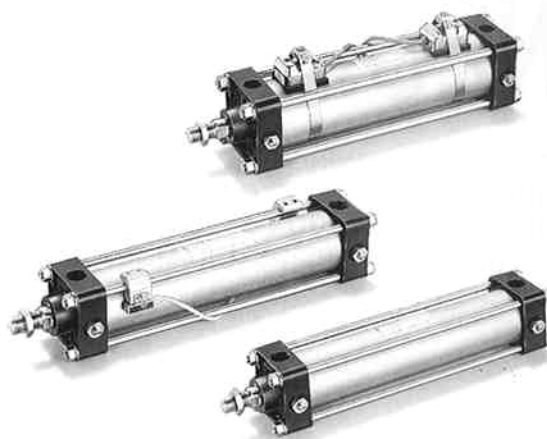


DC7 PNEUMATIC CYLINDER

FURTHER IMPROVED FUNCTIONS WITH CHARACTERISTICS OF DC4 AND DC6 SERIES IN TENSIFIED

- Improved cushioning characteristics with adoption of newly developed cushion mechanism
- Standard installation of magnetic proximity switch
- Standard installation of heavy-duty scraper
- The External dimension and mounting dimension of DC7 are the same as that of DC4, DC6.



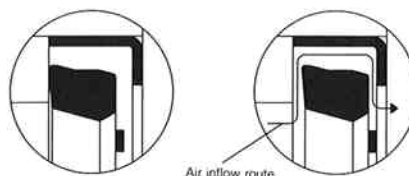
PRODUCT GROUPING

Unit: mm

Structure		Type	φ 40	φ 50	φ 63	φ 80	φ 100	φ 125	φ 150	Fitting switch
General-purpose type	Single rod	Standard type-iron proximity type switch-set DC7	●	●	●	●	●	●	●	(Magnetic proximity type) AX101 AX105 AX111 AX115 AX125 AX11A AX11B AX201 AX205 AX211 AX215 YR101 YR105 SR405 YS211 YS215
		Magnetic proximity type switch-set DC7R	●	●	●	●	●	●	●	
	Double rod	Standard type-iron proximity type switch-set DC7D	●	●	●	●	●	●	●	
		Magnetic proximity type switch-set DC7RD	●	●	●	●	●	●	●	
With heavy-duty scraper	Single rod	Standard type-iron proximity type switch-set DC7H	●	●	●	●	●	●	●	
		Magnetic proximity type switch-set DC7HR	●	●	●	●	●	●	●	
	Double rod	Standard type-iron proximity type switch-set DC7HD	●	●	●	●	●	●	●	(Iron proximity type) L3-101 L3-105 L3-241 L3-245 L4-100 L4- 24
		Magnetic proximity type switch-set DC7HRD	●	●	●	●	●	●	●	

DIFFERENCE FROM DC4-6 SERIES

- All external dimensions and mounting dimensions are same as those of DC4 and DC6 series
- Floating cushion packing adopted.
(Bore: φ 40, 50, 63, 80, 100 and 125)
- Magnetic proximity type switch added.
(Bore: φ 40, 50, 63, 80, 100 and 125)
- Availability of fine adjustment with improved operability as a result of change of the cushion needle.
- Type equipped with heavy-duty scraper standardized as Type H.



Floating cushion packing

Cushioning characteristic is improved as a result of adoption of the floating cushion packing.

