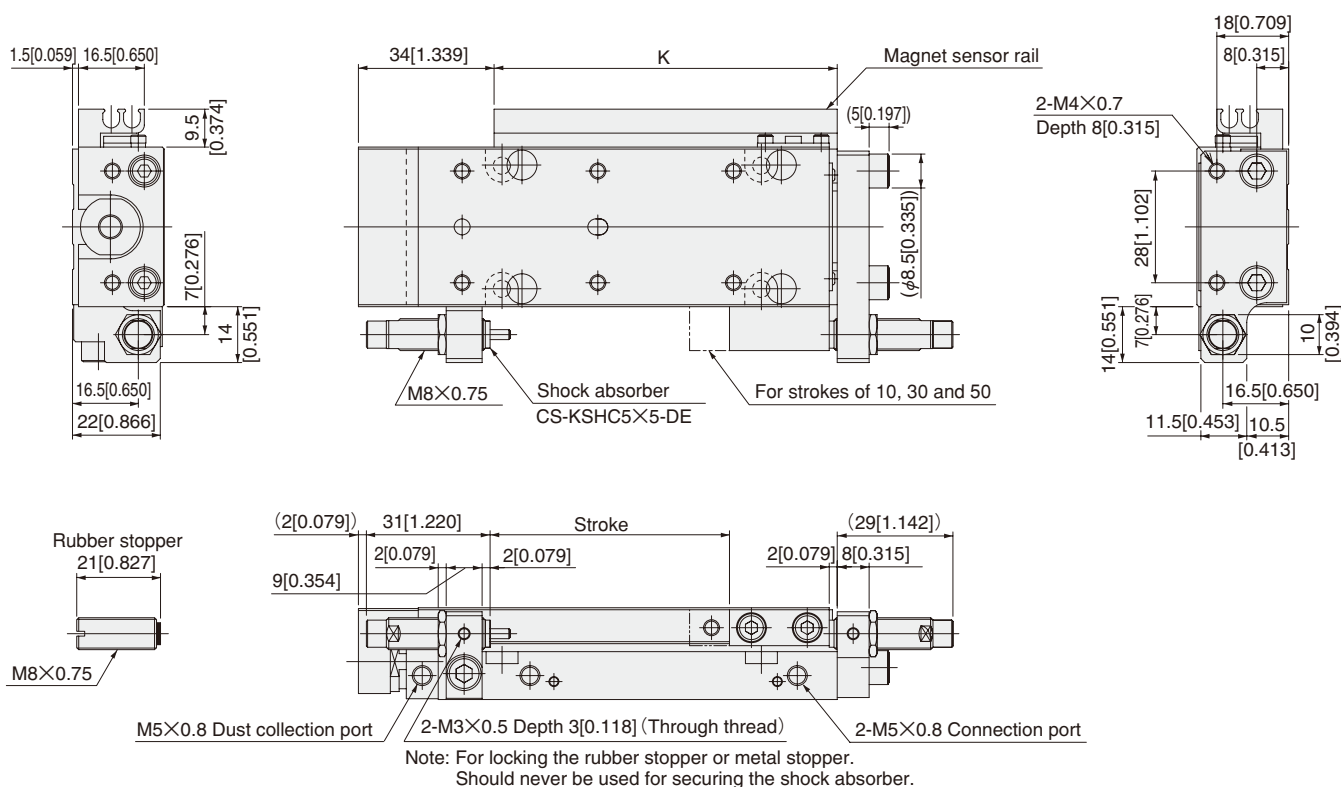
Stroke	A	B	C	D	E	F	G	H	I	J	K	N
10	80 [3.150]	—	28 [1.102]	25 [0.984]	78 [3.071]	62 [2.441]	48.5 [1.909]	16 [0.630]	27 [1.063]	68 [2.677]	46 [1.811]	4
20	80 [3.150]	—	28 [1.102]	25 [0.984]	78 [3.071]	62 [2.441]	48.5 [1.909]	16 [0.630]	27 [1.063]	68 [2.677]	46 [1.811]	4
30	100 [3.937]	—	48 [1.890]	45 [1.772]	98 [3.858]	82 [3.228]	68.5 [2.697]	36 [1.417]	47 [1.850]	88 [3.465]	66 [2.598]	4
40	100 [3.937]	—	48 [1.890]	45 [1.772]	98 [3.858]	82 [3.228]	68.5 [2.697]	36 [1.417]	47 [1.850]	88 [3.465]	66 [2.598]	4
50	120 [4.724]	68 [2.677]	34 [1.339]	65 [2.559]	118 [4.646]	102 [4.016]	88.5 [3.484]	56 [2.205]	67 [2.638]	108 [4.252]	86 [3.386]	6
60	120 [4.724]	68 [2.677]	34 [1.339]	65 [2.559]	118 [4.646]	102 [4.016]	88.5 [3.484]	56 [2.205]	67 [2.638]	108 [4.252]	86 [3.386]	6

