Cylinder with Lock
Double Acting, Single Rod
Series CLS
ø125, ø140, ø160, ø180, ø200, ø250

How to Order

CLS L □ 125 □ – 100 □ ——— D M9B – □

With Auto Switch **CDLS** L 125 □ – 100 □ – M9BW □ – D M9B – □

With auto switch (Built-in magnet)

Mounting style

B	Basic type
L	Foot type
F	Rod flange type
G	Head flange type
C	Single clevis type
D	Double clevis type
T	Center trunnion type

Port thread type

Nil	Rc
TN	NPT
TF	G

Cylinder stroke (mm)
Refer to the maximum stroke table on page 787.

Cylinder unit auto switch

Nil	Without auto switch

* Select applicable auto switches from the table below.

Number of auto switches

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

Lock unit auto switch

Nil	Without auto switch

* Refer to the table below for applicable auto switch models.

Lock unit built-in magnet

Nil	Without magnet (Without auto switch)
D	Built-in magnet

Made to Order
Refer to page 787 for details.

Tube material

Symbol	Bore size	Tube material	
		Without auto switch	With auto switch
Nil	ø125 to ø160	Aluminum tube	Aluminum tube
	ø180, ø200	Steel tube	
	ø250	Steel tube	—
F	ø125 to ø160	Steel tube	—

Bore size

Symbol	Without auto switch	With auto switch
125	125 mm	125 mm
140	140 mm	140 mm
160	160 mm	160 mm
180	180 mm	180 mm
200	200 mm	200 mm
250	250 mm	—

Cylinder

Rod boot	J	Nylon tarpaulin
	K	Heat resistant tarpaulin
Cushion	Nil	With double-side cushion
	N	Without cushion
	R	With rod cushion
	H	With head cushion

* Indicate in alphabetical order when 2 or more symbols are applicable.

Cylinder Unit/Applicable Auto Switches
/Refer to pages 1719 to 1827 for detailed auto switch specifications.

Type	Special function	Electrical entry	Indicator light	Wiring (output)	Load voltage DC	Load voltage DC	Load voltage AC	Auto switch model: Tie-rod mounting	Auto switch model: Band mounting	Lead wire length (m): 0.5 (Nil)	1 (M)	3 (L)	5 (Z)	Pre-wired connector	Applicable load	
Solid state switch	—	Grommet	Yes	3-wire (NPN)	24 V	5 V, 12 V	—	M9N	—	●	●	●	○	○	IC circuit	Relay, PLC
				3-wire (PNP)				M9P	—	●	●	●	○	○		
				2-wire		12 V		M9B	—	●	●	●	○	○		
					—	—	100 V, 200 V	J51	—	●	—	●	○	—	—	
		Terminal conduit		3-wire (NPN)	24 V	12 V	—	G39C	G39	—	—	—	—	—	IC circuit	
				2-wire				K39C	K39	—	—	—	—	—		
	With diagnostic output (2-color indicator)	Grommet		3-wire (NPN)		5 V, 12 V		M9NW	—	●	●	●	○	○		
				3-wire (PNP)				M9PW	—	●	●	●	○	○		
				2-wire		12 V		M9BW	—	●	●	●	○	○		
	Water resistant (2-color indicator)			3-wire (NPN)		5 V, 12 V		M9NA	—	○	○	●	○	○	—	
				3-wire (PNP)				M9PA	—	○	○	●	○	○		
				2-wire		12 V		M9BA	—	○	○	●	○	○		
	With diagnostic output (2-color indicator)			4-wire (NPN)		5 V, 12 V		F59F	—	●	—	●	○	○	IC circuit	
Reed switch	—	—	Yes	3-wire (NPN equiv.)	—	5 V	—	A96	—	●	—	●	—	—	IC circuit	—
			No	2-wire	24 V	12 V	100 V	A93	—	●	—	●	—	—	—	Relay, PLC
						5 V, 12 V	100 V or less	A90	—	●	—	●	—	—	IC circuit	
							100 V, 200 V	A54	—	●	—	●	●	—		PLC
		Terminal conduit	Yes			12 V	—	—	A33	—	—	—	—	—	—	
		DIN terminal					100 V, 200 V	—	A34	—	—	—	—	—		Relay, PLC
	Diagnostic indication (2-color indicator)	Grommet						—	A44	—	—	—	—	—		
						—	—	A59W	—	●	—	●	—	—		

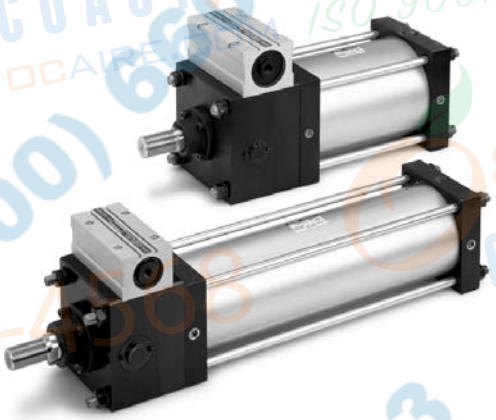
* Lead wire length symbol: 0.5 m ..... Nil (Example) M9NW
1 m ..... M (Example) M9NWM
3 m ..... L (Example) M9NWL
5 m ..... Z (Example) M9NWZ

* Solid state auto switches marked with "○" are produced upon receipt of order.
* There are applicable auto switches other than listed above. For details, refer to page 802.
* For details about auto switches with pre-wired connector, refer to pages 1784 and 1785.
* D-A9□/M9□/M9□W/M9□AL auto switches are shipped together (not assembled). (Only auto switch brackets are assembled at the time of shipment.)

