

# Made to Order Common Specifications:

-XC88: Spatter Resistant Coil Scraper, Lube-retainer, Grease for Welding (Piston rod: Stainless steel 304)

-XC89: Spatter Resistant Coil Scraper, Lube-retainer, Grease for Welding (Piston rod: S45C)

-XC91: Spatter Resistant Coil Scraper, Grease for Welding (Piston rod: S45C)



**62** Spatter Resistant Coil Scraper, Lube-retainer, Grease for Welding (Piston rod: Stainless steel 304) **-XC88**

**63** Spatter Resistant Coil Scraper, Lube-retainer, Grease for Welding (Piston rod: S45C) **-XC89**

Reduces spatter adhesion and improves durability by the use of the coil scraper, Lube-retainer and grease for welding.

**64** Spatter Resistant Coil Scraper, Grease for Welding (Piston rod: S45C) **-XC91**

With coil scraper and grease for welding

## Applicable Series

Series	Description	Model	Action	XC88	XC89	XC91	Vol. no. (for std model)
<b>MB</b>	Air cylinder	MB-Z	Double acting, Single rod	●	●	●	②-1 From P. 392
<b>CA2</b>	Air cylinder	CA2-Z	Double acting, Single rod	●	●	●	②-1 From P. 470
<b>CQ2</b>	Compact cylinder	CQ2-Z	Double acting, Single rod	●	●	●	②-1 From P. 773
	Long stroke	CQ2-Z	Double acting, Single rod	●	●	—	
	Anti-lateral load	CQ2□S-Z	Double acting, Single rod	●	●	—	
<b>MGP</b>	Compact guide cylinder	MGPM-Z	Double acting	●	●	●	②-2 From P. 432
<b>MK2T</b>	Rotary clamp cylinder	MK2T	Double acting	—	●	●	②-3 From P. 406
<b>CKG1</b>	Clamp cylinder	CKG1-Z	Double acting, Single rod	●	●	●	②-3 From P. 421

## Common Specifications: MB, CA2, CQ2, MK2T, CKG1

Part no.	Piston rod material (Hard chrome plating)		Coil scraper	Lube-retainer	Grease for welding
	S45C	Stainless steel 304			
-XC88	—	●	●	●	●
-XC89	●	—	●	●	●
-XC91	●	—	●	—	●

Note) Use the -XC91 in a place where the distance from the welding portion is far and the spatter scattering is minimized.

## Specifications: MGP

Part no.	Piston rod/Guide rod material (Hard chrome plating)		Coil scraper		Lube-retainer		Grease for welding
	S45C	Stainless steel 304	Rod side	Head side	Rod side	Head side	
-XC88	—	●	●	—	●	—	●
-XC91	●	—	●	—	●	—	●
-XC88W	—	●	●	●	●	●	●
-XC89W	●	—	●	●	●	●	●
-XC91W	●	—	●	●	●	—	●

\* The current product MGP-XC89 is equivalent to -XC91.

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- XC89: Spatter Resistant Coil Scraper, Lube-retainer, Grease for Welding (Piston rod: S45C)
- XC91: Spatter Resistant Coil Scraper, Grease for Welding (Piston rod: S45C)



## MB Series

**62** Spatter Resistant Coil Scraper, Lube-retainer, Grease for Welding (Piston rod: Stainless steel 304) **-XC88**

**63** Spatter Resistant Coil Scraper, Lube-retainer, Grease for Welding (Piston rod: S45C) **-XC89**

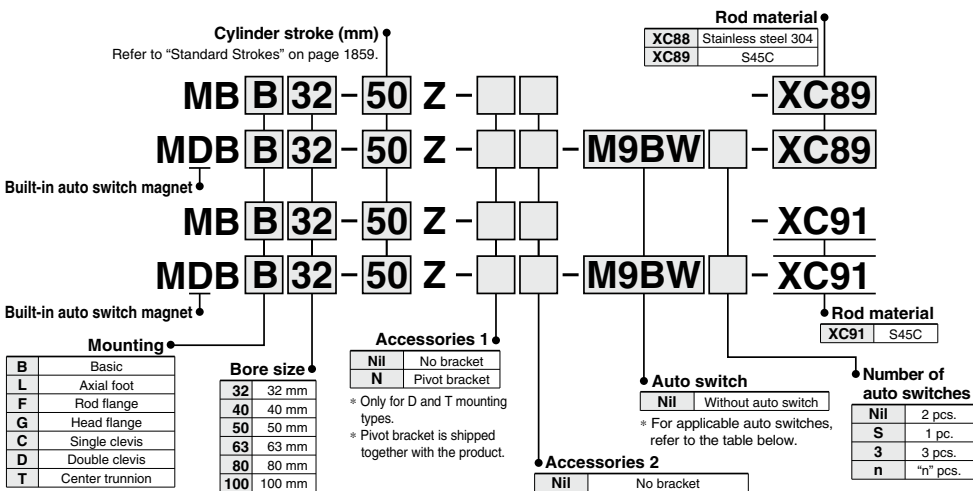
**64** Spatter Resistant Coil Scraper, Grease for Welding (Piston rod: S45C) **-XC91**

Reduces spatter adhesion and improves durability by the use of the coil scraper, Lube-retainer and grease for welding.

With coil scraper and grease for welding

### MB Series

### How to Order



### Made to Order

Part no.	Piston rod material (Hard chrome plated)		Coil scraper	Lube-retainer	Grease for welding
	S45C	Stainless steel 304			
-XC88	—	●	●	●	●
-XC89	●	—	●	●	●
-XC91	●	—	●	—	●

Note) Use the -XC91 in a place where the distance from the welding portion is far and the spatter scattering is minimized.

### Built-in Auto Switch Magnet Cylinder Model

If a built-in auto switch magnet cylinder without an auto switch is required, there is no need to enter the symbol for the auto switch. (Example) MDBB40-100Z-XC89

### Applicable Auto Switches

Refer to pages 1575 to 1701 for further information on auto switches.

Type	Special function	Electrical entry	Indicator light	Wiring (Output)	Load voltage		Auto switch model		Lead wire length (m)				Pre-wired connector	Applicable load		
					DC	AC	Tie-rod mounting	0.5 (Nil)	1 (M)	3 (L)	5 (Z)					
Solid state auto switch	—	Grommet	Yes	3-wire (NPN)	24 V	5 V, 12 V	—	M9N	●	●	●	○	○	IC circuit		
				3-wire (PNP)				M9P	●	●	○	○				
				2-wire				M9B	●	●	○	○				
	3-wire (NPN)			M9NW				●	●	○	○	IC circuit				
	3-wire (PNP)			M9PW				●	●	○	○					
	2-wire			M9BW				●	●	○	○					
Magnetic field resistant (2-color indicator)	—	Grommet	Yes	2-wire (Non-polar)	—	—	P3DWA	●	—	●	●	●	—			
				—			P4DW	—	—	●	●	●				
Reed auto switch	—	Grommet	Yes	3-wire (NPN equivalent)	24 V	5 V	12 V	A96	●	●	●	—	—	IC circuit	—	
				2-wire				A93	●	●	●	—	—	—	—	Relay, PLC
								A90	●	●	●	—	—	—	—	IC circuit

- \* Lead wire length symbols: 0.5 m ..... Nil (Example) M9NW  
1 m ..... M (Example) M9NWM  
3 m ..... L (Example) M9NLW  
5 m ..... Z (Example) M9NZW
- \* Solid state auto switches marked with "O" are produced upon receipt of order.
- \* For D-P3DWA/P4DW, ø40 to ø100 are available.
- \* For details about auto switches with pre-wired connector, refer to pages 1648 and 1649.

- \* Please contact SMC for auto switches, auto switch proper mounting positions and operating ranges other than the above.
- \* The D-A9□/M9□□□/P3DWA auto switches are shipped together, (but not assembled). (However, auto switch mounting brackets are assembled for the D-A9□/M9□□□ before shipment.)

**Made to Order Common Specifications: MB Series**  
**Spatter Resistant Coil Scraper, Lube-retainer, Grease for Welding (Piston rod: Stainless steel 304)**  
**Spatter Resistant Coil Scraper, Lube-retainer, Grease for Welding (Piston rod: S45C)**  
**Spatter Resistant Coil Scraper, Grease for Welding (Piston rod: S45C)**

## Specifications



Bore size (mm)	32	40	50	63	80	100
<b>Action</b>	Double acting, Single rod					
<b>Fluid</b>	Air					
<b>Proof pressure</b>	1.5 MPa					
<b>Max. operating pressure</b>	1.0 MPa					
<b>Min. operating pressure</b>	0.05 MPa					
<b>Ambient and fluid temperature</b>	Without auto switch: -10 to 70°C (No freezing)					
	With auto switch: -10 to 60°C (No freezing)					
<b>Lubrication</b>	Not required (Non-lube)					
<b>Operating piston speed</b>	50 to 1000 mm/s					
<b>Stroke length tolerance</b>	Up to 250: $^{+1.0}_0$ , 251 to 1000: $^{+1.4}_0$ , 1001 to 1500: $^{+1.8}_0$					
<b>Cushion</b>	Air cushion					
<b>Port size (Rc)</b>	1/8	1/4		3/8		1/2
<b>Mounting</b>	Basic, Foot, Rod flange, Head flange, Single clevis, Double clevis, Center trunnion					

## Standard Strokes

Bore size (mm)	Standard stroke (mm)	Max. stroke
<b>32</b>	25, 50, 75, 100, 125, 150, 175, 200, 250, 300, 350, 400, 450, 500	700
	25, 50, 75, 100, 125, 150, 175, 200, 250, 300, 350, 400, 450, 500	
<b>40</b>	25, 50, 75, 100, 125, 150, 175, 200, 250, 300, 350, 400, 450, 500, 600	1000
	25, 50, 75, 100, 125, 150, 175, 200, 250, 300, 350, 400, 450, 500, 600	
<b>63</b>	25, 50, 75, 100, 125, 150, 175, 200, 250, 300, 350, 400, 450, 500, 600, 700, 800	1000
	25, 50, 75, 100, 125, 150, 175, 200, 250, 300, 350, 400, 450, 500, 600, 700, 800	
<b>80</b>	25, 50, 75, 100, 125, 150, 175, 200, 250, 300, 350, 400, 450, 500, 600, 700, 800	1000
	25, 50, 75, 100, 125, 150, 175, 200, 250, 300, 350, 400, 450, 500, 600, 700, 800	
<b>100</b>	25, 50, 75, 100, 125, 150, 175, 200, 250, 300, 350, 400, 450, 500, 600, 700, 800	1000
	25, 50, 75, 100, 125, 150, 175, 200, 250, 300, 350, 400, 450, 500, 600, 700, 800	

Manufacture of intermediate strokes is possible. (Spacers are not used.) Produced upon receipt of order.

The specifications of the cylinder with auto switch are the same as those of the standard model.

- Auto switch proper mounting position (detection at stroke end) and its mounting height
- Minimum stroke for auto switch mounting
- Auto switch mounting brackets/Part no.
- Operating range

## Accessories

Mounting		Basic	Axial foot	Rod flange	Head flange	Single clevis	Double clevis	Center trunnion
Standard	Rod end nut	●	●	●	●	●	●	●
	Clevis pin	—	—	—	—	—	●	—
Option	Single knuckle joint	●	●	●	●	●	●	●
	Double knuckle joint (with pin)	●	●	●	●	●	●	●

## Mounting Brackets/Part No.

Bore size (mm)	32	40	50	63	80	100
Axial foot <small>Note 1)</small>	MB-L03	MB-L04	MB-L05	MB-L06	MB-L08	MB-L10
Flange	MB-F03	MB-F04	MB-F05	MB-F06	MB-F08	MB-F10
Single clevis	MB-C03	MB-C04	MB-C05	MB-C06	MB-C08	MB-C10
Double clevis	MB-D03	MB-D04	MB-D05	MB-D06	MB-D08	MB-D10

Note 1) Order two axial foot brackets per cylinder.

Note 2) Accessories for each mounting bracket are as follows:

Axial foot, flange, single clevis/body mounting bolt, double clevis/body mounting bolt, clevis pin, flat washers and split pins.

# MB-XC88/XC89/XC91

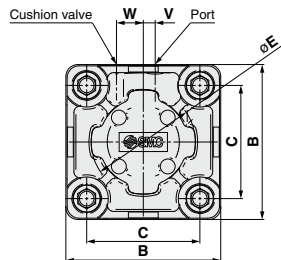
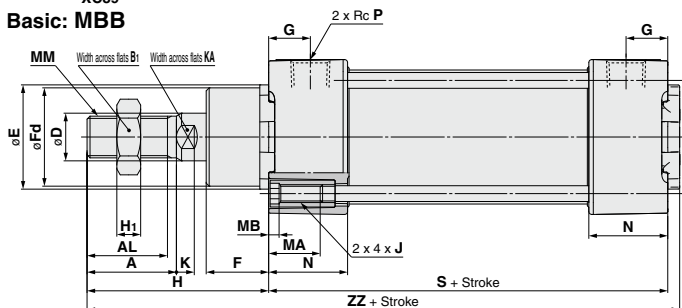
Bore Size

## ø32 to ø100

Dimensions with mounting bracket are the same as standard type. For details, refer to page 397.

M□B□-XC88  
-XC89

Basic: MBB

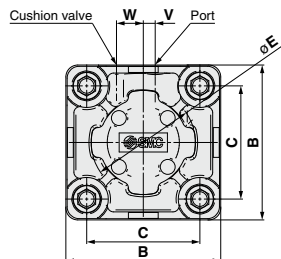
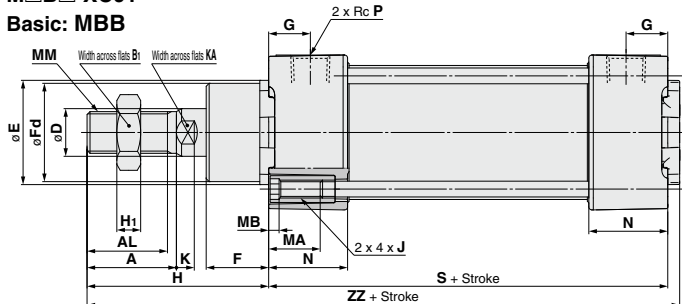


### Dimensions

Bore size (mm)	A	AL	B	B <sub>1</sub>	C	D	E	F	F <sub>d</sub>	G	H	H <sub>1</sub>	J	K	KA	MA	MB	MM	N	P	S	V	W	ZZ
32	22	19.5	46	17	32.5	12	30	21	28	13	50	6	M6 x 1	6	10	16	4	M10 x 1.25	27	1/8	84	4	6.5	138
40	30	27	52	22	38	16	35	23.5	33	14	61	8	M6 x 1	6	14	16	4	M14 x 1.5	27	1/4	84	4	9	149
50	35	32	65	27	46.5	20	40	23	39.5	15.5	67	11	M8 x 1.25	7	18	16	4	M18 x 1.5	31.5	1/4	94	5	10.5	165
63	35	32	75	27	56.5	20	45	23	39.5	16.5	67	11	M8 x 1.25	7	18	16	4	M18 x 1.5	31.5	3/8	94	9	12	165
80	40	37	95	32	72	25	45	29	44.5	19	82	13	M10 x 1.5	10	22	16	5	M22 x 1.5	38	3/8	114	11.5	14	200
100	40	37	114	41	89	30	55	29	54	19	82	16	M10 x 1.5	10	26	16	5	M26 x 1.5	38	1/2	114	17	15	200

M□B□-XC91

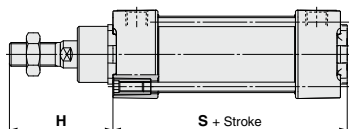
Basic: MBB



### Dimensions

Bore size (mm)	Stroke range	A	AL	B	B <sub>1</sub>	C	D	E	F	F <sub>d</sub>	G	H	H <sub>1</sub>	J	K	KA	MA	MB	MM	N	P	S	V	W	ZZ
32	Up to 1000	22	19.5	46	17	32.5	12	30	13	28	13	47	6	M6 x 1	6	10	16	4	M10 x 1.25	27	1/8	84	4	6.5	135
40	Up to 1000	30	27	52	22	38	16	35	13	33	14	58	8	M6 x 1	6	14	16	4	M14 x 1.5	27	1/4	84	4	9	146
50	Up to 1000	35	32	65	27	46.5	20	40	14	39.5	15.5	67	11	M8 x 1.25	7	18	16	5	M18 x 1.5	31.5	1/4	94	5	10.5	165
63	Up to 1000	35	32	75	27	56.5	20	45	14	39.5	16.5	67	11	M8 x 1.25	7	18	16	5	M18 x 1.5	31.5	3/8	94	9	12	165
80	Up to 1000	40	37	95	32	72	25	45	20	44.5	19	81	13	M10 x 1.5	10	22	16	5	M22 x 1.5	38	3/8	114	11.5	14	199
100	Up to 1000	40	37	114	41	89	30	55	20	54	19	81	16	M10 x 1.5	10	26	16	5	M26 x 1.5	38	1/2	114	17	15	199

## Comparison of the Dimensions of Each Series



Bore size (mm)	XC88, 89		XC91		XC35		Standard	
	H	S	H	S	H	S	H	S
32	50	88	47	88	47	88	47	88
40	61	88	58	88	58	88	51	88
50	67	98	67	98	67	98	58	98
63	67	98	67	98	67	98	58	98
80	82	118	81	118	81	118	72	118
100	82	118	81	118	81	118	72	118

\* At 0 stroke

# Made to Order Common Specifications:

- XC88: Spatter Resistant Coil Scraper, Lube-retainer, Grease for Welding (Piston rod: Stainless steel 304)
- XC89: Spatter Resistant Coil Scraper, Lube-retainer, Grease for Welding (Piston rod: S45C)
- XC91: Spatter Resistant Coil Scraper, Grease for Welding (Piston rod: S45C)



## CA2 Series

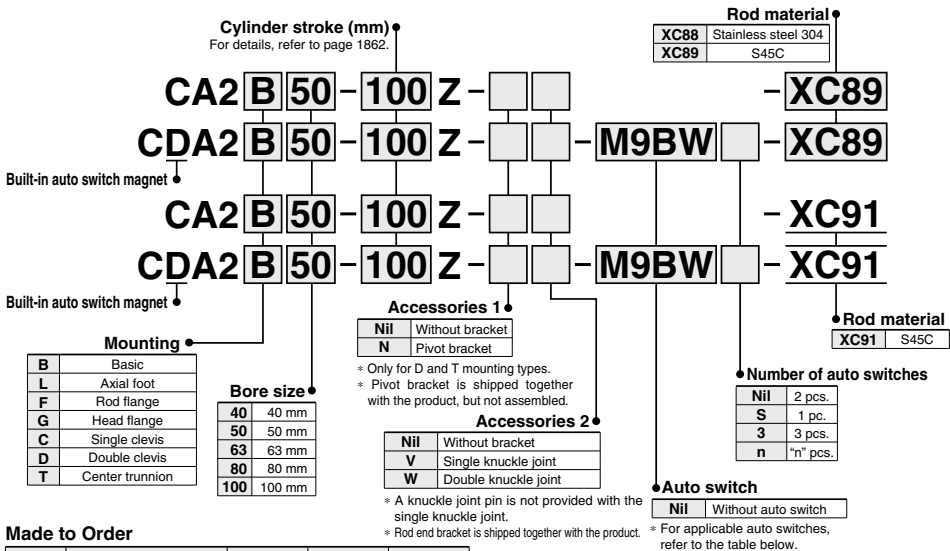
**62** Spatter Resistant Coil Scraper, Lube-retainer, Grease for Welding (Piston rod: Stainless steel 304) **-XC88**

**63** Spatter Resistant Coil Scraper, Lube-retainer, Grease for Welding (Piston rod: S45C) **-XC89**

Reduces spatter adhesion and improves durability by the use of the coil scraper, Lube-retainer and grease for welding.  
**64** Spatter Resistant Coil Scraper, Grease for Welding (Piston rod: S45C) **-XC91**

With coil scraper and grease for welding

### CA2 Series How to Order



### Made to Order

Part no.	Piston rod material (Hard chrome plated)		Coil scraper	Lube-retainer	Grease for welding
	S45C	Stainless steel 304			
-XC88	—	●	●	●	●
-XC89	—	—	●	●	●
-XC91	●	—	●	—	●

Note) Use the -XC91 in a place where the distance from the welding portion is far and the spatter scattering is minimized.

