

Air Slide Table Series MXQ ø6, ø8, ø12, ø16, ø20, ø25



Uses a recirculating linear guide for high rigidity and high precision

Integrated guide rails and table

Uses recirculating linear guide for high rigidity and high precision Air slide table for precision assembly processes

High precision compact design

Comparison of MXQ and MXS

	Accu	iracy	Dimensions					
Model	Parallelism	Height tolerance	Width	Height	Overall length			
MXQ12-30	0.035	±0.08	46	30	86			
MXS12-30	0.2	±0.2	50	32	80			

Wide variety of adjuster options

Positioning pin holes

Improved work piece mounting repeatability

Work piece mounting taps

Improved strength

End plate uses extra super duralumin

Dual rods and and and a second second

Twice the output of conventional cylinders

Recirculating linear guide

Wide type linear guide block body made of martensitic stainless steel

Wide variety of options

Adjuster options and function options can be combined

Symmetric type Adjuster options **Function options** With buffer mechanism With stroke adjuster

Axial piping





Load resistance against sudden and excessive external forces is nearly three times greater than series MXS.

Symmetric type standardized

Available with all options

Body mounting through holes

Auto switch mounting grooves

Auto switches can be mounted in grooves provided on the side of the body where they do . not protrude

Table and guide rail integrated

Made of martensitic stainless steel

Positioning pin holes

Body mounting repeatability improved

Body mounting taps

Can be mounted from 3 directions



3. Perpendicular mount (using tapped holes) 2. Side mount (using through holes)

Applications

As Z-axis for picking and placing



For positioning of pallets on a conveyor



Air Slide Table Series MXQ

Series variations

											A	djuste	er optio	ons		Funct	ion o	ptions		
Model		size			Stand	dard str	okes	(mm)		F	Rubber stopper		Shock absorber		S	Metal stopper		×	ping	
			10	20	30	40 5) 75	100 1	25 150	int end	ar end	th ends	int end	ar end th ends	int end	ar end th ends	Buffer	 End loc 	- Axial pi	Auto switches
Standard type	Symmetric type	(mm)								Fro	Re	Bot	Fro	Boi	Ъ	Boi				Dood owitch co
MXQ 6	MXQL 6	6	-+	-+-	+	+-+	-	_		-+	+	+			-+	-+ +		+	+	• D-A9
MXQ 8	MXQL 8	8	-+	+	+	+-+	-+	_	++	-+-	+	+	+-	┿	-+	++		+	+	• D-A9 V
MXQ12	MXQL12	12	-+	+	+	+-+	-+	-	++	-+-	+	+	+	┿─┿	-+	++		+	+	• D-F9
MXQ16	MXQL16	16	-+	+	+	+ +	-+	-	┥┼	-+-	+	+	+-	┿╌┿	-+	++		+	+	• D-F9 V 2 color indication
MXQ20	MXQL20	20	-+	+	+	+-+	-+	-	┿╴┿	-+	+	+	+-	┥┥	-+	++	-+	+	+	solid state
MXQ25	MXQL25	25	-+	+	+	+-	+	+	┿┿	-+-	+	+	+-	┥┥	-+	++	-+	+	+	• D-F9=WV • D-F9=WV

Adjuster Options





Three different types of adjusting bolt have been standardized for front end rear end and double end adjusters and cushion mechanisms.

- Rubber stopper Standard stroke adjuster
- Shock absorber

For use in harsh conditions Absorbs the impact at the stroke end for smooth stopping and improved stopping accuracy

Metal stopper

Improves stopping accuracy Without cushioning function for use with light loads and low speeds

Function Options

With Buffer Mechanism

- Protects work pieces and tools, etc., by eliminating impact at the end of the extension stroke
- Buffer unit is auto switch capable



* The normally ON/OFF setting is changed by changing the direction of the auto switch mounting.

Application example

In work piece insertion processes when there is a problem such as faulty positioning, the buffer mechanism absorbs the shock from the work piece impact to prevent damage.



With End lock

Holds the cylinder's home position to prevent dropping of the work piece even if the air supply is cut off.



Axial Piping Type

Piping is concentrated in the axial direction to maintain clear space around the body.



Air Slide Table

Series MXQ ø6, ø8, ø12, ø16, ø20, ø25

How to Order



juster, the buffer stroke decreases by the amount of stroke adjusted with the extension end stroke adjuster.

FP

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O Note 3)

Applicable auto swithces/Refer to pages 37 through 39 for detailed specifications of auto switches

					- 5					-			
			ght			Load volta	age	Auto swite	ch model	Lead	wire*		
Туре	Special function	Electrical	ator li	Wiring	Wiring (output) DC		AC	Elec entry d	trical irection	lengt	h (m)	Applicable	
		entry	Indic	(output)				Perpendicular	In-line	0.5 (Nil)	3 (L)		au
			No	Quiting	0414	5V, 12V	100V or less	A90V	A90	•	•	IC circuit	Relay,
vitc	Reec switc	Grommet		2 wire	24V	12V	100V	A93V	A93	•	•		PLC
щ õ			res	3 wire (NPN equiv.)		5V		A96V	A96	•	•	IC circuit	
÷				3 wire (NPN)				F9NV	F9N	•	•		
wite				3 wire (PNP)				F9PV	F9P	•	•]	
le s		Crommet	V	2 wire	2414	101/		F9BV	F9B	•	•]	Relay,
sta		Gronninet	res	3 wire (NPN)	24 V	120		F9NWV	F9NW	•	•] —	PLC
olid	Diagnostic indication			3 wire (PNP)				F9PWV	F9PW	•	•		
S (2 COIOF INDICATO				2 wire				F9BWV	F9BW	•	•		
\sim	and the state of the state of the state					100							

* Lead wire length symbols: 0.5m Nil (Example) A93 A93L 3m L





Specifications

	-	-									
Cylinder bore size (mm)	6	8	12	16	20	25					
Port size		M5	x 0.8		Rc	1/8					
Fluid	Air										
Action			Double	e acting							
Operating pressure	perating pressure 0.15 to 0.7MPa										
Proof pressure											
Ambient and fluid temperature -10 to 60°C											
Operating speed range	(Ad	juster opt	50 to 50 ion/Metal s	00mm/s stopper: 50) to 200mr	n/s)					
Cushion	Rubber b Sho	umper (Si ck absorb None (A	andard, Ao er (Adjuste Adjuster op	djuster opti er option/Sl tion/Metal	on/Rubber nock absor stopper)	r stopper) ber)					
Lubrication			Non	-lube							
Auto switch	Reed switches (2 wire, 3 wire) Solid state switches (2 wire, 3 wire) 2 color indication solid state switches (2 wire, 3 wire)										
Stroke length tolerance			+1 0	mm							

Options

		Extension end (AS)		
	Rubber stopper	Retraction end (AT)	stroke adjustment	
Adjuster option		Both ends (A)		
		Extension end (BS)	Series MXQ6 is not	
	Shock absorber	Retraction end (BT)	available with shock	
		Both ends (B)	absorber.	
		Extension end (CS)		
	Metal stopper	Retraction end (CT)	range 0 to 5mm	
		Both ends (C)	3	
	With buffer (F)		Series MXQ6 is not	
Functional option	With end lock (R))	available with end	
	Axial piping type	lock.		
* For detailed spe on pages 3 and	cifications of adjuster o 4.	ptions and functional options,	refer to option specifications	



Order Made Specifications

For order made specifications of series MXQ, refer to page 42.

Standard Strokes

Model	Standard stroke (mm)
MXQ 6	10, 20, 30, 40, 50
MXQ 8	10, 20, 30, 40, 50, 75
MXQ12	10, 20, 30, 40, 50, 75, 100
MXQ16	10, 20, 30, 40, 50, 75, 100, 125
MXQ20	10, 20, 30, 40, 50, 75, 100, 125, 150
MXQ25	10, 20, 30, 40, 50, 75, 100, 125, 150



Series MXQ

Theoretical Output

Application of the dual rod system generates double the output of conventional cylinders.

conventional c	ylinders.	5					(I	Unit: N	
Cylinder	Rod size	Operating	Piston area		Opera	ating pr	essure	(MPa)	
(mm)	(mm)	direction	(mm²)	0.2	0.3	0.4	0.5	0.6	0.7
		OUT	57	11	17	23	29	34	40
6	3	IN	42	8	13	17	21	25	29
0	4	OUT	101	20	30	40	51	61	71
0	4	IN	75	15	23	30	38	45	53
40		OUT	226	45	68	90	113	136	158
12	6	IN	170	34	51	68	85	102	119
40		OUT	402	80	121	161	201	241	281
10	8	IN	302	60	91	121	151	181	211
20	10	OUT	628	126	188	251	314	377	440
20	10	IN	471	94	141	188	236	283	330
25	12	OUT	982	196	295	393	491	589	687
	12	IN	756	151	227	302	378	454	529

Note) Theoretical output (N) = Pressure (MPa) x Piston area (mm²) 1N = Approx. 0.102kgf, 1MPa = Approx. 10.2kgf/cm²

Weights

																		(Unit: g)
Standard stroke (mm)									Additional weight of adjuster option					Additional weight of functional option				
Model										Rubber stopper		Shock absorber		Metal stopper		With	With	Axial piping type
	10	20	30	40	50	75	100	125	150	Extension end	Retraction end	Extension end	Retraction end	Extension end	Retraction end	buffer	end lock	(S: Stroke mm)
MXQ 6	100	120	140	180	200	—	_	_	-	6	5	—	-	10	5	25	—	13 + 0.2S
MXQ 8	140	170	210	250	315	385	—	—	—	10	10	30	23	23	10	35	40	26 + 0.2S
MXQ12	335	340	380	450	490	655	745	—	—	25	23	47	30	35	23	70	100	43 + 0.2S
MXQ16	605	610	670	735	835	1000	1250	1400	—	45	40	75	53	60	40	105	160	55 + 0.2S
MXQ20	1100	1100	1100	1200	1400	1750	2350	2650	2900	80	65	170	120	115	65	130	310	166 + 0.5S
MXQ25	1750	1750	1750	1950	2400	2750	3450	4300	4700	130	110	220	140	180	110	200	560	240 + 0.5S

Option Specifications

Stroke Adjustment Range of Adjuster Options (Identical for extension and retraction ends)

Туре	Stroke adjustment range
Rubber stopper	0 to 5mm
With shock absorber	Refer to dimensions on page 34.
Metal stopper	0 to 5mm

* Optional wide adjustment range adjusters

ÎN,

OUT

are available with rubber stopper and metal stopper.

How to Order Stroke Adjusters (Accessories)



SMC

Table Accuracy



Model	MXQ6	MXQ8	MXQ12	MXQ16	MXQ20	MXQ25			
B side parallelism to A side	Refer to Table 1.								
B side traveling parallelism to A side		I	Refer to	Graph 1					
C side perpendicularity to A side			0.05	imm					
M dimension tolerance		±0	.08mm (±0.1mm	ı)* ¹				
W dimension tolerance	±0.1mm								
Radial internal clearance (µm)	– 4 to 0	– 4 to 0	– 6 to 0	-10 to 0	-12 to 0	–14 to 0			
				-	-	-			

*1 ± 0.1 mm for 75mm or longer stroke

Table 1	able D side parallelism to A side													
Marial		Stroke (mm)												
IVIOUEI	10	20	30	40	50	75	100	125	150					
MXQ 6	0.025	0.03	0.035	0.04	0.045			_	_					
MXQ 8	0.025	0.03	0.035	0.04	0.055	0.065			—					
MXQ12	0.03	0.03	0.035	0.04	0.045	0.065	0.075	—	_					
MXQ16	0.035	0.035	0.04	0.045	0.05	0.065	0.08	0.095	—					
MXQ20	0.04	0.04	0.04	0.045	0.055	0.07	0.095	0.105	0.125					
MXQ25	0.045	0.045	0.045	0.05	0.06	0.07	0.09	0.115	0.125					

••







Traveling parallelism:

The amount of deflection on a dial gauge when the table travels a full stroke with the body secured on a reference base surface.

