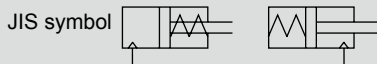




Flat compact cylinder single acting/push/single acting/pull

FCS Series/FCH Series

● Bore size: $\phi 25/\phi 32/\phi 40/\phi 50/\phi 63$



Specifications

Item	FCS FCS-L					FCH FCH-L				
Bore size mm	ø25 or equiv.	ø32 or equiv.	ø40 or equiv.	ø50 or equiv.	ø63 or equiv.	ø25 or equiv.	ø32 or equiv.	ø40 or equiv.	ø50 or equiv.	ø63 or equiv.
Actuation	Single acting push					Single acting pull				
Working fluid	Compressed air									
Max. working pressure MPa	0.7 (≈100 psi, 7 bar)									
Min. working pressure MPa	0.12 (≈17 psi, 1.2 bar)									
Proof pressure MPa	1.05 (≈150 psi, 10.5 bar)									
Ambient temperature °C	-10 (14°F) to 60 (140°F) (no freezing)									
Port size	M5		Rc1/8		Rc1/4	M5		Rc1/8		Rc1/4
Stroke tolerance mm	+0.5 0 (to 50)									
Working piston speed mm/s	50 to 500									
Cushion	None									
Lubrication	Not required (turbine oil type 1 ISO VG32 if necessary for lubrication)									
Allowable absorbed energy J	0.015	0.02	0.026	0.04	0.05	0.015	0.02	0.026	0.04	0.05

Note: Do not leave the single acting cylinder pressurized for a long time. If it is left pressurized for long periods, the piston rod may not return due to spring load when the pressure is released.

Rotation-stop precision/Allowable torque

Item	$\phi 25$ or equiv.	$\phi 32$ or equiv.	$\phi 40$ or equiv.	$\phi 50$ or equiv.	$\phi 63$ or equiv.
Non-rotating accuracy $^{\circ}$	$\pm 1^{\circ}$	$\pm 0.8^{\circ}$	$\pm 0.5^{\circ}$	$\pm 0.5^{\circ}$	$\pm 0.5^{\circ}$
Allowable torque N·m	1	1.6	2.5	3.9	5.9

*1: Avoid applying rotation torque with impact, or with violent changes in torque load direction.

*2: "Non-rotating accuracy" is the value when a torque load equivalent to 10% of "allowable torque" is applied to the end of the piston rod.

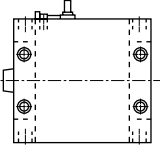
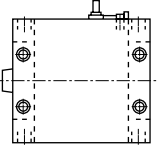
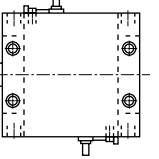
Stroke length

Model No.	Bore size (mm)	Standard stroke length (mm)	Max. stroke length (mm)	Min. stroke length (mm)
FCS	$\phi 25$, $\phi 32$ or equiv.	5, 10	10	1
FCH	$\phi 40$, $\phi 50$, $\phi 63$ or equiv.	10, 20	20	

*1: The custom stroke length is available in 1mm increments.

*2: The min. stroke length varies depending on switch mounting method. Refer to the following table.

Min. stroke length with switch

1	2
Rod side installation	Head side installation
	
	
10 mm	
15 mm	

FCS/FCH spring load

(Unit: N)

Bore size (mm)	Stroke length (mm)	When stroke length = 0	At full stroke length operation
$\phi 25$ or equiv.	5	27.4	35.3
	10	19.6	
$\phi 32$ or equiv.	5	36	47.5
	10	24.5	
$\phi 40$ or equiv.	10	38.5	47.6
	20	29.4	
$\phi 50$ or equiv.	10	56.5	74.9
	20	38.2	
$\phi 63$ or equiv.	10	92.2	119.8
	20	61.7	

Switch specifications

● Proximity switch

Item	Proximity 2-wire		Proximity 3-wire		
	M2V	M2WV (2-color display)	M3V	M3PV (Made to order)	M3WV (2-color display)
Applications	Dedicated for programmable controller		For programmable controller, relay, IC circuit, compact solenoid valve		
Output method	-	-	NPN output	PNP output	NPN output
Power supply voltage	-		4.5 to 28 VDC		10 to 28 VDC
Load voltage	10 to 30 VDC		30 VDC or less		
Load current	5 to 30 mA		100 mA or less	100 mA or less	100 mA or less
Indicator lamp	LED (Lit when ON)	Red/green LED (Lit when ON)	LED (Lit when ON)	Yellow LED (Lit when ON)	Red/green LED (Lit when ON)
Leakage current	1 mA or less		10 µA or less	0.05 mA or less	10 µA or less
Weight g	1 m:22 3 m:57 5 m:93				

● Reed switch

Item	Reed 2-wire			
	M0V		M5V	
Applications	Programmable controller, relay		For programmable controller, relay, IC circuit (without indicator lamp), serial connection	
Power supply voltage	-		-	
Load voltage	12/24 VDC	110 VAC	5/12/24 VDC	110 VAC or less
Load current	5 to 50 mA	7 to 20 mA	50 mA or less	20 mA or less
Indicator lamp	LED (Lit when ON)		Without indicator lamp	
Leakage current	0 mA			
Weight	g	1 m:22	3 m:57	5 m:93

*1 : Refer to Ending Page 1 for other switch specifications.

*2 : Dimensions depend on switch model No. Refer to Ending Page 13 for details.

Cylinder weight

(Unit: g)

Item	Product weight when stroke length (S) = 0 mm				Switch weight	Mounting bracket weight	Additional weight per S = 10 mm
	FCS		FCH				
Bore size (mm)	Without switch	With switch	Without switch	With switch	Refer to the weight in the switch specifications.	2	
ø25 or equiv.	155	217	135	197			
ø32 or equiv.	220	310	190	280			
ø40 or equiv.	345	468	310	433			
ø50 or equiv.	545	733	485	673			
ø63 or equiv.	1090	1226	965	976			
(Example) Product weight of FCS-32-10 ————— ● Product weight when S = 0 mm.....220 g ● Additional weight when S = 10 mm37 g x $\frac{10}{10}$ = 37 g ● Product weight.....220 g + 37 g = 257 g							

Theoretical thrust table

● FCS

(Unit: N)

Bore size (mm)	Working pressure MPa					
	0.2	0.3	0.4	0.5	0.6	0.7
ø25	63.2	1.12×10^2	1.62×10^2	2.11×10^2	2.60×10^2	3.09×10^2
ø32	1.08×10^2	1.85×10^2	2.63×10^2	3.41×10^2	4.18×10^2	4.96×10^2
ø40	2.11×10^2	3.40×10^2	4.69×10^2	5.98×10^2	7.27×10^2	8.56×10^2
ø50	3.11×10^2	5.05×10^2	6.98×10^2	8.91×10^2	1.08×10^3	1.28×10^3
ø63	5.16×10^2	8.34×10^2	1.15×10^3	1.47×10^3	1.79×10^3	2.10×10^3

● FCH

(Unit: N)

Bore size (mm)	Working pressure MPa					
	0.2	0.3	0.4	0.5	0.6	0.7
ø25	40.6	78.5	1.16×10^2	1.54×10^2	1.92×10^2	2.30×10^2
ø32	67.5	1.25×10^2	1.83×10^2	2.40×10^2	2.98×10^2	3.55×10^2
ø40	1.70×10^2	2.79×10^2	3.88×10^2	4.97×10^2	6.06×10^2	7.15×10^2
ø50	2.49×10^2	4.10×10^2	5.72×10^2	7.34×10^2	8.96×10^2	1.06×10^3
ø63	4.53×10^2	7.39×10^2	1.03×10^3	1.31×10^3	1.60×10^3	1.88×10^3

FCS/FCH Series

How to order

Without switch (without magnet for switch)

FCS - **25** - **10** - **N**

With switch (built-in magnet for switch)

FCS-L - **25** - **10** - **M2V** - **R** - **N**

A Model No.

B Bore size

C Port thread

D Stroke length

E Switch model No.
* indicates the lead wire length.

F Switch quantity

⚠ Precautions for model No. selection

*1 : Refer to page 1480 for the min. stroke length with switch.

*2 : Dimensions of copper and PTFE free "P6" are the same as those of the standard.

G Option
*2

[Example of model No.]

FCS-L-25-10-M2V-R-M

Model: Flat compact cylinder

A Model No. : Single acting/push

B Bore size : ø25 mm

C Port thread : Rc thread

D Stroke length : 10 mm

E Switch model No. : Proximity switch M2V

F Switch quantity : 1 on rod side

G Option : Piston rod material (stainless steel)

Code	Description
A Model No.	
FCS	Single acting/push
FCS-L	Single acting/push/with switch
FCH	Single acting/pull
FCH-L	Single acting/pull/with switch

B Bore size (mm)	
25	ø25
32	ø32
40	ø40
50	ø50
63	ø63

C Port thread	
Blank	Rc thread
NN	NPT thread (ø40 or more) (made-to-order product)
GN	G thread (ø40 or more) (made-to-order product)

D Stroke length (mm)		
Bore size	Stroke length *1	Custom stroke length
ø25, ø32	1 to 10	In 1 mm increments
ø40 to ø63	1 to 20	

E Switch model No.					
Radial lead wire	Contact	Voltage		Display	Lead wire
		AC	DC		
M2V*	Proximity		●	1-color display	2-wire
M2WV*			●	2-color display	
M3V*			●	1-color display	3-wire
M3WV*			●	2-color display	
M3PV*	Reed		●	1-color display (made to order)	3-wire
M0V*		●	●	1-color display	2-wire
M5V*		●	●	Without indicator lamp	

* Lead wire length	
Blank	1 m (standard)
3	3 m (option)
5	5 m (option)

F Switch quantity	
R	1 on rod side
H	1 on head side
D	2

G Option	
Blank	Rod end female thread
M	Piston rod material (stainless steel)
N	Rod end male thread
R	With spigot
P6	Copper and PTFE free (copper-based/Teflon-based material is not used)

How to order switch

● Switch body + mounting bracket set

FCS - M2V

Switch model No.
(Item ㊞ on page 1482)

● Switch body only

SW - M2V

Switch model No.
(Item ㊞ on page 1482)

● Mounting bracket set

FCS - M

Mounting bracket

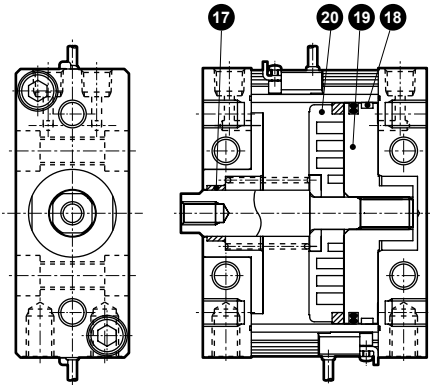
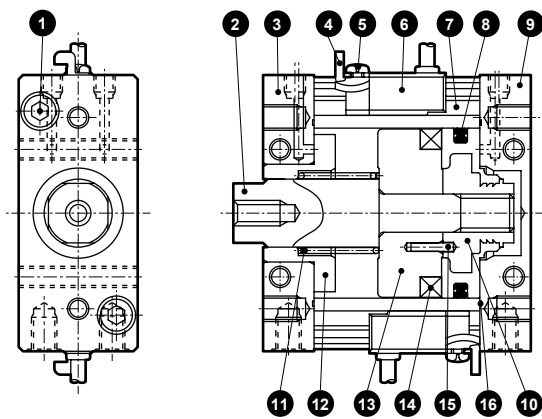
SCP*3
CMK2
CMA2
SCM
SCG
SCA2
SCS2
CKV2
CAV2/ COVP/IN2
SSD2
SSG
SSD
CAT
MDC2
MVC
SMG
MSD/ MSDG
FC*
STK
SRL3
SRG3
SRM3
SRT3
MRL2
MRG2
SM-25
ShkAbs
FJ
FK
Spd Contr
Ending

FCS/FCH Series

Internal structure and parts list

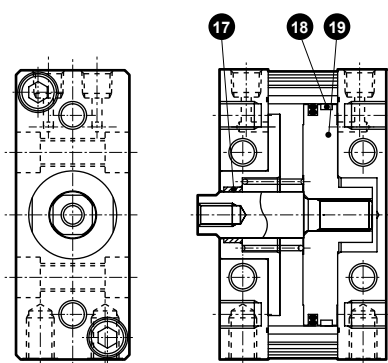
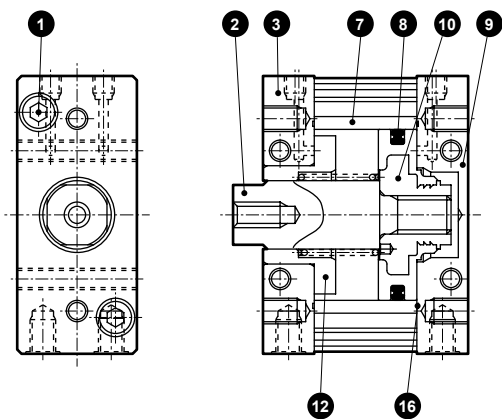
● FCS-L (single acting/push, with switch)
* ø25 to ø40 or equiv.