PNEUMATIC CYLINDER DC7

CYLINDER SPECIFICATION

Type		General-purpose type			With heavy-duty scraper		
Structure		Standard type	Switch set		Standard type	Switch set	
			Iron proximity type	Magnetic proximity type		Iron proximity type	Magnetic proximity type
Series	Single rod type	DC7		DC7R	DC7H		DC7HR
	Double rod type	DC7D		DC7RD	DC7HD		DC7HRD
Bore		φ 40、50、63、80、100、125、150		φ 40、50、63、80、100、125	φ 40、50、63、80、100、125、150		φ 40、50、63、80、100、125
Working fluid		Air					
(※1)Lubrication		Not necessary					
Operating pressure range	Single rod type	0.05~1 MPa					
	Double rod type	0.1~1 MPa					
Proof test pressure		1.5MPa					
(※2)Speed range		50~500mm/s					
(※3)Temperature range		-10~60℃					
Structure of cushioning		Air cushion on both ende (Standard)					
Cushion stroke (cushion ring length)		20mm : φ 40、φ 50、φ 63 25mm : φ 80、φ 100 35mm : φ 125、φ 150					
Tolerance of thread		ISO 4795/1 6g (JIS 6g-6H)					
Tolerance of stroke		1~250 : $+1.0_{-0}$ mm 251~1000 : $+1.4_{-0}$ mm 1001~1500 : $+1.8_{-0}$ mm					
Mounting type		SD、LB、FA、FB、CA、CB、TC					
Accessories	Boots	Standard: Nylon tarpaulin, Semi-standard: Chloroprene, (※4) CONEX					
	attachments	Rod end eye (Type-T), Rod end clevis (Type-Y) with pin, Floatig joint (Type-F)					
	Others	With lock nut for rod end attachment					

※1) If lubrication is once made, continue lubrication.

※2) When setting the switch at an intermediate position, cylinder's maximum speed must be under 300 mm/sec for detection.

※3) Use the cylinder on the conditions not to freeze.

※4) CONEX is a registered trademark of TEIJIN CORP.

STANDARD STROKE AND MAXIMUM ALLOWABLE STROKE

Unit: mm

Bore	Type	Standard stroke		Maximum allowable stroke	
		Single rod	Double rod	Single rod	Double rod
φ 40		600	600	1000	800
φ 50		600	600	1200	800
φ 63		800	800	1200	800
φ 80		1000	1000	1500	1000
φ 100		1200	1000	1500	1000
φ 125		1300	1000	1500	1000
φ 150		1300	1000	1500	1000

MINIMUM CYLINDER STROKE FOR MOUNTING SWITCH

Unit: mm

Bore	Type	Magnetic proximity type									Iron proximity type		
		Type AX			Type YR·YS			Type SR			Type L3·L4		
		1switch	2switch (opposite side)	Trunnion (Type TC)	1switch	2switch (opposite side)	Trunnion (Type TC)	1switch	2switch (opposite side)	Trunnion (Type TC)	1switch	2switch (opposite side)	Trunnion (Type TC)
φ 40		15	15	95	15	15	95	20	20	115	20	50	125
φ 50		15	15	95	15	15	95	20	20	115	20	50	125
φ 63		10	10	100	10	10	100	20	20	120	20	60	135
φ 80		10	10	100	10	10	100	20	20	125	20	60	145
φ 100		10	10	100	10	10	100	20	20	125	20	70	155
φ 125		5	5	120	5	5	120	15	15	140	20	70	175
φ 150		—	—	—	—	—	—	—	—	—	20	70	175

DC7 PNEUMATIC CYLINDER

MAGNETIC PROXIMITY TYPE SWITCH SPECIFICATIONS (WITH CONTACT)

Code	With 1.5m cord	YR101	—	AX101	AX111	—	—	—
	With 5m cord	YR105	SR405	AX105	AX115	—	—	AX125
	With connector (AC type)	—	—	—	—	AX11A	—	—
	With connector (DC type)	—	—	—	—	—	AX11B	—
Voltage range	AC : 5~120V DC : 5~50V		AC : 80~220V		AC : 5~120V DC : 5~30V		AC : 5~120V DC : 5~50V	
Current range	AC : 3~40mA DC : 3~20mA		2~300mA		AC : 5~20mA DC : 5~40mA		AC : 5~20mA DC : 5~40mA	
Inner voltage drop	2V and less		2V and less		TYP : 2V (at 10mA) 3V and less (at 40mA)			0V
Max. load capacity	0mA		1mA or less		0mA		10 μ A and less	
Indicating lamp	LED(lights with switch ON)		Neon lamp (lights with switch OFF)		LED (red lamp lights up during ON)			None
Electric circuit								

※)The details of each switch please refer to the handling instructions at end.