Shock Absorber Specifications

Shock abso	orber model	RB0805	RB0806	RB1007	RB1411	RB1412					
Applicable	slide table	MXQ8	MXQ12	MXQ16	MXQ20	MXQ25					
Max. absorb	ed energy J	0.98	2.94	5.88	14.7	19.6					
Stroke abs	orption mm	5	6	7	11	12					
Max. impact	speed mm/s	50 to 500									
Max. operating fre	equency cycle/min	80	80	70	45	45					
Max. allowa	ble thrust N	245	245	422	814	814					
Ambient tempe	rature range °C	-10 to 60									
Extended		1.96	1.96	4.22	6.86	6.86					
Spring lorce	Compressed	3.83	4.22	6.86	15.30	15.98					
Weight g	15	15	25	65	65						

End Lock Type Specifications

Model	MXQ8	MXQ12	MXQ16	MXQ20	MXQ25
Cylinder bore size (mm)	8	12	16	20	25
Operating speed range		50	to 500mn	n/s	
Holding force (N)	25	60	110	160	250

Note) Refer to page 51 for end lock handling precautions.

Buffer Mechanism Type Specifications

Mode	əl	MXQ6	MXQ8	MXQ12	MXQ16	MXQ20	MXQ25				
Cylinder bore	size (mm)	6	20	25							
Operating spe	ed range	50 to 50	50 to 500mm/s (50 to 300mm/s with horizontal operation)								
Buffer stroke	(mm)	ę	5	10							
Buffer stroke stroke		3	5	10	13	17	21				
load (N)	At maximum stroke	6	8	13	17	25	29				

Note 1) Refer to page 51 for buffer mechanism handling precautions. Note 2) The buffer stroke decreases by the amount of stroke adjusted with the extension end stroke adjuster.

Auto Switches for Buffer Mechanism

Туре	Part no.	Specifications	Electrical entry direction	
	D-F9BV	2 wire with indicator light		
Solid state	D-F9NV	3 wire with indicator light, Output: NPN	Perpendicular	
0	D-F9PV	3 wire with indicator light, Output: PNP		

* Order buffer mechanism auto switches separately using the part numbers listed above.



With buffer mechanism

With end lock



Series MXQ

Table Deflection (Reference Values)

Table displacement due to pitch moment load

Displacement at the section indicated by the arrow when a load is applied to this section with the slide table fully extended.









Table displacement due to yaw moment load

Displacement at the section indicated by the arrow when a load is applied to this section with the slide table fully extended.







Table displacement due to roll moment load

Displacement at "A" when a load is applied to "F" with the slide table retracted.









Table displacement due to pitch moment load

Displacement at the section indicated by the arrow when a load is applied to this section with the slide table fully extended.









Table displacement due to yaw moment load

Displacement at the section indicated by the arrow when a load is applied to this section with the slide table fully extended.



Ø 20 0.08 W 0.06 0.04 0 0.04 0 100 0 100 0 200 0 100 0 200 0 300 (1N = Approx. 0.102kgf)



Table displacement due to roll moment load

Displacement at "A" when a load is applied to "F" with the slide table retracted.









Series MXQ Model Selection

Model Selection Procedure	Formulae/Data	Selection Examples
Operating conditions		
Enumerate the operating conditions considering the mounting position and work piece configuration.	 Model to be used Type of cushion Work piece mounting position Mounting orientation Average speed Va (mm/s) Load weight W (kg) Fig. 1 Overhang Ln (mm) Fig. 2 	Cylinder: MXQ16-50 Cushion: Rubber stopper Work piece table mounting Mounting: Horizontal wall mounting Average speed: Va = 300 [mm/s] Load weight: W = 0.2 [kg] L1 = 10mm L2 = 30mm J3 = 30mm
A Kinetic energy		
Find the kinetic energy E (J) of the load. Find the allowable kinetic energy Ea (J). Confirm that the kinetic energy of the load does not exceed the allowable kinetic energy.	$E = \frac{1}{2} \cdot W \left(\frac{V}{1000}\right)^{2}$ Collision speed V = <u>1.4 · Va</u> * Correction factor (reference value) Ea = K · E max Work piece mounting coefficient K: Fig. 3 Max. allowable kinetic energy Emax: Fig. 1 Kinetic energy (E) ≤ Allowable kinetic energy (Ea)	$E = \frac{1}{2} \cdot 1 \left(\frac{420}{1000}\right)^2 = 0.088$ V = 1.4 x 300 = 420 Ea = 1 x 0.11 = 0.11 Can be used based on E = 0.088 ≤ Ea = 0.11
3 Load factor		
 3-1 Load factor of load weight Find the allowable load weight Wa (kg). Find the load factor of the load weight Q₁. 	$\label{eq:Wa} \begin{array}{l} \text{Wa} = \textbf{K} \cdot \boldsymbol{\beta} \cdot \textbf{Wmax} \\ \text{Work piece mounting coefficient K: Fig. 3} \\ \text{Allowable load weight coefficient } \boldsymbol{\beta} : \end{tabular} \begin{array}{l} \text{Fig. 3} \\ \text{Graph 1} \\ \text{Max. allowable load weight Wmax: Table 2} \\ \end{tabular} \end{array}$	Wa = 1 x 1 x 4 = 4 K = 1 β = 1 Wmax = 4 α_1 = 1/4 = 0.25
3-2 Load factor of static moment		
Find the static moment M (N⋅m). Find the allowable static moment Ma (N⋅m). Find the load factor Cl₂ of the static moment.	$M = W \times 9.8 (Ln + An)/1000$ Corrected value of moment center position distance An: Table 3 $Ma = K \cdot \gamma \cdot Mmax$ Work piece mounting coefficient K: Fig. 3 Allowable moment coefficient γ : Graph 2 Max. allowable moment Mmax: Table 4 $\Omega_2 = M/Ma$	$\begin{tabular}{ c c c c } \hline Yawing & Rolling \\ \hline Examine My. & Examine Mr. \\ My = 1 x 9.8 (10 + 30)/1000 & Mr = 1 x 9.8 (30 + 10.5)/1000 \\ = 0.39 & = 0.39 \\ A_3 = 30 & A_6 = 10.5 \\ \hline May = 1 x 1 x 18 = 18 & Mar = 36 \\ Mymax = 18 & Mrmax = 36 \\ K = 1 & K = 1 \\ \gamma = 1 & \gamma = 1 \\ \hline $X_2 = 0.39/18 = 0.022$ & $X'_2 = 0.39/36 = 0.011$ \\ \hline \end{tabular}$
Load factor of dynamic moment		
Find the dynamic moment Me (N·m). Find the allowable dynamic moment Mea (N·m).	Me = $1/3 \cdot \text{We x } 9.8 \frac{(\text{Ln + An})}{1000}$ Weight equivalent to impact We = $\delta \cdot \text{W} \cdot \text{V}$ δ : Bumper coefficient Rubber stopper without adjuster = $4/100$ Shock absorber = $1/100$ Metal stopper = $16/100$ Corrected value of moment center position distance An: Table 3 Mea = K· γ ·Mmax Work piece mounting coefficient K: Fig. 3 Allowable moment coefficient γ : Graph 2 Max. allowable moment Mmax: Table 4	Pitching Examine Mep. Mep = 1/3 x 16.8 x 9.8 x $(30 + 10.5)$ We = 4/100 x 1 x 420 = 16.8 A ₂ = 10.5 Meap = 1 x 0.7 x 18 = 12.6 K = 1 $\gamma = 0.7$ Mpmax = 18 Q ₃ = 2.2/12.6 = 0.17 Yawing Examine Mey. Mey = 1/3 x 16.8 x 9.8 x $(30 + 24.5)$ 1000 = 3.0 We = 168 A ₄ = 24.5
Find the load factor α_3 of the dynamic moment.	C(₃ = Me/Mea	Meay = 12.6 (same value as Meap) $\Omega'_{3} = 3.0/12.6 = 0.24$
3-4 Sum of the load factors		
Use is possible if the sum of the load factors does not exceed 1.	$\Sigma \Omega n = \Omega_1 + \Omega_2 + \dots + \Omega_n \leq 1$	Can be used based on $\Sigma \alpha n = \alpha_1 + \alpha_2 + \alpha'_{2+} \alpha_3 + \alpha'_3$ = 0.25 + 0.022 + 0.011 + 0.17 + 0.24 = 0.693 \leq 1

Air Slide Table Series MXQ



Fig. 2 Overhang: Ln (mm), Corrected value of moment center position distance: An (mm)

Fig. 3 Work piece mounting coefficient: K







Note 1) Static moment: Moment generated by gravity Dynamic moment: Moment generated by impact when colliding with stopper

Table 1 Allowable kinetic energy: Emax (J)

Static moment

Dynamic moment

		Allowable kinetic energy											
Model			Adjuster option										
	without aujuster	Rubber stopper	Shock absorber	Metal stopper									
MXQ 6	0.018	0.018		0.009									
MXQ 8	0.027	0.027	0.054	0.013									
MXQ12	0.055	0.055	0.11	0.027									
MXQ16	0.11	0.11	0.22	0.055									
MXQ20	0.16	0.16	0.32	0.080									
MXQ25	0.24	0.24	0.48	0.12									

 \triangle Caution The maximum operating speed for metal stopper is 200mm/s.

40

18.5

20.5

25

27

29.5

35.5

Pitch/Yaw moment: Mpmax/Mymax

Stroke (mm)

28

7.9 7.9

A1, A3

Stroke (mm)

50

18 5

28

25

30

43

Maximum allowable moment: Mmax (N·m)

100 125

42 42

33.5

Table 3 Corrected value of moment center position distance: An (mm)

75

28.5

34

33

43

37.5

Corrected value of moment center position distance (Refer to Figure 2.)

100

34

42.5

53.5

50

150 10 20

3.5

5.1

11 | 11 | 11 | 13 | 13 | 14

31 31 31 31 36

125

42.5

55

64

Note) For A2, A4, A5 and A6, there is no difference in the corrected values due to the stroke

35 35 51

5.1 6.0 6.9 7.4 7.4

150

56.5 14

64

30 40

Wmax(kg)

load weight:

Model	Max. allowable load weight
MXQ 6	0.6
MXQ 8	1
MXQ12	2
MXQ16	4
MXQ20	6
MXQ25	9

A

13.5

16

19.5

24.5

30

37

75

41 41 41

A

6

7

9

10.5

16.5

Roll moment: Mrmax

Stroke (mm)

50

51

A5

13.5

16

19.5

24.5

30

37

100

14

A6

6

7

9

14

125 150

10.5

16.5

Table 2 Max. allowable

Graph 1 Allowable load weight coefficient: β



Graph 2 Allowable moment coefficient: γ



Note) Use the average speed when calculating static moment. Use the collision speed when calculating dynamic moment.

Definition

Average speed

Allowable load weight

Weight equivalent to impact

Max. allowable load weight

Allowable load weight coefficient Allowable moment coefficient Work piece mounting coefficient

Load weight

Load factor

MXQ20 19 MXQ25 32

Mode

MXQ 6

MXQ 8

MXQ12

MXQ16

MXQ20

MXQ25

Table 4

Model

MXQ 6

MXQ 8

MXQ12

MXQ16

10

145

16.5

21

27

29.5

35.5

10 20 30

14

2.0 2.0 2.8

4.7 4.7 4.7 7.2 7.2 15 15

13 13 13 13 18 23

19 19 19 19 27 36 84 84 84 47 47 47 47 57 66 75 75 75

14 14 28

32 32 32 52 52 78 140 140 81 81 81 81 110 110 130 130 130

20

145

16.5

21

27

29.5

35.5

30

14 5

18.5

21

27

29.5

35.5

40 50 75

3.7

Symbols			
Symbol	Definition	Unit	Symbol
An (n = 1 to 6)	Corrected value of moment center position distance	mm	Va
E	Kinetic energy	J	w
Emax	Allowable kinetic energy	J	Wa
Ln (n = 1 to 3)	Overhang	mm	We
M (Mp, My, Mr)	Static moment (pitch, yaw, roll)	N⋅m	Wmax
Ma (Map, May, Mar)	Allowable static moment (pitch, yaw, roll)	N⋅m	α
Me (Mep, Mey)	Dynamic moment (pitch, yaw)	N⋅m	β
Mea (Meap, Meay)	Allowable dynamic moment (pitch, yaw)	N⋅m	Ŷ
Mmax (Mpmax, Mymax, Mrmax)	Max. allowable moment (pitch, yaw, roll)	N·m	К
V	Collision speed	mm/s	



Unit

mm/s

kg

kg

kg

kg



													(mm)
Model	F	Ν	G	н	NN	GA	HA	I	J	K	М	Z	ZZ
MXQ6-10	22	4	6	23	2	13	16	9	17	21.5	42	41.5	48
MXQ6-20	25	4	13	26	2	13	26	9	27	31.5	52	51.5	58
MXQ6-30	21	6	_	_	3	29	20	9	37	41.5	62	61.5	68
MXQ6-40	26	6	11	28	3	39	28	16	48	51.5	80	79.5	86
MXQ6-50	27	6	21	28	3	49	28	9	65	61.5	90	89.5	96



With buffer (Ø6) MXQ6-DDF



* Other dimensions are identical to the basic type.