●Cylinder with magnet sensor rail CS-MGAS16

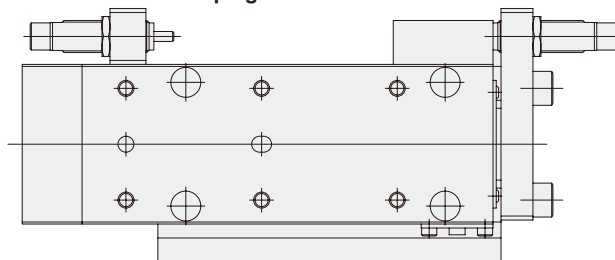
●Cylinder with shock absorber CS-MGA□16-SS□



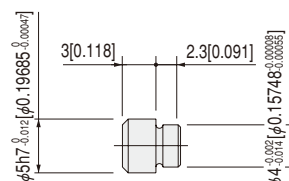
Piping direction: -R



Piping direction: -L

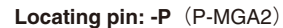


Locating pin: -P (P-MGA2)





CS-MGA20

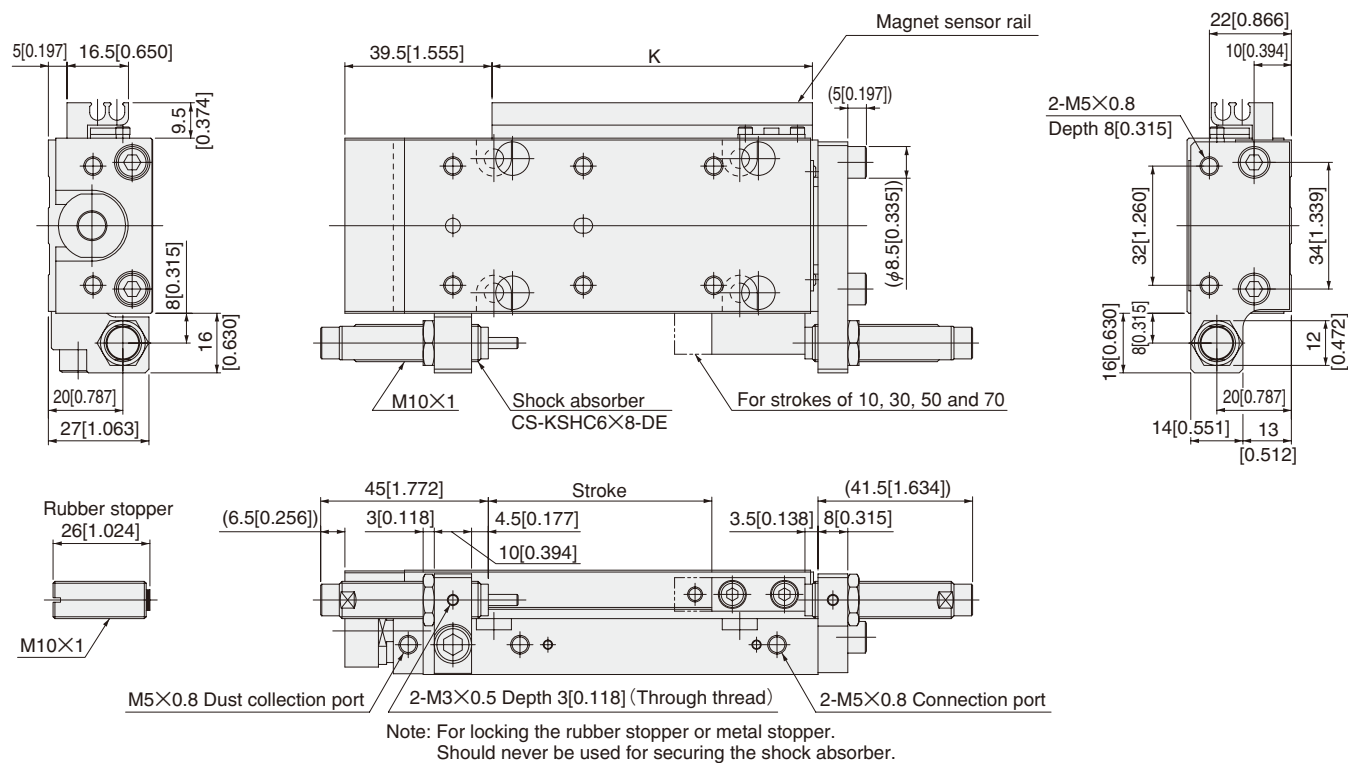
675

●Cylinder with magnet sensor rail CS-MGAS20

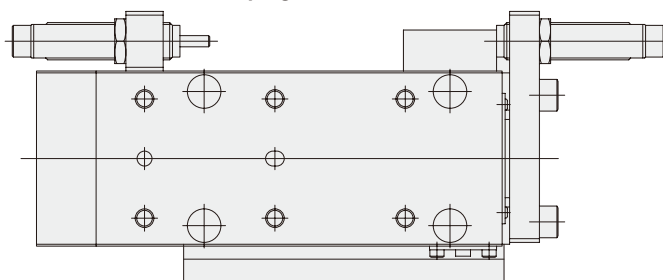
●Cylinder with shock absorber CS-MGA□20-SS□



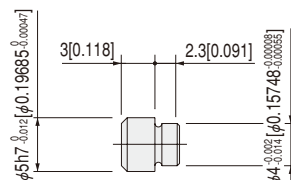
Piping direction: -R



Piping direction: -L



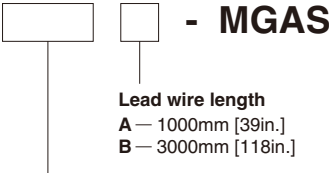
Locating pin: -P (P-MGA2)



SENSOR SWITCHES

Solid State Type, Reed Switch Type

Order Codes