* ø50 to ø63 or equiv.



● FCS (Single acting/push)
* ø25 to ø40 or equiv.

* ø50 to ø63 or equiv.



No.	Part name	Material	Remarks	No.	Part name	Material	Remarks
1	Hexagon socket head cap screw	Steel	Zinc chromate	11	Spring	Steel	Electrodeposition
2	Piston rod	Steel	Industrial chrome plating	12	Bush spacer	Aluminum alloy	Alumite
3	Rod cover	Aluminum alloy	Black alumite	13	Spacer	Aluminum alloy	
4	Switch mounting bracket	Stainless steel		14	Magnet		
5	Cross-recessed pan head machine screw	Steel	Zinc chromate	15	Spring pin	Steel	
6	Switch			16	Cover gasket	Nitrile rubber	
7	Tube	Aluminum alloy	Hard alumite	17	Bush	Aluminum alloy	Alumite
8	Piston packing	Nitrile rubber		18	Wear ring	Acetal resin	ø63 only
9	Head cover	Aluminum alloy	Black alumite	19	Piston	Aluminum alloy	Chromate
10	Piston	Aluminum alloy + Acetal resin		20	Spacer	Aluminum alloy	ø50
						Polyamide resin	ø63

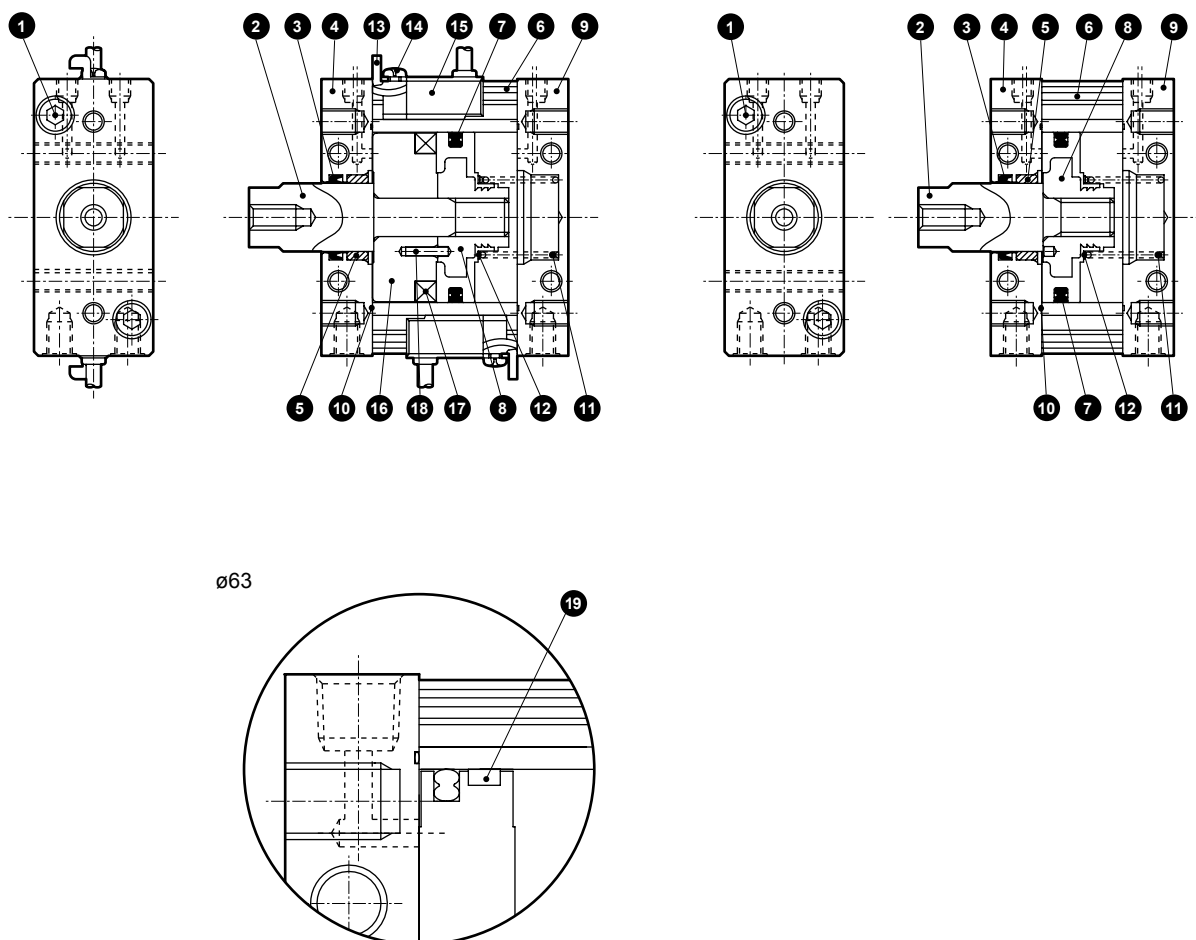
Repair parts list (common to types with/without switch)

Bore size (mm)	Kit No.	Repair parts No.
ø25 or equiv.	FCS-25K	8 16
ø32 or equiv.	FCS-32K	
ø40 or equiv.	FCS-40K	
ø50 or equiv.	FCS-50K	
ø63 or equiv.	FCS-63K	8 16 18

Internal structure and parts list

● FCH-L (single acting/pull, with switch)

● FCH



No.	Part name	Material	Remarks	No.	Part name	Material	Remarks
1	Hexagon socket head cap screw	Steel	Zinc chromate	10	Cover gasket	Nitrile rubber	
2	Piston rod	Steel	Industrial chrome plating	11	Spring	Steel	Electrodeposition
3	Rod packing	Nitrile rubber		12	Spring holder	Stainless steel	
4	Rod cover	Aluminum alloy	Black alumite	13	Switch mounting bracket	Stainless steel	
5	Bush	Special bearing material *1		14	Cross-recessed pan head machine screw	Steel	Zinc chromate
6	Tube	Aluminum alloy	Hard alumite	15	Switch		
7	Piston packing	Nitrile rubber		16	Spacer	Aluminum alloy Polyamide resin	ø25 to ø50 ø63
8	Piston	Aluminum alloy + Acetal resin	ø25 to ø50	17	Magnet		
		Aluminum alloy	ø63: Chromate	18	Spring pin	Steel	
9	Head cover	Aluminum alloy	Black alumite	19	Wear ring	Acetal resin	

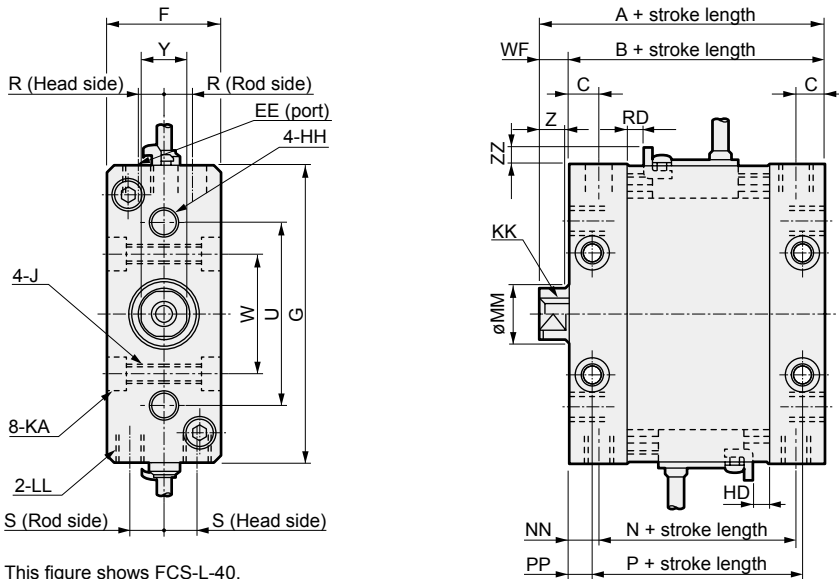
*1: Special aluminum for copper and PTFE free.

Repair parts list (common to types with/without switch)

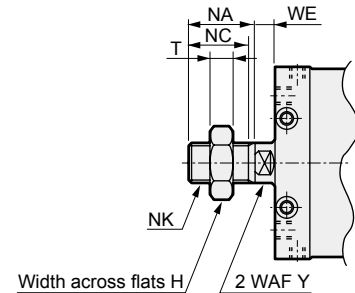
Bore size (mm)	Kit No.	Repair parts No.
ø25 or equiv.	FCH-25K	3 7 10
ø32 or equiv.	FCH-32K	
ø40 or equiv.	FCH-40K	
ø50 or equiv.	FCH-50K	
ø63 or equiv.	FCH-63K	3 7 10 19

Dimensions

● FCS-L (single acting/push, with switch)



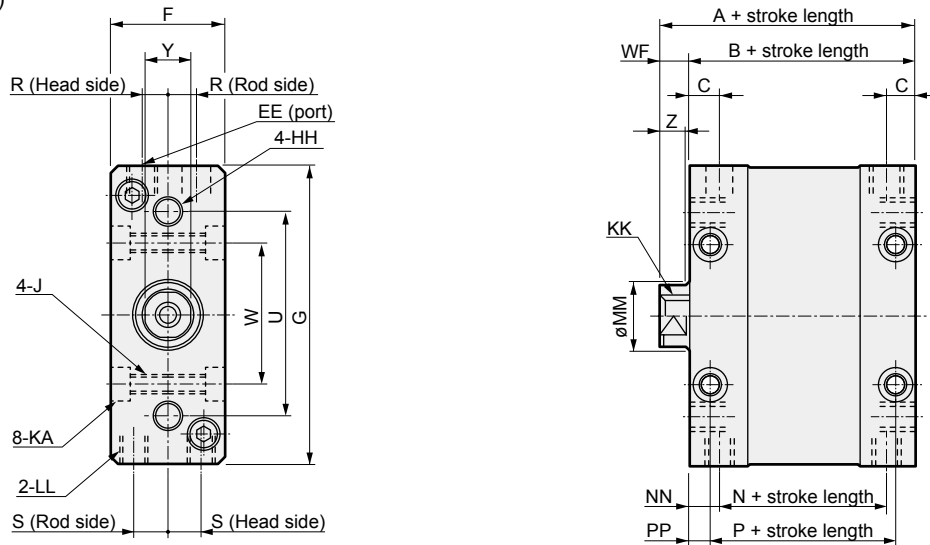
● Dimensions of rod end male thread (Option code N)



*1: This figure shows FCS-L-40.