Axial piping type (Ø6) MXQ6-







Series MXQ Dimensions MXQ 6L/Symmetric Type For detailed dimensions of stroke adjusters, refer to the stroke adjuster options. For rubber stopper: Page 33 **Basic type** For metal stopper: Page 35 ΖZ z 18.2 20 ÷ ÷ 0.3 3.5 3 6.5 4-M2.5 x 0.45 thread depth 2.5 12.5 Κ 5 Μ 3-M3 x 0.5 thread depth 5 3 ^{+0.03} depth 2.5 $\left(\frac{\mathbf{N}}{2}-1\right) \times \mathbf{F}$ 11 4-M2.5 x 0.45 thread depth 3.5 9 (Extension end adjuster) F 1.5 ŝ 13.5 -⊕ -Ð Ę 10 20 ¢ 27 33 0 4 € ¢ ¢ -Ð õ 0.5 5.5 3 4 Retraction end adjuster Extension end adjuster ø3^{+0.03}₀ depth 2.5 N-M3 x 0.5 thread depth 4 19.5 (Extension end adjuster) Bottom view of MXQ6L-30 **6** 5.5 5.5 Φ \oplus Æ -• ¢ 3.5 $\odot \phi$ ٢ ¢ 6 Max. 10 (Retraction end adjuster) 2 6 2-M2.5 x 0.45 thread depth 3 Air supply port 2-M5 x 0.8 20 16 13 $ø3H9^{+0.025}_{0}$ depth 2.5 GA HA NN-M4 x 0.7 thread depth 8 4 в Α 3H9 ^{+0.025} depth 2.5 _ŧ 12 E �-�-@ ٢ ¢ Ġ ø6.5 ø6.5 ø٦ ø٦ ø3.2 ø3.2 10.5 10.5 5.5 5.5 В Α н Section BB Section AA (NN-1) x H G

														(mm)
	Model	F	N	G	н	NN	GA	HA	I	J	ĸ	М	Z	ZZ
Μ	XQ6L-10	22	4	6	23	2	13	16	9	17	21.5	42	41.5	48
M	XQ6L-20	25	4	13	26	2	13	26	9	27	31.5	52	51.5	58
Μ	XQ6L-30	21	6	—	—	3	29	20	9	37	41.5	62	61.5	68
M	XQ6L-40	26	6	11	28	3	39	28	16	48	51.5	80	79.5	86
M	XQ6L-50	27	6	21	28	3	49	28	9	65	61.5	90	89.5	96



With buffer (Ø6) MXQ6L-DDF



 $\ast\,$ Other dimensions are identical to the basic type.

Axial piping type (Ø6) MXQ6L-□□P





Series MXQ Dimensions MXQ **Basic type** 2-M3 x 0.5 thread depth 4 Air supply port 2-M5 x 0.8 2 Max. 11 (Retraction end adjuster) 3.5 8 Ć Œ 6.5 6.5 --0

For detailed dimensions of stroke adjusters, refer to the stroke adjuster options. For rubber stopper: Page 33 For metal stopper: Page 35



	+ +)		1	1	
+	<u>_A</u>	ΗΔ	4 GA	HB Sta	NN-M4 x 0.7 thread depth 8
0.025 depth 3	<u></u>	•	4 07	0.025 dep	Section AA
				3H9 ⁺	

Section BB

															(mm)
Model	F	N	G	Н	NN	GA	HA	I	J	K	KA	NA	М	Z	ZZ
MXQ8-10	25	4	7	25	2	13	19	11	17	23.5	—	4	46	45.5	53
MXQ8-20	25	4	14	28	2	14	28	10	28	33.5	_	4	56	55.5	63
MXQ8-30	26	6	—	—	3	29	27	12	40	43.5	_	4	70	69.5	77
MXQ8-40	32	6	8	31	3	39	31	14	52	53.5	_	4	84	83.5	91
MXQ8-50	46	6	8	29	4	37	58	13	78	63.5	82.5	8	109	108.5	116
MXQ8-75	50	6	31	30	4	61	60	12	105	88.5	112.5	8	135	134.5	142



24

With shock absorber (Ø8) MXQ8-DDBS,BT,B



* Other dimensions are identical to the basic type.

With buffer (Ø8) MXQ8-



* Other dimensions are identical to the basic type.

With end lock (Ø8) MXQ8-



Φ

4

Air supply port 2-M5 x 0.8

* Other dimensions are identical to the basic type.

Axial piping type (Ø8) MXQ8-



* Other dimensions are identical to the basic type.

Φ

Φ

Series MXQ Dimensions MXQ **8**L/Symmetric Type For detailed dimensions of stroke adjusters, refer to the stroke adjuster options. For rubber stopper: Page 33 **Basic type** For metal stopper: Page 35 ΖZ z 21.2 33 ф-ф φ ¢ 0.3 7 3.8 κ 14.6 NA-M3 x 0.5 depth 3.5 7 3.8 KA 14.6 м 6 3-M4 x 0.7 thread depth 6 (<u>N</u> 2 3 ^{+0.03} depth 3 -1) x F 6.5 (Extension end adjuster) 12 10 4-M3 x 0.5 thread depth 4 F 10 ₽ -0 ¢ 24 () () ٢ 16 32 ۲ -13 യ് ß 1... 0.7 4 Retraction end adjuster 3.5 6.5 ø3 +0.03 depth 3 Extension end adjuster **N-M3 x 0.5 thread depth 5** 22.5 (Extension end adjuster) Bottom view of MXQ8L-30 6.5 <u>6.5</u> Ð -⊕-Ð Ē Ð 3.5 8 J 2 7 6 27 23 /Max. 11 (Retraction end adjuster) 2-M3 x 0.5 thread depth 4 Air supply port 2-M5 x 0.8 ^{+0.025} depth 3 $ø3H9_{0}^{+0.025}$ depth 3 HA GA 3H9 ⁺ 4 NN-M4 x 0.7 thread depth 8 в Α ł 4 1 **@**\$@ **@0** ⊕ ✐ ₽ ø6.5 ø6.5 ø٦ ø٦ ø3.2 ø3.2 A 12.5 5.7 5.7 12.5 Н В G (**NN**-1) x **H** Section AA Section BB

															(mm)
Model	F	Ν	G	Н	NN	GA	HA	1	J	K	KA	NA	М	Z	ZZ
MXQ8L-10	25	4	7	25	2	13	19	11	17	23.5	_	4	46	45.5	53
MXQ8L-20	25	4	14	28	2	14	28	10	28	33.5	_	4	56	55.5	63
MXQ8L-30	26	6	—	_	3	29	27	12	40	43.5	—	4	70	69.5	77
MXQ8L-40	32	6	8	31	3	39	31	14	52	53.5	_	4	84	83.5	91
MXQ8L-50	46	6	8	29	4	37	58	13	78	63.5	82.5	8	109	108.5	116
MXQ8L-75	50	6	31	30	4	61	60	12	105	88.5	112.5	8	135	134.5	142



With shock absorber (Ø8) MXQ8L-□□BS, BT, B



* Other dimensions are identical to the basic type.

With buffer (Ø8) MXQ8L-DDF



* Other dimensions are identical to the basic type.

With end lock (Ø8) MXQ8L-



* Other dimensions are identical to the basic type.

Axial piping type (Ø8) MXQ8L-







Series MXQ Dimensions MXQ 12 For detailed dimensions of stroke adjusters, refer to the stroke adjuster options. For rubber stopper: Page 33 **Basic type** For metal stopper: Page 35 2-M4 x 0.7 thread depth 6 Air supply port 2-M5 x 0.8 9.5 2 Max. 13 (Retraction end adjuster) 10 4.75 ŝ 6 Ć Ċ ω Ð 8.5 $(\widehat{\mathbf{\Theta}})(\widehat{\mathbf{\Theta}})$ ΘΘ Extension end adjuster N-M4 x 0.7 thread depth 5 29.5 (Extension end adjuster) ø4H9^{+0.030} depth 4 8 4.5 Retraction end adjuster 5 10 (Extension end adjuster) ÷ -6 ÷ Ð 2 46 29 \oplus 39 Ы \oplus 2 19.5 -Ð -⊕ ÷ ÷ 14.5 4H9^{+0.030} depth 4 2.5 F 4-M4 x 0.7 thread depth 6 $\frac{N}{2}$ –1) x F 13 16 3-M5 x 0.8 thread depth 8 8 М 18.5 KA NA-M4 x 0.7 thread depth 4 8.5 5 κ 18.5 Bottom view of MXQ12-40 8.5 5 0.3 39 29 9 66 0 ¢ 27.2 4.8 8 働♦♠ ()¢ θ Ζ ΖZ Ð Ð (NN-1) × H G Н 16 16 8 8 В Α ø4.2 a4.2 ø8. ø8. õg g 働 ¢ @0@ Ð 19 в Α NN-M5 x 0.8 thread depth 10 5 4H9^{+0.030} depth 4 HA GA Section AA Section BB ø4H9^{+0.030}₀ depth 4 (mm) Model F Ν G Н NN GA HA J Κ KA NA Μ Ζ ΖZ I MXQ12- 10 28 4 18 32 2 18 32 12 34 26.5 4 67 66 76 MXQ12- 20 36.5 4 28 4 18 32 2 18 32 12 34 67 66 76 MXQ12- 30 38 4 20 40 2 20 40 14 42 46.5 4 77 76 86 MXQ12- 40 6 3 38 39 15 58 56.5 4 94 93 103 34 MXQ12- 50 9 34 6 39 3 48 39 13 70 66.5 4 104 103 113



110

135

91.5 117.5

116.5 142.5

8

8

148

173

147

172

157

182

MXQ12-75

MXQ12-100

36

36

23

12

36

36

4

5

59

84

72

72

17

17

8

10



With buffer (ø12) MXQ12-DDF



* Other dimensions are identical to the basic type.

With end lock (ø12) MXQ12-□□R



* Other dimensions are identical to the basic type.

Axial piping type (ø12) MXQ12-□□P



Air supply port 2-M5 x 0.8





Series MXQ Dimensions MXQ **12L**/Symmetric Type For detailed dimensions of stroke adjusters, refer to the stroke adjuster options. For rubber stopper: Page 33 **Basic type** ΖZ For metal stopper: Page 35 z 27.2 4.8 30 φφ Ф ¢ 0.3 8.5 5 18.5 κ NA-M4 x 0.7 thread depth 4 8.5 5 18.5 KA 8 М 3-M5 x 0.8 thread depth 8 4H9 ^{+0.030} depth 4 $\left(\frac{\mathbf{N}}{2}-1\right) \times \mathbf{F}$ 13 16 10 (Extension end adjuster) F 4-M4 x 0.7 thread depth 6 2.5 19.5 22 14.5 ÷ Ġ փ Ð 29 \oplus \oplus 20 Ð (39 46 -(Ē ÷ 20 ¢ ίĐ, œ 5 N-M4 x 0.7 thread depth 5 Retraction end adjuster 4.5 8 ø4H9^{+0.030}depth 4 Extension end adjuster 29.5 (Extension end adjuster) ÷∲÷∲ ΦΦ 8.5 Bottom view of MXQ12L-40 Œ ÷ ¢ Æ Ð Æ ю 10 J 2-M4 x 0.7 thread depth 6 4.75 Air supply port 2-M5 x 0.8 $\oplus \oplus \oplus$ ()¢ Œ 2 9.5 Max. 13 (Retraction end adjuster) 4H9^{+0.030} depth 4 39 29 9 ø4H9^{+0.030}depth 4 HA GA 5 в Α NN-M5 x 0.8 thread depth 10 19 ๎๏¢๏ Φ ¢ 0 6ø ø4.2 ø8.5 ø4.2 ø8.5 6ø в A 16 8 16 8 н (NN-1) x H G Section AA Section BB (mm) Model F Ν G н NN GA HA Κ KA NA М Ζ ZZ I J MXQ12L- 10 28 4 18 32 2 18 32 12 34 26.5 4 67 66 76 MXQ12L- 20 36.5 28 4 18 32 2 18 32 12 34 4 67 66 76 MXQ12L- 30 38 4 20 40 2 20 40 14 42 46.5 4 77 76 86 MXQ12L- 40 6 3 38 39 15 58 56.5 4 94 93 103 34



70

110

135

66.5

91.5 117.5

116.5 142.5

4

8

8

104

148

173

103

147

172

113

157

182

MXQ12L- 50

MXQ12L- 75

MXQ12L-100

34

36

36

9

23

12

6

8

10

39

36

36

3

4

5

48

59

84

39

72

72

13

17

17

With shock absorber (Ø12) MXQ12L-DBS, BT, B



With buffer (Ø12) MXQ12L-□□F



* Other dimensions are identical to the basic type.