### Built-in Auto Switch Magnet Cylinder Model

If a built-in auto switch magnet cylinder without an auto switch is required, there is no need to enter the symbol for the auto switch. (Example) CDA2L40-100Z-XC89

### Applicable Auto Switches

Refer to pages 1575 to 1701 for further information on auto switches.

Type	Special function	Electrical entry	Indicator light	Wiring (Output)	Load voltage		Auto switch model	Lead wire length (m)	Pre-wired connector	Applicable load											
					DC	AC															
Solid state auto switch	—	Grommet	Yes	3-wire (NPN)	24 V	5 V, 12 V	—	0.5 (Nil)	1 (M)	3 (L)	5 (Z)	—	—	IC circuit							
				3-wire (PNP)											—						
				2-wire												—					
	3-wire (NPN)			—																	
	3-wire (PNP)																—				
	2-wire																	—			
2-wire (Non-polar)	—																				
Magnetic field resistant (2-color indicator)		—	—		—	—	—	—	—	—	—	—									
													—	—	—	—			—	—	—
				—																	
Reed auto switch		—	Grommet		Yes	3-wire (NPN equivalent)	—	5 V	—	—	—	—					IC circuit				
						2-wire							24 V	12 V	—	—		—	—	—	
—	—	—	No	—	—	—	—	—	—	—	—	—					—				—
													—	—	—	—		—	—	—	

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

\* Solid state auto switches marked with "O" are produced upon receipt of order.

\* Please contact SMC for auto switches, auto switch proper mounting positions and operating ranges other than the above.

\* For details about auto switches with pre-wired connector, refer to pages 1648 and 1649.

\* The D-A9□M9□□P3DWA auto switches are shipped together. (but not assembled). (However, auto switch mounting brackets are assembled for the D-A9□M9□□ before shipment.)



# CA2-XC88/XC89/XC91



## Specifications

Bore size (mm)		40	50	63	80	100
Fluid		Air				
Action		Double acting				
Proof pressure		1.5 MPa				
Maximum operating pressure		1.0 MPa				
Ambient and fluid temperature		Without auto switch: -10 to 70°C <sup>Note 1)</sup> With auto switch: -10 to 60°C <sup>Note 1)</sup>				
Minimum operating pressure		0.05 MPa				
Piston speed		50 to 500 mm/s				
Cushion		Air cushion				
Stroke length tolerance		Up to 250 <sup>±0.15</sup> ; 251 to 1000 <sup>±0.14</sup>				
Lubrication		Not required (Non-lube)				
Mounting		Basic, Foot, Rod flange, Head flange Single clevis, Double clevis, Center trunnion				
Allowable kinetic energy (J) <sup>Note 2)</sup>	When air cushion is activated	2.8	4.6	7.8	16	29
	When air cushion is not activated	0.33	0.56	0.91	1.50	2.68

Note 1) With no freezing

Note 2) Activate the air cushion when operating the cylinder. If this is not done, the rod parts assembly or the tie-rods will be damaged when the allowable kinetic energy exceeds the values shown in the table above.

## Standard Strokes

Bore size	Standard stroke <sup>Note 1)</sup>	(mm)	
		Standard stroke	Max. manufacturable stroke <sup>Note 2)</sup>
40	25, 50, 75, 100, 125, 150, 175, 200, 250, 300, 350, 400, 450, 500	1000	
	25, 50, 75, 100, 125, 150, 175, 200, 250, 300, 350, 400, 450, 500, 600	1000	
80, 100	25, 50, 75, 100, 125, 150, 175, 200, 250, 300, 350, 400, 450, 500, 600, 700	1000	

Note 1) Intermediate strokes not listed above are produced upon receipt of order.

Note 2) For details about applicable maximum stroke, refer to the model selection table on front matter pages.

### Minimum Stroke for Auto Switch Mounting

## ⚠ Caution

- The minimum stroke for mounting varies with the auto switch type and cylinder mounting type. In particular, the center trunnion type needs careful attention. (For details, refer to pages 521 and 522.)

The specifications of the cylinder with auto switch are the same as those of the standard model.

- Auto switch proper mounting position (detection at stroke end) and its mounting height
- Minimum stroke for auto switch mounting
- Auto switch mounting brackets/Part no.
- Operating range

## Accessories

Mounting		Basic	Axial foot	Rod flange	Head flange	Single clevis	Double clevis	Center trunnion
Standard	Rod end nut	●	●	●	●	●	●	●
	Clevis pin	—	—	—	—	—	●	—
Option	Single knuckle joint	●	●	●	●	●	●	●
	Double knuckle joint (With pin)	●	●	●	●	●	●	●

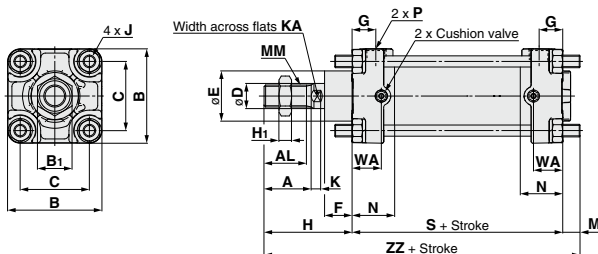
**Made to Order Common Specifications: CA2 Series**  
**Spatter Resistant Coil Scraper, Lube-retainer, Grease for Welding (Piston rod: Stainless steel 304)**  
**Spatter Resistant Coil Scraper, Lube-retainer, Grease for Welding (Piston rod: S45C)**  
**Spatter Resistant Coil Scraper, Grease for Welding (Piston rod: S45C)**

Bore Size  
**ø40 to ø100**

Dimensions with mounting bracket are the same as standard type. For details, refer to pages 476 to 483.

CA2-XC88  
 XC89

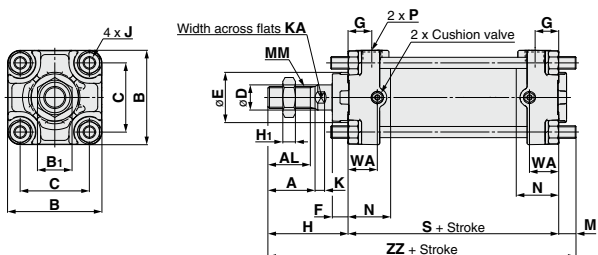
Basic: CA2B



Bore size (mm)	A	AL	B	B <sub>1</sub>	C	D	E	F	G	H <sub>1</sub>	J	K	KA	M	MM	N	P	S	WA	H	ZZ
40	30	27	60	22	44	16	32	17.5	15	8	M8 x 1.25	6	14	11	M14 x 1.5	27	1/4	84	18.5	56	151
50	35	32	70	27	52	20	40	15	17	11	M8 x 1.25	7	18	11	M18 x 1.5	30	3/8	90	18.5	60	161
63	35	32	85	27	64	20	40	15	17	11	M10 x 1.25	7	18	14	M18 x 1.5	31	3/8	98	23	60	172
80	40	37	102	32	78	25	52	19	21	13	M12 x 1.75	10	22	17	M22 x 1.5	37	1/2	116	28.5	73	206
100	40	37	116	41	92	30	52	19	21	16	M12 x 1.75	10	26	17	M26 x 1.5	40	1/2	126	28.5	74	217

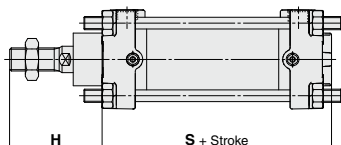
CA2B□-XC91 \* Dimensions are the same as the standard product (CA2 series).

Basic: CA2B



Bore size (mm)	A	AL	B	B <sub>1</sub>	C	D	E	F	G	H <sub>1</sub>	J	K	KA	M	MM	N	P	S	WA	H	ZZ
40	30	27	60	22	44	16	32	10	15	8	M8 x 1.25	6	14	11	M14 x 1.5	27	1/4	84	18.5	51	146
50	35	32	70	27	52	20	40	10	17	11	M8 x 1.25	7	18	11	M18 x 1.5	30	3/8	90	18.5	58	159
63	35	32	85	27	64	20	40	10	17	11	M10 x 1.25	7	18	14	M18 x 1.5	31	3/8	98	23	58	170
80	40	37	102	32	78	25	52	14	21	13	M12 x 1.75	10	22	17	M22 x 1.5	37	1/2	116	28.5	71	204
100	40	37	116	41	92	30	52	14	21	16	M12 x 1.75	10	26	17	M26 x 1.5	40	1/2	126	28.5	72	215

**Comparison of the Dimensions of Each Series**



Bore size (mm)	XC88, 89		XC91		XC35		Standard	
	H	S	H	S	H	S	H	S
40	56	95	51	95	51	95	51	95
50	60	101	58	101	58	101	58	101
63	60	112	58	112	58	112	58	112
80	73	133	71	133	71	133	71	133
100	74	143	72	143	72	143	72	143

\* At 0 stroke



# Made to Order Common Specifications:

-XC88: Spatter Resistant Coil Scraper, Lube-retainer, Grease for Welding (Piston rod: Stainless steel 304)

-XC89: Spatter Resistant Coil Scraper, Lube-retainer, Grease for Welding (Piston rod: S45C)

-XC91: Spatter Resistant Coil Scraper, Grease for Welding (Piston rod: S45C)



## CDQ2 Series

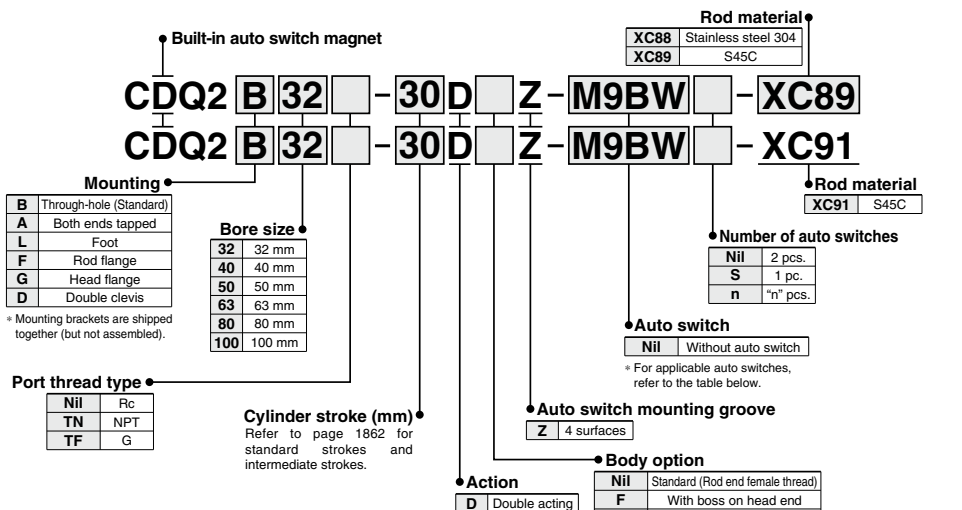
**62** Spatter Resistant Coil Scraper, Lube-retainer, Grease for Welding (Piston rod: Stainless steel 304) **-XC88**

**63** Spatter Resistant Coil Scraper, Lube-retainer, Grease for Welding (Piston rod: S45C) **-XC89**

**64** Spatter Resistant Coil Scraper, Grease for Welding (Piston rod: S45C) **-XC91**

With coil scraper and grease for welding

### CDQ2 Series: Standard How to Order



### Made to Order

Part no.	Piston rod material (Hard chrome plated)		Coil scraper	Lube-retainer	Grease for welding
	S45C	Stainless steel 304			
-XC88	—	●	●	●	●
-XC89	—	—	●	●	●
-XC91	●	—	●	—	●

Note) Use the -XC91 in a place where the distance from the welding portion is far and the spatter scattering is minimized.

### Built-in Auto Switch Magnet Cylinder Model

If a built-in auto switch magnet cylinder without an auto switch is required, there is no need to enter the symbol for the auto switch. (Example) CDQ2L32-25DZ-XC89

### Applicable Auto Switches/Refer to pages 1575 to 1701 for further information on auto switches.

Type	Special function	Electrical entry	Indicator light	Wiring (Output)	Load voltage		Auto switch model		Lead wire length (m)					Pre-wired connector	Applicable load
					DC	AC	Perpendicular	In-line	0.5 (Nil)	1 (M)	3 (L)	5 (Z)	None (N)		
									—	—	—	—	—		
Solid state auto switch	—	Grommet	Yes	3-wire (NPN)	24 V	5 V, 12 V	—	M9NV	M9N	●	●	○	—	○	IC circuit
				3-wire (PNP)				M9PV	M9P	●	●	○	—	○	
				2-wire				M9BV	M9B	●	●	○	—	○	
	3-wire (NPN)			M9NWV				M9NW	●	●	○	—	○	IC circuit	
	3-wire (PNP)			M9P WV				M9PW	●	●	○	—	○		
	2-wire			M9B WV				M9BW	●	●	○	—	○		
Reed auto switch	—	Grommet	Yes	3-wire (NPN equivalent)	24 V	5 V, 12 V	—	A96V	A96	●	●	—	—	—	IC circuit
				2-wire				A93V	A93	●	●	—	—	—	Relay, PLC
				—				A90V	A90	●	●	—	—	—	IC circuit

\* Lead wire length symbols: 0.5 m ..... Nil  
1 m ..... M  
3 m ..... L  
5 m ..... Z  
(Example) M9NV  
(Example) M9NWM  
(Example) M9NWL  
(Example) M9NWX

\* Solid state auto switches marked with "○" are produced upon receipt of order.  
\* The D-P3DWA□ is mountable on ø32 to ø100.

\* Please contact SMC for auto switches, auto switch proper mounting positions and operating ranges other than the above.  
\* For details about auto switches with pre-wired connector, refer to pages 1648 and 1649.





# CDQ2-XC88/XC89/XC91

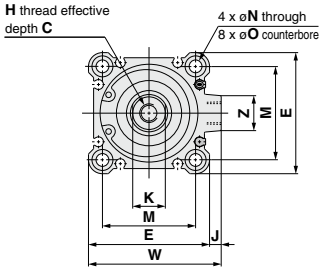
Bore Size

## ø32 to ø50

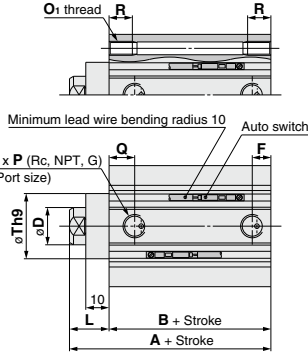
Dimensions with mounting bracket are the same as standard type. For details, refer to pages 790 to 792.

CDQ2□-XC88  
XC89

Through-hole (Standard): CDQ2B



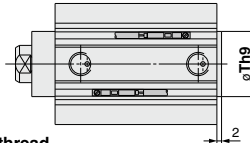
Both ends tapped: CDQ2A



Both Ends Tapped (mm)

Bore size (mm)	O1	R
32	M6 x 1.0	10
40	M6 x 1.0	10
50	M8 x 1.25	14

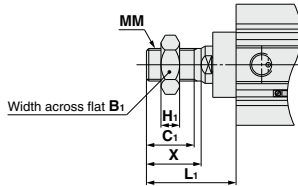
With boss on head end



With Boss on Head End (mm)

Bore size (mm)	Th9
32	21 <sup>0</sup> <sub>-0.032</sub>
40	28 <sup>0</sup> <sub>-0.032</sub>
50	35 <sup>0</sup> <sub>-0.032</sub>

Rod end male thread



Rod End Male Thread (mm)

Bore size (mm)	B1	C1	H1	L1	MM	X
32	22	20.5	8	38.5	M14 x 1.5	23.5
40	22	20.5	8	38.5	M14 x 1.5	23.5
50	27	26	11	43.5	M18 x 1.5	28.5

Standard

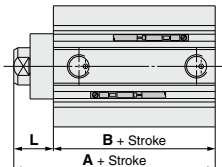
Bore size (mm)	Stroke range (mm)	A	B	C	D	E	F	H	J	K	L	M	N	O	P	Q	Th9	W	Z
32	5 to 50, 75, 100	50	33	13	16	45	7.5	M8 x 1.25	4.5	14	17	34	5.5	9 depth 7	1/8	10	23 <sup>0</sup> <sub>-0.032</sub>	49.5	14
40	5 to 50, 75, 100	56.5	39.5	13	16	52	7.5	M8 x 1.25	5	14	17	40	5.5	9 depth 7	1/8	12.5	28 <sup>0</sup> <sub>-0.032</sub>	57	15
50	10 to 50, 75, 100	58.5	40.5	15	20	64	10.5	M10 x 1.5	7	17	18	50	6.6	11 depth 8	1/4	10.5	35 <sup>0</sup> <sub>-0.032</sub>	71	19

Note 1) The external dimensions with rubber bumper are same as those of the standard, as shown above.

\* For details about the rod end nut and accessory brackets, refer to pages 796 to 798.