*2: Position for Y section 2 WAF is unspecified.

● FCS (without switch)



*1: This figure shows FCS-40.

*2: Position for Y section 2 WAF is unspecified.

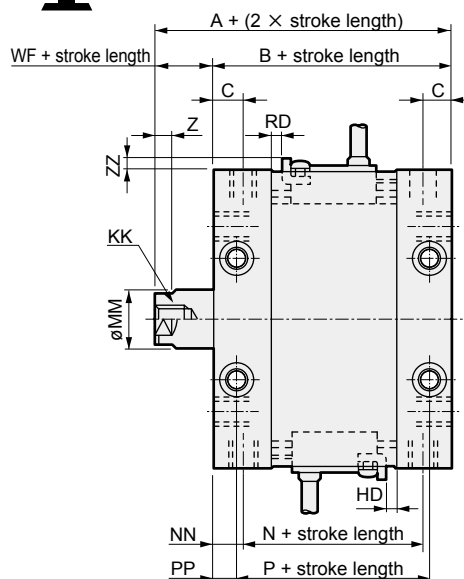
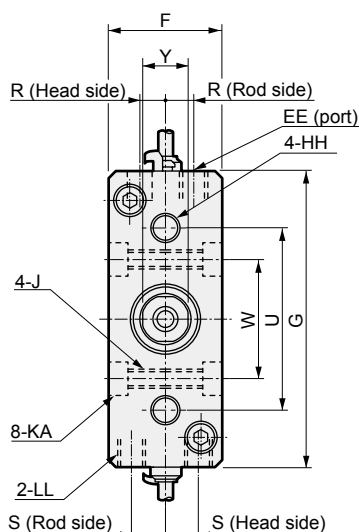
Code	Dimensions without switch				Dimensions with switch				Common dimensions							
Bore size (mm)	A	B	N	P	A	B	N	P	C	EE	F	G	HH	J	KA	
ø25 or equiv.	42	37	25	29	57	40	44	44	7.5	M5 depth 4	25	55	M5 depth 7	M5 (through)	-	
ø32 or equiv.	45	38	26	30	60	53	41	45	7.5	M5 depth 4	28	65	M6 depth 8	M5 (through)	-	
ø40 or equiv.	54	46	30	34	69	61	45	49	8.5	Rc1/8	32	83	M8 depth 10	M6 (through)	9.5 spot face depth 5.4	
ø50 or equiv.	60.5	51	34	32	75.5	66	49	47	10.5	Rc1/8	39	101	M10 depth 12	M8 (through)	11 spot face depth 6.5	
ø63 or equiv.	71.5	62	42	42	86.5	77	57	57	11.5	Rc1/4	49	125	M12 depth 15	M12 (through)	17.5 spot face depth 10.5	
Code	Common dimensions with switch															
Bore size (mm)	KK	LL	MM	NN	PP	R	S	U	W	WF	ZZ	RD	HD	Y	Z	
ø25 or equiv.	M5 depth 9	M5 depth 7	12	6	4	4.7	7	38	24	5	5.5 or less	3.5	0	10	5	
ø32 or equiv.	M6 depth 11	M6 depth 8	16	6	4	6.2	8	45	30	7	5.5 or less	4.5	0	14	7	
ø40 or equiv.	M8 depth 13	M8 depth 10	16	8	6	7.5	9	52	34	8	5.5 or less	4.5	0	14	7	
ø50 or equiv.	M8 depth 13	M10 depth 12	20	8.5	9.5	9	10	62	40	9.5	5.5 or less	4.5	0.5	17	8	
ø63 or equiv.	M10 depth 15	M12 depth 18	20	10	10	10.5	14	86	54	9.5	5.5 or less	4.5	4.5	17	8	

● Rod end male thread dimensions

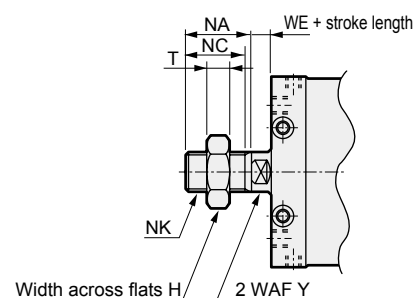
Code	H	NA	NC	NK	T	WE
Bore size (mm)						
ø25 or equiv.	17	22	20	M10×1.25	6	5
ø32 or equiv.	22	22	20	M14×1.5	8	7
ø40 or equiv.	22	22	20	M14×1.5	8	7
ø50 or equiv.	27	28	26	M18×1.5	11	8
ø63 or equiv.	27	28	26	M18×1.5	11	8

Dimensions

● FCH-L (single acting/pull, with switch)



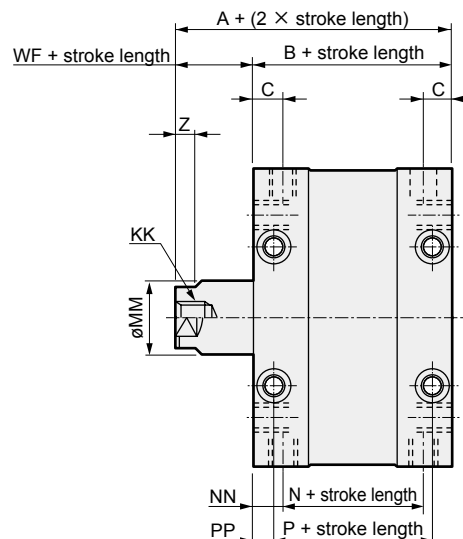
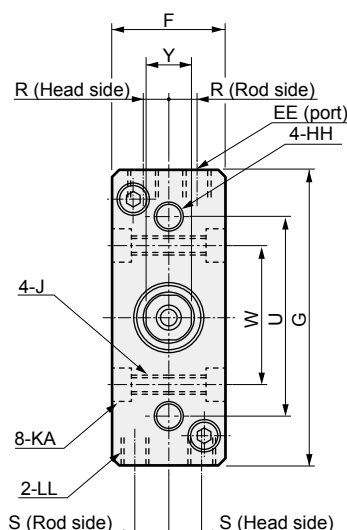
● Dimensions of rod end male thread (Option code: N)



*1: This figure shows FCH-L-40.

*2: Position for Y section 2 WAF is unspecified.

● FCH (without switch)



*1: This figure shows FCH-40.

*2: Position for Y section 2 WAF is unspecified.

Code	Dimensions without switch				Dimensions with switch				Common dimensions							
Bore size (mm)	A	B	N	P	A	B	N	P	C	EE	F	G	HH	J	KA	
ø25 or equiv.	37	32	20	24	52	47	35	39	7.5	M5 depth 4	25	55	M5 depth 7	M5 (through)	-	
ø32 or equiv.	40	33	21	25	55	48	36	40	7.5	M5 depth 4	28	65	M6 depth 8	M5 (through)	-	
ø40 or equiv.	49	41	25	29	64	56	40	44	8.5	Rc1/8	32	83	M8 depth 10	M6 (through)	9.5 spot face depth 5.4	
ø50 or equiv.	55.5	46	29	27	70.5	61	44	42	10.5	Rc1/8	39	101	M10 depth 12	M8 (through)	11 spot face depth 6.5	
ø63 or equiv.	66.5	57	37	37	81.5	72	52	52	11.5	Rc1/4	49	125	M12 depth 15	M12 (through)	17.5 spot face depth 10.5	

Code	Common dimensions with switch															
Bore size (mm)	KK		LL	MM	NN	PP	R	S	U	W	WF	ZZ	RD	HD	Y	Z
ø25 or equiv.	M5 depth 9		M5 depth 7	12	6	4	4.7	7	38	24	5	5.5 or less	0	0	10	5
ø32 or equiv.	M6 depth 11		M6 depth 8	16	6	4	6.2	8	45	30	7	5.5 or less	0	0	14	7
ø40 or equiv.	M8 depth 13		M8 depth 10	16	8	6	7.5	9	52	34	8	5.5 or less	0	0	14	7
ø50 or equiv.	M8 depth 13		M10 depth 12	20	8.5	9.5	9	10	62	40	9.5	5.5 or less	0	0.5	17	8
ø63 or equiv.	M10 depth 15		M12 depth 18	20	10	10	10.5	14	86	54	9.5	5.5 or less	0	4.5	17	8

● Rod end male thread dimensions

Code	H	NA	NC	NK	T	WE
Bore size (mm)						
ø25 or equiv.	17	22	20	M10×1.25	6	5
ø32 or equiv.	22	22	20	M14×1.5	8	7
ø40 or equiv.	22	22	20	M14×1.5	8	7
ø50 or equiv.	27	28	26	M18×1.5	11	8
ø63 or equiv.	27	28	26	M18×1.5	11	8



Flat compact cylinder double acting/single rod

FCD Series

● Bore size: $\phi 25/\phi 32/\phi 40/\phi 50/\phi 63$



Specifications

Item	FCD FCD-L				
Bore size mm	ø25 or equiv.	ø32 or equiv.	ø40 or equiv.	ø50 or equiv.	ø63 or equiv.
Actuation	Double acting				
Working fluid	Compressed air				
Max. working pressure MPa	0.7 (≈100 psi, 7 bar)				
Min. working pressure MPa	0.07 (≈10 psi, 0.7 bar)				
Proof pressure MPa	1.05 (≈150 psi, 10.5 bar)				
Ambient temperature °C	-10 (14°F) to 60 (140°F) (no freezing)				
Port size	M5		Rc1/8		Rc1/4
Stroke tolerance mm	+0.5 0 (to 50)				
Working piston speed mm/s	50 to 500				
Cushion	None				
Lubrication	Not required (turbine oil type 1 ISO VG32 if necessary for lubrication)				
Allowable absorbed energy J	0.015	0.02	0.026	0.04	0.05

Rotation-stop precision/Allowable torque

Item		$\phi 25$ or equiv.	$\phi 32$ or equiv.	$\phi 40$ or equiv.	$\phi 50$ or equiv.	$\phi 63$ or equiv.
Non-rotating accuracy *2		$\pm 1^{\circ}$	$\pm 0.8^{\circ}$	$\pm 0.5^{\circ}$	$\pm 0.5^{\circ}$	$\pm 0.5^{\circ}$
Allowable torque	N·m	1	1.6	2.5	3.9	5.9

*1: Avoid applying rotation torque with impact, or with violent changes in torque load direction.

*2: "Non-rotating accuracy" is the value when a torque load equivalent to 10% of "allowable torque" is applied to the end of the piston rod.

Stroke length

Model No.	Bore size (mm)	Standard stroke length (mm)	Max. stroke length (mm)	Min. stroke length (mm)
FCD	$\phi 25, \phi 32$ $\phi 40, \phi 50$ $\phi 63$ or equiv.	5/10/15/20/25 30/40/50	50	1

*1: The custom stroke length is available in 1mm increments.

*2: The min. stroke length varies depending on switch mounting method. Refer to the following table.