With end lock (Ø12) MXQ12L-DDR



* Other dimensions are identical to the basic type.

Axial piping type (Ø12) MXQ12L-□□P













With buffer (Ø16) MXQ16-DDF



* Other dimensions are identical to the basic type.

With end lock (Ø16) MXQ16-



* Other dimensions are identical to the basic type.

Axial piping type (Ø16) MXQ16-DDP











MXQ16L- 10	38	4	18	39	2	18	39	12	40	28	—	4	78	77	8
MXQ16L- 20	38	4	18	39	2	18	39	12	40	38	—	4	78	77	8
MXQ16L- 30	48	4	19	48	2	19	48	12	50	48	_	4	88	87	9
MXQ16L- 40	58	4	19	58	2	19	58	12	60	58	—	4	98	97	10
MXQ16L- 50	40	6	_	_	3	48	45	20	68	68	91	8	114	113	12
MXQ16L- 75	46	6	21	52	3	73	52	15	105	93	123	8	146	145	15
MXQ16L-100	44	8	36	44	4	80	88	18	145	118	166	8	189	188	20
MXQ16L-125	44	10	17	44	5	105	88	23	165	143	191	8	214	213	22



With shock absorber (Ø16) MXQ16L-DBS, BT, B ÷ -0 Æ \odot ę 6 æ ÷ θ 12.5 Adjustable stroke range (Unit: mm) 12 Max. 34 Extension end Retraction end 36.5 22 22 36.5 Max. 20 Extension end shock absorber Retraction end shock absorber * Other dimensions are identical to the basic type.

With buffer (Ø16) MXQ16L-DDF



* Other dimensions are identical to the basic type.

With end lock (Ø16) MXQ16L-



* Other dimensions are identical to the basic type.

Axial piping type (Ø16) MXQ16L-DDP -0 Φ ÷ \odot Π 20 22 ¢ -0 6.3 /Air supply port 2-M5 x 0.8 φ φ \oplus Φ 21 14

∕⁄ SMC

Series MXQ Dimensions MXQ 20 Basic type

For detailed dimensions of stroke adjusters, refer to the stroke adjuster options. For rubber stopper: Page 33 For metal stopper: Page 35



92.5

92.5

102.5

120.5

153 5

210.5

238.5

268 266.5

MXQ20- 20

MXQ20- 30

MXQ20- 40

MXQ20- 50

MXQ20- 75

MXQ20-100

MXQ20-125

MXQ20-150

With shock absorber (Ø20) MXQ20-DBS, BT, B Retraction end shock absorber Extension end shock absorber 46.5 46.5 Max. 35 0.5 0.5 Max. 13 54 10 Adjustable stroke range ф ф ఉ (Unit: mm) \$ ۲ † 💮 -17 Extension end Retraction end ٠Ð •**\$**--**\$**-35 35 * Other dimensions are identical to the basic type.

With buffer (Ø20) MXQ20-



* Other dimensions are identical to the basic type.

With end lock (Ø20) MXQ20-



* Other dimensions are identical to the basic type.

Axial piping type (Ø20) MXQ20-DDP







MXQ20L- 50 120.5 MXQ20L- 75 153.5 MXQ20L-100 210.5 MXQ20L-125 238.5 MXQ20L-150 268 266.5 282





With shock absorber (Ø20) MXQ20L-DBS, BT, B

* Other dimensions are identical to the basic type.

With buffer (Ø20) MXQ20L-□□F



* Other dimensions are identical to the basic type.

With end lock (Ø20) MXQ20L-DR



* Other dimensions are identical to the basic type.

Axial piping type (Ø20) MXQ20L-□□P



Series MXQ Dimensions MXQ 25

For detailed dimensions of stroke adjusters, refer to the stroke adjuster options. For rubber stopper: Page 33 **Basic type** For metal stopper: Page 35 2-M8 x 1.25 thread depth 9 Air supply port 2-Rc 1/8 16 4 Max. 17 (Retraction end adjuster) 8 m 5 16 \odot ÷ ⊕-⊕ Extension end adjuster $ø6H9^{+0.030}_{0}$ depth 6 54.5 (Extension end adjuster) Retraction end adjuster 20 6.5 N-M6 x 1 thread depth 11 7 Ð Ð 16.5 (Extension end adjuster Ð Ð Ð Ð 8 84 **&** (†) \oplus ۲ 44 b© ജ 7 22 Ð Ð Ð 37 Ð 9 6 6.5 1.5 F e 6H9^{+0.030} depth 4-M6 x 1 thread depth 10 $\left(\frac{\mathbf{N}}{2}-1\right) \times \mathbf{F}$ 21.5 30 3-M8 x 1.25 thread depth 15 NA-M8 x 1.25 thread depth 8 15 Μ KA 31 Bottom view of MXQ25-75 15 8 Κ 31 65 50 22 15 0.5 8 ω 0-0 6-6 49.5 55 œ Θ Ē Z \oplus -ΖZ (<u>NN</u>-1) x H G 11.5 Н 32 32 11.5 в A ø6.6 ø6.6 ⊕ ⊕ ø12 ø11 ø11 ø12 A æ A ⊕ ⊕ 35 1.5 7 Α В NN-M8 x 1.25 thread depth 16 6H9 ^{+0.030} depth 6 / GA HA ø6H9^{+0.030}₀ depth 6 Section AA Section BB (mm) NN HA NA Model F Ν G н GA Т J Κ KA Μ Ζ ZZ MXQ25- 10 23 55 23 55 16 56 35 107 105 5 123 4 55 2 4 MXQ25- 20 46 4 23 55 2 23 55 16 56 45 4 107 105.5 123 MXQ25- 30 107 123 55 4 23 55 2 23 55 16 56 55 4 105.5 MXQ25-40 65 4 23 65 2 23 65 16 66 65 4 117 115.5 133 MXQ25- 50 75 4 32 80 2 32 80 16 90 75 4 141 139.5 157 MXQ25-75 3 72 65 100 100 166 164.5 182 60 6 31 4 MXQ25-100 48 8 44 44 4 88 88 20 150 125 170 8 205 203.5 221



205

230

150

175

223

248

8

8

258

256.5

283 281.5 299

274

MXQ25-125

MXQ25-150

60

65

8

8

31

56

66

66

4

4

97

122

132

132

18

18



With buffer (Ø25) MXQ25-DDF



* Other dimensions are identical to the basic type.





Series MXQ

Dimensions MXQ 25L/Symmetric Type



															(mm)
Model	F	Ν	G	Н	NN	GA	HA	I	J	κ	KA	NA	М	Z	ZZ
MXQ25L- 10	55	4	23	55	2	23	55	16	56	35	_	4	107	105.5	123
MXQ25L- 20	46	4	23	55	2	23	55	16	56	45	—	4	107	105.5	123
MXQ25L- 30	55	4	23	55	2	23	55	16	56	55	_	4	107	105.5	123
MXQ25L- 40	65	4	23	65	2	23	65	16	66	65	—	4	117	115.5	133
MXQ25L- 50	75	4	32	80	2	32	80	16	90	75	_	4	141	139.5	157
MXQ25L- 75	60	6	_	_	3	72	65	31	100	100	_	4	166	164.5	182
MXQ25L-100	48	8	44	44	4	88	88	20	150	125	170	8	205	203.5	221
MXQ25L-125	60	8	31	66	4	97	132	18	205	150	223	8	258	256.5	274
MXQ25L-150	65	8	56	66	4	122	132	18	230	175	248	8	283	281.5	299



With shock absorber (Ø25) MXQ25L-DBS, BT, B



* Other dimensions are identical to the basic type.

With buffer (Ø25) MXQ25L-DDF



* Other dimensions are identical to the basic type.

With end lock (Ø25) MXQ25L-DDR



* Other dimensions are identical to the basic type.

Axial piping type (Ø25) MXQ25L-□□P





Adjuster Dimensions

Rubber Stopper (AS, AT)

Extension end

Body mounting section	Applicable	Model	Stroke				Bod	y mou	Inting	sectio	n		Tat	ole mo	ounting	g section
D A <u>P</u>	size	Woder	range mm	Α	В	С	D	Е	F	G	М	P *1)	Н	J	κ	Q *1)
	MYO 6	MXQ-AS 6	5	6	10	0	7	16.5	7	25	MEXOD	MOEXC	10.5	6	0.0	MOEVO
		MXQ-AS 6-X11	15	ю	19	0	1	26.5	'	2.5	0.0 X CIVI	IVIZ.5 X 0	12.5	o	0.3	1012.3 X 0
		MXQ-AS 8	5					19.5								
	MXQ 8	MXQ-AS 8-X11	15	7	22	9	7.5	29.5	8	3	M6 x 1	M3 x 8	14.6	7	9.8	M3 x 10
		MXQ-AS 8-X12	25					39.5								
G		MXQ-AS12	5					23.5								
	MXQ12	MXQ-AS12-X11	15	9.5	.5 29	14	11	33.5	12	4	M8 x 1	M4 x 12	18.5	10.5	12.7	M4 x 12
→		MXQ-AS12-X12	25					43.5		_						
		MXQ-AS16	5			36 17 1	7 13.5	24.5								
Table mounting section	MXQ16	MXQ-AS16-X11	15	11	36			34.5	14	5	M10 x 1	M5 x 16	21	13	15	M5 x 16
<u>`</u>		MXQ-AS16-X12	25					44.5								
		MXQ-AS20	5					27.5								
	→ MXQ20 M K M M MXQ25 M	MXQ-AS20-X11	15	13	45	20	16	37.5	17	6	M12 x 1.25	M6 x 16	25	16	18	M6 x 16
н к		MXQ-AS20-X12	25					47.5								
		MXQ-AS25	5					32.5								
		MXQ-AS25-X11	15	16	54 2	22	18	42.5	19	6	M14 x 1.5	M8 x 18	31	17	20	M8 x 18
		MXQ-AS25-X12	25					52.5								

*1) Dimensions of hexagon socket head cap screws.

*2) Also applicable to symmetric type. Refer to page 3 for ordering instructions.

Dimensions are identical to standard type.

Retraction end

ß

G

	Applicable size	Model	adjustment range mm	Α	В	С	D	Е	F	G	н	J	K *1)
	MYO 6	MXQ-AT 6	5	175	10	10.5	0	16.5	6	7	25	MEVOR	MOEVE
		MXQ-AT 6-X11	15	17.5	19	10.5	0	26.5	0		2.0		1012.5 X 0
		MXQ-AT 8	5					19.5					
4	MXQ 8	MXQ-AT 8-X11	15	21	22	12.5	10	29.5	8	8	3	M6 x 1	M3 x 8
		MXQ-AT 8-X12	25					39.5					
		MXQ-AT12	5					23.5					
+	MXQ12	MXQ-AT12-X11	15	28	29	16	16	33.5	10	12	4	M8 x 1	M4 x 10
⊐		MXQ-AT12-X12	25					43.5					
_		MXQ-AT16	5					24.5	12				
-	MXQ16	MXQ-AT16-X11	15	33.5	35.5	20	17	34.5		14	5	M10 x 1	M5 x 12
		MXQ-AT16-X12	25					44.5					
		MXQ-AT20	5					27.5					
	MXQ20	MXQ-AT20-X11	15	41	44.5	25	23	37.5	13	17	6	M12 x 1.25	M5 x 14
		MXQ-AT20-X12	25					47.5					
		MXQ-AT25 5	5					32.5					
	MXQ25 MX	MXQ-AT25-X11	15	49	53.5	31	28	42.5	5 15	19	6	M14 x 1.5	M6 x 18
		MXQ-AT25-X12	25					52.5					

*1) Dimensions of hexagon socket head cap screws.