Note 2) For calculation on the longitudinal dimension of intermediate strokes, refer to page 1865.

## Comparison of the Dimensions of Each Series



Bore size (mm)	XC88, 89			XC91			XC35			Standard		
	A	B	L	A	B	L	A	B	L	A	B	L
32	50	33	17	45	33	12	45	33	12	40	33	7
40	56.5	39.5	17	51.5	39.5	12	51.5	39.5	12	46.5	39.5	7
50	58.5	40.5	18	53.5	40.5	13	53.5	40.5	13	48.5	40.5	8
63	64	46	18	59	46	13	59	46	13	54	46	8
80	73.5	53.5	20	68.5	53.5	15	68.5	53.5	15	63.5	53.5	10
100	85	63	22	80	63	17	80	63	17	75	63	12

\* At 0 stroke

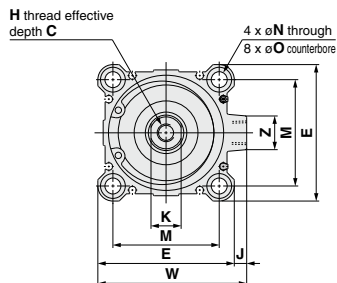
**Made to Order Common Specifications: CDQ2 Series**  
**Spatter Resistant Coil Scraper, Lube-retainer, Grease for Welding (Piston rod: Stainless steel 304)**  
**Spatter Resistant Coil Scraper, Lube-retainer, Grease for Welding (Piston rod: S45C)**  
**Spatter Resistant Coil Scraper, Grease for Welding (Piston rod: S45C)**

**Bore Size**  
**ø63 to ø100**

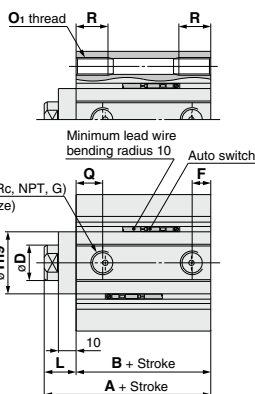
Dimensions with mounting bracket are the same as standard type. For details, refer to pages 793 to 795.

CDQ2□-XC88  
 □-XC89

**Through-hole (Standard): CDQ2B**



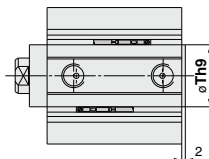
**Both ends tapped: CDQ2A**



**Both Ends Tapped** (mm)

Bore size (mm)	O1	R
63	M10 x 1.5	18
80	M12 x 1.75	22
100	M12 x 1.75	22

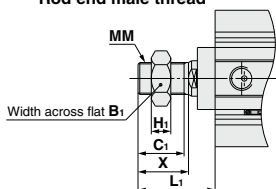
**With boss on head end**



**With Boss on Head End** (mm)

Bore size (mm)	Th9
63	35 <sup>0</sup> <sub>-0.062</sub>
80	43 <sup>0</sup> <sub>-0.062</sub>
100	59 <sup>0</sup> <sub>-0.074</sub>

**Rod end male thread**



**Rod End Male Thread** (mm)

Bore size (mm)	B1	C1	H1	L1	MM	X
63	27	26	11	43.5	M18 x 1.5	28.5
80	32	32.5	13	53.5	M22 x 1.5	35.5
100	41	32.5	16	53.5	M26 x 1.5	35.5

**Standard**

Bore size (mm)	Stroke range (mm)	A	B	C	D	E	F	H	J	K	L	M	N	O	P	Q	Th9	W	Z
63	10 to 50, 75, 100	64	46	15	20	77	10.5	M10 x 1.5	7	17	18	60	9	14 depth 10.5	1/4	15	35 <sup>0</sup> <sub>-0.062</sub>	84	19
80	10 to 50, 75, 100	73.5	53.5	21	25	98	12.5	M16 x 2.0	6	22	20	77	11	17.5 depth 13.5	3/8	16	43 <sup>0</sup> <sub>-0.062</sub>	104	25
100	10 to 50, 75, 100	85	63	27	30	117	13	M20 x 2.5	6.5	27	22	94	11	17.5 depth 13.5	3/8	23	59 <sup>0</sup> <sub>-0.074</sub>	123.5	25

Note 1) The external dimensions with rubber bumper are same as those of the standard, as shown above.

\* For details about the rod end nut and accessory brackets, refer to pages 796 to 798.

Note 2) For calculation on the longitudinal dimension of intermediate strokes, refer to page 1865.



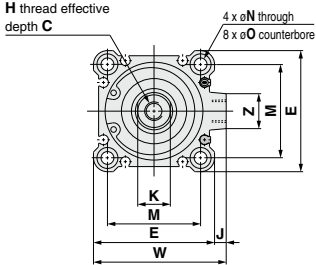
# CDQ2-XC88/XC89/XC91

Bore Size

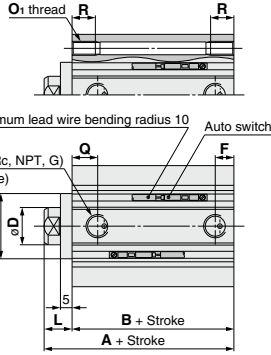
**ø32 to ø50**

CDQ2□-XC91

Through-hole (Standard): CDQ2B



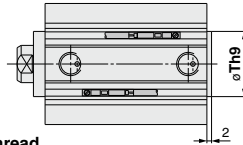
Both ends tapped: CDQ2A



Both Ends Tapped (mm)

Bore size (mm)	O1	R
32	M6 x 1.0	10
40	M6 x 1.0	10
50	M8 x 1.25	14

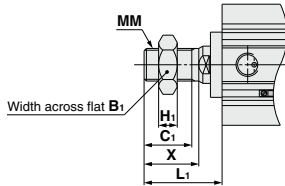
With boss on head end



With Boss on Head End (mm)

Bore size (mm)	Th9
32	21 <sup>0</sup> <sub>-0.032</sub>
40	28 <sup>0</sup> <sub>-0.032</sub>
50	35 <sup>0</sup> <sub>-0.032</sub>

Rod end male thread



Rod End Male Thread (mm)

Bore size (mm)	B1	C1	H1	L1	MM	X
32	22	20.5	8	33.5	M14 x 1.5	23.5
40	22	20.5	8	33.5	M14 x 1.5	23.5
50	27	26	11	38.5	M18 x 1.5	28.5

Standard

(mm)

Bore size (mm)	Stroke range (mm)	A	B	C	D	E	F	H	J	K	L	M	N	O	P	Q	Th9	W	Z
32	5 to 50, 75, 100	45	33	13	16	45	7.5	M8 x 1.25	4.5	14	12	34	5.5	9 depth 7	1/8	10	23 <sup>0</sup> <sub>-0.032</sub>	49.5	14
40	5 to 50, 75, 100	51.5	39.5	13	16	52	7.5	M8 x 1.25	5	14	12	40	5.5	9 depth 7	1/8	12.5	28 <sup>0</sup> <sub>-0.032</sub>	57	15
50	10 to 50, 75, 100	53.5	40.5	15	20	64	10.5	M10 x 1.5	7	17	13	50	6.6	11 depth 8	1/4	10.5	35 <sup>0</sup> <sub>-0.032</sub>	71	19

Note 1) The external dimensions with rubber bumper are same as those of the standard, as shown above.

\* For details about the rod end nut and accessory brackets, refer to pages 796 to 798.

Note 2) For calculation on the longitudinal dimension of intermediate strokes, refer to page 1865.

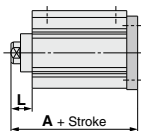
**Made to Order Common Specifications: CDQ2 Series**  
**Spatter Resistant Coil Scraper, Lube-retainer, Grease for Welding (Piston rod: Stainless steel 304)**  
**Spatter Resistant Coil Scraper, Lube-retainer, Grease for Welding (Piston rod: S45C)**  
**Spatter Resistant Coil Scraper, Grease for Welding (Piston rod: S45C)**

Bore Size

**Ø32 to Ø50**

Dimensions other than those listed below and other dimensions for the model with mounting bracket are the same as the standard type. For details, refer to pages 791 and 792.

**Head flange: CDQ2G**



**Head Flange**

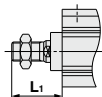
(mm)

Bore Size (mm)	A	L	L <sub>1</sub>
<b>32</b>	53	12	33.5
<b>40</b>	59.5	12	33.5
<b>50</b>	62.5	13	38.5

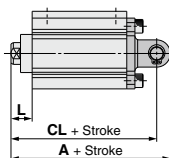
(\* The dimensions except A are the same as those of the rod flange.)

Flange bracket material: Carbon steel  
 Surface treatment: Nickel plating

**Rod end male thread**



**Double clevis: CDQ2D**



**Double Clevis**

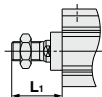
(mm)

Bore Size (mm)	A	CL	L	L <sub>1</sub>
<b>32</b>	75	65	12	33.5
<b>40</b>	83.5	73.5	12	33.5
<b>50</b>	95.5	81.5	13	38.5

\* A double clevis pin and retaining rings are included.

Double clevis bracket material: Cast iron  
 Surface treatment: Painted

**Rod end male thread**



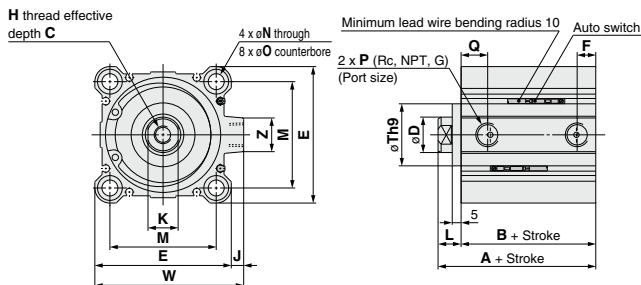


**Made to Order Common Specifications: CDQ2 Series**  
**Spatter Resistant Coil Scraper, Lube-retainer, Grease for Welding (Piston rod: Stainless steel 304)**  
**Spatter Resistant Coil Scraper, Lube-retainer, Grease for Welding (Piston rod: S45C)**  
**Spatter Resistant Coil Scraper, Grease for Welding (Piston rod: S45C)**

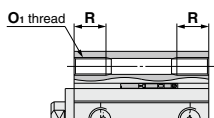
**Bore Size**  
**ø63 to ø100**

**CDQ2□-XC91**

**Through-hole (Standard): CDQ2B**



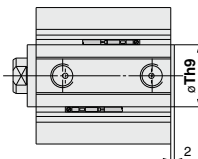
**Both ends tapped: CDQ2A**



**Both Ends Tapped (mm)**

Bore size (mm)	O <sub>1</sub>	R
63	M10 x 1.5	18
80	M12 x 1.75	22
100	M12 x 1.75	22

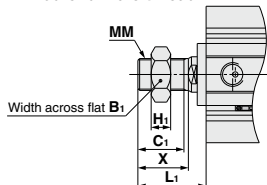
**With boss on head end**



**With Boss on Head End (mm)**

Bore size (mm)	Th9
63	35 <sup>0</sup> <sub>-0.062</sub>
80	43 <sup>0</sup> <sub>-0.062</sub>
100	59 <sup>0</sup> <sub>-0.074</sub>

**Rod end male thread**



**Rod End Male Thread (mm)**

Bore size (mm)	B <sub>1</sub>	C <sub>1</sub>	H <sub>1</sub>	L <sub>1</sub>	MM	X
63	27	26	11	38.5	M18 x 1.5	28.5
80	32	32.5	13	48.5	M22 x 1.5	35.5
100	41	32.5	16	48.5	M26 x 1.5	35.5

**Standard**

Bore size (mm)	Stroke range (mm)	A	B	C	D	E	F	H	J	K	L	M	N	O	P	Q	Th9	W	Z
63	10 to 50, 75, 100	59	46	15	20	77	10.5	M10 x 1.5	7	17	13	60	9	14 depth 10.5	1/4	15	35 <sup>0</sup> <sub>-0.062</sub>	84	19
80	10 to 50, 75, 100	68.5	53.5	21	25	98	12.5	M16 x 2.0	6	22	15	77	11	17.5 depth 13.5	3/8	16	43 <sup>0</sup> <sub>-0.062</sub>	104	25
100	10 to 50, 75, 100	80	63	27	30	117	13	M20 x 2.5	6.5	27	17	94	11	17.5 depth 13.5	3/8	23	59 <sup>0</sup> <sub>-0.074</sub>	123.5	25

Note 1) The external dimensions with rubber bumper are same as those of the standard, as shown above.

\* For details about the rod end nut and accessory brackets, refer to pages 796 to 798.

Note 2) For calculation on the longitudinal dimension of intermediate strokes, refer to page 1865.

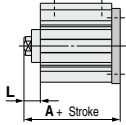
# CDQ2-XC88/XC89/XC91

Bore Size

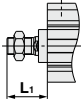
Ø63 to Ø100

Dimensions other than those listed below and other dimensions for the model with mounting bracket are the same as the standard type. For details, refer to pages 794 and 795.

## Head flange: CDQ2G



## Rod end male thread



## Head Flange

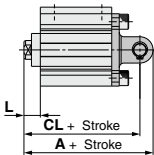
(mm)

Bore Size (mm)	A	L	L <sub>1</sub>
63	68	13	38.5
80	79.5	15	48.5
100	91	17	48.5

(\* The dimensions except A are the same as those of the rod flange.)

Flange bracket material: Carbon steel  
Surface treatment: Nickel plating

## Double clevis: CDQ2D



## Rod end male thread



## Double Clevis

(mm)

Bore Size (mm)	A	CL	L	L <sub>1</sub>
63	103	89	13	38.5
80	124.5	106.5	15	48.5
100	147	125	17	48.5

\* A double clevis pin and retaining rings are included.

Double clevis bracket material: Cast iron  
Surface treatment: Painted





# Made to Order Common Specifications:

-XC88: Spatter Resistant Coil Scraper, Lube-retainer, Grease for Welding (Piston rod: Stainless steel 304)

-XC89: Spatter Resistant Coil Scraper, Lube-retainer, Grease for Welding (Piston rod: S45C)



## CDQ2 Series: Long Stroke

**62** Spatter Resistant Coil Scraper, Lube-retainer, Grease for Welding (Piston rod: Stainless steel 304) **-XC88**

**63** Spatter Resistant Coil Scraper, Lube-retainer, Grease for Welding (Piston rod: S45C) **-XC89**

Reduces spatter adhesion and improves durability by the use of the coil scraper, Lube-retainer and grease for welding.

### CDQ2 Series: Long Stroke How to Order

**CDQ2 A 32 - 200 DC Z - M9BW - XC89**

**Built-in auto switch magnet**

**Mounting**

A	Both ends tapped
L	Foot
F	Rod flange
G	Head flange
D	Double clevis

\* Mounting brackets are shipped together, (but not assembled).

**Number of auto switches**

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

**Auto switch**

Nil	Without auto switch
-----	---------------------

\* Refer to the below table for applicable auto switches.

**Auto switch mounting groove**

Z	4 surfaces
---	------------

**Body option**

Nil	Standard (Rod end female thread)
M	Rod end male thread

**Cushion**

C	Rubber bumper
---	---------------

**Bore size**

32	32 mm
40	40 mm
50	50 mm
63	63 mm
80	80 mm
100	100 mm

**Port thread type**

Nil	Rc
TN	NPT
TF	G

**Cylinder stroke (mm)**

Refer to page 1871 for standard strokes.

**Action**

D	Double acting
---	---------------

**Rod material**

XC88	Stainless steel 304
XC89	S45C

### Made to Order

Part no.	Piston rod material (Hard chrome plated)		Coil scraper	Lube-retainer	Grease for welding
	S45C	Stainless steel 304			
-XC88	—	●	●	●	●
-XC89	●	—	●	●	●

### Built-in Auto Switch Magnet Cylinder Model

If a built-in auto switch magnet cylinder without an auto switch is required, there is no need to enter the symbol for the auto switch. (Example) CDQ2L40-200DC-Z-XC89

### Applicable Auto Switches/Refer to pages 1575 to 1701 for further information on auto switches.

Type	Special function	Electrical entry	Indicator light	Wiring (Output)	Load voltage		Auto switch model		Lead wire length (m)					Pre-wired connector	Applicable load	
					DC	AC	Perpendicular	In-line	0.5 (Nil)	1 (M)	3 (L)	5 (Z)	None (N)			
									—	—	—	—	—			
Solid state auto switch	—	Grommet	Yes	3-wire (NPN)	24 V	—	M9NV	M9N	●	●	●	○	—	○	IC circuit	
				3-wire (PNP)			M9PV	M9P	●	●	●	○	—	○		
	2-wire			M9BV			M9B	●	●	●	○	—	○	IC circuit		
	3-wire (NPN)			M9NVV			M9NV	●	●	●	○	—	○			
	3-wire (PNP)			M9PVV			M9PV	●	●	●	○	—	○			
	2-wire			M9BWW			M9BW	●	●	●	○	—	○			
Reed auto switch	—	Grommet	Yes	3-wire (NPN equivalent)	24 V	—	A96V	A96	●	—	●	—	—	—	IC circuit	
				2-wire			A93V	A93	●	●	●	—	—	—	Relay, PLC	
				No			2-wire	A90V	A90	●	—	●	—	—	—	IC circuit
								—	P3DWA	—	—	●	●	●	—	—

\* Lead wire length symbols: 0.5 m ..... Nil (Example) M9NV  
 1 m ..... M (Example) M9NVM  
 3 m ..... L (Example) M9NVL  
 5 m ..... Z (Example) M9NVZ

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

\* Please contact SMC for auto switches, auto switch proper mounting positions and operating ranges other than the above.

\* For details about auto switches with pre-wired connector, refer to pages 1648 and 1649.

**Made to Order Common Specifications: *CDQ2 Series/Long Stroke***  
**Spatter Resistant Coil Scraper, Lube-retainer, Grease for Welding (Piston rod: Stainless steel 304)**  
**Spatter Resistant Coil Scraper, Lube-retainer, Grease for Welding (Piston rod: S45C)**

## Specifications

Bore size (mm)	32	40	50	63	80	100
<b>Action</b>	Double acting, Single rod					
<b>Fluid</b>	Air					
<b>Proof pressure</b>	1.5 MPa					
<b>Maximum operating pressure</b>	1.0 MPa					
<b>Minimum operating pressure</b>	0.05 MPa					
<b>Ambient and fluid temperature</b>	-10 to 60°C (No freezing)					
<b>Lubrication</b>	Not required (Non-lube)					
<b>Piston speed</b>	50 to 500 mm/s					
<b>Allowable kinetic energy (J)</b>	0.29	0.52	0.91	1.54	2.71	4.54
<b>Stroke length tolerance</b>	+1.4 mm (Note) 0					

Note) Stroke length tolerance does not include the amount of bumper change.