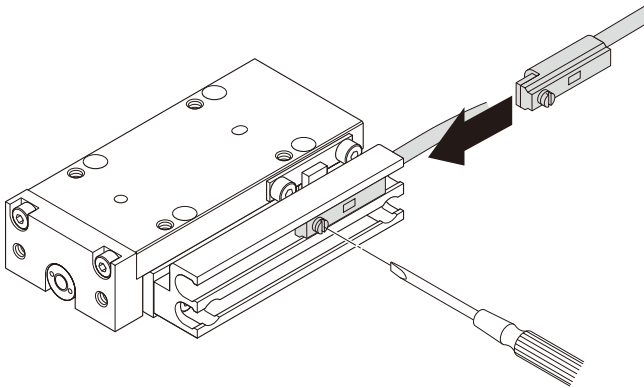
Sensor switch

ZE135	— Solid state type	2-lead wire	with indicator lamp	DC10~28V	Horizontal lead wire
ZE235	— Solid state type	2-lead wire	with indicator lamp	DC10~28V	Vertical lead wire
ZE101	— Reed switch type		without indicator lamp	DC5~28V AC85~115V	Horizontal lead wire
ZE201	— Reed switch type		without indicator lamp	DC5~28V AC85~115V	Vertical lead wire
ZE155	— Solid state type	3-lead wire	with indicator lamp	DC4.5~28V	Horizontal lead wire
ZE255	— Solid state type	3-lead wire	with indicator lamp	DC4.5~28V	Vertical lead wire
ZE102	— Reed switch type		with indicator lamp	DC10~28V AC85~115V	Horizontal lead wire
ZE202	— Reed switch type		with indicator lamp	DC10~28V AC85~115V	Vertical lead wire