IRON PROXIMITY TYPE SWITCH SPECIFICATIONS (WITH CONTACT)

Code	Terminal type	L4-24	L4-100
	With 1.5m cord	L3-241	L3-101
	With 5m cord	L3-245	L3-105
Voltage range	DC : 5~50V		AC : 80~220V
Current range	3~20mA		3~20mA
Inner voltage drop	2V and less		2V and less
Max. load capacity	1.5W		2VA
Indicating lamp	LED (lights with switch ON)		Neon lamp (lights with switch OFF)
Electric circuit			

※)The details of each switch please refer to the handling instructions at end.

MAGNETIC PROXIMITY TYPE SWITCH SPECIFICATIONS (WITH NO CONTACT)

Code	With 1.5m cord	YS211	AX201	AX211
	With 5m cord	YS215	AX205	AX215
Voltage range	—		DC : 5~30V	
Current range	DC : 10~30V, 6~7mA		DC : 5~40mA	
Leakage current	1mA and less at DC 30V		1mA and less	
Internal voltage drop	4V and less		3V and less(at 40mA)	
Indicating lamp	Working position : red / green LED lights up Most suitable position : green LED lights up		LED (red lamp lights up during ON)	Working position : red / green LED lights up Most suitable position : green LED lights up
Electric circuit				

※)The details of each switch please refer to the handling instructions at end.



Type YR-YS



Type SR



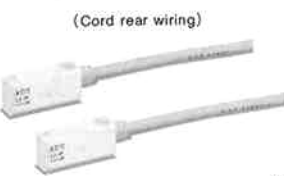
Type L3-L4



(Cord rear wiring)



(Cord upper wiring)



(With cord)



(With connector)

Type AX

PNEUMATIC CYLINDER DC7

WEIGHT TABLE/DOUBLE-ACTING SINGLE-ROD TYPE

Unit: kg

Kind Bore	General-purpose type basic weight		Basic weight of type with heavy-duty scraper		Additional weight per 1mm of stroke
	Standard type	Magnetic proximity type	Standard type	Magnetic proximity type	
	DC7	DC7R	DC7H	DC7HR	
φ 40	0.88	0.78	0.91	0.80	0.00351
φ 50	1.30	1.14	1.33	1.17	0.00480
φ 63	1.92	1.63	1.95	1.65	0.00578
φ 80	3.56	3.03	3.61	3.08	0.00916
φ 100	4.89	3.91	4.96	3.98	0.01144
φ 125	8.87	7.10	9.03	7.26	0.01710
φ 150	11.69	—	11.89	—	0.02024

WEIGHT TABLE/DOUBLE-ACTING DOUBLE-ROD TYPE

Unit: kg

Kind Bore	General-purpose type basic weight		Basic weight of type with heavy-duty scraper		Additional weight per 1mm of stroke
	Standard type	Magnetic proximity type	Standard type	Magnetic proximity type	
	DC7D	DC7RD	DC7HD	DC7HRD	
φ 40	0.98	0.88	1.03	0.92	0.00508
φ 50	1.48	1.32	1.55	1.39	0.00725
φ 63	2.13	1.83	2.19	1.89	0.00823
φ 80	3.92	3.39	4.03	3.50	0.01299
φ 100	5.43	4.45	5.56	4.58	0.01695
φ 125	9.63	7.86	9.95	8.19	0.02460
φ 150	12.82	—	13.22	—	0.03004