Min. stroke length with switch

1		2	
Rod side installation	Head side installation	Different surface mounting	Same surface mounting
10 mm		15 mm	35 mm ($\phi 25/32/40/50$) 30 mm ($\phi 63$)

Switch specifications

● Proximity switch

Item	Proximity 2-wire		Proximity 3-wire		
	M2V	M2WV (2-color display)	M3V	M3PV (Made to order)	M3WV (2-color display)
Applications	Dedicated for programmable controller		Programmable controller, relay, IC circuit, small solenoid valve		
Output method	-	-	NPN output	PNP output	NPN output
Power supply voltage	-		4.5 to 28 VDC		10 to 28 VDC
Load voltage	10 to 30 VDC		30 VDC or less		
Load current	5 to 30 mA		100 mA or less	100 mA or less	100 mA or less
Indicator lamp	LED (Lit when ON)	Red/green LED (Lit when ON)	LED (Lit when ON)	Yellow LED (Lit when ON)	Red/green LED (Lit when ON)
Leakage current	1 mA or less		10 μA or less	0.05 mA or less	10 μA or less
Weight	g 1 m:22 3 m:57 5 m:93				

● Reed switch

Item	Reed 2-wire			
	M0V		M5V	
Applications	Programmable controller, relay		For programmable controller, relay, IC circuit (without indicator lamp), serial connection	
Power supply voltage	-		-	
Load voltage	12/24 VDC	110 VAC	5/12/24 VDC	110 VAC or less
Load current	5 to 50 mA	7 to 20 mA	50 mA or less	20 mA or less
Indicator lamp	LED (Lit when ON)		Without indicator lamp	
Leakage current	0 mA			
Weight	g	1 m:22 3 m:57 5 m:93		

*1: Refer to Ending Page 1 for other switch specifications.

*2: Dimensions depend on switch model No. Refer to Ending Page 13 for details.

Cylinder weight

(Unit: g)

Item	Product weight when stroke length (S) = 0 mm		Switch weight	Mounting bracket weight	Additional weight per S = 10 mm
	FCD				
Bore size (mm)	Without switch	With switch	Refer to the weight in the switch specifications.	2	
ø25 or equiv.	130	192			
ø32 or equiv.	185	275			
ø40 or equiv.	300	423			
ø50 or equiv.	470	658			
ø63 or equiv.	950	1086			

(Example) Product weight of FCD-32-20

- Product weight when S = 0 mm.....185 g
- Additional weight when S = 20 mm37 g × $\frac{20}{10}$ = 74 g
- Product weight.....185 g + 74 g = 259 g

Theoretical thrust table

(Unit: N)

Bore size (mm)	Operating direction	Working pressure MPa							
		0.1	0.15	0.2	0.3	0.4	0.5	0.6	0.7
ø25	Push	49.3	73.9	98.5	1.48×10^2	1.97×10^2	2.46×10^2	2.96×10^2	3.45×10^2
	Pull	37.9	56.9	75.9	1.14×10^2	1.52×10^2	1.90×10^2	2.28×10^2	2.66×10^2
ø32	Push	77.6	1.16×10^2	1.55×10^2	2.33×10^2	3.10×10^2	3.88×10^2	4.66×10^2	5.43×10^2
	Pull	57.5	86.3	1.15×10^2	1.73×10^2	2.30×10^2	2.88×10^2	3.45×10^2	4.03×10^2
ø40	Push	1.29×10^2	1.94×10^2	2.58×10^2	3.87×10^2	5.16×10^2	6.45×10^2	7.75×10^2	9.04×10^2
	Pull	1.09×10^2	1.63×10^2	2.18×10^2	3.27×10^2	4.36×10^2	5.45×10^2	6.54×10^2	7.63×10^2
ø50	Push	1.93×10^2	2.90×10^2	3.86×10^2	5.80×10^2	7.73×10^2	9.66×10^2	1.16×10^3	1.35×10^3
	Pull	1.62×10^2	2.43×10^2	3.24×10^2	4.85×10^2	6.47×10^2	8.09×10^2	9.71×10^2	1.13×10^3
ø63	Push	3.18×10^2	4.77×10^2	6.36×10^2	9.53×10^2	1.27×10^3	1.59×10^3	1.91×10^3	2.22×10^3
	Pull	2.86×10^2	4.30×10^2	5.73×10^2	8.59×10^2	1.15×10^3	1.43×10^3	1.72×10^3	2.00×10^3

How to order

Without switch (without magnet for switch)

FCD - **25** - **10** - **N**

With switch (built-in magnet for switch)

FCD-L - **25** - **10** - **M2V** - **R** - **N**

A Model No.

B Bore size

C Port thread

D Stroke length

E Switch model No.
* indicates the lead wire length.

F Switch quantity

G Option
*2

⚠ Precautions for model No. selection

*1: Refer to page 1488 for the min. stroke length with switch.

*2: Dimensions of copper and PTFE free "P6" are the same as those of the standard.

[Example of model No.]

FCD-L-25-10-M2V-R-M

Model: Flat compact cylinder

- A** Model No. : Double acting/with switch
- B** Bore size : ø25 mm
- C** Port thread : Rc thread
- D** Stroke length : 10 mm
- E** Switch model No. : Proximity switch M2V
- F** Switch quantity : 1 on rod side
- G** Option : Piston rod material (stainless steel)

Code		Description			
A Model No.					
FCD	Double acting				
FCD-L	Double acting/with switch				
B Bore size (mm)					
25	ø25				
32	ø32				
40	ø40				
50	ø50				
63	ø63				
C Port thread					
Blank	Rc thread				
NN	NPT thread (ø40 or more) (made-to-order product)				
GN	G thread (ø40 or more) (made-to-order product)				
D Stroke length (mm)					
Bore size	Stroke length *1	Custom stroke length			
ø25 to ø63	1 to 50	In 1 mm increments			
E Switch model No.					
Radial lead wire	Contact	Voltage		Display	Lead wire
		AC	DC		
M2V*	Proximity		●	1-color display	2-wire
M2WV*			●	2-color display	
M3V*			●	1-color display	3-wire
M3WV*			●	2-color display	
M3PV*	Reed		●	1-color display (made to order)	2-wire
M0V*		●	●	1-color display	
M5V*		●	●	Without indicator lamp	
* Lead wire length					
Blank	1 m (standard)				
3	3 m (option)				
5	5 m (option)				
F Switch quantity					
R	1 on rod side				
H	1 on head side				
D	2				
T	3				
G Option					
Blank	Rod end female thread				
M	Piston rod material (stainless steel)				
N	Rod end male thread				
R	With spigot				
P6	Copper and PTFE free (copper-based/Teflon-based material is not used)				

How to order switch

● Switch body + mounting bracket set

FCS - M2V

↓
Switch model No.
(Item ㊞ on page 1490)

● Switch body only

SW - M2V

↓
Switch model No.
(Item ㊞ on page 1490)

● Mounting bracket set

FCS - M

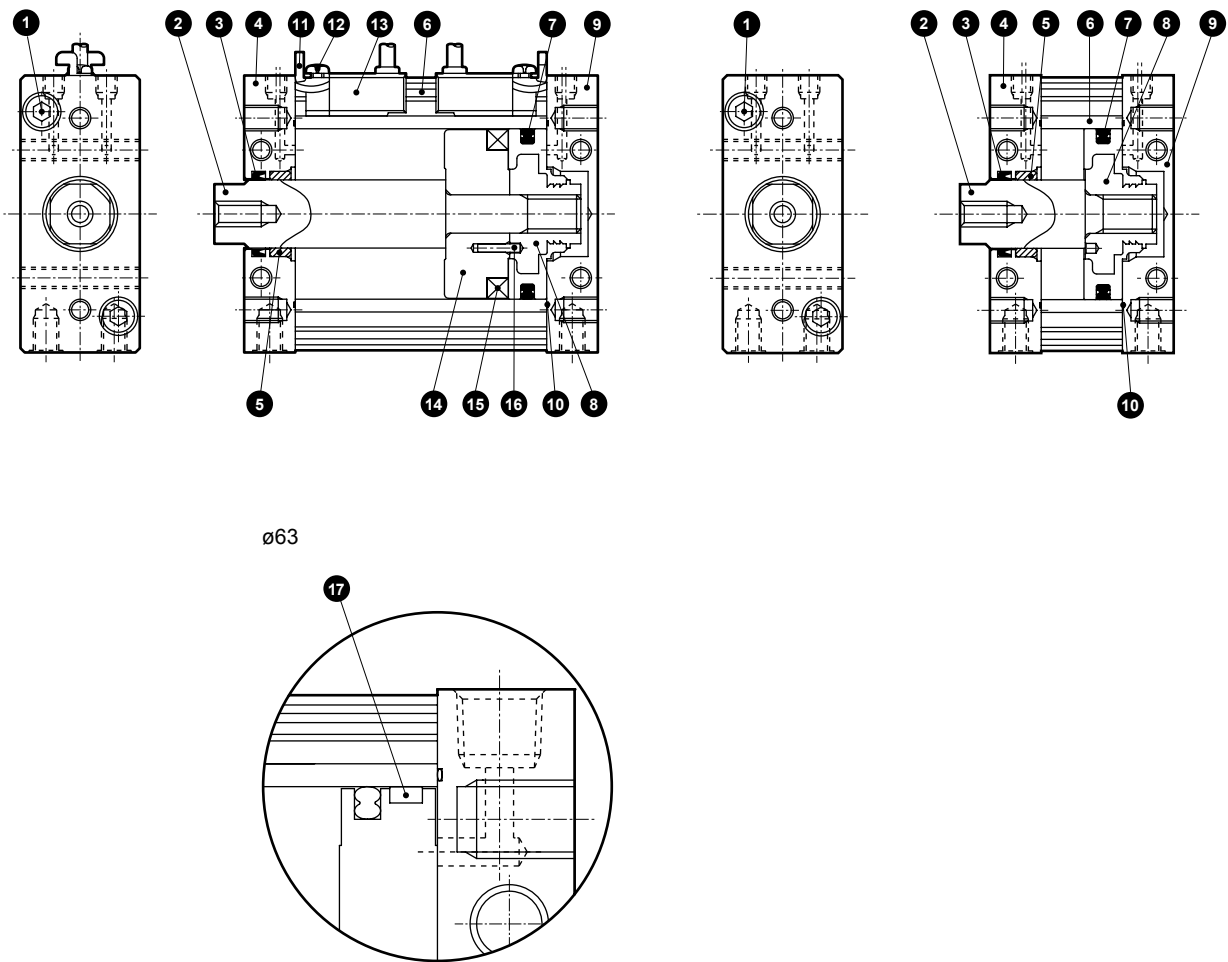
↓
Mounting bracket

SCP*3
CMK2
CMA2
SCM
SCG
SCA2
SCS2
CKV2
CAV2/ COVP/IN2
SSD2
SSG
SSD
CAT
MDC2
MVC
SMG
MSD/ MSDG
FC*
STK
SRL3
SRG3
SRM3
SRT3
MRL2
MRG2
SM-25
ShkAbs
FJ
FK
Spd Contr
Ending

Internal structure and parts list

● FCD-L (with switch)

● FCD



No.	Part name	Material	Remarks	No.	Part name	Material	Remarks
1	Hexagon socket head cap screw	Steel	Zinc chromate	9	Head cover	Aluminum alloy	Black alumite
2	Piston rod	Steel	Industrial chrome plating	10	Cover gasket	Nitrile rubber	
3	Rod packing	Nitrile rubber		11	Switch mounting bracket	Stainless steel	
4	Rod cover	Aluminum alloy	Black alumite	12	Cross-recessed pan head machine screw	Steel	Zinc chromate
5	Bush	Special bearing material *1		13	Switch		
6	Tube	Aluminum alloy	Hard alumite	14	Spacer	Aluminum alloy Polyamide resin	ø25 to ø50 ø63
7	Piston packing	Nitrile rubber		15	Magnet		
8	Piston	Aluminum alloy + Acetal resin Aluminum alloy	ø25 to ø50 ø63: Chromate	16	Spring pin	Steel	
				17	Wear ring	Acetal resin	

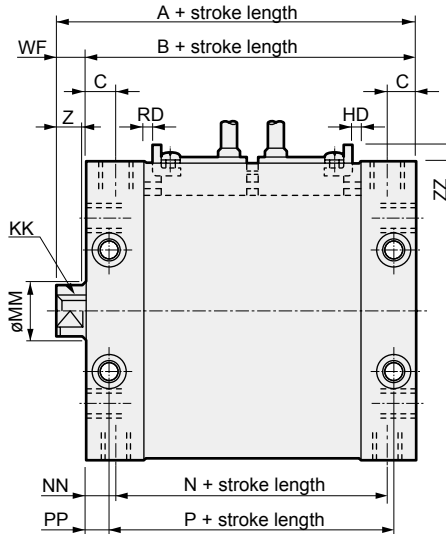
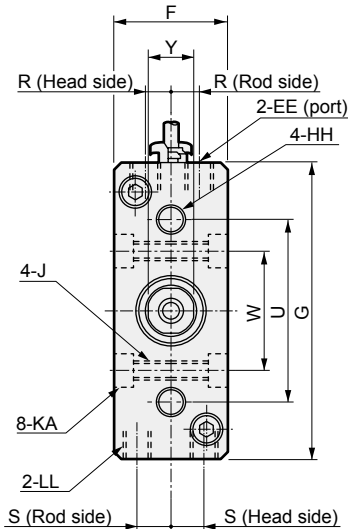
*1: Special aluminum for copper and PTFE free.