## Standard Strokes

Bore size	Standard stroke (mm)
<b>32, 40, 50 63, 80, 100</b>	125, 150, 175, 200, 250, 300

## Manufacture of Intermediate Strokes

<b>Type</b>	A spacer is installed in the standard stroke body.	
<b>Part no.</b>	Refer to "How to Order" for the standard model number. (Page 1870)	
<b>Description</b>	Strokes in 1 mm increments are available by installing a spacer in the standard stroke cylinder.	
<b>Stroke range</b>	Bore size	Stroke range
	32 to 100	101 to 299
<b>Example</b>	Part no.: CDQ2A50-166DCZ-XC89 CDQ2A50-175DCZ-XC89 with 9 mm width spacer inside The B dimension is 235.5 mm.	

## Type

The specifications of the cylinder with auto switch are the same as those of the standard model.
<ul style="list-style-type: none"> <li>· Auto switch proper mounting position (detection at stroke end) and its mounting height</li> <li>· Minimum stroke for auto switch mounting</li> <li>· Auto switch mounting brackets/Part no.</li> <li>· Operating range</li> </ul>

		Bore size (mm)		32	40	50	63	80	100
Pneumatic	Built-in magnet for auto switch			●	●	●	●	●	●
	Piping	Pipe thread	—	Rc1/8	Rc1/8	Rc1/4	Rc1/4	Rc3/8	Rc3/8
			<b>TN</b>	NPT1/8	NPT1/8	NPT1/4	NPT1/4	NPT3/8	NPT3/8
			<b>TF</b>	G1/8	G1/8	G1/4	G1/4	G3/8	G3/8
	Rod end male thread			●	●	●	●	●	●

# CDQ2-XC88/XC89

Long Stroke

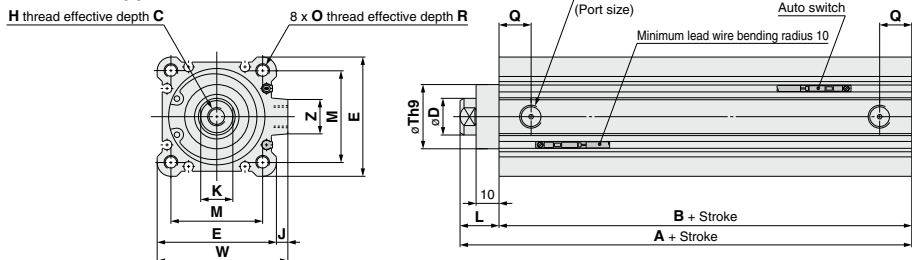
Bore Size

## Ø32 to Ø50

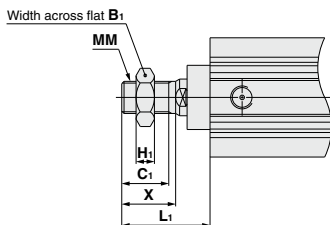
Dimensions with mounting bracket are the same as standard type. For details, refer to pages 790 to 792.

CDQ2□-XC88  
XC89

### Both ends tapped: CDQ2A



### Rod end male thread



### Rod End Male Thread

Bore size (mm)	B <sub>1</sub>	C <sub>1</sub>	H <sub>1</sub>	L <sub>1</sub>	MM	X
32	22	20.5	8	38.5	M14 x 1.5	23.5
40	22	20.5	8	38.5	M14 x 1.5	23.5
50	27	26	11	43.5	M18 x 1.5	28.5

### Both Ends Tapped

Bore size (mm)	Stroke range (mm)	A	B	C	D	E	H	J	K	L	M	O	P	Q	R	Th9	W	Z
32	125 to 200 (Note 1)	67.5	50.5	13	16	45	M8 x 1.25	4.5	14	17	34	M6 x 1.0	1/8	10	10	23 <sub>0.052</sub>	49.5	14
	250, 300	77	60	13	16	52	M8 x 1.25	5	14	17	40	M6 x 1.0	1/8	12.5	10	28 <sub>0.052</sub>	57	15
40		78.5	60.5	15	20	64	M10 x 1.5	7	17	18	50	M8 x 1.25	1/4	14	14	35 <sub>0.052</sub>	71	19

Note 1) For 125 to 200 strokes, strokes are available in 25 mm increments.

Note 2) For calculation on the longitudinal dimension of intermediate strokes, refer to page 1865.

### Comparison of the Dimensions of Each Series

Bore size (mm)	XC88, 89			Standard		
	A	B	L	A	B	L
32	67.5	50.5	17	62.5	45.5	17
40	77	60	17	72	55	17
50	78.5	60.5	18	73.5	55.5	18
63	80	62	18	75	57	18
80	91	71	20	86	66	20
100	102.5	80.5	22	97.5	75.5	22

\* At 0 stroke

**Made to Order Common Specifications: CDQ2 Series/Long Stroke**  
**Spatter Resistant Coil Scraper, Lube-retainer, Grease for Welding (Piston rod: Stainless steel 304)**  
**Spatter Resistant Coil Scraper, Lube-retainer, Grease for Welding (Piston rod: S45C)**

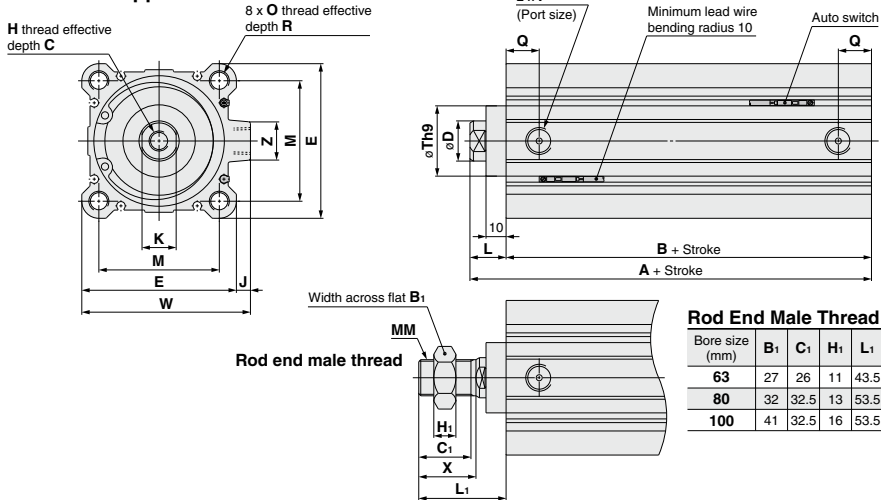
Bore Size

**Ø63 to Ø100**

Dimensions with mounting bracket are the same as standard type. For details, refer to pages 793 to 795.

CDQ2□-XC88  
 CDQ2□-XC89

**Both ends tapped: CDQ2A**



**Rod End Male Thread** (mm)

Bore size (mm)	B <sub>1</sub>	C <sub>1</sub>	H <sub>1</sub>	L <sub>1</sub>	MM	X
63	27	26	11	43.5	M18 x 1.5	28.5
80	32	32.5	13	53.5	M22 x 1.5	35.5
100	41	32.5	16	53.5	M26 x 1.5	35.5

**Both Ends Tapped**

Bore size (mm)	Stroke range (mm)	A	B	C	D	E	H	J	K	L	M	O	P	Q	R	Th9	W	Z
63	125 to 200 <small>Note 1)</small>	80	62	15	20	77	M10 x 1.5	7	17	18	60	M10 x 1.5	1/4	16.5	18	35 <sup>0</sup> <sub>0.062</sub>	84	19
	250, 300	91	71	21	25	98	M16 x 2.0	6	22	20	77	M12 x 1.75	3/8	19	22	43 <sup>0</sup> <sub>0.062</sub>	104	25
80		102.5	80.5	27	30	117	M20 x 2.5	6.5	27	22	94	M12 x 1.75	3/8	23	22	59 <sup>0</sup> <sub>0.074</sub>	123.5	25

Note 1) For 125 to 200 strokes, strokes are available in 25 mm increments.

Note 2) For calculation on the longitudinal dimension of intermediate strokes, refer to page 1865.



# Made to Order Common Specifications:

-XC88: Spatter Resistant Coil Scraper, Lube-retainer, Grease for Welding (Piston rod: Stainless steel 304)

-XC89: Spatter Resistant Coil Scraper, Lube-retainer, Grease for Welding (Piston rod: S45C)



## CDQ2□S Series: Anti-lateral Load

**62** Spatter Resistant Coil Scraper, Lube-retainer, Grease for Welding (Piston rod: Stainless steel 304)

Symbol

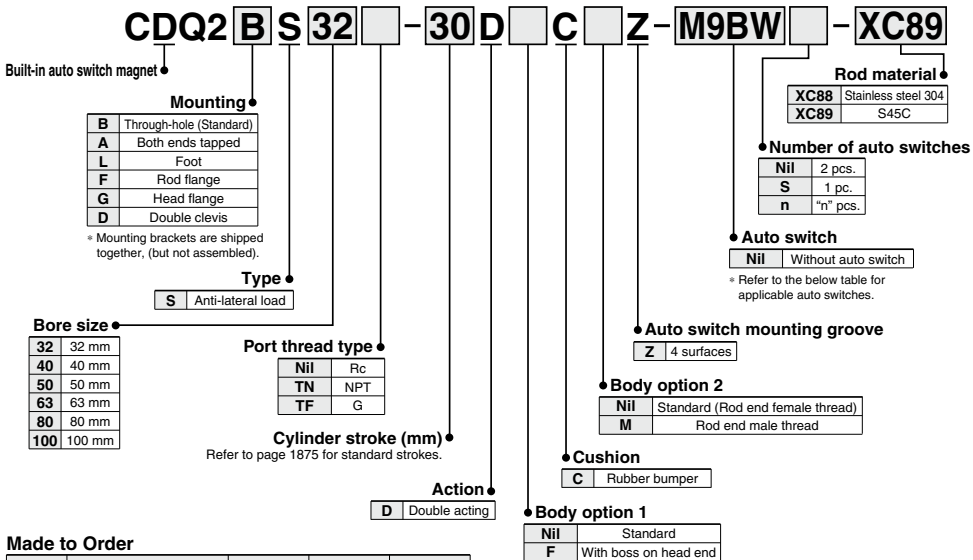
**-XC88**

**63** Spatter Resistant Coil Scraper, Lube-retainer, Grease for Welding (Piston rod: S45C)

**-XC89**

Reduces spatter adhesion and improves durability by the use of the coil scraper, Lube-retainer and grease for welding.

### CDQ2□S Series: Anti-lateral Load How to Order



### Made to Order

Part no.	Piston rod material (Hard chrome plated)		Coil scraper	Lube-retainer	Grease for welding
	S45C	Stainless steel 304			
-XC88	—	●	●	●	●
-XC89	●	—	●	●	●

### Built-in Auto Switch Magnet Cylinder Model

If a built-in auto switch magnet cylinder without an auto switch is required, there is no need to enter the symbol for the auto switch. (Example) CDQ2L540-30DCZ-XC89

### Applicable Auto Switches/Refer to pages 1575 to 1701 for further information on auto switches.

Type	Special function	Electrical entry	Indicator light	Wiring (Output)	Load voltage		Auto switch model		Lead wire length (m)					Pre-wired connector	Applicable load						
					DC	AC	Perpendicular	In-line	0.5 (Nil)	1 (M)	3 (L)	5 (Z)	None (N)		IC circuit	Relay, PLC					
																	5 V, 12 V	5 V, 12 V	M9NV	M9P	●
Solid state auto switch	—	Grommet	Yes	3-wire (NPN)	24 V	—	M9PV	M9P	●	●	○	—	—	—	—						
				3-wire (PNP)					●	●	○	—	—			—					
				2-wire					●	●	○	—					—	—			
	3-wire (NPN)			24 V					—	M9NVV	M9NW	●	●	○	—	—			—		
	3-wire (PNP)											●	●	○	—					—	—
	2-wire											●	●	○	—		—	—			
Magnetic field resistant (2-color indicator)	—	Grommet	Yes	2-wire (Non-polar)	24 V	—	M9PWV	M9PW	●	●	○	—	—	—							
				—					—	—	—	—			—						
				—												—	—	—	—		
Reed auto switch	—	Grommet	Yes	3-wire (NPN equivalent)	24 V	—	A96V	A96	●	●	—	—	—	—							
				2-wire					24 V	5 V, 12 V	100 V or less	A93V			A93	●	●	●	—	—	—
				—												—	—	—	A90V		

\* Lead wire length symbols: 0.5 m ..... Nil (Example) M9NV  
1 m ..... M (Example) M9NWM  
3 m ..... L (Example) M9NWL  
5 m ..... Z (Example) M9NWZ

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

\* Please contact SMC for auto switches, auto switch proper mounting positions and operating ranges other than the above.

\* For details about auto switches with pre-wired connector, refer to pages 1648 and 1649.

**Made to Order Common Specifications: CDQ2□S Series/Anti-lateral Load  
Spatter Resistant Coil Scraper, Lube-retainer, Grease for Welding (Piston rod: Stainless steel 304)  
Spatter Resistant Coil Scraper, Lube-retainer, Grease for Welding (Piston rod: S45C)**

## Specifications

Bore size (mm)	32	40	50	63	80	100
<b>Action</b>	Double acting, Single rod					
<b>Fluid</b>	Air					
<b>Proof pressure</b>	1.5 MPa					
<b>Maximum operating pressure</b>	1.0 MPa					
<b>Minimum operating pressure</b>	0.05 MPa					
<b>Ambient and fluid temperature</b>	-10 to 60°C (No freezing)					
<b>Lubrication</b>	Not required (Non-lube)					
<b>Piston speed</b>	50 to 500 mm/s					
<b>Allowable kinetic energy (J)</b>	0.29	0.52	0.91	1.54	2.71	4.54
<b>Stroke length tolerance</b>	+1.0 mm (Note) 0					

Note) Stroke length tolerance does not include the amount of dumper change.

## Standard Strokes

Bore size	Standard stroke (mm)
<b>32, 40</b>	5, 10, 15, 20, 25, 30, 35, 40, 45, 50, 75, 100
<b>50, 63, 80, 100</b>	10, 15, 20, 25, 30, 35, 40, 45, 50, 75, 100

## Manufacture of Intermediate Strokes

<b>Type</b>	A spacer is installed in the standard stroke body.	
<b>Part no.</b>	Refer to "How to Order" for the standard model number. (Page 1874)	
<b>Description</b>	Strokes in 1 mm increments are available by installing a spacer in the standard stroke cylinder.	
<b>Stroke range</b>	Bore size	Stroke range
	32 to 100	1 to 99
<b>Example</b>	Part no.: CDQ2BS50-57DCZ-XC89 CDQ2BS50-75DCZ-XC89 with 18 mm width spacer inside The B dimension is 125.5 mm.	

## Type

The specifications of the cylinder with auto switch are the same as those of the standard model.

- Auto switch proper mounting position (detection at stroke end) and its mounting height
- Minimum stroke for auto switch mounting
- Auto switch mounting brackets/Part no.
- Operating range

		Bore size (mm)	32	40	50	63	80	100
Pneumatic	Mounting	Through-hole (Standard)	●	●	●	●	●	●
		Both ends tapped	●	●	●	●	●	●
		Built-in magnet for auto switch	●	●	●	●	●	●
	Piping	Pipe thread	Rc1/8	Rc1/8	Rc1/4	Rc1/4	Rc3/8	Rc3/8
			NPT1/8	NPT1/8	NPT1/4	NPT1/4	NPT3/8	NPT3/8
			G1/8	G1/8	G1/4	G1/4	G3/8	G3/8
		Rod end male thread	●	●	●	●	●	●
	With rubber bumper (Standard)	●	●	●	●	●	●	
	With boss on head end	●	●	●	●	●	●	

# CDQ2□S-XC88/XC89

Anti-lateral Load

Bore Size

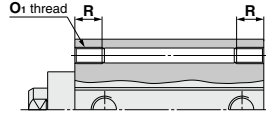
## ø32 to ø50

Dimensions with mounting bracket are the same as standard type. For details, refer to pages 790 to 792.

CDQ2□S-XC88  
XC89

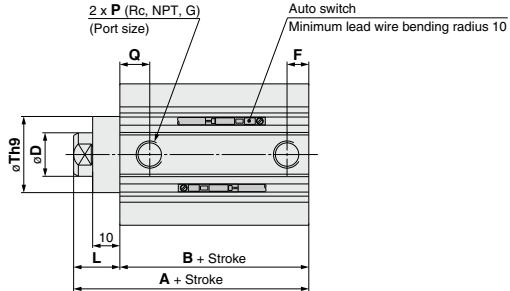
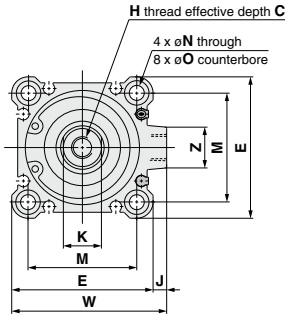
Both ends tapped: CDQ2AS

Through-hole (Standard): CDQ2BS

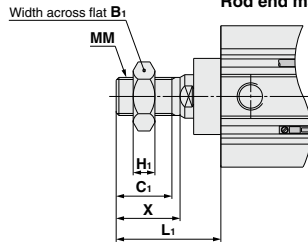


Both Ends Tapped

Bore size (mm)	O1	R
32	M6 x 1.0	10
40	M6 x 1.0	10
50	M8 x 1.25	14



Rod end male thread



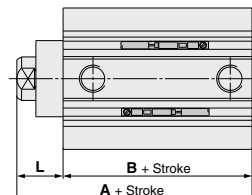
Rod End Male Thread

Bore size (mm)	B1	C1	H1	L1	MM	X
32	22	20.5	8	38.5	M14 x 1.5	23.5
40	22	20.5	8	38.5	M14 x 1.5	23.5
50	27	26	11	43.5	M18 x 1.5	28.5

The dimensions with boss on head end are equivalent to those of the CDQ2 series, double acting, single rod. Refer to page 1866.