ADDITIONAL WEIGHT TABLE

Unit: kg

Bore	Mounting accessory weight						Rod end attachment weight			Switch addition weight (1 piece)								
	LB	FA	FB	CA	CB	TC	Type T	Type Y	Type F	Magnetic proximity type						Iron-piece proximity type		
										AX			YR-YS		SR	L3		L4
										With cord 1.5m	With cord 5m	Connector type	With cord 1.5m	With cord 5m		With cord 1.5m	With cord 5m	Terminal type
φ 40	0.16	0.28	0.28	0.27	0.34	0.35	0.09	0.10	0.19	0.05	0.13	0.04	0.05	0.10	0.22	0.13	0.24	0.15
φ 50	0.18	0.39	0.39	0.38	0.44	0.38	0.19	0.24	0.37									
φ 63	0.28	0.71	0.71	0.61	0.69	0.69	0.19	0.24	0.37									
φ 80	0.55	1.35	1.35	1.10	1.38	1.35	0.35	0.45	0.73	0.07	0.14	0.06	0.05	0.10	0.22	0.13	0.24	0.15
φ 100	0.72	1.75	1.75	1.65	1.88	1.60	0.65	0.79	1.38									
φ 125	1.50	2.95	3.25	3.25	3.81	4.50	1.20	1.50	2.55									
φ 150	1.85	4.55	5.05	4.65	5.23	6.85	2.15	2.50	4.35	—	—	—	—	—	—	—	—	—

Calculation formula: Cylinder weight (kg) = Basic weight + (Cylinder stroke mm x Addition weight per mm of stroke) + (Switch addition weight x No. of switches) + Mounting accessory weight + Rod end attachment weight

Example of calculation: DC7R, bore of φ 50, cylinder stroke of 200 mm, YR101, 2 pcs, Type LB

$$1.14 + (0.0048 \times 200) + (0.05 \times 2) + 0.18 = 2.38 \text{ kg}$$

DC7 PNEUMATIC CYLINDER

Code

□ : Semistandard type

For order, specify the following code.

<p>• STANDARD TYPE</p> <p>DC7</p>	<p>Series ①</p> <p>LB 50 B 100</p> <p>Mounting ②</p> <p>Cylinder bore ③</p> <p>Cushion type ④</p> <p>Stroke ⑤</p>	<p>Switch symbol ⑥</p> <p>Switch quantity ⑦</p> <p>Rod end attachment ⑧</p> <p>Boot ⑨</p>
<p>• SWITCH SET/IRON PROXIMITY TYPE</p> <p>DC7</p>	<p>LB 50 B 100</p> <p>FA 2</p> <p>T</p> <p>J</p>	<p>T</p> <p>J</p>
<p>• SWITCH SET MAGNETIC PROXIMITY TYPE</p> <p>DC7R</p>	<p>LB 50 B 100</p> <p>AH 2</p> <p>T</p> <p>J</p>	<p>T</p> <p>J</p>

<p>Series</p> <p>General-purpose type</p> <p>DC7 Double-acting single-rod type/standard type</p> <p>DC7 Double-acting single-rod type/iron proximity type</p> <p>DC7R Double-acting single-rod type/magnetic proximity type</p> <p>DC7D Double-acting double-rod type/standard type</p> <p>DC7D Double-acting double-rod type/iron proximity type</p> <p>DC7RD Double-acting double-rod type/magnetic proximity type</p> <p>With heavy-duty scraper</p> <p>DC7H Double-acting single-rod type/standard type</p> <p>DC7H Double-acting single-rod type/iron proximity type</p> <p>DC7HR Double-acting single-rod type/magnetic proximity type</p> <p>DC7HD Double-acting double-rod type/standard type</p> <p>DC7HD Double-acting double-rod type/iron proximity type</p> <p>DC7HRD Double-acting double-rod type/magnetic proximity type</p>	<p>Mounting</p> <p>Double-acting single-rod type</p> <p>SD Type SD (basic type) (Type A)</p> <p>LB Type LB (axia foot type) (Type H)</p> <p>FA Type FA (rod side rectangular flange type) (Type F)</p> <p>FB Type FB (head side rectangular flange type) (Type E)</p> <p>CA Type CA (eye type) (Type Y)</p> <p>CB Type CB (clevis type) (Type U)</p> <p>TC Type TC (intermediate trunnion type) (Type N)</p> <p>Double-acting double-rod type</p> <p>SD Type SD (basic type)</p> <p>LB Type LB (axial foot type)</p> <p>FA Type FA (rectangular flange type)</p> <p>TC Type TC (intermediate trunnion type)</p>	<p>With rod boot</p> <p>J Nylon tarpaulin</p> <p>JN Chloroprene</p> <p>CONEX</p> <p>No entry None</p>
--	---	---