Repair parts list (common to types with/without switch)

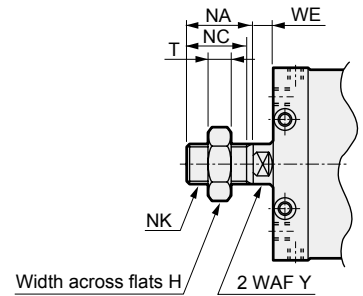
Bore size (mm)	Kit No.	Repair parts No.
ø25 or equiv.	FCD-25K	3 7 10
ø32 or equiv.	FCD-32K	
ø40 or equiv.	FCD-40K	
ø50 or equiv.	FCD-50K	
ø63 or equiv.	FCD-63K	3 7 10 17

Dimensions

● FCD-L (double acting with switch)



● Dimensions of rod end male thread (Option code N)

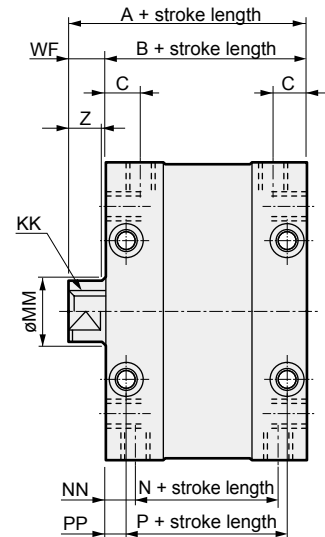
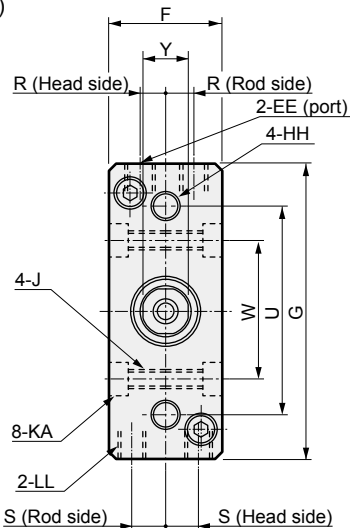


*1: This figure shows FCD-L-40.

*2: For same-surface installation with 2 switches, the stroke length of 35 mm and over for ø25 to ø50 equivalent or 30 mm and over for ø63 equivalent is required. For the stroke length of that value or less, set on both sides.

*3: Position for Y section 2 WAF is unspecified.

● FCD (Without switch)



*1: This figure shows FCD-40.

*2: Position for Y section 2 WAF is unspecified.

Code	Dimensions without switch				Dimensions with switch				Common dimensions								
Bore size (mm)	A	B	N	P	A	B	N	P	C	EE	F	G	HH	J	KA		
ø25 or equiv.	37	32	20	24	52	47	35	39	7.5	M5 depth 4	25	55	M5 depth 7	M5 (through)	-		
ø32 or equiv.	40	33	21	25	55	48	36	40	7.5	M5 depth 4	28	65	M6 depth 8	M5 (through)	-		
ø40 or equiv.	49	41	25	29	64	56	40	44	8.5	Rc1/8	32	83	M8 depth 10	M6 (through)	9.5 spot face depth 5.4		
ø50 or equiv.	55.5	46	29	27	70.5	61	44	42	10.5	Rc1/8	39	101	M10 depth 12	M8 (through)	11 spot face depth 6.5		
ø63 or equiv.	66.5	57	37	37	81.5	72	52	52	11.5	Rc1/4	49	125	M12 depth 15	M12 (through)	17.5 spot face depth 10.5		

Code	Common dimensions with switch															
Bore size (mm)	KK	LL	MM	NN	PP	R	S	U	W	WF	ZZ	RD	HD	Y	Z	
ø25 or equiv.	M5 depth 9	M5 depth 7	12	6	4	4.7	7	38	24	5	5.5 or less	0	0	10	5	
ø32 or equiv.	M6 depth 11	M6 depth 8	16	6	4	6.2	8	45	30	7	5.5 or less	0	0	14	7	
ø40 or equiv.	M8 depth 13	M8 depth 10	16	8	6	7.5	9	52	34	8	5.5 or less	0	0	14	7	
ø50 or equiv.	M8 depth 13	M10 depth 12	20	8.5	9.5	9	10	62	40	9.5	5.5 or less	0	0.5	17	8	
ø63 or equiv.	M10 depth 15	M12 depth 18	20	10	10	10.5	14	86	54	9.5	5.5 or less	0	4.5	17	8	

● Rod end male thread dimensions

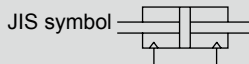
Code	H	NA	NC	NK	T	WE
Bore size (mm)						
ø25 or equiv.	17	22	20	M10×1.25	6	5
ø32 or equiv.	22	22	20	M14×1.5	8	7
ø40 or equiv.	22	22	20	M14×1.5	8	7
ø50 or equiv.	27	28	26	M18×1.5	11	8
ø63 or equiv.	27	28	26	M18×1.5	11	8



Flat compact cylinder double acting/double rod

FCD-D Series

● Bore size: $\phi 25/\phi 32/\phi 40/\phi 50/\phi 63$



Specifications

Item	FCD-D FCD-DL				
Bore size mm	ø25 or equiv.	ø32 or equiv.	ø40 or equiv.	ø50 or equiv.	ø63 or equiv.
Actuation	Double acting/double rod				
Working fluid	Compressed air				
Max. working pressure MPa	0.7 (≈100 psi, 7 bar)				
Min. working pressure MPa	0.10 (≈15 psi, 1 bar)				
Proof pressure MPa	1.05 (≈150 psi, 10.5 bar)				
Ambient temperature °C	-10 (14°F) to 60 (140°F) (no freezing)				
Port size	M5		Rc1/8		Rc1/4
Stroke tolerance mm	+0.5 0 (to 50)				
Working piston speed mm/s	50 to 500				
Cushion	None				
Lubrication	Not required (turbine oil type 1 ISO VG32 if necessary for lubrication)				
Allowable absorbed energy J	0.015	0.02	0.026	0.04	0.05

Rotation-stop precision/Allowable torque

Item	$\phi 25$ or equiv.	$\phi 32$ or equiv.	$\phi 40$ or equiv.	$\phi 50$ or equiv.	$\phi 63$ or equiv.
Non-rotating accuracy *2	$\pm 1^{\circ}$	$\pm 0.8^{\circ}$	$\pm 0.5^{\circ}$	$\pm 0.5^{\circ}$	$\pm 0.5^{\circ}$
Allowable torque N·m	1	1.6	2.5	3.9	5.9

*1: Avoid applying rotation torque with impact, or with violent changes in torque load direction.

*2: "Non-rotating accuracy" is the value when a torque load equivalent to 10% of "allowable torque" is applied to the end of the piston rod.

Stroke length

Model No.	Bore size (mm)	Standard stroke length (mm)	Max. stroke length (mm)	Min. stroke length (mm)
FCD-D	$\phi 25, \phi 32$ $\phi 40, \phi 50$ $\phi 63$ or equiv.	5/10/15/20/25 30/40/50	50	1

*1: The custom stroke length is available in 1mm increments.

*2: The min. stroke length varies depending on switch mounting method. Refer to the following table.

Min. stroke length with switch

1		2	
Rod side installation	Head side installation	Different surface mounting	Same surface mounting
10 mm		15 mm	35 mm ($\phi 25/32/40/50$) 30 mm ($\phi 63$)

Switch specifications

● Proximity switch

Item	Proximity 2-wire		Proximity 3-wire		
	M2V	M2WV (2-color display)	M3V	M3PV (Made to order)	M3WV (2-color display)
Applications	Dedicated for programmable controller		Programmable controller, relay, IC circuit, small solenoid valve		
Output method	-	-	NPN output	PNP output	NPN output
Power supply voltage	-		4.5 to 28 VDC		10 to 28 VDC
Load voltage	10 to 30 VDC		30 VDC or less		
Load current	5 to 30 mA		100 mA or less	100 mA or less	100 mA or less
Indicator lamp	LED (Lit when ON)	Red/green LED (Lit when ON)	LED (Lit when ON)	Yellow LED (Lit when ON)	Red/green LED (Lit when ON)
Leakage current	1 mA or less		10 µA or less	0.05 mA or less	10 µA or less
Weight g	1 m:22 3 m:57 5 m:93				

● Reed switch

Item	Reed 2-wire			
	M0V		M5V	
Applications	Programmable controller, relay		For programmable controller, relay, IC circuit (without indicator lamp), serial connection	
Power supply voltage	-		-	
Load voltage	12/24 VDC	110 VAC	5/12/24 VDC	110 VAC or less
Load current	5 to 50 mA	7 to 20 mA	50 mA or less	20 mA or less
Indicator lamp	LED (Lit when ON)		Without indicator lamp	
Leakage current	0 mA			
Weight	g	1 m:22	3 m:57	5 m:93

*1: Refer to Ending Page 1 for other switch specifications.

*2: Dimensions depend on switch model No. Refer to Ending Page 13 for details.

Cylinder weight

(Unit: g)

Item	Product weight when stroke length (S) = 0 mm		Switch weight	Mounting bracket weight	Additional weight per S = 10 mm
	FCD-D				
Bore size (mm)	Without switch	With switch	Refer to the weight in the switch specifications.	2	
ø25 or equiv.	145	220			
ø32 or equiv.	215	330			
ø40 or equiv.	330	478			
ø50 or equiv.	545	773			
ø63 or equiv.	1050	1226			

(Example) Product weight of FCD-D-32-20

- Product weight when S = 0 mm.....215 g
- Additional weight when S = 20 mm53g x $\frac{20}{10}$ = 106 g
- Product weight.....215 g + 106 g = 321 g

Theoretical thrust table

(Unit: N)

Bore size (mm)	Operating direction	Working pressure MPa							
		0.1	0.15	0.2	0.3	0.4	0.5	0.6	0.7
ø25	Push/Pull	37.9	56.9	75.9	1.14×10^2	1.52×10^2	1.90×10^2	2.28×10^2	2.66×10^2
ø32	Push/Pull	57.5	86.3	1.15×10^2	1.73×10^2	2.30×10^2	2.88×10^2	3.45×10^2	4.03×10^2
ø40	Push/Pull	1.09×10^2	1.63×10^2	2.18×10^2	3.27×10^2	4.36×10^2	5.45×10^2	6.54×10^2	7.63×10^2
ø50	Push/Pull	1.62×10^2	2.43×10^2	3.24×10^2	4.85×10^2	6.47×10^2	8.09×10^2	9.71×10^2	1.13×10^3
ø63	Push/Pull	2.86×10^2	4.30×10^2	5.73×10^2	8.59×10^2	1.15×10^3	1.43×10^3	1.72×10^3	2.00×10^3

FCD-D Series

How to order

Without switch (without magnet for switch)

FCD-D - **25** - **10** - **N**

With switch (built-in magnet for switch)

FCD-DL - **25** - **10** - **M2V** - **R** - **N**

A Model No.