Bore size (mm)	Stroke range (mm)	A	B	C	D	E	F	H	J	K	L	M	N	O	Th9	P	Q	W	Z
32	5 to 50, 75, 100	60	43	13	16	45	7.5	M8 x 1.25	4.5	14	17	34	5.5	9 depth 7	23 <sup>+0.052</sup>	1/8	10	49.5	14
40	5 to 50, 75, 100	66.5	49.5	13	16	52	7.5	M8 x 1.25	5	14	17	40	5.5	9 depth 7	28 <sup>+0.052</sup>	1/8	12.5	57	15
50	10 to 50, 75, 100	68.5	50.5	15	20	64	10.5	M10 x 1.5	7	17	18	50	6.6	11 depth 8	35 <sup>+0.062</sup>	1/4	10.5	71	19

## Comparison of the Dimensions of Each Series



Bore size (mm)	XC88, 89			Standard		
	A	B	L	A	B	L
32	60	43	17	50	43	17
40	66.5	49.5	17	56.5	49.5	17
50	68.5	50.5	18	58.5	50.5	18
63	74	56	18	64	56	18
80	83.5	63.5	20	73.5	63.5	20
100	95	73	22	85	73	22

\* At 0 stroke



Made to Order Common Specifications: **CDQ2□S Series/Anti-lateral Load**  
 Spatter Resistant Coil Scraper, Lube-retainer, Grease for Welding (Piston rod: Stainless steel 304)  
 Spatter Resistant Coil Scraper, Lube-retainer, Grease for Welding (Piston rod: S45C)

Bore Size

**ø63 to ø100**

Dimensions with mounting bracket are the same as standard type. For details, refer to pages 793 to 795.

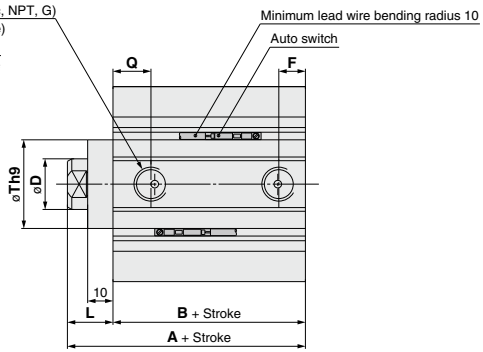
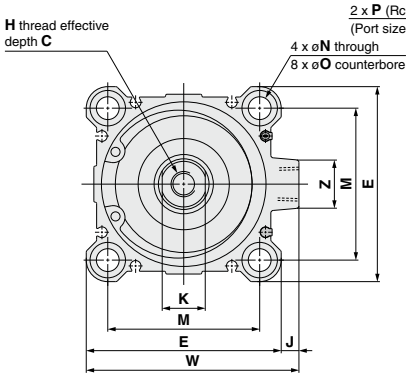
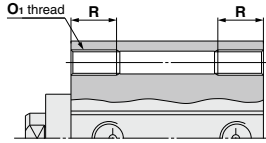
CDQ2□S-**XC88**  
 -**XC89**

Both ends tapped: CDQ2AS

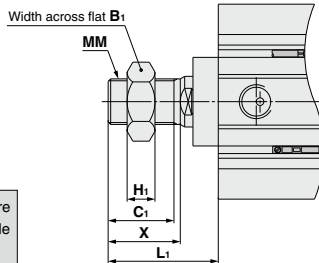
Through-hole (Standard): CDQ2BS

Both Ends Tapped

Bore size (mm)	O <sub>1</sub>	R
63	M10 x 1.5	18
80	M12 x 1.75	22
100	M12 x 1.75	22



Rod end male thread



Rod End Male Thread

Bore size (mm)	B <sub>1</sub>	C <sub>1</sub>	H <sub>1</sub>	L <sub>1</sub>	MM	X
63	27	26	11	43.5	M18 x 1.5	28.5
80	32	32.5	13	53.5	M22 x 1.5	35.5
100	41	32.5	16	53.5	M26 x 1.5	35.5

The dimensions with boss on head end are equivalent to those of the CDQ2 series, double acting, single rod. Refer to page 1867.

Bore size (mm)	Stroke range (mm)	A	B	C	D	E	F	H	J	K	L	M	N	O	P	Q	Th9	W	Z
63	10 to 50, 75, 100	74	56	15	20	77	10.5	M10 x 1.5	7	17	18	60	9	14 depth 10.5	1/4	15	35 <sup>0</sup> <sub>-0.062</sub>	84	19
80	10 to 50, 75, 100	83.5	63.5	21	25	98	12.5	M16 x 2.0	6	22	20	77	11	17.5 depth 13.5	3/8	16	43 <sup>0</sup> <sub>-0.062</sub>	104	25
100	10 to 50, 75, 100	95	73	27	30	117	13	M20 x 2.5	6.5	27	22	94	11	17.5 depth 13.5	3/8	23	59 <sup>0</sup> <sub>-0.074</sub>	123.5	25



# Made to Order Common Specifications:

- XC88: Spatter Resistant Coil Scraper, Lube-retainer, Grease for Welding (Piston rod: Stainless steel 304)
- XC89: Spatter Resistant Coil Scraper, Lube-retainer, Grease for Welding (Piston rod: S45C)
- XC91: Spatter Resistant Coil Scraper, Grease for Welding (Piston rod: S45C)



## MGP Series

**62** Spatter Resistant Coil Scraper, Lube-retainer, Grease for Welding (Piston rod: Stainless steel 304) **-XC88**

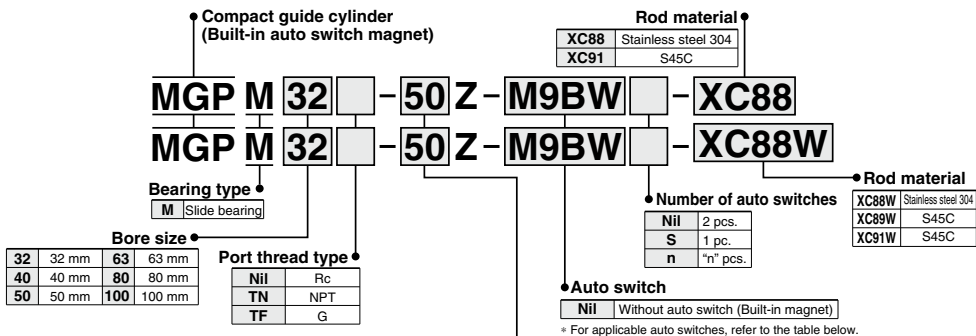
**63** Spatter Resistant Coil Scraper, Lube-retainer, Grease for Welding (Piston rod: S45C) **-XC89**

Reduces spatter adhesion and improves durability by the use of the coil scraper, Lube-retainer and grease for welding.  
**64** Spatter Resistant Coil Scraper, Grease for Welding (Piston rod: S45C) **-XC91**

With coil scraper and grease for welding

### MGP Series

### How to Order



### Made to Order

Part no.	Piston rod/ Guide rod material (Hard chrome plating)		Coil scraper		Lube-retainer		Grease for welding
	S45C	Stainless steel 304	Rod side	Head side	Rod side	Head side	
-XC88	—	●	●	—	●	—	●
-XC91	●	—	●	—	●	—	●
-XC88W	—	●	●	●	●	●	●
-XC89W	●	—	●	●	●	●	●
-XC91W	●	—	●	●	—	●	●

\* The current product MGP-XC89 is equivalent to -XC91.

The specifications of the cylinder with auto switch are the same as those of the standard model.

- Auto switch proper mounting position (detection at stroke end) and its mounting height
- Minimum stroke for auto switch mounting
- Auto switch mounting brackets/Part no.
- Operating range

### Cylinder stroke (mm)

25, 50, 75, 100, 125, 150, 175, 200, 250, 300, 350, 400

## Specifications

Action	Bore size					
	ø32	ø40	ø50	ø63	ø80	ø100
Fluid	Double acting					
Fluid	Air					
Proof pressure	1.5 MPa					
Maximum operating pressure	1.0 MPa					
Minimum operating pressure	XC88, XC91		0.12 MPa			
	XC88W, XC89W, XC91W		0.14 MPa			
Ambient and fluid temperature	-10°C to 60°C (No freezing)					
Cushion	Rubber bumper on both ends					
Lubrication	Not required (Non-Lube)					
Stroke length tolerance	+1.5 0 mm					

### Applicable Auto Switches/Refer to pages 1575 to 1701 for further information on auto switches.

Type	Special function	Electrical entry	Indicating light	Wiring (Output)	Load voltage		Auto switch model		Lead wire length (m)			Pre-wired connector	Applicable load		
					DC	AC	Perpendicular	In-line	0.5 (Nil)	1 (M)	3 (L)		5 (Z)		
Solid state auto switch	—	Grommet	Yes	3-wire (NPN)	24 V	5 V, 12 V	—	M9NV	M9N	●	●	●	○	IC circuit	Relay, PLC
				3-wire (PNP)				M9PV	M9P	●	●	●	○		
	2-wire			M9BV				M9B	●	●	●	○			
	3-wire (NPN)			M9NVV				M9NV	●	●	●	○			
	3-wire (PNP)			M9PVV				M9PV	●	●	●	○			
	2-wire			M9BVV				M9BV	●	●	●	○			
Reed auto switch	—	Grommet	No	3-wire (NPN equivalent)	24 V	12 V	100 V or less	A96V	A96	●	●	—	IC circuit	Relay, PLC	
				2-wire				A93V	A93	●	●	—			
				—				A90V	A90	●	●	—			
				—				A90V	A90	●	●	—			

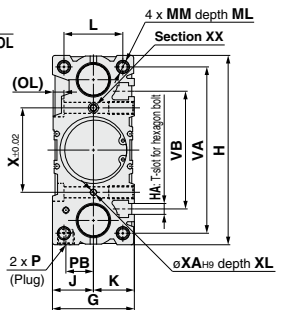
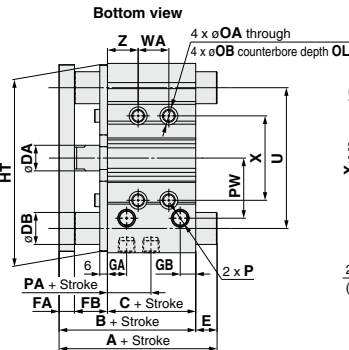
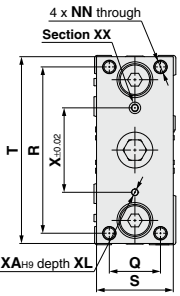
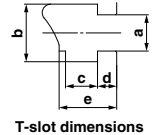
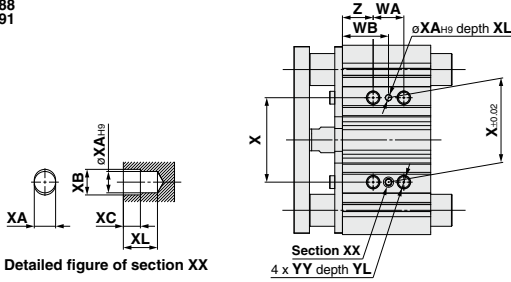
- \* Lead wire length symbols: 0.5 m..... Nil (Example) M9NV  
1 m..... M (Example) M9NVW  
3 m..... L (Example) M9NWL  
5 m..... Z (Example) M9NVZ
- \* Auto switches are shipped together, (but not assembled).
- \* Solid state auto switches marked with "○" are produced upon receipt of order.
- \* Auto switches other than D-P3DWA/D-P4DW cannot be used under the magnetic field environment.
- \* Please contact SMC for auto switches, auto switch proper mounting positions and operating ranges other than the above.
- \* For details about auto switches with pre-wired connector, refer to pages 1648 and 1649.

**Made to Order Common Specifications: *MGP Series***  
**Spatter Resistant Coil Scraper, Lube-retainer, Grease for Welding (Piston rod: Stainless steel 304)**  
**Spatter Resistant Coil Scraper, Lube-retainer, Grease for Welding (Piston rod: S45C)**  
**Spatter Resistant Coil Scraper, Grease for Welding (Piston rod: S45C)**

Bore Size

**ø32 to ø63**

MGPM-**XC88**  
-**XC91**



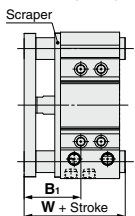
Bore size (mm)	Standard stroke	A			B	C	DA	DB	E			FA	FB	G	GA	GB	H	HA	HT	J
		50 st or less	Over 50 st or less	Over 200 st					50 st or less	Over 50 st or less	Over 200 st									
		85	103.5	139.5					69.5	37.5	14									
32	25, 50, 75, 100	85	103.5	139.5	69.5	37.5	14	20	15.5	34	70	10	22	48	12	9	112	M6	110	24
40	125, 150, 175, 200	85	103.5	139.5	76	44	14	20	9	27.5	63.5	10	22	54	15	12	120	M6	118	27
50	250, 300, 350, 400	98.5	119.5	160.5	82	44	20	25	16.5	37.5	78.5	12	26	64	15	12	148	M8	146	32
63		98.5	119.5	160.5	87	49	20	25	11.5	32.5	73.5	12	26	78	15.5	13.5	162	M10	160	39

Bore size	K	L	MM	ML	NN	OA	OB	OL	P				PA	PB	PW	Q	R	S	T	U	VA	VB
									NI	TN	TF	TF										
32	24	34	M8 x 1.25	20	M8 x 1.25	6.7	11	7.5	Rc1/8	NPT1/8	G1/8	6.5	16	35.5	30	96	44	110	78	98	63	
40	27	40	M8 x 1.25	20	M8 x 1.25	6.7	11	7.5	Rc1/8	NPT1/8	G1/8	13	18	39.5	30	104	44	118	86	106	72	
50	32	46	M10 x 1.5	22	M10 x 1.5	8.6	14	9	Rc1/4	NPT1/4	G1/4	9	21.5	47	40	130	60	146	110	130	92	
63	39	58	M10 x 1.5	22	M10 x 1.5	8.6	—	9	Rc1/4	NPT1/4	G1/4	13	28	58	50	130	70	158	124	142	110	

Bore size	WA					WB					X	XA	XB	XC	XL	YY	YL	Z	a	b	c	d	e
	25 st or less	Over 25 st or less	Over 100 st or less	Over 200 st or less	Over 300 st	25 st or less	Over 25 st or less	Over 100 st or less	Over 200 st or less	Over 300 st													
	24	48	124	200	300	33	45	83	121	171													
32	24	48	124	200	300	33	45	83	121	171	42	4	4.5	3	6	M8 x 1.25	16	21	6.5	10.5	5.5	3.5	9.5
40	24	48	124	200	300	34	46	84	122	172	50	4	4.5	3	6	M8 x 1.25	16	22	6.5	10.5	5.5	4	11
50	24	48	124	200	300	36	48	86	124	174	66	5	6	4	8	M10 x 1.5	20	24	8.5	13.5	7.5	4.5	13.5
63	28	52	128	200	300	38	50	88	124	174	80	5	6	4	8	M10 x 1.5	20	24	11	17.8	10	7	18.5

**Comparison of the Dimensions of Each Series**

**Single side scraper (-XC88, -XC91)**



Bore size (mm)	XC88		XC91		XC35		Standard	
	B <sub>1</sub>	W (Note)	B <sub>1</sub>	W (Note)	B <sub>1</sub>	W (Note)	B <sub>1</sub>	W (Note)
32	53	85	53	85	53	85	43	75
40	54	85	54	85	54	85	44	75
50	62	98.5	62	98.5	62	98.5	52	88.5
63	62	98.5	62	98.5	62	98.5	52	88.5
80	78	114.5	78	114.5	78	114.5	68	104.5
100	71	136.5	71	136.5	71	136.5	61	126.5

\* At 0 stroke  
 Note) W dimensions are for 50 stroke or less.

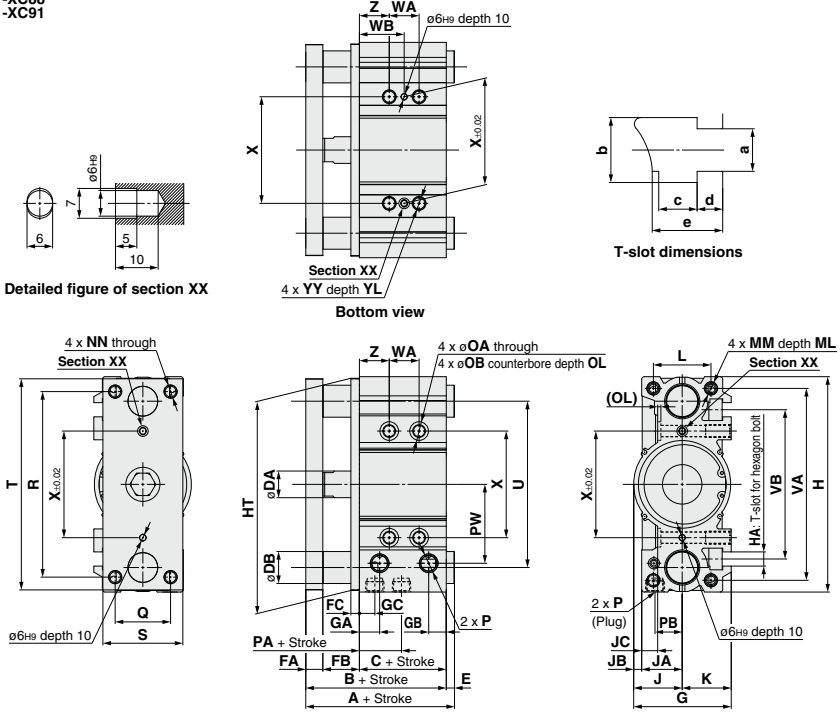


# MGP-XC88/XC89/XC91

Bore Size

**ø80, ø100**

MGPM-XC88  
-XC91



(mm)