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

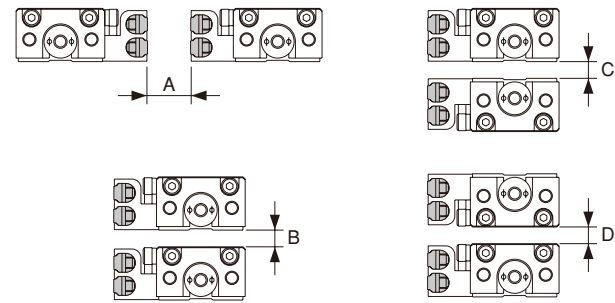
Moving Sensor Switch

- Loosening the mounting screw allows the sensor switch to be moved along the switch mounting groove of the Mini Guide Slider.
- Tighten the mounting screw with a tightening torque of 0.1 ~ 0.2N · m [0.9 ~ 1.8in · lbf].



When Mounting the Cylinders with Sensor Switches in Close Proximity

When mounting Mini Guide Sliders in close proximity, install them at the values shown in the table below, or larger.

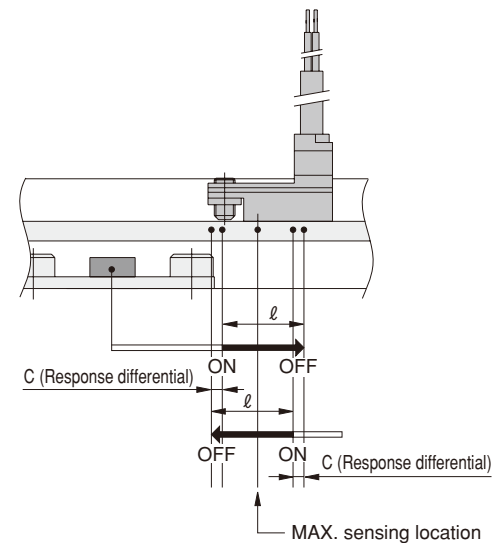


●Solid state type		mm [in.]			
Model		A	B	C	D
MGAS4.5		4 [0.16]	2 [0.08]	3 [0.12]	5 [0.20]
MGAS6		3 [0.12]	2 [0.08]	4 [0.16]	4 [0.16]
MGAS8		3 [0.12]	2 [0.08]	4 [0.16]	4 [0.16]
MGAS10		3 [0.12]	2 [0.08]	4 [0.16]	4 [0.16]
MGAS12		3 [0.12]	2 [0.08]	2 [0.08]	4 [0.16]
MGAS16		3 [0.12]	2 [0.08]	2 [0.08]	2 [0.08]
MGAS20		3 [0.12]	2 [0.08]	2 [0.08]	2 [0.08]

●Reed switch type		mm [in.]			
Model		A	B	C	D
MGAS4.5		2 [0.08]	2 [0.08]	2 [0.08]	2 [0.08]
MGAS6		2 [0.08]	2 [0.08]	4 [0.16]	2 [0.08]
MGAS8		2 [0.08]	2 [0.08]	4 [0.16]	2 [0.08]
MGAS10		2 [0.08]	2 [0.08]	4 [0.16]	2 [0.08]
MGAS12		2 [0.08]	2 [0.08]	2 [0.08]	2 [0.08]
MGAS16		2 [0.08]	2 [0.08]	2 [0.08]	2 [0.08]
MGAS20		2 [0.08]	2 [0.08]	2 [0.08]	2 [0.08]

Sensor Switch Operating Range, Response Differential, and Maximum Sensing Location

- Operating range: ℓ
The distance the piston travels in one direction, while the switch is in the ON position.
- Response differential: C
The distance between the point where the piston turns the switch ON and the point where the switch is turned OFF as the piston travels in the opposite direction.



●Solid state type		mm[in.]						
Item	Model	MGAS4.5	MGAS6	MGAS8	MGAS10	MGAS12	MGAS16	MGAS20
Operating range : ℓ		1.5~3.2 [0.059~0.126]						
Response differential : C		0.2 [0.008] or less						
MAX. sensing location ^{Note}		6 [0.236]						

Remark: The above table shows reference values.