B Bore size

C Port thread

D Stroke length

E Switch model No.
* indicates the lead wire length.

F Switch quantity

G Option
*2

⚠ Precautions for model No. selection

*1 : Refer to page 1494 for the min. stroke length with switch.

*2 : Dimensions of copper and PTFE free "P6" are the same as those of the standard.

[Example of model No.]

FCD-DL-25-10-M2V-R-M

Model: Flat compact cylinder

- A** Model No. : Double acting/double rod/with switch
- B** Bore size : ø25 mm
- C** Port thread : Rc thread
- D** Stroke length : 10 mm
- E** Switch model No. : Proximity switch M2V
- F** Switch quantity : 1 on rod side
- G** Option : Piston rod material (stainless steel)

Code	Description				
A Model No.					
FCD-D	Double acting/double rod				
FCD-DL	Double acting/double rod/with switch				
B Bore size (mm)					
25	ø25				
32	ø32				
40	ø40				
50	ø50				
63	ø63				
C Port thread					
Blank	Rc thread				
NN	NPT thread (ø40 or more) (made-to-order product)				
GN	G thread (ø40 or more) (made-to-order product)				
D Stroke length (mm)					
Bore size	Stroke length *1	Custom stroke length			
ø25 to ø63	1 to 50	In 1 mm increments			
E Switch model No.					
Radial lead wire	Contact	Voltage	Display	Lead wire	
		AC	DC		
M2V*	Proximity		●	1-color display	2-wire
M2WV*			●	2-color display	
M3V*			●	1-color display	3-wire
M3WV*			●	2-color display	
M3PV*			●	1-color display (made to order)	
M0V*	Reed	●	●	1-color display	2-wire
M5V*		●	●	Without indicator lamp	
* Lead wire length					
Blank	1 m (standard)				
3	3 m (option)				
5	5 m (option)				
F Switch quantity					
R	1 on rod side				
H	1 on head side				
D	2				
T	3				
G Option					
Blank	Rod end female thread				
M	Piston rod material (stainless steel)				
N	Rod end male thread				
R	With spigot				
P6	Copper and PTFE free (copper-based/Teflon-based material is not used)				

How to order switch

● Switch body + mounting bracket set

FCS - M2V

↓
Switch model No.
(Item ㊞ on page 1496)

● Switch body only

SW - M2V

↓
Switch model No.
(Item ㊞ on page 1496)

● Mounting bracket set

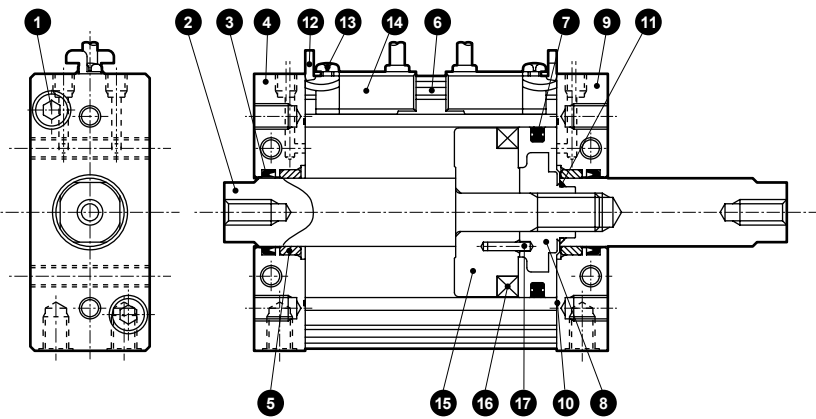
FCS - M

↓
Mounting bracket

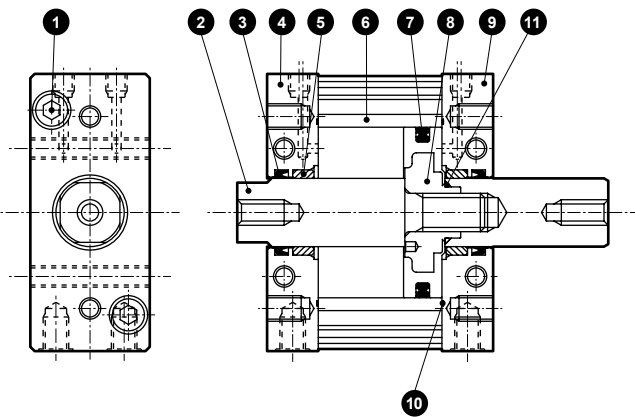
SCP*3
CMK2
CMA2
SCM
SCG
SCA2
SCS2
CKV2
CAV2/ COVP/IN2
SSD2
SSG
SSD
CAT
MDC2
MVC
SMG
MSD/ MSDG
FC*
STK
SRL3
SRG3
SRM3
SRT3
MRL2
MRG2
SM-25
ShkAbs
FJ
FK
Spd Contr
Ending

Internal structure and parts list

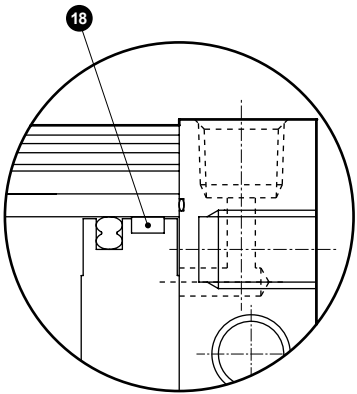
● FCD-DL (with switch)



● FCD-D



ø63



No.	Part name	Material	Remarks	No.	Part name	Material	Remarks
1	Hexagon socket head cap screw	Steel	Zinc chromate	10	Cover gasket	Nitrile rubber	
2	Piston rod	Steel	Industrial chrome plating	11	Piston gasket	Nitrile rubber	
3	Rod packing	Nitrile rubber		12	Switch mounting bracket	Stainless steel	
4	Rod cover	Aluminum alloy	Black alumite	13	Cross-recessed pan head machine screw	Steel	Zinc chromate
5	Bush	Special bearing material *1		14	Switch		
6	Tube	Aluminum alloy	Hard alumite	15	Spacer	Aluminum alloy Polyamide resin	ø25 to ø50 ø63
7	Piston packing	Nitrile rubber		16	Magnet		
8	Piston	Aluminum alloy + Acetal resin	ø25 to ø50	17	Spring pin	Steel	
9	Head cover	Aluminum alloy	Black alumite	18	Wear ring	Acetal resin	

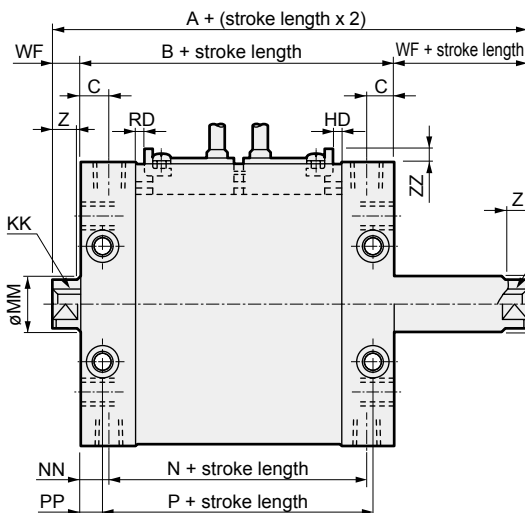
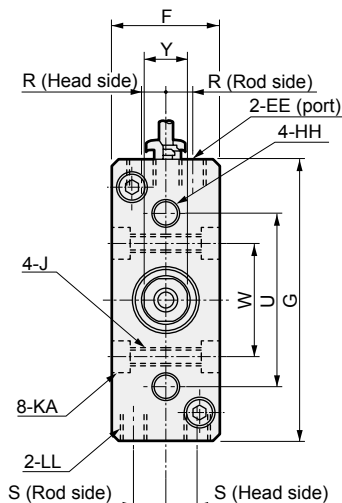
*1: Special aluminum for copper and PTFE free.

Repair parts list (common to types with/without switch)

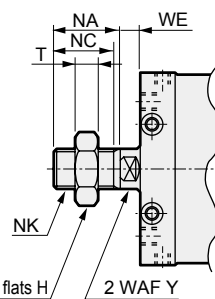
Bore size (mm)	Kit No.	Repair parts No.
ø25 or equiv.	FCD-D-25K	3 7 10
ø32 or equiv.	FCD-D-32K	
ø40 or equiv.	FCD-D-40K	
ø50 or equiv.	FCD-D-50K	
ø63 or equiv.	FCD-D-63K	3 7 10 18

Dimensions

● FCD-DL (double acting double rod with switch)



● Dimensions of rod end male thread (Option code: N)

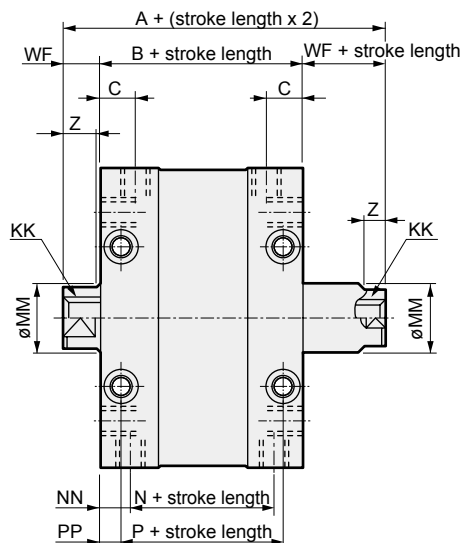
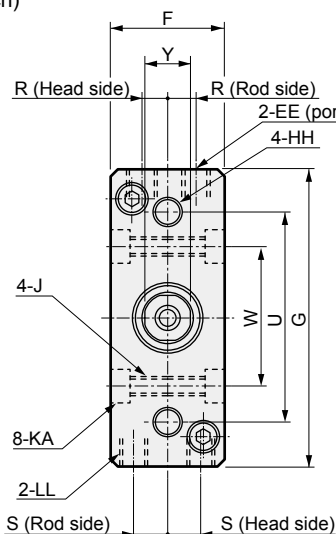


*1: This figure shows FCD-DL-40.

*2: For same-surface installation with 2 switches, the stroke length of 35 mm and over for $\phi 25$ to $\phi 50$ equivalent or 30 mm and over for $\phi 63$ equivalent is required. For the stroke length of that value or less, set on both sides.

*3: Position for Y section 2 WAF is unspecified.

● FCD-D (without switch)



*1: This figure shows FCD-D-40.

*2: Position for Y section 2 WAF is unspecified.