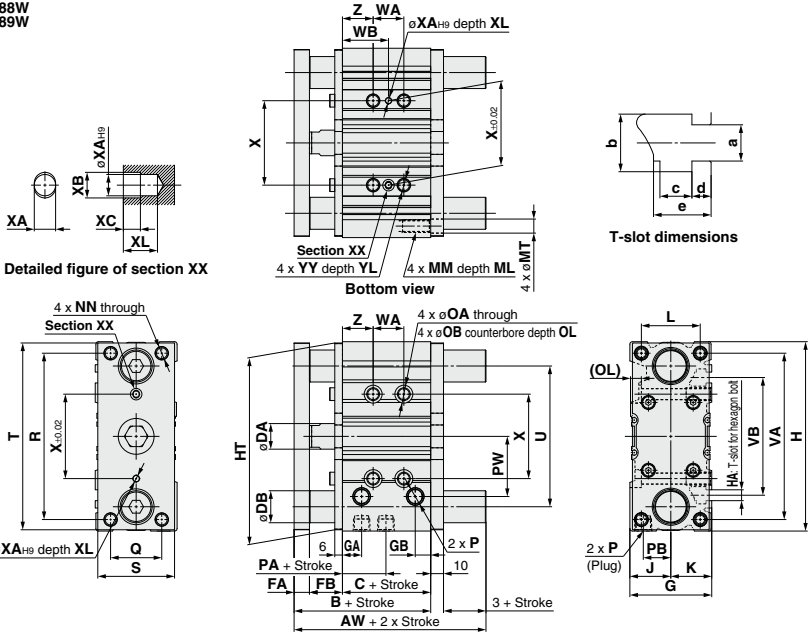
Bore size	Standard stroke	A			B	C	DA	DB	E			FA	FB	FC	G	GA	GB	GC	H	HA				
		50 st or less	Over 50 st 200 st or less	Over 200 st					50 st or less	Over 50 st 200 st or less	Over 200 st													
80	25, 50, 75, 100, 125, 150, 175,	114.5	141.5	190.5	106.5	56.5	25	30	8	35	84	16	34	8	91.5	19	16.5	14.5	202	M12				
100	200, 250, 300, 350, 400	136.5	161.5	200.5	126	66	30	36	10.5	35.5	74.5	19	41	9	111.5	22.5	20.5	18	240	M14				
Bore size	HT	J	JA	JB	JC	K	L	MM	ML	NN	OA	OB	OL	P			PA	PB	PW	Q	R	S	T	U
														Nil	TN	TF								
80	199	45.5	38	7.5	15	46	54	M12 x 1.75	25	M12 x 1.75	10.6	17.5	3	Rc3/8	NPT3/8	G3/8	14.5	25.5	74	52	174	75	198	156
100	236	55.5	45	10.5	10	56	62	M14 x 2	31	M14 x 2	12.5	20	8	Rc3/8	NPT3/8	G3/8	17.5	32.5	89	64	210	90	236	188
Bore size	VA	VB	WA				WB				X	YY	YL	Z	a	b	c	d	e					
			25 st or less	Over 25 st 100 st or less	Over 100 st 200 st or less	Over 200 st 300 st or less	25 st or less	Over 25 st 100 st or less	Over 100 st 200 st or less	Over 200 st 300 st or less														
80	180	140	28	52	128	200	300	42	54	92	128	178	100	M12 x 1.75	24	28	13.3	20.3	12	8	22.5			
100	210	166	48	72	148	220	320	35	47	85	121	171	124	M14 x 2	28	11	15.3	23.3	13.5	10	30			

**Made to Order Common Specifications: *MGP Series***  
**Spatter Resistant Coil Scraper, Lube-retainer, Grease for Welding (Piston rod: Stainless steel 304)**  
**Spatter Resistant Coil Scraper, Lube-retainer, Grease for Welding (Piston rod: S45C)**  
**Spatter Resistant Coil Scraper, Grease for Welding (Piston rod: S45C)**

Bore Size

**ø32 to ø63**

**MGPM-XC88W**  
**-XC89W**



(mm)

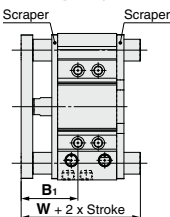
Bore size	Standard stroke	AW	B	C	DA	DB	FA	FB	G	GA	GB	H	HA	HT	J	K	L	MM	ML	MT	NN
<b>32</b>	25, 50, 75, 100, 125,	82.5	69.5	37.5	14	20	10	22	48	12	9	112	M6	110	24	24	34	M8 x 1.25	20	9	M8 x 1.25
<b>40</b>	150, 175, 200, 250,	89	76	44	14	20	10	22	54	15	12	120	M6	118	27	27	40	M8 x 1.25	20	8.5	M8 x 1.25
<b>50</b>	300, 350, 400	95	82	44	20	25	12	26	64	15	12	148	M8	146	32	32	46	M10 x 1.5	22	11	M10 x 1.5
<b>63</b>		100	87	49	20	25	12	26	78	15.5	13.5	162	M10	160	39	39	58	M10 x 1.5	22	11	M10 x 1.5

Bore size	OA	OB	OL	P			PA	PB	PW	Q	R	S	T	U	VA	VB	WA				
				NII	TN	TF											25 st or less	Over 25 st 100 st or less	Over 100 st 200 st or less	Over 200 st 300 st or less	Over 300 st
<b>32</b>	6.7	11	7.5	Rc1/8	NPT1/8	G1/8	6.5	16	35.5	30	96	44	110	78	98	63	24	48	124	200	300
<b>40</b>	6.7	11	7.5	Rc1/8	NPT1/8	G1/8	13	18	39.5	30	104	44	118	86	106	72	24	48	124	200	300
<b>50</b>	8.6	14	9	Rc1/4	NPT1/4	G1/4	9	21.5	47	40	130	60	146	110	130	92	24	48	124	200	300
<b>63</b>	8.6	—	9	Rc1/4	NPT1/4	G1/4	13	28	58	50	130	70	158	124	142	110	28	52	128	200	300

Bore size	WB					X	XA	XB	XC	XL	YY	YL	Z	a	b	c	d	e
	25 st or less	Over 25 st 100 st or less	Over 100 st 200 st or less	Over 200 st 300 st or less	Over 300 st													
<b>32</b>	33	45	83	121	171	42	4	4.5	3	6	M8 x 1.25	16	21	6.5	10.5	5.5	3.5	9.5
<b>40</b>	34	46	84	122	172	50	4	4.5	3	6	M8 x 1.25	16	22	6.5	10.5	5.5	4	11
<b>50</b>	36	48	86	124	174	66	5	6	4	8	M10 x 1.5	20	24	8.5	13.5	7.5	4.5	13.5
<b>63</b>	38	50	88	124	174	80	5	6	4	8	M10 x 1.5	20	24	11	17.8	10	7	18.5

**Comparison of the Dimensions of Each Series**

**Both sides scraper (-XC88W, -XC89W, -XC91W)**



Bore size (mm)	XC88W XC89W		XC91W		XC35W	
	B <sub>1</sub>	W	B <sub>1</sub>	W	B <sub>1</sub>	W
<b>32</b>	53	82.5	53	82.5	53	82.5
<b>40</b>	54	89	54	89	54	89
<b>50</b>	62	95	62	95	62	95
<b>63</b>	62	100	62	100	62	100
<b>80</b>	78	120.5	78	120.5	78	120.5
<b>100</b>	71	143	71	143	71	143

\* At 0 stroke

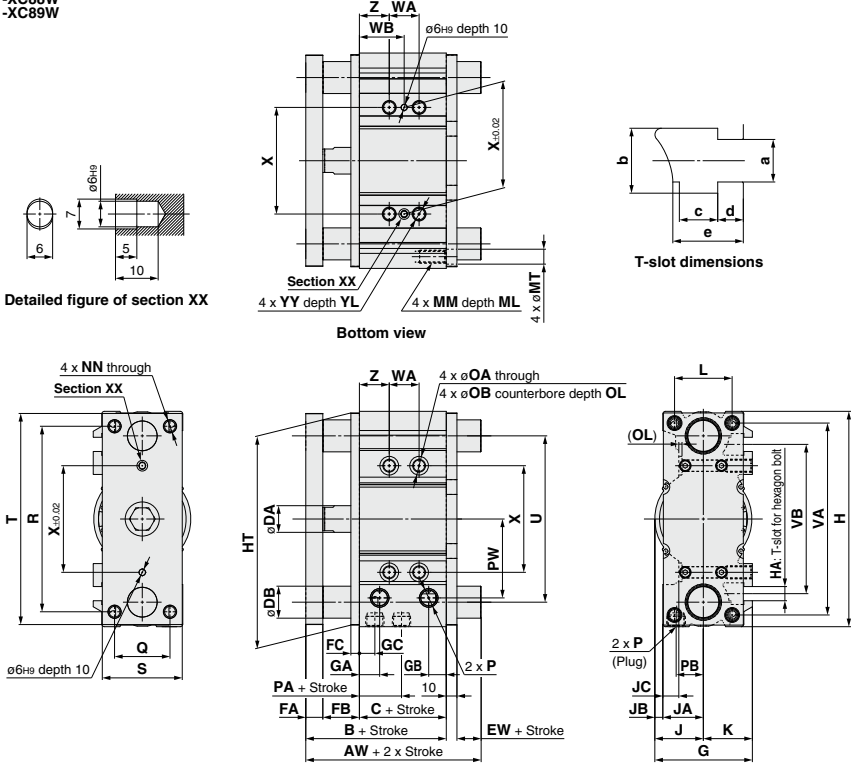


# MGP-XC88/XC89/XC91

Bore Size

**ø80, ø100**

MGPM-XC88W  
-XC89W



Bore size	Standard stroke																AW	B	C	DA	DB	EW	FA	FB	FC	G	GA	GB	GC	H	HA	HT	J	JA	JB
80	25, 50, 75, 100, 125, 150, 175																120.5	106.5	56.5	25	30	4	16	34	8	91.5	19	16.5	14.5	202	M12	199	45.5	38	7.5
100	200, 250, 300, 350, 400																143	126	66	30	36	7	19	41	9	111.5	22.5	20.5	18	240	M14	236	55.5	45	10.5

Bore size	JC	K	L	MM	ML	MT	NN	OA	OB	OL	P			PA	PB	PW	Q	R	S	T	U	VA	
80	15	46	54	M12 x 1.75	25	14	M12 x 1.75	10.6	17.5	3	Nil	TN	TF	G3/8	14.5	25.5	74	52	174	75	198	156	180
100	10	56	62	M14 x 2	31	16	M14 x 2	12.5	20	8	Rc3/8	NPT3/8	G3/8	17.5	32.5	89	64	210	90	236	188	210	

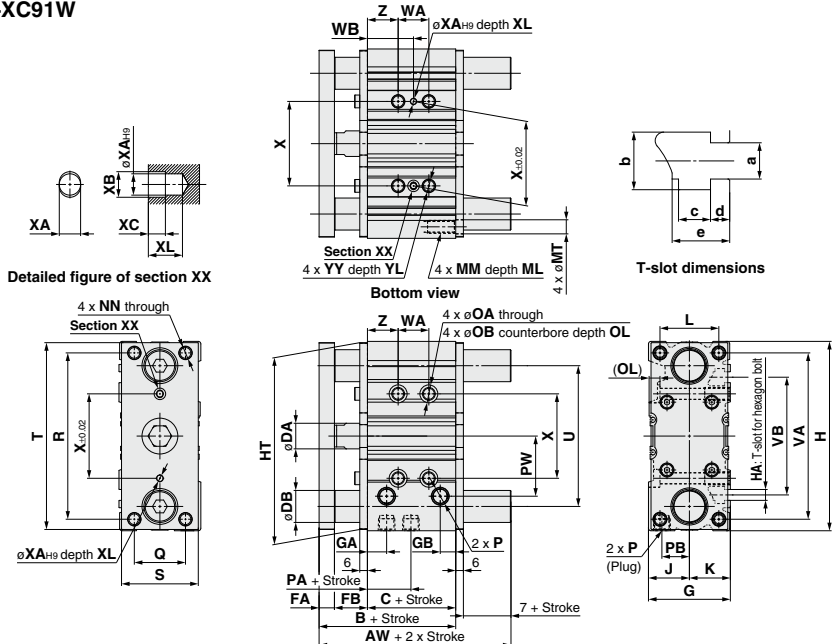
  

Bore size	VB	WA			WB						X	YY	YL	Z	a	b	c	d	e	
		25 st or less	Over 25 st or less	Over 100 st or less	Over 200 st or less	Over 300 st or less	25 st or less	Over 25 st or less	Over 100 st or less	Over 200 st or less										Over 300 st or less
80	140	28	52	128	200	300	42	54	92	128	178	100	M12 x 1.75	24	28	13.3	20.3	12	8	22.5
100	166	48	72	148	220	320	35	47	85	121	171	124	M14 x 2	28	11	15.3	23.3	13.5	10	30

**Made to Order Common Specifications: *MGP Series***  
**Spatter Resistant Coil Scraper, Lube-retainer, Grease for Welding (Piston rod: Stainless steel 304)**  
**Spatter Resistant Coil Scraper, Lube-retainer, Grease for Welding (Piston rod: S45C)**  
**Spatter Resistant Coil Scraper, Grease for Welding (Piston rod: S45C)**

Bore Size  
**ø32 to ø63**

**MGPM-XC91W**



Bore size	Standard stroke	AW	B	C	DA	DB	FA	FB	G	GA	GB	H	HA	HT	J	K	L	MM	ML	MT	NN
<b>32</b>	25, 50, 75, 100, 125,	82.5	69.5	37.5	14	20	10	22	48	12	9	112	M6	110	24	24	34	M8 x 1.25	20	9	M8 x 1.25
<b>40</b>	150, 175, 200, 250,	89	76	44	14	20	10	22	54	15	12	120	M6	118	27	27	40	M8 x 1.25	20	8.5	M8 x 1.25
<b>50</b>	300, 350, 400	95	82	44	20	25	12	26	64	15	12	148	M8	146	32	32	46	M10 x 1.5	22	11	M10 x 1.5
<b>63</b>		100	87	49	20	25	12	26	78	15.5	13.5	162	M10	160	39	39	58	M10 x 1.5	22	11	M10 x 1.5

Bore size	OA	OB	OL	P			PA	PB	PW	Q	R	S	T	U	VA	VB	WA				
				Nil	TN	TF											25 st or less	Over 25 st or less	Over 100 st or less	Over 200 st or less	Over 300 st or less
<b>32</b>	6.7	11	7.5	Rc1/8	NPT1/8	G1/8	6.5	16	35.5	30	96	44	110	78	98	63	24	48	124	200	300
<b>40</b>	6.7	11	7.5	Rc1/8	NPT1/8	G1/8	13	18	39.5	30	104	44	118	86	106	72	24	48	124	200	300
<b>50</b>	8.6	14	9	Rc1/4	NPT1/4	G1/4	9	21.5	47	40	130	60	146	110	130	92	24	48	124	200	300
<b>63</b>	8.6	—	9	Rc1/4	NPT1/4	G1/4	13	28	58	50	130	70	158	124	142	110	28	52	128	200	300

Bore size	WB					X	XA	XB	XC	XL	YY	YL	Z	a	b	c	d	e
	25 st or less	Over 25 st or less	Over 100 st or less	Over 200 st or less	Over 300 st													
<b>32</b>	33	45	83	121	171	42	4	4.5	3	6	M8 x 1.25	16	21	6.5	10.5	5.5	3.5	9.5
<b>40</b>	34	46	84	122	172	50	4	4.5	3	6	M8 x 1.25	16	22	6.5	10.5	5.5	4	11
<b>50</b>	36	48	86	124	174	66	5	6	4	8	M10 x 1.5	20	24	8.5	13.5	7.5	4.5	13.5
<b>63</b>	38	50	88	124	174	80	5	6	4	8	M10 x 1.5	20	24	11	17.8	10	7	18.5

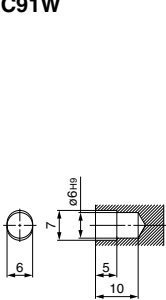


# MGP-XC88/XC89/XC91

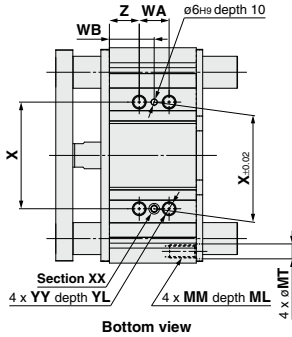
Bore Size

**ø80, ø100**

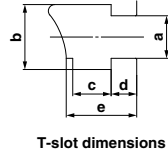
MGPM-XC91W



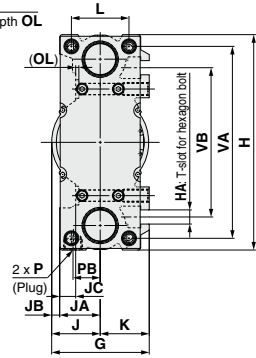
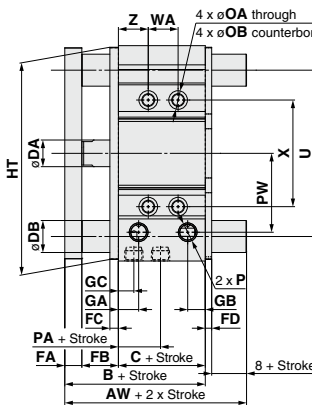
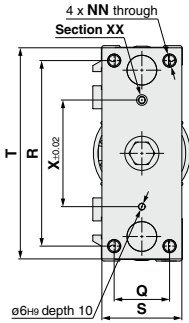
Detailed figure of section XX



Bottom view



T-slot dimensions



(mm)

Bore size	Standard stroke	AW	B	C	DA	DB	FA	FB	FC	FD	G	GA	GB	GC	H	HA	HT	J	JA	JB	JC
80	25, 50, 75, 100, 125, 150, 175	120.5	106.5	56.5	25	30	16	34	8	6	91.5	19	16.5	14.5	202	M12	199	45.5	38	7.5	15
100	200, 250, 300, 350, 400	143	126	66	30	36	19	41	9	9	111.5	22.5	20.5	18	240	M14	236	55.5	45	10.5	10

Bore size	K	L	MM	ML	MT	NN	OA	OB	OL	P			PA	PB	PW	Q	R	S	T	U	VA
										Nil	TN	TF									
80	46	54	M12 x 1.75	25	14	M12 x 1.75	10.6	17.5	3	Rc3/8	NPT3/8	G3/8	14.5	25.5	74	52	174	75	198	156	180
100	56	62	M14 x 2	31	16	M14 x 2	12.5	20	8	Rc3/8	NPT3/8	G3/8	17.5	32.5	89	64	210	90	236	188	210

Bore size	VB	WA				WB				X	YY	YL	Z	a	b	c	d	e		
		25 st or less	Over 25 st 100 st or less	Over 100 st 200 st or less	Over 200 st 300 st or less	25 st or less	Over 25 st 100 st or less	Over 100 st 200 st or less	Over 200 st 300 st or less											
80	140	28	52	128	200	300	42	54	92	128	178	100	M12 x 1.75	24	28	13.3	20.3	12	8	22.5
100	166	48	72	148	220	320	35	47	85	121	171	124	M14 x 2	28	11	15.3	23.3	13.5	10	30



# Made to Order Common Specifications:

-XC89: Spatter Resistant Coil Scraper, Lube-retainer, Grease for Welding (Piston rod: S45C)

-XC91: Spatter Resistant Coil Scraper, Grease for Welding (Piston rod: S45C)



## MK2T Series

**63 Spatter Resistant Coil Scraper, Lube-retainer, Grease for Welding (Piston rod: S45C) -XC89**

Reduces spatter adhesion and improves durability by the use of the coil scraper, Lube-retainer and grease for welding.