*2) Also applicable to symmetric type.

Refer to page 3 for ordering instructions. Dimensions are identical to standard type.

SMC

Stroko

With Shock Absorber (BS, BT)

Extension end



MXQ-BS20 MXQ-BS 8 MXQ-BS25 MXQ-BS12 MXQ-BS16

Table mounting section



Applicable	Model	Stroke		Body mounting section									Table mounting section						
size	Woder	range mm	Α	В	С	D	Е	E1	F	G	М	P *1)	н	J	K	L	Q *1)		
MXQ 8	MXQ-BS 8	20	7	24.5	14	12.5	40.8	5	12	1.4	M8 x 1	M3 x 12	16.6	8	12	14.6	M3 x 12		
MXQ12	MXQ-BS12	18	9.5	29	14	11	40.8	6	12	1.4	M8 x 1	M4 x 12	20.5	11	13	18.5	M4 x 12		
MXQ16	MXQ-BS16	22	11	36	17	13.5	46.7	7	14	1.4	M10 x 1	M5 x 16	23	13.5	16	21	M5 x 16		
MXQ20	MXQ-BS20	35	13	46	22	17.5	67.3	11	19	12	M14 x 1.5	M6 x 18	27	17	22	25	M6 x 20		
MXQ25	MXQ-BS25	35	16	54	22	18	67.3	12	19	12	M14 x 1.5	M8 x 18	33	19	22	31	M8 x 20		

*1) Dimensions of hexagon socket head cap screws.

*2) Also applicable to symmetric type. Refer to page 3 for ordering instructions. Dimensions are identical to standard type.

Retraction end



Applicable size	Model	Stroke adjustment range mm	A	в	с	D	E	E1	F	G	н	J	K *1)
MXQ 8	MXQ-BT 8	20	23	24.5	12.5	14	40.8	5	8	12	1.4	M8 x 1	M3 x 8
MXQ12	MXQ-BT12	18	28	29	16	16	40.8	6	10	12	1.4	M8 x 1	M4 x 10
MXQ16	MXQ-BT16	22	33.5	35.5	20	17	46.7	7	12	14	1.4	M10 x 1	M5 x 12
MXQ20	MXQ-BT20	35	43	46	26	25	67.3	11	13	19	12	M14 x 1.5	M5 x 14
MXQ25	MXQ-BT25	35	49	53.5	31	28	67.3	12	15	19	12	M14 x 1.5	M6 x 18

*1) Dimensions of hexagon socket head cap screws.

*2) Also applicable to symmetric type.

Refer to page 3 for ordering instructions. Dimensions are identical to standard type.



Adjuster Dimensions

Metal Stopper (CS, CT)

Extension end

ψψ L

Body mounting section	Applicable	Madal	Stroke			1	Body	mour	nting	sectio	n		T	able r	noun	ting s	ection
D. A. <u>P</u>	size	woder	range mm	Α	В	С	D	Ε	F	G	М	P *1)	Н	J	Κ	L	Q *1)
	MYO 6	MXQ-CS 6	5	6	10	0	7	15.5	7	25	MEXOD	MOEVE	115	7	0.0	10 5	MOEVO
		MXQ-CS 6-X11	15	б	19	0	1	25.5	1	2.5	0.0 X CIVI	IVI2.5 X 6	14.5	'	0.3	12.5	IVIZ.3 X 8
		MXQ-CS 8	5					18									
	MXQ 8	MXQ-CS 8-X11	15	7	22	9	7.5	28	8	3	M6 x 1	M3 x 8	16.6	8	9.8	14.6	M3 x 10
		MXQ-CS 8-X12	25					38									
GE		MXQ-CS12	5					22									
	MXQ12	MXQ-CS12-X11	15	9.5	29	14	11	32	12	4	M8 x 1	M4 x 12	20.5	11	13	18.5	M4 x 12
← →		MXQ-CS12-X12	25					42									
Table mounting section		MXQ-CS16	5				17 13.5	23	14 5								
Q	MXQ16	MXQ-CS16-X11	15	11	36	17		33		5	M10 x 1	M5 x 16	23	13.5	16	21	M5 x 16
$\overline{\nabla}$		MXQ-CS16-X12	25					43									
		MXQ-CS20	5					27									
	MXQ20	MXQ-CS20-X11	15	13	45	20	16	37	17	6	M12 x 1.25	M6 x 16	27	17	22	25	M6 x 20
		MXQ-CS20-X12	25					47									
		MXQ-CS25	5					30	19 6								
	MXQ25	MXQ-CS25-X11	15	16 5	54 22	54 22	22 18	40		6 M14 x 1.5	M8 x 18	33	19	22	31	M8 x 20	
τωτωί		MXQ-CS25-X12	25			4 22		50									

*1) Dimensions of hexagon socket head cap screws.

*2) Also applicable to symmetric type.

Refer to page 3 for ordering instructions.

Dimensions are identical to standard type.

Retraction end



Applicable size	Model	Stroke adjustment range mm	Α	в	С	D	Е	F	G	н	J	K *1)	
MYO 6	MXQ-CT 6	5	175	10	10.5	0	15.5	6	7	25	MEVOR	MOEVE	
	MXQ-CT 6-X11	15	17.5	19	10.5	0	25.5	0	'	2.5	IVID X 0.0	IVIZ.5 X 0	
	MXQ-CT 8	5					18						
MXQ 8	MXQ-CT 8-X11	15	21	22	12.5	10	28	8	8	3	M6 x 1	M3 x 8	
	MXQ-CT 8-X12	25					38						
	MXQ-CT12	5					22						
MXQ12	MXQ-CT12-X11	15	28 29	29	16	16	32	10	12	4	M8 x 1	M4 x 10	
	MXQ-CT12-X12	25					42						
	MXQ-CT16	5					23						
MXQ16	MXQ-CT16-X11	15	33.5	35.5	20	17	33	12	14	5	M10 x 1	M5 x 12	
	MXQ-CT16-X12	25					43						
	MXQ-CT20	5					27						
MXQ20	MXQ-CT20-X11	15	41	44.5	25	23	37	13	17	6	M12 x .25	M5 x 14	
	MXQ-CT20-X12	25					47						
	MXQ-CT25	5					30						
MXQ25	MXQ-CT25-X11	15	49	53.5 3	31	28	40	15	19	6	M14 x 1.5	M6 x 18	
M	MXQ-CT25-X12	25	49			20	50						

*1) Dimensions of hexagon socket head cap screws.

*2) Also applicable to symmetric type.

Refer to page 3 for ordering instructions. Dimensions are identical to standard type.



Construction



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ган	15 1151		
No.	Description	Material	Note
1	Body	Aluminum alloy	Hard anodized
2	Table	Stainless steel	Heat treated
3	End plate	Aluminum alloy	Hard anodized
4	Guide block	Stainless steel	Heat treated
5	Cover	Synthetic resin	
6	Return guide	Synthetic resin	
7	Scraper	Stainless steel, NBR	
8	Rod	Stainless steel	
9	Piston assembly		With magnet on one side
10	Rod cover	Aluminum alloy	Anodized
11	Seal support	Brass	Electroless nickel plated
12	Head cap	Synthetic resin	
13	Floating bushing	Stainless steel	
14	Rod bumper	Polyurethane	
15	End bumper	Polyurethane	
16	Steel ball	High carbon chromium bearing steel	
17	Parallel pin	Stainless steel	
18	Piston seal	NBR	
19	Rod seal	NBR	
20	O-ring	NBR	

With buffer/Parts list

No.	Description	Material	Note
21	End plate	Aluminum alloy	Hard anodized
22	Spring collar	Stainless steel	
23	Head cap	Stainless steel	
24	Spring	Stainless steel	
25	Magnet	Rare earth	

Replacement parts: Seal kits

Cylinder bore size (mm)	Kit no.	Content
6	MXQ 6-PS	
8	MXQ 8-PS	Above numbers
12	MXQ12-PS	18 to 20
16	MXQ16-PS	(1 set)
20	MXQ20-PS	(1 300)
25	MXQ25-PS	

Replacement parts: End lock type seal kits

Cylinder bore size (mm)	Kit no.	Content					
8	MXQ 8R-PS	Above numbers					
12	MXQ12R-PS	18 to 20,					
16	MXQ16R-PS	and					
20	MXQ20R-PS	33 to 36					
25	MXQ25R-PS	(1 set)					

Axial piping type

(42)

37

(41)

(39)

With end lock/Parts list

No.	Description	Material	Note
26	Locking body	Aluminum alloy	Hard anodized
27	Table support	Carbon steel	Anticorrosive treatment
28	Rod cover	Aluminum alloy	
29	Piston rod	Stainless steel	
30	Bushing	Aluminum alloy	Chromated
31	Blanking plug	Brass	Electroless nickel plated
32	Return spring	Stainless steel	
33	Piston seal	NBR	
34	Rod seal	NBR	
35	O-ring	NBR	
36	O-ring	NBR	

Axial piping type/Parts list

No.	Description	Material	Note
37	Axial piping plate	Aluminum alloy	Hard anodized
38	Pipe	Aluminum alloy	Hard anodized
39	Bushing	Aluminum alloy	Chromated
40	Stud	Brass	Electroless nickel plated
41	O-ring	NBR	
42	O-ring	NBR	
43	Gasket	NBR, Stainless steel	
44	O-ring	NBR	

* Seal kits consist of items in the table below, and can be ordered using the kit number for each cylinder bore size.

Replacement parts: Axial piping type seal kits

Cylinder bore size (mm)	Kit no.	Content
6	MXQ 6P-PS	Above numbers
8	MXQ 8P-PS	18 to 20, and 41 to 44
12	MXQ12P-PS	(1 set)
16	MXQ16P-PS	Above numbers
20	MXQ20P-PS	18 to 20, and 41 to 43
25	MXQ25P-PS	(1 set)



Reed Switches/Direct Mount Type D-A90(V), D-A93(V), D-A96(V)



Auto Switch Internal Circuits Lead wire colors inside [] are those prior to

conformity with IEC standards.



Auto Switch Specifications

Auto switch part no.	D-A90	D-A90V	D-A93	D-A93V	D-A96	D-A96V	
Electrical entry direction	In-line	Perpendicular	In-line	Perpendicular	In-line	Perpendicular	
Wiring type		2 w	/ire		3 v	vire	
Applicable load	IC circui Pl	t, Relay, ₋C	Relay	v, PLC	IC c	ircuit	
Load /Load voltage and Max. load current	24V ^{AC} _{DC} or I 48V ^{AC} _{DC} or I 100V ^{AC} _{DC} or	ess/50mA ess/40mA less/20mA	24VDC/5 100VAC/5	5 to 40mA 5 to 20mA	4 to 8VE	0C/20mA	
Contact protection circuit			No	ne			
Internal voltage drop	()	2.6V (or less	0.8V or less		
Indicator light	No	ne		Red LED ligh	nts when ON		
Lead wire Oil resistant h D-A90(V), D-A93(V) 0.18m D-A96(V) 0.15m [Red, [Red, Insulation resistance .501 (bb (bb Withstand voltage .100 (bb (bb Auto Switch We	eavy duty vinyl c mm ² x 2 cores (Br mm ² x 3 cores (Br White, Black]) MΩ or more at 50 tween lead wire 00VAC for 1min. tween lead wire Eights	ord, ø2.7, 0.5m own, Blue [Red, E own, Black, Blue 00VDC and case) and case)	Operat Operat Ambie Impact Leakag Enclos For 3 n part nu Example	ing time resistance ge current Watert neter lead wire, imber. e) D-A90L	12ms 	C 0.6G} (JISCO920) nd of	
						(0	

Туре	D-A90	D-A90V	D-A93	D-A93V	D-A96	D-A96V
Lead wire length 0.5m	8	8	8	8	8	8
Lead wire length 3m	41	41	41	41	41	41

Contact Protection Boxes

Type D-A9 switches do not have internal contact protection circuits. Use a contact protection box with an induction load, when lead wires are 5 meters or longer, and with 100VAC.

Part no.	Voltage	Lead wire length
CD-P11	100VAC	Switch connection side 0.5m
CD-P12	24VDC	Load connection side 0.5m

Since D-A90(V) switches have no particular specified voltage below 100VAC, select a model based on the voltage being used.





Auto Switch Dimensions

D-A90, D-A93, D-A96



Type D-A93 dimensions are shown inside ().