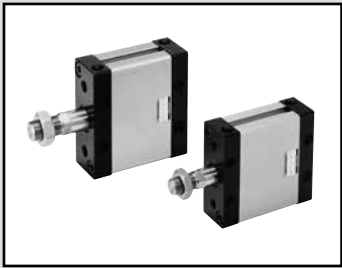
Code	Dimensions without switch				Dimensions with switch				Common dimensions							
Bore size (mm)	A	B	N	P	A	B	N	P	C	EE	F	G	HH	J	KA	
ø25 or equiv.	42	32	20	24	57	47	35	39	7.5	M5 depth 4	25	55	M5 depth 7	M5 (through)	-	
ø32 or equiv.	47	33	21	25	62	48	36	40	7.5	M5 depth 4	28	65	M6 depth 8	M5 (through)	-	
ø40 or equiv.	57	41	25	29	72	56	40	44	8.5	Rc1/8	32	83	M8 depth 10	M6 (through)	9.5 spot face depth 5.4	
ø50 or equiv.	65	46	29	27	80	61	44	42	10.5	Rc1/8	39	101	M10 depth 12	M8 (through)	11 spot face depth 6.5	
ø63 or equiv.	76	57	37	37	91	72	52	52	11.5	Rc1/4	49	125	M12 depth 15	M12 (through)	17.5 spot face depth 10.5	

Code	Common dimensions with switch															
Bore size (mm)	KK	LL	MM	NN	PP	R	S	U	W	WF	ZZ	RD	HD	Y	Z	
ø25 or equiv.	M5 depth 9	M5 depth 7	12	6	4	4.7	7	38	24	5	5.5 or less	0	0	10	5	
ø32 or equiv.	M6 depth 11	M6 depth 8	16	6	4	6.2	8	45	30	7	5.5 or less	0	0	14	7	
ø40 or equiv.	M8 depth 13	M8 depth 10	16	8	6	7.5	9	52	34	8	5.5 or less	0	0	14	7	
ø50 or equiv.	M8 depth 13	M10 depth 12	20	8.5	9.5	9	10	62	40	9.5	5.5 or less	0	0.5	17	8	
ø63 or equiv.	M10 depth 15	M12 depth 18	20	10	10	10.5	14	86	54	9.5	5.5 or less	0	4.5	17	8	

● Rod end male thread dimensions

Code	H	NA	NC	NK	T	WE
Bore size (mm)						
$\phi 25$ or equiv.	17	22	20	M10×1.25	6	5
$\phi 32$ or equiv.	22	22	20	M14×1.5	8	7
$\phi 40$ or equiv.	22	22	20	M14×1.5	8	7
$\phi 50$ or equiv.	27	28	26	M18×1.5	11	8
$\phi 63$ or equiv.	27	28	26	M18×1.5	11	8

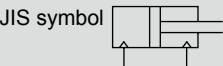
SCP*3
CMK2
CMA2
SCM
SCG
SCA2
SCS2
CKV2
CAV2/
COVPIN2
SSD2
SSG
SSD
CAT
MDC2
MVC
SMG
MSD/
MSDG
FC*
STK
SRL3
SRG3
SRM3
SRT3
MRL2
MRG2
SM-25
ShkAbs
FJ
FK
Spd
Contr
Ending



Flat compact cylinder double acting/cushioned

FCD-K Series

● Bore size: $\phi 25/\phi 32/\phi 40/\phi 50/\phi 63$



Specifications

Item	FCD-K FCD-KL				
Bore size mm	ø25 or equiv.	ø32 or equiv.	ø40 or equiv.	ø50 or equiv.	ø63 or equiv.
Actuation	Double acting/cushioned				
Working fluid	Compressed air				
Max. working pressure MPa	0.7 (≈100 psi, 7 bar)				
Min. working pressure MPa	0.07 (≈10 psi, 0.7 bar)				
Proof pressure MPa	1.05 (≈150 psi, 10.5 bar)				
Ambient temperature °C	-10 (14°F) to 60 (140°F) (no freezing)				
Port size	M5		Rc1/8		Rc1/4
Stroke tolerance mm	+1.5 0 (to 50), +2.0 0 (to 150)				
Working piston speed mm/s	50 to 500				
Cushion	Rubber cushion				
Lubrication	Not required (turbine oil class 1 ISO VG32 if necessary for lubrication)				
Allowable absorbed energy J	0.34	0.54	0.67	1.02	1.56

Rotation-stop precision/Allowable torque

Item		$\phi 25$ or equiv.	$\phi 32$ or equiv.	$\phi 40$ or equiv.	$\phi 50$ or equiv.	$\phi 63$ or equiv.
Non-rotating accuracy	*2	$\pm 1^{\circ}$	$\pm 0.8^{\circ}$	$\pm 0.5^{\circ}$	$\pm 0.5^{\circ}$	$\pm 0.5^{\circ}$
Allowable torque	N·m	1	1.6	2.5	3.9	5.9

*1: Avoid applying rotation torque with impact, or with violent changes in torque load direction.

*2: "Non-rotating accuracy" is the value when a torque load equivalent to 10% of "allowable torque" is applied to the end of the piston rod.

Stroke length

Model No.	Bore size (mm)	Standard stroke length (mm)	Max. stroke length (mm)	Min. stroke length (mm)
FCD-K	$\phi 25, \phi 32$	5/10/15/20/25	150	1
	$\phi 40, \phi 50$	30/40/50		
	$\phi 63$ or equiv.			

*1: The custom stroke length is available in 1mm increments.

*2: The min. stroke length varies depending on switch mounting method. Refer to the following table.

Min. stroke length with switch

1		2	
Rod side installation	Head side installation	Different surface mounting	Same surface mounting
10 mm		15 mm	35 mm ($\phi 25/32/40/50$) 30 mm ($\phi 63$)

Switch specifications

● Proximity switch

Item	Proximity 2-wire		Proximity 3-wire		
	M2V	M2WV (2-color display)	M3V	M3PV (Made to order)	M3WV (2-color display)
Applications	Dedicated for programmable controller		Programmable controller, relay, IC circuit, small solenoid valve		
Output method	-	-	NPN output	PNP output	NPN output
Power supply voltage	-		4.5 to 28 VDC		10 to 28 VDC
Load voltage	10 to 30 VDC		30 VDC or less		
Load current	5 to 30 mA		100 mA or less	100 mA or less	100 mA or less
Indicator lamp	LED (Lit when ON)	Red/green LED (Lit when ON)	LED (Lit when ON)	Yellow LED (Lit when ON)	Red/green LED (Lit when ON)
Leakage current	1 mA or less		10 µA or less	0.05 mA or less	10 µA or less
Weight	g 1 m:22 3 m:57 5 m:93				

● Reed switch

Item	Reed 2-wire			
	M0V		M5V	
Applications	Programmable controller, relay		For programmable controller, relay, IC circuit (without indicator lamp), serial connection	
Power supply voltage	-		-	
Load voltage	12/24 VDC	110 VAC	5/12/24 VDC	110 VAC or less
Load current	5 to 50 mA	7 to 20 mA	50 mA or less	20 mA or less
Indicator lamp	LED (Lit when ON)		Without indicator lamp	
Leakage current	0 mA			
Weight	g 1 m:22 3 m:57 5 m:93			

*1: Refer to Ending Page 1 for other switch specifications.

*2: Dimensions depend on switch model No. Refer to Ending Page 13 for details.

Cylinder weight

(Unit: g)

Item	Product weight when stroke length (S) = 0 mm		Switch weight	Mounting bracket weight	Additional weight per S = 10 mm
	FCD-K				
Bore size (mm)	Without switch	With switch	Refer to the weight in the switch specifications.	2	
ø25 or equiv.	155	221			26
ø32 or equiv.	225	316			37
ø40 or equiv.	355	481			46
ø50 or equiv.	550	741			71
ø63 or equiv.	1135	1196			90

(Example) Product weight of FCD-K-32-20

- Product weight when S = 0 mm.....225 g
- Additional weight when S = 20 mm $37 \text{ g} \times \frac{20}{10} = 74 \text{ g}$
- Product weight..... $225 \text{ g} + 74 \text{ g} = 299 \text{ g}$

Theoretical thrust table

(Unit: N)

Bore size (mm)	Operating direction	Working pressure MPa							
		0.1	0.15	0.2	0.3	0.4	0.5	0.6	0.7
ø25	Push	49.3	73.9	98.5	1.48×10^2	1.97×10^2	2.46×10^2	2.96×10^2	3.45×10^2
	Pull	37.9	56.9	75.9	1.14×10^2	1.52×10^2	1.90×10^2	2.28×10^2	2.66×10^2
ø32	Push	77.6	1.16×10^2	1.55×10^2	2.33×10^2	3.10×10^2	3.88×10^2	4.66×10^2	5.43×10^2
	Pull	57.5	86.3	1.15×10^2	1.73×10^2	2.30×10^2	2.88×10^2	3.45×10^2	4.03×10^2
ø40	Push	1.29×10^2	1.94×10^2	2.58×10^2	3.87×10^2	5.16×10^2	6.45×10^2	7.75×10^2	9.04×10^2
	Pull	1.09×10^2	1.63×10^2	2.18×10^2	3.27×10^2	4.36×10^2	5.45×10^2	6.54×10^2	7.63×10^2
ø50	Push	1.93×10^2	2.90×10^2	3.86×10^2	5.80×10^2	7.73×10^2	9.66×10^2	1.16×10^3	1.35×10^3
	Pull	1.62×10^2	2.43×10^2	3.24×10^2	4.85×10^2	6.47×10^2	8.09×10^2	9.71×10^2	1.13×10^3
ø63	Push	3.18×10^2	4.77×10^2	6.36×10^2	9.53×10^2	1.27×10^3	1.59×10^3	1.91×10^3	2.22×10^3
	Pull	2.86×10^2	4.30×10^2	5.73×10^2	8.59×10^2	1.15×10^3	1.43×10^3	1.72×10^3	2.00×10^3

How to order

Without switch (without magnet for switch)

FCD-K - **25** - **10** - **N**

With switch (built-in magnet for switch)

FCD-KL - **25** - **10** - **M2V** - **R** - **N**

A Model No.

B Bore size

C Port thread

D Stroke length

E Switch model No.
* indicates the lead wire length.

F Switch quantity

G Option
*2

⚠ Precautions for model No. selection

*1 : Refer to page 1500 for the min. stroke length with switch.

*2 : Dimensions of copper and PTFE free "P6" are the same as those of the standard.

[Example of model No.]

FCD-KL-25-10-M2V-R-M

Model: Flat compact cylinder

- A** Model No. : Double acting/cushioned/with switch
- B** Bore size : ø25 mm
- C** Port thread : Rc thread
- D** Stroke length : 10 mm
- E** Switch model No. : Proximity switch M2V
- F** Switch quantity : 1 on rod side
- G** Option : Piston rod material (stainless steel)

Code	Description				
A Model No.					
FCD-K	Double acting/cushioned				
FCD-KL	Double acting/cushioned/with switch				
B Bore size (mm)					
25	ø25				
32	ø32				
40	ø40				
50	ø50				
63	ø63				
C Port thread					
Blank	Rc thread				
NN	NPT thread (ø40 or more) (made-to-order product)				
GN	G thread (ø40 or more) (made-to-order product)				
D Stroke length (mm)					
Bore size	Stroke length *1	Custom stroke length			
ø25 to ø63	1 to 150	In 1 mm increments			
E Switch model No.					
Radial lead wire	Contact	Voltage ACDC	Display	Lead wire	
M2V*	Proximity		●	1-color display	2-wire
M2WV*			●	2-color display	
M3V*			●	1-color display	3-wire
M3WV*			●	2-color display	
M3PV*	Reed		●	1-color display (made to order)	2-wire
M0V*		●	●	1-color display	
M5V*		●	●	Without indicator lamp	
* Lead wire length					
Blank	1 m (standard)				
3	3 m (option)				
5	5 m (option)				
F Switch quantity					
R	1 on rod side				
H	1 on head side				
D	2				
T	3				
G Option					
Blank	Rod end female thread				
M	Piston rod material (stainless steel)				
N	Rod end male thread				
R	With spigot				
P6	Copper and PTFE free (copper-based/Teflon-based material is not used)				

How to order switch

● Switch body + mounting bracket set

FCS - M2V

↓
Switch model No.
(Item ㊞ on page 1502)

● Switch body only

SW - M2V

↓
Switch model No.
(Item ㊞ on page 1502)