**64 Spatter Resistant Coil Scraper, Grease for Welding (Piston rod: S45C) -XC91**

With coil scraper and grease for welding

### MK2T Series

### How to Order

**MK2T B 32** - **10 R** - **M9BW** - **XC89**

**MK2T B 32** - **10 R** - **M9BW** - **XC91**

**Symbol**

**-XC89**

**-XC91**

**Rotary clamp cylinder**  
Double guide type  
(Built-in auto switch magnet)

**Mounting bracket**

<b>B</b>	Through-hole/Both ends tapped common (Standard)
<b>G</b>	Head flange

**Bore size**

<b>32</b>	32 mm	<b>50</b>	50 mm
<b>40</b>	40 mm	<b>63</b>	63 mm

**Cylinder port**

<b>Nil</b>	Rc
<b>TN</b>	NPT
<b>TF</b>	G

**Clamp stroke**

	Clamp stroke	Rotary stroke	Applicable bore size
<b>10</b>	10 mm	29 mm	ø32, ø40
<b>20</b>	20 mm		
<b>20</b>	20 mm	33 mm	ø50, ø63
<b>50</b>	50 mm		

**Number of auto switches**

<b>Nil</b>	2 pcs.
<b>S</b>	1 pc.

**Auto switch**

<b>Nil</b>	Without auto switch (Built-in magnet)
<b>N</b>	With arm

\* For applicable auto switches, refer to the table below.

**Body option**

<b>Nil</b>	Standard (Female thread)
<b>N</b>	With arm

\* Arms are included when shipped, (but not assembled).

**Rotary direction (Unclamp → Clamp)**

<b>R</b>	Clockwise
<b>L</b>	Counterclockwise

**L type**  
During unclamping (Extension end)  
85° to 95° (90°±5°)

**R type**  
During unclamping (Extension end)  
85° to 95° (90°±5°)

**Clamp part**  
Non-rotating accuracy ±0.5° to 1.0°  
During clamping (Retraction end)

**Number of auto switches**

**Auto switch**

**Body option**

**Rotary direction (Unclamp → Clamp)**

### Made to Order

Part no.	Piston rod material (Hard chrome plating)	Coil scraper	Lube-retainer	Grease for welding
	<b>S45C</b>			
<b>-XC89</b>	●	●	●	●
<b>-XC91</b>	●	●	—	●

(Note) Use the -XC91 in a place where the distance from the welding portion is far and the spatter scattering is minimized.

### Applicable Auto Switches/Refer to pages 1575 to 1701 for further information on auto switches.

Type	Special function	Electrical entry	Indicator light	Wiring (Output)	Load voltage		Auto switch model		Lead wire length (m)				Pre-wired connector	Applicable load	
					DC	AC	Perpendicular	In-line	0.5 (Nil)	1 (M)	3 (L)	5 (Z)			None
Solid state auto switch	—	Grommet	Yes	3-wire (NPN)	24 V	5 V, 12 V	—	<b>M9NV</b>	<b>M9N</b>	●	—	●	○	○	IC circuit
				3-wire (PNP)				<b>M9PV</b>	<b>M9P</b>	●	—	●	○	○	
				2-wire				<b>M9BV</b>	<b>M9B</b>	●	—	●	○	○	
	Diagnostic indication (2-color indicator)	Grommet	Yes	3-wire (NPN)	24 V	5 V, 12 V	—	<b>M9NWX</b>	<b>M9NW</b>	●	●	●	○	○	IC circuit
				3-wire (PNP)				<b>M9PWX</b>	<b>M9PW</b>	●	●	●	○	○	
				2-wire				<b>M9BWX</b>	<b>M9BW</b>	●	●	●	○	○	
Magnetic field resistant (2-color indicator)	Grommet	Yes	2-wire (Non-polar)	24 V	—	—	—	<b>P3DWA</b>	●	●	●	●	●	—	
			—				<b>P4DW**</b>	—	—	●	●	●	●		
Reed auto switch	—	Grommet	Yes	3-wire (NPN equivalent)	24 V	5 V	—	<b>A96V</b>	<b>A96</b>	●	—	●	—	—	IC circuit
				2-wire				<b>A93V</b>	<b>A93</b>	●	●	●	—	—	
				—				<b>A90V</b>	<b>A90</b>	●	—	●	—	—	

\* Lead wire length symbols: 0.5 m..... Nil (Example) M9NV  
1 m..... M (Example) M9NWX  
3 m..... L (Example) M9NWL  
5 m..... Z (Example) M9NWX

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

\*\*\* For D-P4DW, ø40 to ø63 are available.

\*\*\* Only D-P4DW type is assembled at the time of shipment.

\* Please contact SMC for auto switches, auto switch proper mounting positions and operating ranges other than the above.

\* For details about auto switches with pre-wired connector, refer to pages 1648 and 1649.

\* When D-M9C(V)/M9C(W)/M9C(A)/A9C(V) types are mounted on a side other than the port side, order auto switch mounting brackets separately. Refer to page 1684.

\* Auto switches are shipped together, (but not assembled).





## Specifications

Bore size (mm)	32	40	50	63
<b>Action</b>	Double acting			
<b>Rotation angle</b> <sup>Note 1)</sup>	90° ±5°			
<b>Rotary direction</b> <sup>Note 2)</sup>	Clockwise, Counterclockwise			
<b>Rotary stroke (mm)</b>	29		33	
<b>Clamp stroke (mm)</b>	10, 20		20, 50	
<b>Theoretical clamp force (N)</b> <sup>Note 3)</sup>	300	525	825	1300
<b>Fluid</b>	Air			
<b>Proof pressure</b>	1.5 MPa			
<b>Operating pressure range</b>	0.1 to 1 MPa			
<b>Ambient and fluid temperature</b>	Without auto switch: -10 to 70°C (No freezing) With auto switch: -10 to 60°C (No freezing)			
<b>Lubrication</b>	Non-lube			
<b>Piping port size</b>	Rc1/8, NPT1/8, G1/8		Rc1/4, NPT1/4, G1/4	
<b>Mounting</b>	Through-hole/Both ends tapped common, Head end flange			
<b>Cushion</b>	Rubber bumper			
<b>Stroke length tolerance</b>	+1.0 0			
<b>Piston speed</b>	50 to 200 mm/s			
<b>Non-rotating accuracy (Clamp part)</b>	±0.5°			

Note 1) Refer to "Rotary Angle" figure in Best Pneumatics No.2-3.

Note 2) Direction of rotation viewed from the rod end when rod parts are retracting.

Note 3) At 0.5 MPa.

## Theoretical Output

Unit: N

Bore size (mm)	Rod size (mm)	Operating direction	Piston area (cm <sup>2</sup> )	Operating pressure (MPa)			
				0.3	0.5	0.7	1.0
32	16	R	6	182	300	418	600
		H	8	243	400	557	800
40	16	R	10.5	319	525	731	1050
		H	12.5	380	625	870	1250
50	20	R	16.5	502	825	1149	1648
		H	19.6	596	980	1365	1961
63	25	R	26	780	1300	1820	2600
		H	31.2	948	1560	2172	3121

(Note) Theoretical output (N) = Pressure (MPa) x Piston area (cm<sup>2</sup>) x 100

Operating direction  
R: Rod end (Clamp)  
H: Head end (Unclamp)

The specifications of the cylinder with auto switch are the same as those of the standard model.

- Auto switch proper mounting position (detection at stroke end) and its mounting height
- Minimum stroke for auto switch mounting
- Auto switch mounting brackets/Part no.
- Operating range

**Made to Order Common Specifications: MK2T Series**  
**Spatter Resistant Coil Scraper, Lube-retainer, Grease for Welding (Piston rod: S45C)**  
**Spatter Resistant Coil Scraper, Grease for Welding (Piston rod: S45C)**

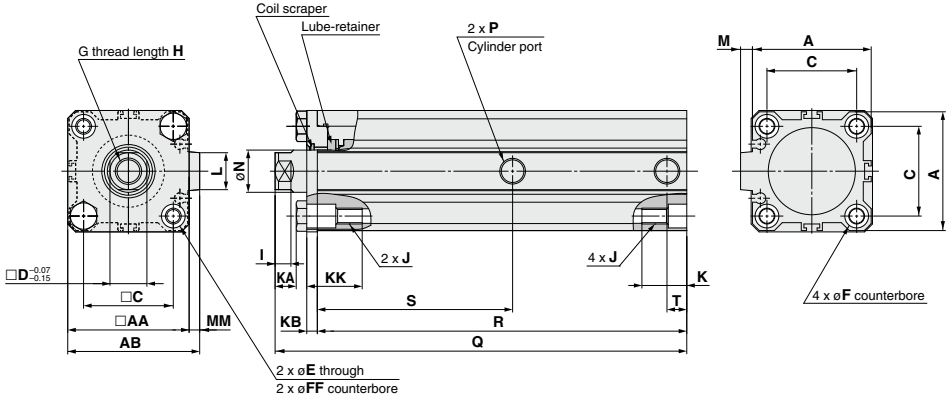
Bore Size

**ø32 to ø63**

Dimensions with mounting bracket are the same as standard type. For details, refer to Best Pneumatics No.2-3.

**MK2T□-XC89**

**Through-hole/Both ends tapped (Standard): MK2TB**



(mm)

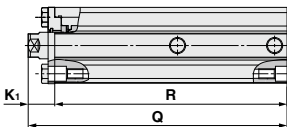
Bore size	AA	AB	A	C	D	E	FF	F	G	H	I	J	KK	K	KA	KB	L	MM	M	øN
<b>32</b>	46	50	45	34	14	5.5	9 depth 11	9 depth 7	M10 x 1.5	12	6	M6 x 1.0	21	17	8	4	14	4	4.5	16
<b>40</b>	52	57	52	40	14	5.5	9 depth 12	9 depth 7	M10 x 1.5	12	6	M6 x 1.0	22	17	7.5	5	14	5	5	16
<b>50</b>	64	71	64	50	17	6.6	11 depth 14	11 depth 8	M12 x 1.75	15	7	M8 x 1.25	28	22	12	6	19	7	7	20
<b>63</b>	77	84	77	60	22	9	14 depth 16.5	14 depth 10.5	M16 x 2	21	8	M10 x 1.5	34.5	28.5	10	6	19	7	7	25

Bore size	P			Clamp stroke: 10 mm				Clamp stroke: 20 mm				Clamp stroke: 50 mm			
	Nil	TN	TF	Q	R	S	T	Q	R	S	T	Q	R	S	T
<b>32</b>	Rc1/8	NPT1/8	G1/8	156	140	74	7.5	176	160	84	7.5	—	—	—	—
<b>40</b>	Rc1/8	NPT1/8	G1/8	160.5	144	75	8	180.5	164	85	8	—	—	—	—
<b>50</b>	Rc1/4	NPT1/4	G1/4	—	—	—	—	202.5	179	91.5	12.5	266	242.5	121.5	14
<b>63</b>	Rc1/4	NPT1/4	G1/4	—	—	—	—	205	182	93	10.5	269	246	123	15

Note 1) The cylinder rod is retracted.

Note 2) The overall length when the rod is extended is the value that the clamp stroke and rotary stroke are added to the dimension Q.

**Comparison of the Dimensions of Each Series**



Bore size (mm)	XC89			XC91			Standard		
	K <sub>1</sub>	Q	R	K <sub>1</sub>	Q	R	K <sub>1</sub>	Q	R
<b>32</b>	16	176	160	8	168	160	8	168	160
<b>40</b>	16.5	180.5	164	7.5	171.5	164	7.5	171.5	164
<b>50</b>	23.5	202.5	179	12	191	179	12	191	179
<b>63</b>	23	205	182	10	192	182	10	192	182

\* When the clamp stroke is 20 mm



# MK2T-XC89/XC91

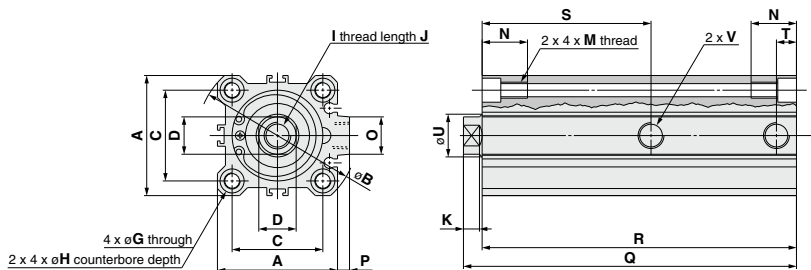
Bore Size

## ø32 to ø63

Dimensions with mounting bracket are the same as standard type. For details, refer to Best Pneumatics No.2-3.

**MK2T□-XC91** \* Dimensions are the same as the standard product (MK2T series).

**Through-hole/Both ends tapped (Standard): MK2TB**



**Through-hole/Both Ends Tapped Common (Standard)**

(mm)

Bore size	A	øB	C	D	G	H	I	J	K	M	N	O	P	øU	V		
															Nii	TN	TF
32	45	60	34	14 <sup>+0.07</sup> / <sub>-0.15</sub>	5.5	9 depth 7	M10 x 1.5	12	6	M6 x 1.0	17	14	4.5	16	Rc1/8	NPT1/8	G1/8
40	52	69	40	14 <sup>+0.07</sup> / <sub>-0.15</sub>	5.5	9 depth 7	M10 x 1.5	12	6	M6 x 1.0	17	14	5	16	Rc1/8	NPT1/8	G1/8
50	64	86	50	17 <sup>+0.07</sup> / <sub>-0.15</sub>	6.6	11 depth 8	M12 x 1.75	15	7	M8 x 1.25	22	19	7	20	Rc1/4	NPT1/4	G1/4
63	77	103	60	22 <sup>+0.07</sup> / <sub>-0.15</sub>	9	14 depth 10.5	M16 x 2	21	8	M10 x 1.5	28.5	19	7	25	Rc1/4	NPT1/4	G1/4

Bore size	Clamp stroke 10 mm				Clamp stroke 20 mm				Clamp stroke 50 mm			
	Q	R	S	T	Q	R	S	T	Q	R	S	T
32	148	140	74	7.5	168	160	84	7.5	—	—	—	—
40	151.5	144	75	8	171.5	164	85	8	—	—	—	—
50	—	—	—	—	191	179	91.5	12.5	254.5	242.5	121.5	14
63	—	—	—	—	192	182	93	10.5	256	246	123	15

# Made to Order Common Specifications:

-XC88: Spatter Resistant Coil Scraper, Lube-retainer, Grease for Welding (Piston rod: Stainless steel 304)

-XC89: Spatter Resistant Coil Scraper, Lube-retainer, Grease for Welding (Piston rod: S45C)

-XC91: Spatter Resistant Coil Scraper, Grease for Welding (Piston rod: S45C)



## CKG1 Series

**62** Spatter Resistant Coil Scraper, Lube-retainer, Grease for Welding (Piston rod: Stainless steel 304) **-XC88**

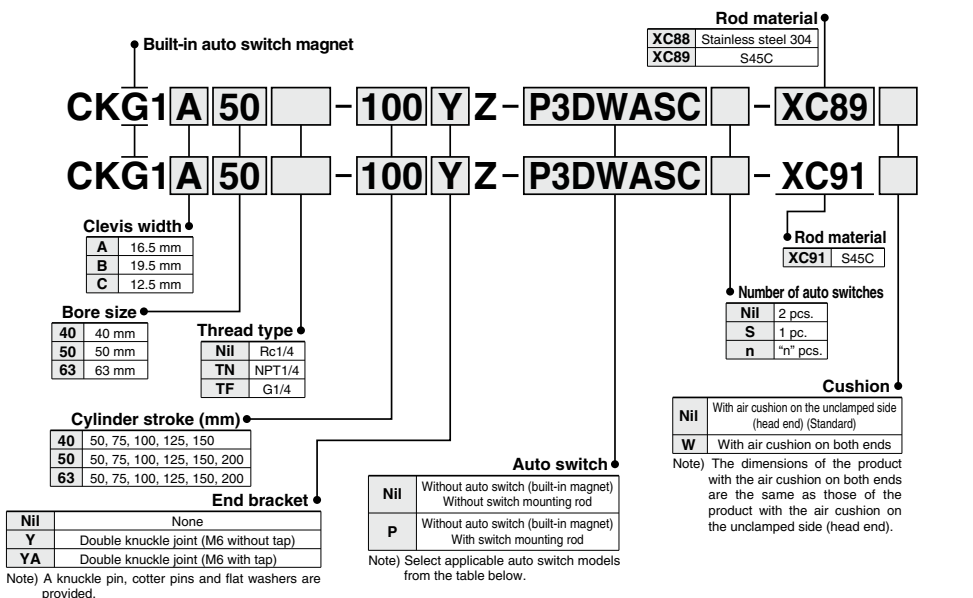
**63** Spatter Resistant Coil Scraper, Lube-retainer, Grease for Welding (Piston rod: S45C) **-XC89**

**64** Spatter Resistant Coil Scraper, Grease for Welding (Piston rod: S45C) **-XC91**

Reduces spatter adhesion and improves durability by the use of the coil scraper, Lube-retainer and grease for welding.

With coil scraper and grease for welding

### CKG1 Series: Magnetic Field Resistant Auto Switch Rod Mounting Type **How to Order**



### Made to Order

Part no.	Piston rod material (Hard chrome plated)		Coil scraper	Lube- retainer	Grease for welding
	S45C	Stainless steel 304			
-XC88	—	●	●	●	●
-XC89	●	—	●	●	●
-XC91	●	—	—	—	●

Note) Use the -XC91 in a place where the distance from the welding portion is far and the spatter scattering is minimized.

### Built-in Auto Switch Magnet Cylinder Part No.

- Built-in auto switch magnet type without auto switch, without switch mounting rod  
Symbol for the auto switch type is "Nil" as shown below.  
(Example) CKG1A50-50YZ-XC89
- Built-in auto switch magnet type without auto switch, with switch mounting rod  
Symbol for the auto switch type is "P" as shown below.  
(Example) CKG1A50-50YZ-P-XC89

### Applicable Auto Switches/Refer to pages 1575 to 1701 for further information on auto switches.

Type	Special function	Auto switch model	Applicable magnetic field	Electrical entry	Indicator light	Wiring (Pin no. in use)	Load voltage	Lead wire length	Applicable load	
Solid state auto switch	Magnetic field resistant (2-color indicator)	P3DWASC	AC magnetic field (Single-phase AC welding magnetic field)	Pre-wired connector	2-color display	2-wire (3-4)	24 VDC	0.3 m	Relay, PLC (Note 1)	
		P4DWSC				2-wire (1-4)				
		P3DWASE				2-wire				0.5 m
		P4DWSE								3 m
		P3DWA				Grommet		2-wire		5 m
		P3DWAL								
		P4DWL								
		P3DWAZ								
P4DWZ										

Note 1) PLC: Programmable Logic Controller

Note 2) Please contact SMC for auto switches, auto switch proper mounting positions and operating ranges other than the above.