<p>Cylinder bore mm</p> <p>Standard type/Iron proximity type</p> <p>φ 40 · φ 50 · φ 63 · φ 80 · φ 100 · φ 125 · φ 150</p> <p>Magnetic proximity type</p> <p>φ 40 · φ 50 · φ 63 · φ 80 · φ 100 · φ 125</p>	<p>Cylinder stroke mm</p> <p>Cushion code</p> <p>B With cushion on both sides</p> <p>N No cushion</p>
---	---

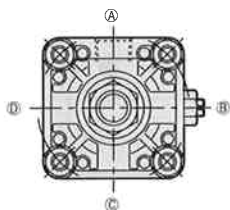
<p>Number of switches</p> <p>Switch code</p> <table border="0"> <tr> <td> <p>MAGNETIC PROXIMITY TYPE</p> <p>With contact</p> <p>C YR101(with 1.5m long cord)</p> <p>U YR105(with 5m long cord)</p> <p>S SR405(with 5m long cord)</p> <p>AF AX101(With 1.5m long cord)</p> <p>AG AX105(With 5m long cord)</p> <p>With no contact</p> <p>A YS211(with 1.5m long cord)</p> <p>B YS215(with 5m long cord)</p> <p>BE AX201(With 1.5m long cord)</p> <p>BF AX205(With 5m long cord)</p> </td> <td> <p>IRON PROXIMITY TYPE</p> <p>With contact</p> <p>FA LS-101 (with 1m long cord)</p> <p>FB L3-105(with 5m long cord)</p> <p>FC L3-241 (with 1m long cord)</p> <p>FD L3-245(with 5m long cord)</p> <p>FM L4-101 (terminal type)</p> <p>FN L4-24 (terminal type)</p> <p>No switch 0</p> </td> </tr> </table>	<p>MAGNETIC PROXIMITY TYPE</p> <p>With contact</p> <p>C YR101(with 1.5m long cord)</p> <p>U YR105(with 5m long cord)</p> <p>S SR405(with 5m long cord)</p> <p>AF AX101(With 1.5m long cord)</p> <p>AG AX105(With 5m long cord)</p> <p>With no contact</p> <p>A YS211(with 1.5m long cord)</p> <p>B YS215(with 5m long cord)</p> <p>BE AX201(With 1.5m long cord)</p> <p>BF AX205(With 5m long cord)</p>	<p>IRON PROXIMITY TYPE</p> <p>With contact</p> <p>FA LS-101 (with 1m long cord)</p> <p>FB L3-105(with 5m long cord)</p> <p>FC L3-241 (with 1m long cord)</p> <p>FD L3-245(with 5m long cord)</p> <p>FM L4-101 (terminal type)</p> <p>FN L4-24 (terminal type)</p> <p>No switch 0</p>	<p>AX111(With 1.5m long cord)</p> <p>AX115(With 5m long cord)</p> <p>AX125(With 5m long cord/no lamp)</p> <p>AX11A(connector type/AC)</p> <p>AX11B(connector type/DC)</p> <p>AX211(With 1.5m long cord)</p> <p>AX215(With 5m long cord)</p>
<p>MAGNETIC PROXIMITY TYPE</p> <p>With contact</p> <p>C YR101(with 1.5m long cord)</p> <p>U YR105(with 5m long cord)</p> <p>S SR405(with 5m long cord)</p> <p>AF AX101(With 1.5m long cord)</p> <p>AG AX105(With 5m long cord)</p> <p>With no contact</p> <p>A YS211(with 1.5m long cord)</p> <p>B YS215(with 5m long cord)</p> <p>BE AX201(With 1.5m long cord)</p> <p>BF AX205(With 5m long cord)</p>	<p>IRON PROXIMITY TYPE</p> <p>With contact</p> <p>FA LS-101 (with 1m long cord)</p> <p>FB L3-105(with 5m long cord)</p> <p>FC L3-241 (with 1m long cord)</p> <p>FD L3-245(with 5m long cord)</p> <p>FM L4-101 (terminal type)</p> <p>FN L4-24 (terminal type)</p> <p>No switch 0</p>		