D-A90V, D-A93V, D-A96V



SMC

Solid State Switches/Direct Mount Type **D-F9N(V)**, **D-F9P(V)**, **D-F9B(V)**

Grommet



Auto Switch Internal Circuits

Lead wire colors inside [] are those prior to conformity with IEC standards.





Auto Switch Specifications

D-F9 , D-F9	V (with ind	dicator ligh	t)					
Auto switch part no.	D-F9N	D-F9NV	D-F9P	D-F9PV	D-F9B	D-F9BV		
Electrical entry direction	In-line	Perpendicular	In-line	Perpendicular	In-line	Perpendicular		
Wiring type		3 w	vire		2 v	vire		
Output type	N	PN	Р	NP	-	_		
Applicable load		IC circuit, F	Relay, PLC		24VDC r	elay, PLC		
Power supply voltage		5, 12, 24VDC	(4.5 to 28V)	-	_		
Current consumption		10mA	or less		-	_		
Load voltage	28VD0	C or less	-	_	24VDC (10 to 28VDC			
Load current	40mA	or less	80mA	or less	5 to 4	40mA		
Internal voltage drop	1.5V (0.8V or less at ?	or less 10mA load current)	0.8V	or less	4V o	r less		
Leakage current		100µA or les	s at 24VDC		0.8mA or less			
Indicator light			Red LED lig	hts when ON				
• Lead wireOil resist D-F9N(V), D-F9P(V)	tant heavy duty 0.15mm ² x 3 (Brown, Bla	vinyl cord, ø2.7, 0. 3 cores ck, Blue [Red, Wh	5m • C • Ir ite, Black]) • E	perating time npact resistance nclosure IE	1ms o 	r less /s² P67 (JISCO920)		
D-F9B(V) • Insulation resistance	0.18mm² x 2 (Brown, Blu 50MΩ or mo	2 cores e [Red, Black]) ore at 500VDC	• F n	W or 3 meter lead v umber.	atertight type vire, L is added	to end of part		
Withstand voltage	(between les 1000VAC fo (between les	ad wire and case) r 1min. ad wire and case)						
 Indicator light Ambient temperature 	Lights when –10 to 60°C	ON						

Auto Switch Weights

						(g)
Model	D-F9N	D-F9P	D-F9B	D-F9NV	D-F9PV	D-F9BV
Lead wire length 0.5m	7	7	6	7	7	6
Lead wire length 3m	37	37	31	37	37	31

Auto Switch Dimensions



D-F9NV, D-F9PV, D-F9BV

SMC

Indicator light



Mounting screw M2.5 x 42 Slotted set screw



2 Color Indication Solid State Switches Direct Mount Type D-F9NW(V), D-F9PW(V), D-F9BW(V)

Grommet



Auto Switch Internal Circuits

Lead wire colors inside [] are those prior to conformity with IEC standards.

D-F9NW(V)





D-F9BW(V)



Indicator light/Display method



Auto Switch Specifications

D-F9□W, D-	F9□WV (with indica	tor light)							
Auto switch part no.	D-F9NW	D-F9NWV	D-F9PW	D-F9PWV	D-F9BW	D-F9BWV				
Electrical entry direction	In-line	Perpendicular	In-line	Perpendicular	In-line	Perpendicular				
Wiring type		3 wire 2 wire								
Output type	N	PN	PI	NP	-	_				
Applicable load		IC circuit, F	Relay, PLC		24VDC r	elay, PLC				
Power supply voltage		5, 12, 24VDC	C (4.5 to 28V)		-	_				
Current consumption		10mA								
Load voltage	28VDC	or less	-	_	24VDC (10 to 28VDC)					
Load current	0.4mA	or less	80mA	or less	5 to	40mA				
Internal voltage drop	1.5V of (0.8V or less at 1	or less 0mA load current)	0.8V (or less	4V or less					
Leakage current		100µA or les	s at 24VDC		0.8mA	or less				
Indicator light		Actuated pos Optimum op	sition erating positio	Red LED on Green L	lights up ED lights up					
Lead wireOil resistant heavy duty vinyl cord, ø2.7, 0.5m D-F9NW(V), D-F9PW(V) 0.15mm ^e x 3 cores (Brown, Black, Blue [Red, White, Black]) D-F9BW(V) 0.18mm ^e x 2 cores (Brown, Blue [Red, Black]) Insulation resistance										

For 3 meter lead wire, L is added to end of part number. Example) D-F9NWL

Auto Switch Weights

						(g)
Model	D-F9NW	D-F9NWV	D-F9PW	D-F9PWV	D-F9BW	D-F9BWV
Lead wire length 0.5m	7	7	7	7	7	7
Lead wire length 3m	34	34	34	34	32	32

Auto Switch Dimensions

D-F9NW, D-F9PW, D-F9BW



D-F9NWV, D-F9PWV, D-F9BWV



Auto Switch Connections and Examples

Basic Wiring

3 wire, NPN



3 wire, PNP



PLC input specifications, as the connection method will vary depending on the PLC input specifications.

Connection Examples for AND (Series) and OR (Parallel)





Series MXQ

Auto Switches/Proper Mounting Position for Stroke End Detection

Reed switches: D-A90, D-A93, D-A96, D-A90V, D-A93V, D-A96V

		В												Switch						
Model	A				S	strok	е				Stroke									operating
		10	20	30	40	50	75	100	125	150	10	20	30	40	50	75	100	125	150	range
MXQ6	6	5.5	5.5	5.5	13.5	13.5	_	-	-	_	3.5 (1)	3.5 (1)	3.5 (1)	11.5 (9)	11.5 (9)	-	-	-	-	4.5
MXQ8	7.5	8	8	12	16	31	32	-	_	_	6 (3.5)	6 (3.5)	10 (7.5)	14 (11.5)	29 (26.5)	30 (27.5)	-	-	-	5
MXQ12	11.5	24.5	14.5	14.5	21.5	21.5	40.5	40.5	—	—	22.5 (20)	12.5 (10)	12.5 (10)	19.5 (17)	19.5 (17)	38.5 (36)	38.5 (36)	—	-	6
MXQ16	16.5	30.5	20.5	20.5	20.5	26.5	33.5	51.5	51.5	—	28.5 (26)	18.5 (16)	18.5 (16)	18.5 (16)	24.5 (22)	31.5 (29)	49.5 (47)	49.5 (47)	-	7
MXQ20	19	43.5	33.5	23.5	33.5	31.5	39.5	71.5	74.5	77.5	41.5 (39)	31.5 (29)	21.5 (19)	31.5 (29)	29.5 (27)	37.5 (35)	69.5 (67)	72.5 (70)	77.5 (75)	8
MXQ25	22	52.5	42.5	32.5	32.5	46.5	46.5	60.5	88.5	88.5	50.5 (48)	40.5 (38)	30.5 (28)	30.5 (28)	44.5 (42)	44.5 (42)	58.5 (56)	86.5 (84)	77.5 (75)	9



Solid state switches: D-F9B, D-F9N, D-F9P, D-F9BW, D-F9NW, D-F9PW

						В							Switch							
Model	A				S	Strok	е				Stroke									operating
		10	20	30	40	50	75	100	125	150	10	20	30	40	50	75	100	125	150	range
MXQ6	10	9.5	9.5	9.5	17.5	17.5	_	_	_	_	-0.5	-0.5	-0.5	7.5	7.5	—	_	_	_	2
MXQ8	11.5	12	12	16	20	35	36	_	_	_	2	2	6	10	25	26	—	—	_	2.5
MXQ12	15.5	28.5	18.5	18.5	25.5	25.5	44.5	44.5	_	—	18.5	8.5	8.5	15.5	15.5	34.5	34.5	—		3
MXQ16	20.5	34.5	24.5	24.5	24.5	30.5	37.5	55.5	55.5	—	24.5	14.5	14.5	14.5	20.5	27.5	45.5	45.5		4
MXQ20	23	47.5	37.5	27.5	37.5	35.5	43.5	75.5	78.5	81.5	37.5	27.5	17.5	27.5	25.5	33.5	65.5	68.5	73.5	6
MXQ25	27	56.5	46.5	36.5	36.5	50.5	50.5	64.5	92.5	92.5	46.5	36.5	26.5	26.5	40.5	40.5	54.5	82.5	73.5	6

Solid state switches: D-F9BV, D-F9NV, D-F9PV, D-F9BWV, D-F9NWV, D-F9PWV

		BE				Switch														
Model	A				S	Strok	е							S	troke	Э				operating
		10	20	30	40	50	75	100	125	150	10	20	30	40	50	75	100	125	150	range
MXQ6	10	9.5	9.5	9.5	17.5	17.5	—	—	—	—	1.5	1.5	1.5	9.5	9.5	—	—	—	—	2
MXQ8	11.5	12	12	16	20	35	36	—	—	—	4	4	8	12	27	28	—	_	—	2.5
MXQ12	15.5	28.5	18.5	18.5	25.5	25.5	44.5	44.5	_	—	20.5	10.5	10.5	17.5	17.5	36.5	36.5	_	—	3
MXQ16	20.5	34.5	24.5	24.5	24.5	30.5	37.5	55.5	55.5	—	26.5	16.5	16.5	16.5	22.5	29.5	47.5	47.5	_	4
MXQ20	23	47.5	37.5	27.5	37.5	35.5	43.5	75.5	78.5	81.5	39.5	29.5	19.5	29.5	27.5	35.5	67.5	70.5	75.5	6
MXQ25	27	56.5	46.5	36.5	36.5	50.5	50.5	64.5	92.5	92.5	48.5	38.5	28.5	28.5	42.5	42.5	56.5	84.5	75.5	6

Auto Switch Mounting



Auto switch mounting tools

 When tightening the auto switch set screw (included with auto switch), use a watchmakers screw driver with a handle diameter of about 5 to 6mm.

Tightening torque

 Apply a torque of approximately 0.05 to 0.1N·m. As a rule, it can be tightened about 90° past the position at which tightening can be felt.







Series MXQ Order Made Specifications Contact SMC for detailed dimensions, specifications and lead times.





Although martensitic stainless steel is used for the table and the guide block, use this specification when further anticorrosive measures are required. Anticorrosive treatment is applied to the table and the guide block.

Specifications

Туре	Anticorrosive specification type
Bore size (mm)	6, 8, 12, 16, 20, 25
Fluid	Air
Surface treatment	Anticorrosive treatment Note 2)

Note 1) Dimensions are identical to standard type.

Note 2) The table and the guide block will be black due to the anticorrosive treatment.

Series MXQ Safety Instructions

specific requirements.

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



Note 1) ISO 4414: Pneumatic fluid power – Recommendations for the application of equipment to transmission and control Note 2) JIS B 8370: General Rules for Pneumatic Equipment

🗥 Warning

- The compatibility of pneumatic equipment is the responsibility of the person who designs the pneumatic system or decides its specifications.
 Since the products specified here are used in various operating conditions, their compatibility for the specific pneumatic system must be based on specifications or after analysis and/or tests to meet your
- 2. Only trained personnel should operate pneumatically operated machinery and equipment.

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

- 3. Do not service machinery/equipment or attempt to remove components until safety is confirmed.
- 1. Inspection and maintenance of machinery/equipment should only be performed after confirmation of safe locked-out control positions.
- 2. When equipment is to be removed, confirm the safety process as mentioned above. Cut the supply pressure for this equipment and exhaust all residual compressed air in the system.
- 3. Before machinery/equipment is restarted, take measures to prevent shooting-out of cylinder piston rod, etc. (Bleed air into the system gradually to create back pressure.)

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

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



Series MXQ Actuator Precautions 1 Be sure to read before handling.

Design

A Warning

1. There is a danger of sudden action by air cylinders if sliding parts of machinery are twisted, etc., and changes in forces occur.

In such cases, human injury may occur; e.g., by catching hands or feet in the machinery, or damage to the machinery itself may occur. Therefore, the machine should be designed to avoid such dangers.

2. Install a protective cover when there is a risk of human injury.

If a driven object and moving parts of a cylinder pose a danger of human injury, design the structure to avoid contact with the human body.

3. Securely tighten all stationary parts and connected parts so that they will not become loose.

Especially when a cylinder operates with high frequency or is installed where there is a lot of vibration, ensure that all parts remain secure.

4. A deceleration circuit or shock absorber, etc., may be required.

When a driven object is operated at high speed or the load is heavy, a cylinder's cushion will not be sufficient to absorb the impact. Install a deceleration circuit to reduce the speed before cushioning, or install an external shock absorber to relieve the impact. In this case, the rigidity of the machinery should also be examined.