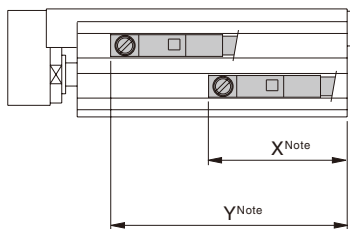
Note: This is the length measured from the switch's opposite end side to the lead wire.

●Reed switch type		mm[in.]						
Item	Model	MGAS4.5	MGAS6	MGAS8	MGAS10	MGAS12	MGAS16	MGAS20
Operating range : ℓ		3.0~6.0 [0.118~0.236]						
Response differential : C		1.5 [0.059] or less						
MAX. sensing location ^{Note}		10 [0.394]						

Remark: The above table shows reference values.

Note: This is the length measured from the switch's opposite end side to the lead wire.

Mounting Location of End of Stroke Detection Sensor Switch



Note : Dimensions from the end of the sensor rail.

● Solid state type

Model	MGAS4.5		MGAS6			MGAS8				MGAS10				
Stroke	5	10	5	10	15	5	10	15	20	5	10	15	20	30
X	18 [0.709]	18 [0.709]	18 [0.709]	18 [0.709]	18 [0.709]	18 [0.709]	18 [0.709]	18 [0.709]	18 [0.709]	19 [0.748]	19 [0.748]	19 [0.748]	19 [0.748]	19 [0.748]
Y	23 [0.906]	28 [1.102]	23 [0.906]	28 [1.102]	33 [1.299]	23 [0.906]	28 [1.102]	33 [1.299]	38 [1.496]	24 [0.945]	29 [1.142]	34 [1.339]	39 [1.535]	49 [1.929]

Model	MGAS12						MGAS16						MGAS20							
Stroke	10	20	30	40	50	60	10	20	30	40	50	60	10	20	30	40	50	60	70	80
X	17 [0.669]	17 [0.669]	17 [0.669]	17 [0.669]	17 [0.669]	17 [0.669]	17 [0.669]	17 [0.669]	17 [0.669]	17 [0.669]	17 [0.669]	17 [0.669]	17 [0.669]	17 [0.669]	17 [0.669]	17 [0.669]	17 [0.669]	17 [0.669]	17 [0.669]	17 [0.669]
Y	27 [1.063]	37 [1.457]	47 [1.850]	57 [2.244]	67 [2.638]	77 [3.031]	27 [1.063]	37 [1.457]	47 [1.850]	57 [2.244]	67 [2.638]	77 [3.031]	27 [1.063]	37 [1.457]	47 [1.850]	57 [2.244]	67 [2.638]	77 [3.031]	87 [3.425]	97 [3.819]

● Reed switch type

Model	MGAS4.5		MGAS6			MGAS8				MGAS10				
Stroke	5	10	5	10	15	5	10	15	20	5	10	15	20	30
X	22 [0.866]	22 [0.866]	22 [0.866]	22 [0.866]	22 [0.866]	22 [0.866]	22 [0.866]	22 [0.866]	22 [0.866]	23 [0.906]	23 [0.906]	23 [0.906]	23 [0.906]	23 [0.906]
Y	27 [1.063]	32 [1.260]	27 [1.063]	32 [1.260]	37 [1.457]	27 [1.063]	32 [1.260]	37 [1.457]	42 [1.654]	28 [1.102]	33 [1.299]	38 [1.496]	43 [1.693]	53 [2.087]

Model	MGAS12						MGAS16						MGAS20							
Stroke	10	20	30	40	50	60	10	20	30	40	50	60	10	20	30	40	50	60	70	80
X	21 [0.827]	21 [0.827]	21 [0.827]	21 [0.827]	21 [0.827]	21 [0.827]	21 [0.827]	21 [0.827]	21 [0.827]	21 [0.827]	21 [0.827]	21 [0.827]	21 [0.827]	21 [0.827]	21 [0.827]	21 [0.827]	21 [0.827]	21 [0.827]	21 [0.827]	21 [0.827]
Y	31 [1.220]	41 [1.614]	51 [2.008]	61 [2.402]	71 [2.795]	81 [3.189]	31 [1.220]	41 [1.614]	51 [2.008]	61 [2.402]	71 [2.795]	81 [3.189]	31 [1.220]	41 [1.614]	51 [2.008]	61 [2.402]	71 [2.795]	81 [3.189]	91 [3.583]	101 [3.976]

Special Specifications

For the Mini Guide Slider, we have prepared certain special specifications that have been proven to be particularly popular.