● Mounting bracket set

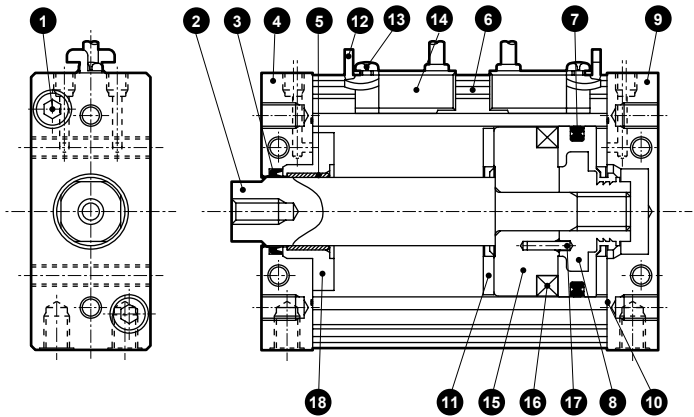
FCS - M

↓
Mounting bracket

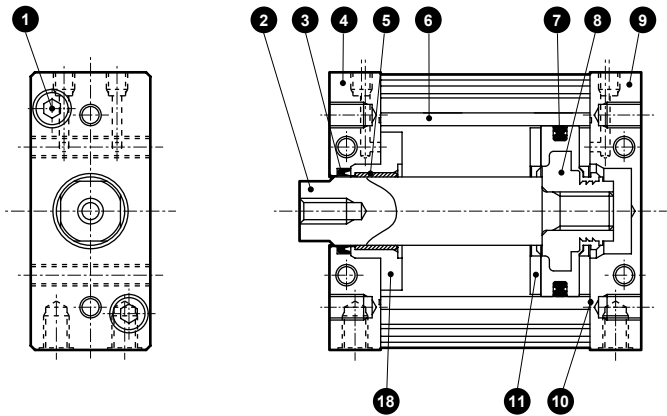
SCP*3
CMK2
CMA2
SCM
SCG
SCA2
SCS2
CKV2
CAV2/ COVP/N2
SSD2
SSG
SSD
CAT
MDC2
MVC
SMG
MSD/ MSDG
FC*
STK
SRL3
SRG3
SRM3
SRT3
MRL2
MRG2
SM-25
ShkAbs
FJ
FK
Spd Contr
Ending

Internal structure and parts list

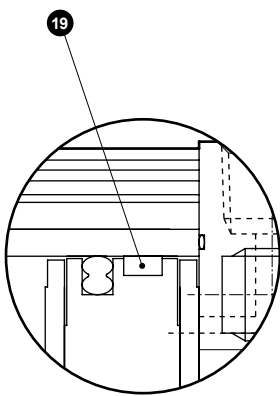
● FCD-KL (with switch)



● FCD-K



ø63



No.	Part name	Material	Remarks	No.	Part name	Material	Remarks
1	Hexagon socket head cap screw	Steel	Zinc chromate	10	Cover gasket	Nitrile rubber	
2	Piston rod	Steel	Industrial chrome plating	11	Cushion rubber	Urethane rubber	
3	Rod packing	Nitrile rubber		12	Switch mounting bracket	Stainless steel	
4	Rod cover	Aluminum alloy	Black alumite	13	Cross-recessed pan head machine screw	Steel	Zinc chromate
5	Bush	Special bearing material *1		14	Switch		
6	Tube	Aluminum alloy	Hard alumite	15	Spacer	Aluminum alloy Polyamide resin	ø25 to ø50 ø63
7	Piston packing	Nitrile rubber		16	Magnet		
8	Piston	Aluminum alloy + Acetal resin	ø25 to ø50	17	Spring pin	Steel	
9	Head cover	Aluminum alloy	Black alumite	18	Bush spacer	Aluminum alloy	ø63: Chromate
				19	Wear ring	Acetal resin	

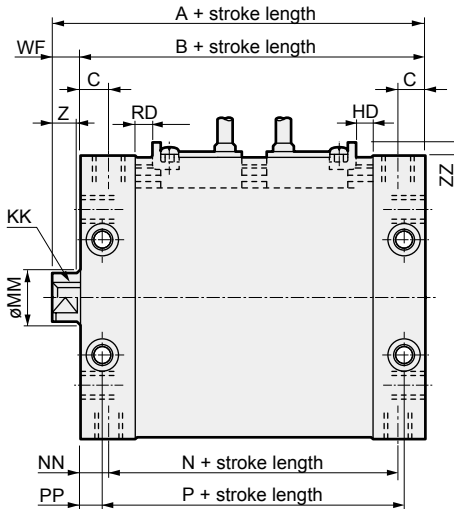
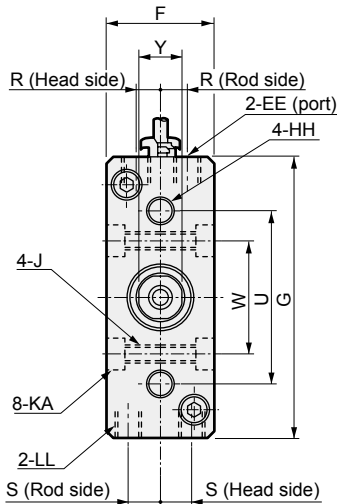
*1: Special aluminum for copper and PTFE free.

Repair parts list (common to types with/without switch)

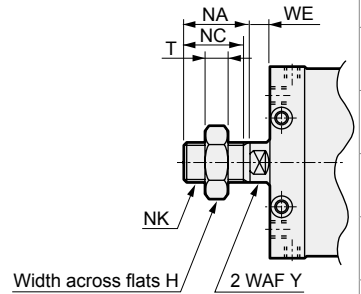
Bore size (mm)	Kit No.	Repair parts No.
ø25 or equiv.	FCD-K-25K	3 7 10 11
ø32 or equiv.	FCD-K-32K	
ø40 or equiv.	FCD-K-40K	
ø50 or equiv.	FCD-K-50K	
ø63 or equiv.	FCD-K-63K	3 7 10 11 19

Dimensions

● FCD-KL (double acting cushioned, with switch)



● Dimensions of rod end male thread (Option code: N)

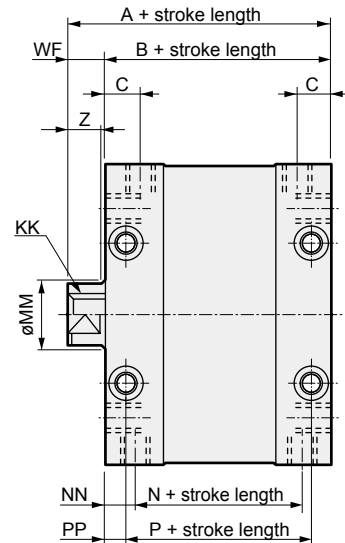
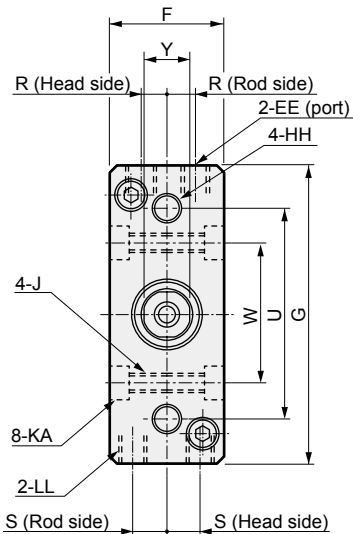


*1: This figure shows FCD-KL-40.

*2: For same-surface installation with 2 switches, the stroke length of 35 mm and over for $\phi 25$ to $\phi 50$ equivalent or 30 mm and over for $\phi 63$ equivalent is required.
For the stroke length of that value or less, set on both sides.

*3: Position for Y section 2 WAF is unspecified.

● FCD-K (without switch)



*1: This figure shows FCD-K-32.

*2: Position for Y section 2 WAF is unspecified.

Code	Dimensions without switch				Dimensions with switch				Common dimensions							
Bore size (mm)	A	B	N	P	A	B	N	P	C	EE	F	G	HH	J	KA	
$\phi 25$ or equiv.	47	42	30	34	62	57	45	49	7.5	M5 depth 4	25	55	M5 depth 7	M5 (through)	-	
$\phi 32$ or equiv.	50	43	31	35	65	58	46	50	7.5	M5 depth 4	28	65	M6 depth 8	M5 (through)	-	
$\phi 40$ or equiv.	59	51	35	39	74	66	50	54	8.5	Rc1/8	32	83	M8 depth 10	M6 (through)	9.5 spot face depth 5.4	
$\phi 50$ or equiv.	65.5	56	39	37	80.5	71	54	52	10.5	Rc1/8	39	101	M10 depth 12	M8 (through)	11 spot face depth 6.5	
$\phi 63$ or equiv.	76.5	67	47	47	91.5	82	62	62	11.5	Rc1/4	49	125	M12 depth 15	M12 (through)	17.5 spot face depth 10.5	
Code	Common dimensions with switch															
Bore size (mm)	KK	LL	MM	NN	PP	R	S	U	W	WF	ZZ	RD	HD	Y	Z	
$\phi 25$ or equiv.	M5 depth 9	M5 depth 7	12	6	4	4.7	7	38	24	5	5.5 or less	6	1	10	5	
$\phi 32$ or equiv.	M6 depth 11	M6 depth 8	16	6	4	6.2	8	45	30	7	5.5 or less	7	1	14	7	
$\phi 40$ or equiv.	M8 depth 13	M8 depth 10	16	8	6	7.5	9	52	34	8	5.5 or less	7	2	14	7	
$\phi 50$ or equiv.	M8 depth 13	M10 depth 12	20	8.5	9.5	9	10	62	40	9.5	5.5 or less	7	3	17	8	
$\phi 63$ or equiv.	M10 depth 15	M12 depth 18	20	10	10	10.5	14	86	54	9.5	5.5 or less	7	7	17	8	

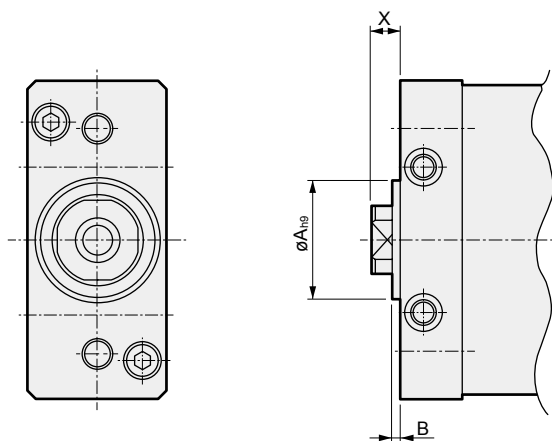
● Rod end male thread dimensions

Code	H	NA	NC	NK	T	WE
Bore size (mm)						
$\phi 25$ or equiv.	17	22	20	M10×1.25	6	5
$\phi 32$ or equiv.	22	22	20	M14×1.5	8	7
$\phi 40$ or equiv.	22	22	20	M14×1.5	8	7
$\phi 50$ or equiv.	27	28	26	M18×1.5	11	8
$\phi 63$ or equiv.	27	28	26	M18×1.5	11	8

FC Series common dimensions: Option (with spigot)



● Dimensions with spigot (option code R)



Code	A	B	X
Bore size (mm)			
ø25 or equiv.	20	$2 \begin{smallmatrix} 0 \\ -0.4 \end{smallmatrix}$	5
ø32 or equiv.	24	$2 \begin{smallmatrix} 0 \\ -0.4 \end{smallmatrix}$	7
ø40 or equiv.	28	$2 \begin{smallmatrix} 0 \\ -0.4 \end{smallmatrix}$	8
ø50 or equiv.	32	$2 \begin{smallmatrix} 0 \\ -0.4 \end{smallmatrix}$	9.5
ø63 or equiv.	32	$2 \begin{smallmatrix} 0 \\ -0.4 \end{smallmatrix}$	9.5

SCP*3
CMK2
CMA2
SCM
SCG
SCA2
SCS2
CKV2
CAV2/
COVPIN2
SSD2
SSG
SSD
CAT
MDC2
MVC
SMG
MSD/
MSDG
FC*
STK
SRL3
SRG3
SRM3
SRT3
MRL2
MRG2
SM-25
ShkAbs
FJ
FK
Spd
Contr
Ending