Lock Unit/Applicable Auto Switches

Auto switch type	Special function	Indicator light	Wiring (output)	Load voltage DC	Load voltage DC	Load voltage AC	Auto switch model	Lead wire length (m): 0.5 (Nil)	1 (M)	3 (L)	5 (Z)	Applicable load	
Solid state	Grommet	Yes	3-wire (NPN)	24 V	5 V, 12 V	—	M9N	●	●	●	○	IC circuit	Relay, PLC
			3-wire (PNP)				M9P	●	●	●	○		
			2-wire		12 V		M9B	●	●	●	○	—	
Reed		No			5 V, 12 V	100 V or less	A90	●	—	●	—	IC circuit	Relay, PLC
		Yes			12 V	100 V	A93	●	—	●	—	—	

*D-A9□/M9□ auto switches are shipped together (not assembled).



Made to Order:

(For details, refer to pages 1829 to 1954.)

Symbol	Specifications
-XA□	Change of rod end style
-XC3	Special port location
-XC14	Change of trunnion bracket mounting position (125, 140, 160 only)
-XC35	With coil scraper (125, 140, 160 only)*

* Ø180 to Ø250 come with a coil scraper as standard.

Stopping Accuracy

Unit: mm

Lock type	Piston speed (mm/s)		
	100	300	500
Spring lock	±0.5	±1.0	±2.0

Conditions:
Horizontal, Supply pressure P = 0.5 MPa
Load mass ..... Upper limit of allowed value
Solenoid valve for locking ... Mounted directly to unlocking port
Maximum value from range of 100 measured stopping positions

Class 2 Pressure Vessel

A class 2 pressure vessel will be required for strokes exceeding those shown below.

Bore size (mm)	Cylinder stroke (mm)
180	1569
200	998
250	813

Refer to pages 799 to 802
for cylinders with auto switches.

- Minimum auto switch mounting stroke
- Proper auto switch mounting position (detection at stroke end) and mounting height
- Operating range
- Switch mounting bracket: Part no.

Cylinder Specifications

Bore size (mm)	125	140	160	180	200	250
Type	Not required (Non-lube)					
Fluid	Air					
Proof pressure	1.57 MPa 1.2 MPa*					
Max. operating pressure	0.97 MPa 0.7 MPa*					
Min. operating pressure	0.08 MPa					
Piston speed	50 to 500 mm/s**					
Cushion	Yes					
Ambient and fluid temperature	Without auto switch: 0°C to 70°C With auto swiatch: 0°C to 60°C (with no freezing)					
Stroke length tolerance	to 250: $^{+1.0}_{0}$, 251 to 1000: $^{+1.4}_{0}$, 1001 to 1500: $^{+1.8}_{0}$, 1501 to 2000: $^{+2.2}_{0}$, 2001 to 2400: $^{+2.6}_{0}$					
Mounting	Basic type, Foot type, Rod flange type, Head flange type, Single clevis type, Double clevis type, Center trunnion type					

* For Ø180 and Ø200 with auto switches.
** There are load limitations depending on the piston speed when locked, the mounting method, and the operating pressure.

Lock Specifications

Bore size (mm)	125	140	160	180	200	250
Locking action	Spring locking (exhaust locking)					
Unlocking pressure	0.25 MPa or more					
Locking pressure	0.20 MPa or less					
Max. operating pressure	1.0 MPa					
Locking direction	Both directions					
Holding force kN	8.4	10.5	13.8	17.4	21.5	33.6

* Be sure to make cylinder selections in accordance with the method given on page 784.

Cylinder Stroke

Unit: mm

Tube material	Aluminum alloy	Carbon steel tube	
Bore size (mm)	Basic type, Head flange type, Single clevis type, Double clevis type, Center trunnion type, Foot type, Rod flange type	Basic type, Head flange type, Single clevis type, Double clevis type, Center trunnion type	Foot type Rod flange type
125, 140	1000 or less	1000 or less	1600 or less
160	1200 or less	1200 or less	1600 or less
180	—	1200 or less	2000 or less
200	—	1200 or less	2000 or less
250	—	1200 or less	2400 or less

Cylinder Stroke/Auto Switch Mounting on Cylinder Unit (Built-in Magnet)

Refer to the minimum auto switch mounting stroke (page 800) for those with an auto switch.

Unit: mm

Bore size (mm)	Basic type, Head flange type, Single clevis type, Double clevis type, Center trunnion type	Foot type Rod flange type
125, 140	1000 or less	1400 or less
160	1200 or less	1400 or less
180	1200 or less	1500 or less
200	998 or less	998 or less
Note	For ø200, 998 to 1200 strokes are available as made to order.	For ø200, 998 to 1500 strokes are available as made to order.