To place an order, enter codes in the parentheses at the end of the order code.

For detailed specifications, dimensions, and delivery schedules, consult us.

1. Low speed and adaptable to speed change specification (-1W)

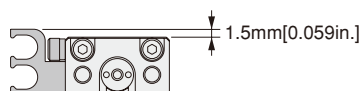
Suitable for repeated stops and movements, or for operation at fixed low speeds.

Speed range 5 to 300mm/s [0.2~11.8in./sec.]

- ※ Outward dimensions are the same as the standard products.
- ※ The -1W option is not available for the clean system cylinder (cleanroom specification).

2. Two sensor switch specification (-4W)

Specifications are for MGA4.5 with 2 sensor switches. Note that the sensor rail protrudes from the table surface by 1.5mm[0.059in.].



Order example: For low speed and adaptable to speed change specification

●MGA6×10 - R - 1W

Caution: The above special specification may vary from the standard products in terms of delivery schedule, price, dimensions, and operating life. Consult us before placing an order.

Handling Instructions and Precautions



General precautions

Allowable kinetic energy

To carry the inertial load, operate the Mini Guide Slider with the kinetic energy below the allowable value. For details about the relation between the load and table speed, see “Allowable load mass” on p.600.

Piping

In piping connection with the Mini Guide Sliders, flush the tube completely (by blowing compressed air) before piping. Intrusion of machining chips, sealing tape, rust, etc., generated during plumbing could result in air leaks and other defective operations.

Media

1. Use air for the media. For the use of any other media, consult us.
2. Air used for the Mini Guide Sliders should be clean air that contains no deteriorated compressor oil, etc. Install an air filter (filtration of a minimum 40 μm) near the Mini Guide Slider or valve to remove collected liquid or dust. In addition, drain the air filter periodically. Collected liquid or dust entering the Mini Guide Slider may cause improper operation.

Lubrication

1. Do not lubricate the clean system cylinders (cleanroom specification). Lubrication causes malfunctions.
2. The standard cylinder can be used without lubrication, if lubrication is required, use Turbine Oil Class 1 (ISO VG32) or equivalent. Avoid using spindle oil or machine oil.
3. Apply CGL grease (Nippon Thompson Co., Ltd. made) on the raceway surface of the track rail in the guide portion every 6 months or 3 million operations.

Atmosphere

1. When using in locations subject to dripping water, dripping oil, etc., or to large amounts of dust, use a cover to protect the unit.
2. Do not use the Mini Guide Sliders in a corrosive atmosphere. Use in such surroundings causes damage or malfunctions.
3. The main body and table are made of stainless steel. However, they may rust depending on the operating environment. Apply no-rust oil to them periodically.
4. Do not use the products under extremely dry conditions.
5. The ambient temperature range most suitable for use of the Mini Guide Slider is from 5°C to 60°C [41~140°F]. Use at temperatures exceeding 60°C [140°F] causes damage or malfunctions. When the temperature is 5°C [41°F] or below, moisture in the air is frozen to cause damage and malfunctions. Take some anti-freezing measures.

During Operation

1. Do not place hands in the operating direction of the Mini Guide Sliders.
2. At initial operation, pay sufficient attention to the operating direction of the slider.
3. Care should be taken not to be trapped your body or fingers between the slider and the plate when the slider table is retracting.
4. For maintenance, check that there is no residual pressure in the slider.
5. The slider speed should be 500mm/s [20in./sec.] or less (300 mm/s [12in./sec.] or less for the clean system cylinders (cleanroom specification)). Even within the allowable range, if the speed and load are large, install external stoppers to avoid applying direct shocks to the slider.