5. Consider a possible drop in operating pressure due to a power outage, etc.

When a cylinder is used in a clamping mechanism, there is a danger of work pieces dropping if there is a decrease in clamping force due to a drop in circuit pressure caused by a power outage, etc. Therefore, safety equipment should be installed to prevent damage to machinery and/or human injury. Suspension mechanisms and lifting devices also require consideration for drop prevention.

6. Consider a possible loss of power source.

Measures should be taken to protect against human injury and equipment damage in the event that there is a loss of power to equipment controlled by air pressure, electricity or hydraulics, etc.

7. Design circuitry to prevent sudden lurching of driven objects.

When a cylinder is driven by an exhaust center type directional control valve or when starting up after residual pressure is exhausted from the circuit, etc., the piston and its driven object will lurch at high speed if pressure is applied to one side of the cylinder because of the absence of air pressure inside the cylinder. Therefore, equipment should be selected and circuits designed to prevent sudden lurching because, there is a danger of human injury and/or damage to equipment when this occurs.

8. Consider emergency stops.

Design so that human injury and/or damage to machinery and equipment will not be caused when machinery is stopped by a safety device under abnormal conditions, a power outage or a manual emergency stop.

9. Consider the action when operation is restarted after an emergency stop or abnormal stop.

Design the machinery so that human injury or equipment damage will not occur upon restart of operation. When the cylinder has to be reset at the starting position, install safe manual control equipment.

Selection

A Warning

1. Confirm the specifications.

The products advertised in this catalog are designed according to use in industrial compressed air systems. If the products are used in conditions where pressure, temperature, etc., are out of specification, damage and/or malfunction may be caused. Do not use in these conditions. (Refer to specifications.)

Consult SMC if you use a fluid other than compressed air.

2. Intermediate stops

When intermediate stopping of a cylinder piston is performed with a 3 position closed center type directional control valve, it is difficult to achieve stopping positions as accurate and minute as with hydraulic pressure due to the compressibility of air.

Furthermore, since valves and cylinders, etc., are not guaranteed for zero air leakage, it may not be possible to hold a stopped position for an extended period of time. Contact SMC in case it is necessary to hold a stopped position for an extended period.

\land Caution

1. Use a speed controller to adjust the cylinder drive speed, gradually increasing from a low speed to the desired speed setting.

Mounting

▲ Caution

1. Do not use until you can verify that equipment can operate properly.

Verify correct mounting by suitable function and leakage inspections after compressed air and power are connected following mounting, maintenance or conversions.

2. Instruction manual

The product should be mounted and operated after thoroughly reading the manual and understanding its contents. Keep the instruction manual where it can be referred to as needed.

Piping

Caution Preparation before piping

Before piping is connected, it should be thoroughly blown out with air (flushing) or washed to remove chips, cutting oil and other debris from inside the pipe.

Lubrication

▲ Caution

1. Lubrication of non-lube type cylinder

The cylinder is lubricated at the factory and can be used without any further lubrication.

However, in the event that it will be lubricated, use class 1 turbine oil (without additives) ISO VG32.

Stopping lubrication later may lead to malfunction due to the loss of the original lubricant. Therefore, lubrication must be continued once it has been started.



Series MXQ Actuator Precautions 2 Be sure to read before handling.

Air Supply

Warning

1. Use clean air.

Do not use compressed air which includes chemicals, synthetic oils containing organic solvents, salt or corrosive gases, etc., as it can cause damage or malfunction.

\land Caution

1. Install air filters.

Install air filters at the upstream side of valves. The filtration degree should be $5\mu m$ or finer.

2. Install an after cooler, air dryer or water separator, etc.

Air that includes excessive drainage may cause malfunction of valves and other pneumatic equipment. To prevent this, install an after cooler, air dryer or water separator, etc.

3. Use the product within the specified range of fluid and ambient temperature.

Take measures to prevent freezing, since moisture in circuits can be frozen under $5^\circ\text{C},$ and this may cause damage to seals and lead to malfunction.

Refer to SMC's "Air Cleaning Equipment" catalog for further details on compressed air quality.

Operating Environment

\land Warning

1. Do not use in environments where there is a danger of corrosion.

Refer to the construction drawings regarding cylinder materials.

- 2. In dusty locations or where water, oil, etc., splash on the equipment, take suitable measures to protect the entire unit.
- 3. When using auto switches, do not operate in an environment with strong magnetic fields. This can cause auto switch malfunction.

Maintenance

Warning

1. Maintenance should be performed according to the procedure indicated in the instruction manual.

If handled improperly, malfunction and damage of machinery or equipment may occur.

2. Removal of equipment, and supply/exhaust of compressed air.

When equipment is removed, first check measures to prevent dropping of driven objects and run-away of equipment, etc. Then cut off the supply pressure and electric power, and exhaust all compressed air from the system.

When machinery is restarted, proceed with caution after confirming measures to prevent cylinder lurching.

\land Caution

1. Drain flushing

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

Series MXQ Auto Switch Precautions 1

Be sure to read before handling.

Design and Selection

A Warning

1. Confirm the specifications.

Read the specifications carefully and use this product appropriately. The product may be damaged or malfunction if it is used outside the range of specifications of current load, voltage, temperature or impact.

2. Take precautions when multiple cylinders are used close together.

When multiple auto switch cylinders are used in close proximity, magnetic field interference may cause the switches to malfunction. Maintain a minimum cylinder separation of 40mm. (When the allowable separation is indicated for each cylinder series, use the specified value.)

3. Pay attention to the length of time that a switch is ON at an intermediate stroke position.

When an auto switch is placed at an intermediate position of the stroke and a load is driven at the time the piston passes, the auto switch will operate, but if the speed is too great the operating time will be shortened and the load may not operate properly. The maximum detectable piston speed is:

 $V(mm/s) = \frac{Auto switch operating range (mm)}{Time load applied (ms)} \times 1000$

4. Keep wiring as short as possible.

<Reed switch>

As the length of the wiring to a load gets longer, the rush current at switching ON becomes greater, and this may shorten the product's life. (The switch will stay ON all the time.)

- 1) For an auto switch without a contact protection circuit, use a contact protection box when the wire length is 5m or longer.
- 2) Even if an auto switch has a built-in contact protection circuit, when the wiring is more than 30m long, it is not able to adequately absorb the rush current and its life may be reduced. It is again necessary to connect a contact protection box in order to extend its life. Please contact SMC in this case.

<Solid state switch>

3) Although wire length should not affect switch function, use wiring 100m or shorter.

5. Take precautions for the internal voltage drop of the switch.

<Reed switch>

- 1) Switches with an indicator light (Except D-A96, A96V)
 - If auto switches are connected in series as shown below, take note that there will be a large voltage drop because of internal resistance in the light emitting diodes. (Refer to internal voltage drop in the auto switch specifications.)

[The voltage drop will be "n" times larger when "n" auto switches are connected.]

Even though an auto switch operates normally, the load may not operate.

		ł
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\land Warning

 In the same way, when operating under a specified voltage, although an auto switch may operate normally, the load may not operate. Therefore, the formula below should be satisfied after confirming the minimum operating voltage of the load.

Supply _ Internal voltage _ Minimum operating voltage _ drop of switch _ voltage of load

 If the internal resistance of a light emitting diode causes a problem, select a switch without an indicator light (Model D-A90, 90V).

<Solid state switch>

3) Generally, the internal voltage drop will be greater with a 2 wire solid state auto switch than with a reed switch. Take the same precautions as in 1).

Also, note that a 12VDC relay is not applicable.

6. Pay attention to leakage current.

<Solid state switch>

With a 2 wire solid state auto switch, current (leakage current) flows to the load to operate the internal circuit even when in the OFF state.

Operating current of load (OFF condition) > Leakage current

If the criteria given in the above formula are not met, it will not reset correctly (stays ON). Use a 3 wire switch if this specification will not be satisfied.

Moreover, leakage current flow to the load will be "n" times larger when "n" auto switches are connected in parallel.

7. Do not use a load that generates surge voltage.

<Reed switch>

If driving a load such as a relay that generates a surge voltage, use a switch with a built-in contact protection circuit or use a contact protection box.

<Solid state switch>

Although a zener diode for surge protection is connected at the output side of a solid state auto switch, damage may still occur if the surge is applied repeatedly. When a load, such as a relay or solenoid valve, which generates surge is directly driven, use a type of switch with a built-in surge absorbing element.

8. Cautions for use in an interlock circuit

When an auto switch is used for an interlock signal requiring high reliability, devise a double interlock system to avoid trouble by providing a mechanical protection function, or by also using another switch (sensor) together with the auto switch. Also perform periodic maintenance and confirm proper operation.

9. Ensure sufficient clearance for maintenance activities.

When designing an application, be sure to allow sufficient clearance for maintenance and inspections.



Series MXQ **Auto Switch Precautions 2** Be sure to read before handling.

Mounting and Adjustment

A Warning

1. Do not drop or bump.

Do not drop, bump or apply excessive impacts (300m/s² or more for reed switches and 1000m/s² or more for solid state switches) while handling

Although the body of the switch may not be damaged, the inside of the switch could be damaged and cause a malfunction.

2. Do not carry a cylinder by the auto switch lead wires.

Never carry a cylinder by its lead wires. This may not only cause broken lead wires, but it may cause internal elements of the switch to be damaged by the stress.

3. Mount switches using the proper tightening torque.

When a switch is tightened beyond the range of tightening torque, the mounting screws, mounting bracket or switch may be damaged. On the other hand, tightening below the range of tightening torque may allow the switch to slip out of position. (Refer to page 41 regarding switch mounting, moving, and tightening torque, etc.)

4. Mount a switch at the center of the operating range.

Adjust the mounting position of an auto switch so that the piston stops at the center of the operating range (the range in which a switch is ON). (The mounting positions shown in the catalog indicate the optimum positions at stroke end.) If mounted at the end of the operating range (around the borderline of ON and OFF), operation may be unstable.

Wiring

🗥 Warning

1. Avoid repeatedly bending or stretching lead wires

Broken lead wires will result from repeatedly applying bending stress or stretching force to the lead wires.

2. Be sure to connect the load before power is applied.

<2 wire type>

If the power is turned ON when an auto switch is not connected to a load, the switch will be instantly damaged because of excess current

3. Confirm proper insulation of wiring.

Be certain that there is no faulty wiring insulation (contact with other circuits, ground fault, improper insulation between terminals, etc.). Damage may occur due to excess current flow into a switch.

4. Do not wire with power lines or high voltage lines

Wire separately from power lines or high voltage lines, avoiding parallel wiring or wiring in the same conduit with these lines. Control circuits containing auto switches may malfunction due to noise from these other lines.

Wiring

A Warning

5. Do not allow short circuit of loads.

<Reed switch>

If the power is turned ON with a load in a short circuit condition, the switch will be instantly damaged because of excess current flow into the switch

<Solid state switch>

Models D-F9 (V). F9 W(V) and all models of PNP output type switches do not have built-in short circuit protection circuits. If loads are short circuited, the switches will be instantly damaged, as in the case of reed switches

Take special care to avoid reverse wiring with the brown (red) power supply line and the black (white) output line on 3 wire type switches.

6. Avoid incorrect wiring.

<Reed switch>

* A 24VDC switch with indicator light has polarity. The brown (red) lead wire or terminal no. 1 is (+), and the blue (black) lead wire or terminal no. 2 is (-).

- 1) If connections are reversed, a switch will operate, however, the light emitting diode will not light up.
 - Also note that a current greater than that specified will damage a light emitting diode and it will no longer operate.

Applicable models: D-A93, A93V

<Solid state switch>

- 1) If connections are reversed on a 2 wire type switch, the switch will not be damaged if protected by a protection circuit, but the switch will be in a normally ON state. However, note that the switch will be damaged if reversed connections are made while the load is in a short circuited condition.
- *2) If connections are reversed (power supply line + and power supply line -) on a 3 wire type switch, the switch will be protected by a protection circuit. However, if the power supply line (+) is connected to the blue (black) wire and the power supply line (-) is connected to the black (white) wire, the switch will be damaged.

* Lead wire color changes

Lead wire colors of SMC switches have been changed in order to meet NECA Standard 0402 for production beginning September, 1996 and thereafter. Please refer to the tables provided. Special care should be taken regarding wire polarity during the time that the old colors still coexist with the new colors.