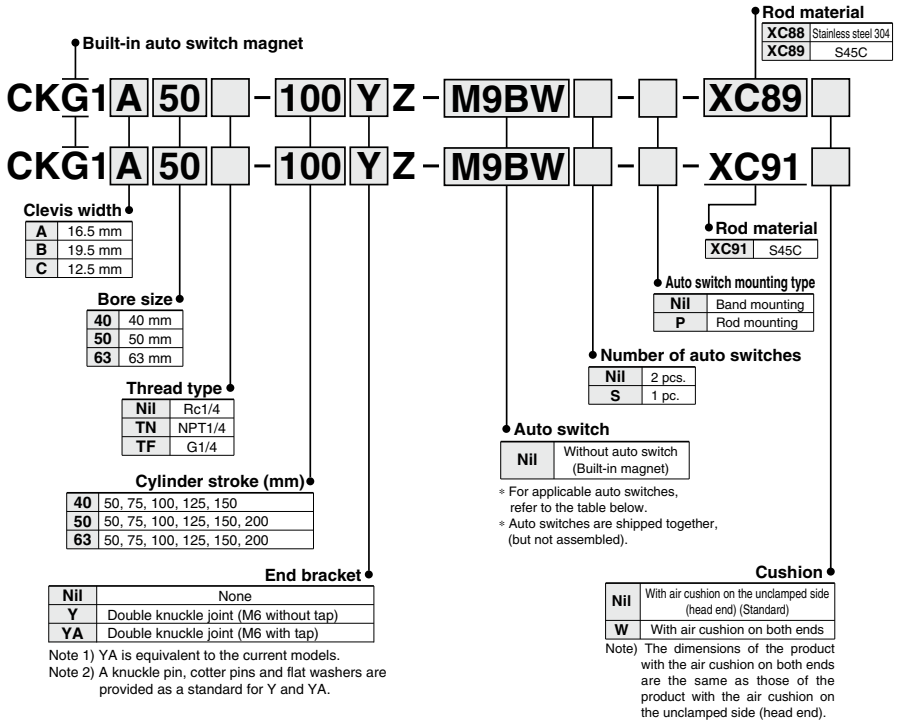
Note 3) Refer to page 1632 when ordering the auto switch mounting bracket assembly or switch mounting rod assembly.

Note 4) For the D-P3DWAC□, the auto switch and auto switch mounting bracket are packed together, (but not assembled).



# CKG1-XC88/XC89/XC91

CKG1 Series: General Purpose Auto Switch Band Mounting/Rod Mounting **How to Order**



## Made to Order

Part no.	Piston rod material (Hard chrome plated)		Coil scraper	Lube-retainer	Grease for welding
	S45C	Stainless steel 304			
-XC88	—	●	●	●	●
-XC89	●	—	●	●	●
-XC91	●	—	●	—	●

Note) Use the -XC91 in a place where the distance from the welding portion is far and the spatter scattering is minimized.

## Caution

The standard auto switch cannot be used in a magnetic field environment. For information on our cylinders that can be fitted with a magnetic field resistant auto switch, refer to page 1889.

**Standard Auto Switches** (Refer to pages 1575 to 1701 for detailed auto switch specifications.)

Applicable cylinder series	Type	Electrical entry	Indicator light	Wiring (Output)	Load voltage			Auto switch model	Lead wire length (m)					Applicable load	
					DC	5 V	AC		0.5(Nil)	1(M)	3(L)	5(Z)			
CKG1	Solid state auto switch	Grommet	Yes	2-wire	24 V	5 V	12 V	—	<b>M9B</b>	●	●	●	○	—	Relay, PLC
									<b>M9BW</b>	●	●	●	○		
	Reed auto switch	Grommet	Yes	2-wire	24 V	12 V	100 V	200 V	<b>A93</b>	●	●	●	●		
									<b>B54</b>	●	—	●	●		

Note 1) Lead wire length symbol: 0.5 m..... Nil  
1 m..... M  
3 m..... L  
5 m..... Z

M9BW  
M9BWM  
M9BWL  
M9BWZ

Note 2) Auto switches marked with "○" are produced upon receipt of order.

Note 3) Refer to pages 1680 and 1681 when ordering the auto switch mounting bracket assembly.

**Made to Order Common Specifications: CKG1 Series**  
**Spatter Resistant Coil Scraper, Lube-retainer, Grease for Welding (Piston rod: Stainless steel 304)**  
**Spatter Resistant Coil Scraper, Lube-retainer, Grease for Welding (Piston rod: S45C)**  
**Spatter Resistant Coil Scraper, Grease for Welding (Piston rod: S45C)**



## Specifications

Bore size (mm)	40	50	63
Fluid	Air		
Proof pressure	1.5 MPa		
Maximum operating pressure	1.0 MPa		
Minimum operating pressure	0.05 MPa		
Ambient and fluid temperature	-10°C to +60°C (No freezing)		
Piston speed	50 to 500 mm/s		
Cushion <sup>Note 1)</sup>	Unclamped side (head end): With air cushion		
Speed controller	Equipped on both ends		
Lubrication	Non-lube		
Stroke length tolerance	+1.0 0		
Mounting <sup>Note 2)</sup>	Double clevis		

Note 1) The model with air cushion on both ends (Symbol: W) is also available.

Note 2) A clevis pin, cotter pins, flat washers are equipped as a standard.

Clevis width	16.5 mm	CKG1A
	19.5 mm	CKG1B
	12.5 mm	CKG1C

## Standard Strokes

Bore size (mm)	Standard stroke (mm)
40	50, 75, 100, 125, 150
50, 63	50, 75, 100, 125, 150, 200

## End Bracket/Options

Symbol	Description	Part no.		
		CKG1A series	CKG1B series	CKG1C series
Y	Double knuckle joint (A knuckle pin, cotter pins, flat washers are equipped.)	M6 without tap CKA-Y04	CKB-Y04	CKC-Y04
YA	M6 with tap CKA-YA04	CKB-YA04	CKC-YA04	

## Weight (Basic weight includes the switch mounting rod. At 0 stroke)

Unit: kg

Bore size (mm)	40	50	63
Basic weight	0.76	0.98	1.18
Additional weight per 25 mm of stroke	0.11	0.12	0.14
Double knuckle joint (A knuckle pin, cotter pins, flat washers are equipped.)	0.34		

Calculation

Example) CKG1□50-100YZ-P-XC88

- Basic weight ..... 1.03 (ø50)
  - Additional weight ..... 0.12/25 mm
  - Cylinder stroke ..... 100 mm
  - Double knuckle joint ..... 0.34 (Y)
- 1.03 + 0.12 x 100/25 + 0.34 = 1.85 kg

## Theoretical Output

Unit: N

Bore size (mm)	Rod size (mm)	Operating direction	Piston area (mm <sup>2</sup> )	Operating pressure (MPa)			
				0.3	0.4	0.5	0.6
40	20	OUT	1260	378	504	630	756
		IN	943	283	377	472	566
50	20	OUT	1960	588	784	980	1180
		IN	1650	495	660	825	990
63	20	OUT	3120	934	1250	1560	1870
		IN	2800	840	1120	1400	1680

The specifications of the cylinder with auto switch are the same as those of the standard model.

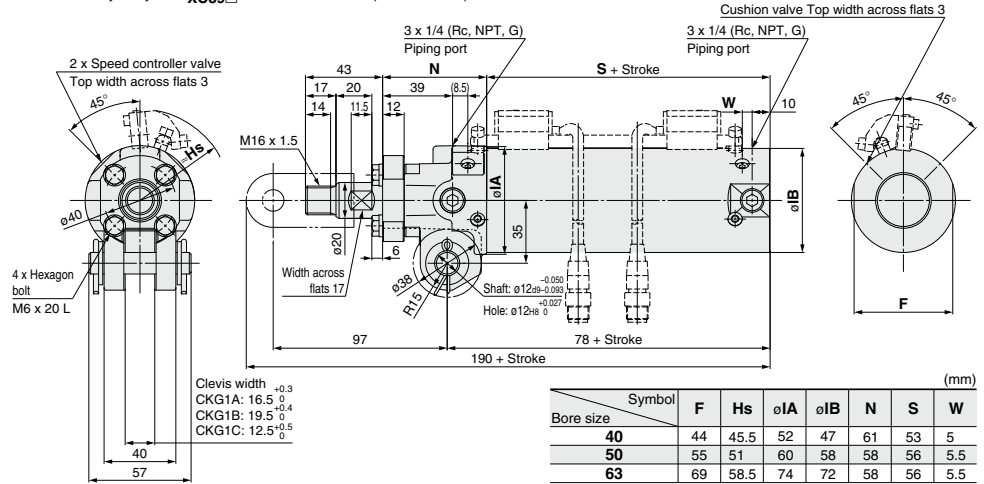
- Auto switch proper mounting position (detection at stroke end) and its mounting height
- Minimum stroke for auto switch mounting
- Auto switch mounting brackets/Part no.
- Operating range

# CKG1-XC88/XC89/XC91

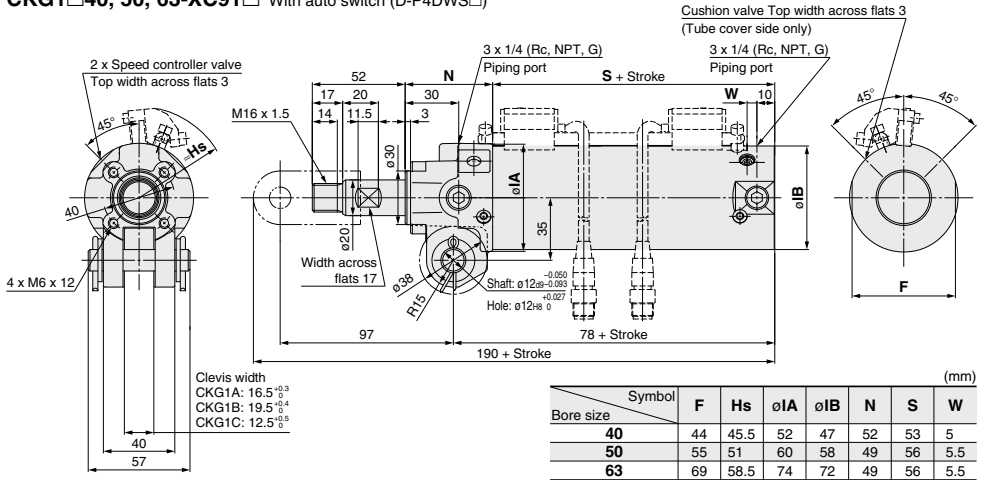
Bore Size

## ø40 to ø63

CKG1□40, 50, 63-XC88□ With auto switch (D-P4DWS□)

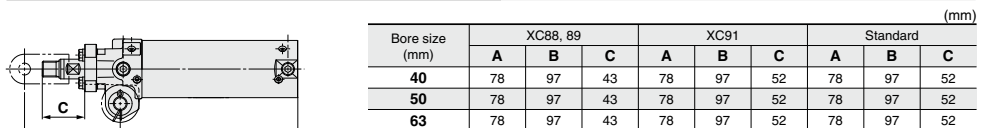


CKG1□40, 50, 63-XC91□ With auto switch (D-P4DWS□)



The specifications of the end bracket (double knuckle joint with pins) are the same as those of the standard model.

## Comparison of the Dimensions of Each Series



\* At 0 stroke



# Made to Order Common Specifications:

-XC88: Spatter Resistant Coil Scraper, Lube-retainer, Grease for Welding (Piston rod: Stainless steel 304)

-XC89: Spatter Resistant Coil Scraper, Lube-retainer, Grease for Welding (Piston rod: S45C)

-XC91: Spatter Resistant Coil Scraper, Grease for Welding (Piston rod: S45C)



## CKGA Series

**62** Spatter Resistant Coil Scraper, Lube-retainer, Grease for Welding (Piston rod: Stainless steel 304) **-XC88**

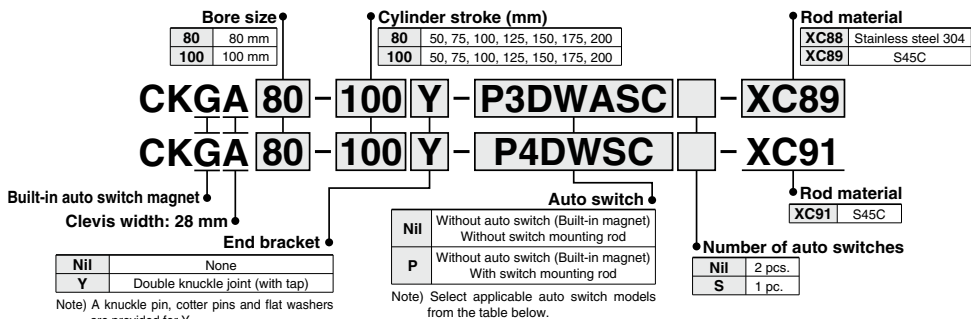
**63** Spatter Resistant Coil Scraper, Lube-retainer, Grease for Welding (Piston rod: S45C) **-XC89**

Reduces spatter adhesion and improves durability by the use of the coil scraper, Lube-retainer and grease for welding.

**64** Spatter Resistant Coil Scraper, Grease for Welding (Piston rod: S45C) **-XC91**

With coil scraper and grease for welding

### CKGA Series: Rod Mounting How to Order



### Made to Order

Part no.	Piston rod material (Hard chrome plated)		Coil scraper	Lube-retainer	Grease for welding
	S45C	Stainless steel 304			
-XC88	—	●	●	●	●
-XC89	●	—	●	●	●
-XC91	●	—	●	—	●

Note) Use the -XC91 in a place where the distance from the welding portion is far and the spatter scattering is minimized.

### Built-in Auto Switch Magnet Cylinder Part No.

- Built-in auto switch magnet type without auto switch, without switch mounting rod  
Symbol for the auto switch type is "Nil" as shown below.  
(Example) CKGA80-50Y-XC89
- Built-in auto switch magnet type without auto switch, with switch mounting rod  
Symbol for the auto switch type is "P" as shown below.  
(Example) CKGA80-50Y-P-XC89

### Applicable Auto Switches/Refer to pages 1525 to 1701 for further information on auto switches.

Type	Special function	Auto switch model	Applicable magnetic field	Electrical entry	Indicator light	Wiring (Pin no in use)	Load voltage	Lead wire length	Applicable load	
Solid state auto switch	Magnetic field resistant (2-color indication)	P3DWASC	AC magnetic field (Single-phase AC welding magnetic field)	Pre-wired connector	2-color display	2-wire (3-4)	24 VDC	0.3 m	Relay, PLC (Note1)	
		P4DWASC								
		P3DWASE								
		P4DWASE								
		P3DWA				Grommet		2-wire		0.5 m
		P3DWAL								
		P4DWL								
		P3DWAZ								
P4DWZ	5 m									

Note1) PLC: Programmable Logic Controller

Note2) Please contact SMC for auto switches, auto switch proper mounting positions and operating ranges other than the above.

Note3) Refer to page 1692 when ordering the auto switch mounting bracket assembly or switch mounting rod assembly.

Note4) For D-P3DWAL□, the auto switch and auto switch mounting bracket are packed together (not assembled).

### Specifications

	80	100
Bore size (mm)	80	100
Fluid	Air	
Proof pressure	1.5 MPa	
Maximum operating pressure	1.0 MPa	
Minimum operating pressure	0.05 MPa	
Ambient and fluid temperature	-10°C to +60°C (No freezing)	
Piston speed	50 to 500 mm/s	
Cushion	With air cushion on both ends	
Speed controller	Equipped on both ends	
Lubrication	Non-lube	
Stroke length tolerance	+1.0 0	
Mounting (Note)	Double clevis	

Note) A clevis pin, cotter pins and flat washers are provided.

Clevis width	28 mm	CKGA
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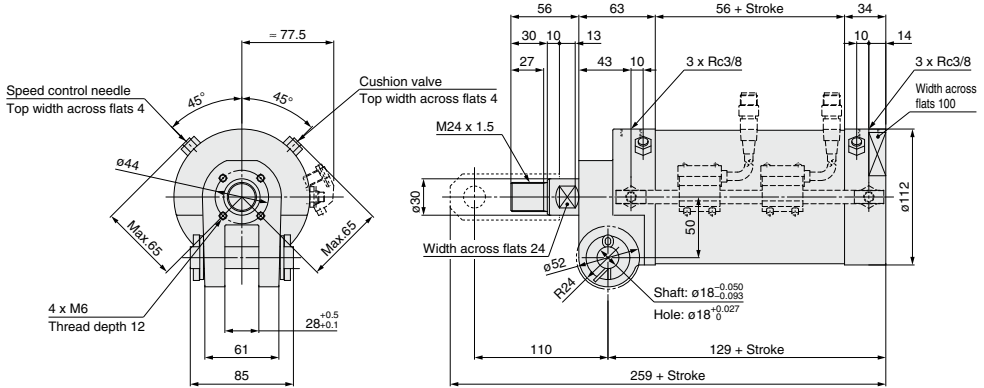
# CKGA-XC88/XC89/XC91

Rod Mounting

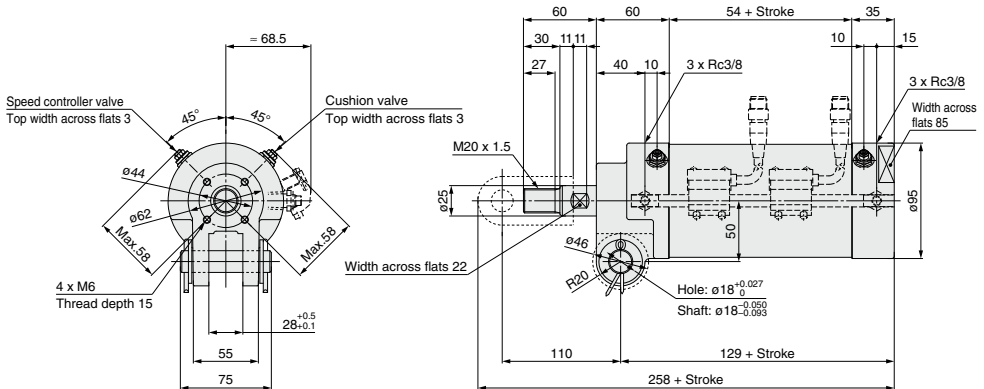
Bore Size

**ø80 to ø100**

**CKGA100-XC88/XC89-XC91** With auto switch (D-P4DWS□).



**CKGA80-XC88/XC89-XC91** With auto switch (D-P4DWS□).



The specifications of the end bracket (double knuckle joint with pins) are the same as those of the standard model.

## Comparison of the Dimensions of Each Series

The -XC88/XC89/XC91 and standard product have the same dimensions.