2 wire			3 wire		
	Old	New		Old	New
Output (+)	Red	Brown	Power supply	Red	Brown
Output (–)	Black	Blue	GND	Black	Blue
			Output	White	Black

Solid state with latch

Solid state

with diagnostic output			type diagnostic output			
	Old	New		Old	New	
Power supply	Red	Brown	Power supply	Red	Brown	
GND	Black	Blue	GND	Black	Blue	
Output	White	Black	Output	White	Black	
Diagnostic output	Yellow	Orange	Latch type diagnostic output	Yellow	Orange	

Series MXQ Auto Switch Precautions 3 Be sure to read before handling.

Operating Environment

A Warning

1. Never use in an atmosphere of explosive gases.

The structure of auto switches is not intended to prevent explosion. Never use in an atmosphere with an explosive gas since this may cause a serious explosion.

2. Do not use in an area where a magnetic field is generated.

Auto switches will malfunction or magnets inside cylinders will become demagnetized. (Consult SMC regarding the availability of a magnetic field resistant auto switch.)

3. Do not use in an environment where the auto switch will be continually exposed to water.

Although switches, except for some models, satisfy IEC standard IP67 construction (JIS C 0920: watertight construction), do not use switches in applications where continually exposed to water splash or spray. Poor insulation or swelling of the potting resin inside switches may cause malfunction.

4. Do not use in an environment with oil or chemicals.

Consult SMC if auto switches will be used in an environment with coolant, cleaning solvent, various oils or chemicals. If auto switches are used under these conditions for even a short time, they may be adversely affected by improper insulation, malfunction due to swelling of the potting resin, or hardening of the lead wires.

5. Do not use in an environment with temperature cycles.

Consult SMC if switches are used where there are temperature cycles other than normal temperature changes, as they may be adversely affected.

6. Do not use in an environment where there is excessive impact shock.

<Reed switch>

When excessive impact (300m/s² or more) is applied to a reed switch during operation, the contact will malfunction and generate or cut off a signal momentarily (1ms or less). Consult SMC regarding the need to use a solid state switch depending upon the environment.

7. Do not use in an area where surges are generated.

<Solid state switch>

When there are units (solenoid type lifter, high frequency induction furnace, motor, etc.) which generate a large amount of surge in the area around cylinders with solid state auto switches, this may cause deterioration or damage to internal circuit elements of the switch. Avoid sources of surge generation and disorganized lines.

8. Avoid accumulation of iron debris or close contact with magnetic substances.

When a large amount of ferrous debris such as machining chips or welding spatter is accumulated, or a magnetic substance (something attracted by a magnet) is brought into close proximity with an auto switch cylinder, it may cause auto switches to malfunction due to a loss of the magnetic force inside the cylinder.

Maintenance

A Warning

- 1. Perform the following maintenance periodically in order to prevent possible danger due to unexpected auto switch malfunction.
- Securely tighten switch mounting screws. If screws become loose or the mounting position is dislocated, retighten them after readjusting the mounting position.
- Confirm that there is no damage to lead wires. To prevent faulty insulation, replace switches or repair lead wires, etc., if damage is discovered.
- 3) Confirm the lighting of the green light on a 2 color indicator type switch.

Confirm that the green LED is on when stopped at the established position. If the red LED is on, the mounting position is not appropriate. Readjust the mounting position until the green LED lights up.

Other

A Warning

1. Consult SMC concerning water resistance, elasticity of lead wires and usage at welding sites, etc.



Series MXQ Specific Product Precautions 1

Be sure to read before handling.

Refer to pages 43 through 48 for safety instructions, actuator precautions and auto switch precautions.

Selection

ACaution

1. Use a load within a range that does not exceed the operating limit.

Select models based on the maximum load weight and the allowable moment. Refer to model selection on pages 7 and 8 for detailed methods. If operated beyond the operating limit, the eccentric load applied to the guide section will be excessive. This can have an adverse effect on service life due to vibration in the guide unit and loss of accuracy, etc.

2. When performing intermediate stops with an external stopper, employ measures to prevent lurching.

If lurching occurs damage can result. When making a stop with an external stopper to be followed by continued forward movement, first supply pressure to momentarily reverse the table, then retract the intermediate stopper, and finally apply pressure to the opposite port to operate the table again.

3. Do not operate in such a way that excessive external forces or impact forces are applied to the product.

This can cause damage.

Mounting

A Caution

1. Do not scratch or gouge the mounting surfaces of the body, table and end plate.

This can cause loss of parallelism in the mounting surfaces, vibration in the guide unit and increased operating resistance, etc.

2. Do not scratch or gouge the transfer surfaces of the rail and guide.

This can cause vibration and increased operating resistance, etc.



Mounting

3. Do not apply strong impacts or excessive moment when mounting work pieces.

Application of external forces greater than the allowable moment can cause vibration in the guide unit and increased operating resistance, etc.

4. Ensure that the parallelism of the mounting surface is 0.02mm or less.

Poor parallelism of the work piece mounted on the air slide table, the base, and other parts can cause vibration in the guide unit and increased operating resistance, etc.

- 5. For connection to a load that has an external support or guide mechanism, select an appropriate connection method and perform careful alignment.
- 6. Do not bring hands, etc., near the air slide table when in operation.

Hands, etc., may get caught in the stroke adjuster. Install a cover as a safety measure if there are instances to be near the slide table during operation.

7. Do not bring into close contact with objects which would be influenced by a magnetic field.

As an air slide table has magnets builtin, do not allow close contact with magnetic disks, magnetic cards or magnetic tapes. Data may be erased.



8. Do not attach magnets to the table section.

Since the table is constructed with a magnetic substance, it becomes magnetized when magnets, etc. are attached to it, and this may cause malfunction of auto switches, etc.

9. When mounting an air slide table, use screws of an appropriate length and tighten them properly at no more than the maximum tightening torque.

Tightening with a torque above the limit can cause malfunction, while insufficient tightening can cause slippage and dropping, etc.

1. Side mounting type (tapped holes)



Model	Bolt	Max. tightening torque N·m	Max. screw-in depth (Imm)
MXQ 6	M4 x 0.7	2.1	8
MXQ 8	M4 x 0.7	2.1	8
MXQ12	M5 x 0.8	4.4	10
MXQ16	M6 x 1	7.4	12
MXQ20	M6 x 1	7.4	12
MXQ25	M8 x 1.25	18	16

2. Side mounting type (through holes)

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Model	Bolt	Max. tightening torque N·m	/ mm
MXQ 6	M3 x 0.5	1.2	10.5
MXQ 8	M3 x 0.5	1.2	12.5
MXQ12	M4 x 0.7	2.8	16
MXQ16	M5 x 0.8	5.7	21
MXQ20	M5 x 0.8	5.7	26
MXQ25	M6 x 1	10	32

3. Vertical mounting type (tapped holes)



Model	Bolt	Max. tightening torque N⋅m	Max. screw-in depth (
MXQ 6	M2.5 x 0.45	0.5	4
MXQ 8	M3 x 0.5	0.9	4
MXQ12	M4 x 0.7	2.1	6
MXQ16	M5 x 0.8	4.4	7
MXQ20	M5 x 0.8	4.4	8
MXQ25	M6 x 1	7.4	10

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Series MXQ Specific Product Precautions 2 Be sure to read before handling.

Refer to pages 43 through 48 for safety instructions, actuator precautions and auto switch precautions.

Mounting

ACaution



Caution To prevent the work piece holding bolts from touching the end plate, use bolts that are 0.5mm or more shorter than the maximum screw-in depth. I long bolts are used, they can touch the end plate and cause malfunction, etc.

Model	Bolt	Max. tightening torque N⋅m	Max. screw-in depth (Imm)
MXQ 6	M3 x 0.5	0.9	5
MXQ 8	M4 x 0.7	2.1	6
MXQ12	M5 x 0.8	4.4	8
MXQ16	M6 x 1	7.4	10
MXQ20	M6 x 1	7.4	13
MXQ25	M8 x 1.25	18	15



bolts from touching the guide block, use bolts that are 0.5mm or more shorter than the maximum screw-in depth. If long bolts are used, they can touch the guide block and cause malfunction, etc.

Model	Bolt	Max. tightening torque N⋅m	Max. screw-in depth (Imm)
MXQ 6	M3 x 0.5	1.2	4
MXQ 8	M3 x 0.5	1.2	4.8
MXQ12	M4 x 0.7	2.8	6
MXQ16	M5 x 0.8	5.7	7
MXQ20	M5 x 0.8	5.7	9.5
MXQ25	M6 x 1	10	11.5

1. The positioning holes of the table and the bottom side of the body are not aligned. These positioning holes are used for re-mounting purposes after the product has been removed for maintenance, etc.

Operating Environment

A Caution

1. Do not use in environments where there is direct exposure to liquids such as cutting oil.

Operation in environments where the body is exposed to cutting oil, coolant or oil mist can cause vibration, increased operating resistance and air leakage, etc.

2. Do not use in environments where there is direct exposure to foreign matter such as dust, dirt, chips and spatter.

This can cause vibration, increased operating resistance and air leakage, etc. Consult SMC regarding use in this kind of environment.

- 3. Provide shade in locations exposed to direct sunlight.
- 4. Block off sources of heat located near by.

When there are heat sources in the surrounding area, radiated heat may cause the product's temperature to rise and exceed the operating temperature range. Block off the heat with a cover, etc.

5. Do not use in locations where vibration or impact occurs.

Consult SMC regarding use in this kind of environment, as damage and malfunction can result.

Handling of Adjuster Options

Stroke adjuster

▲ Caution

1. Do not replace the special adjusting bolt with other bolts.

This may cause looseness and damage due to impact forces, etc.

2. Use the tightening torque in the table below for the lock nut.

Insufficient torque will cause a decrease in the positioning accuracy.

Model	Tightening torque N·m
MXQ 6	3.0
MXQ 8	5.0
MXQ12	12.5
MXQ16	25.0
MXQ20	43.0
MXQ25	69.0

Handling of Adjuster Options

Stroke adjuster

ACaution

3. Do not strike the table with a wrench, etc., when adjusting the stroke adjuster.

This will cause looseness.



With shock absorber

A Caution

1. Never turn the screw on the bottom of the shock absorber body.

This is not an adjustment screw. Turning it can cause oil leakage.

2. Do not scratch the sliding surface of the shock absorber's piston rod.

This can cause a loss of durability and return malfunction.



3. The shock absorber is a consumable part. Replacement is necessary when a drop in energy absorbing capacity is noticed.

Applicable size	Shock absorber model	
MXQ 8	RB0805	
MXQ12	RB0806	
MXQ16	RB1007	
MXQ20	RB1411	
MXQ25	RB1412	

4. Use the tightening torque in the table below for the shock absorber's lock nut.

Model	Tightening torque N·m	
MXQ 8 MXQ12	1.67	
MXQ16	3.14	
MXQ20 MXQ25	10.8	





Series MXQ Specific Product Precautions 3

Be sure to read before handling. Refer to pages 43 through 48 for safety instructions, actuator precautions and auto switch precautions.

Handling of Functional Options

With end lock

1. Use 2 position solenoid valves with 4 or 5 ports.

A malfunction may occur with a control circuit that exhausts from both ports, such as exhaust center 3 position valves.



2. Be sure to connect a meterout speed controller to the cylinder.

When the cylinder is operated with meter-in speed control or without a speed controller, a malfunction may occur.

3. Be sure to release the air pressure when manually unlocking the end lock.

When the end lock is unlocked while the air pressure still remains, it may cause a damage to the work piece, etc.



With buffer mechanism

Caution

1. Use air slide tables with buffer mechanism in the orientations shown below.

In horizontal operation, the buffer may travel the stroke length and activate the auto switch depending on the load and the speed. Therefore, adjust the speed according to the load.



Vertical



Horizontal

2. Buffer mechanism auto switch: Refer to the table below for the proper mounting positions for stroke end detection.



*Adjust the auto switch position according to the load and the speed.

SMC

	(Unit: mm)	
Model	A	В
MXQ 6	2	
MXQ 8	2.5	
MXQ12	4	2
MXQ16	5	3
MXQ20	5.5	
MXQ25	10	

Handling of Symmetric Type

ACaution

1. When mounting a standard type and a symmetric type side by side, allow a space of 3mm or more between them.

A malfunction of the auto switch may occur with less space.

Allow a space of 3mm or more for a side by side mounting.





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