Note) Details of the type with heavy-duty scraper are same as those of the general-purpose type.
Type in [] : corresponding DC4 and DC6 series type.

PNEUMATIC CYLINDER DC7

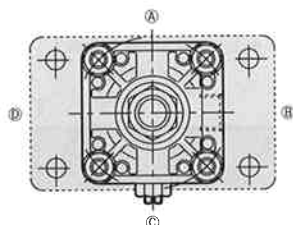
● ORDER OUTLINE

1. Standard product specifications



- With cushion on both sides
- Port position ①, cushion valve position ②

2. The standard port position is ①. The standard cushion valve position is ②. When the position is changed, enter the code shown below.



Example of marking DC7 FA 50 B 100 — B C
 Port position(A, B, C, D)
 Cushion valve position(A, B, C, D, 0)

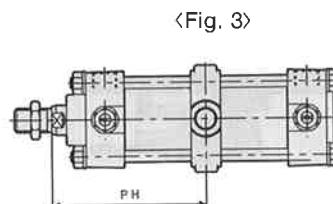
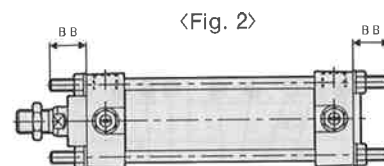
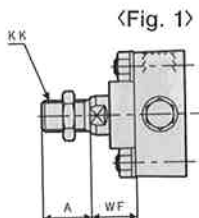
All codes of port and cushion valve positions are entered clockwise viewed from the rod side.

3. In the following cases, all will be manufactured as semi-standard products.

- Piston rod tip changed. (A, KK, WF) <Fig. 1>
- Tie rod protruding dimensions changed. (BB) <Fig. 2>
- When Type T (rod trunnion type) of DC4/6 series is used, give instructions at the minimum dimension PH in the Dimension PH Table shown below.
- TC metal fitting dimension PH changed. <Fig. 3>
- With dust cover (Chloroprene, CONEX)

Minimum dimension PH

Series	Bore	φ 40	φ 50	φ 63	φ 80	φ 100	φ 125	φ 150
DC7		55	59	68.5	77	77	88	88
DC7H		63	69	78.5	87	87	103	103



4. Precautions on order for switch set

- When an order is for a type with magnetic proximity type switch and no further switch is required, place the order with entry of ⑧ as the switch code and ⑩ ⑩ for the switch quantity ⑨.
- The switch will be despatched separately, not assembled with the cylinder body.

5. Contents of change of type code

DC 4 series (conventional type)

With iron piece proximity switch

DC4 - A - 50 - 100 - RU - J - L3 - D - 201 - A - 1
 ① ② ③ ④ ⑤ ⑥ ⑦ ⑧ ⑨ ⑩ ⑪ ⑫ ⑬ ⑭ ⑮

Note) • To be entered, justified to the left.

DC7 series (new type)

With iron piece proximity switch

DC7 - SD - 50 - B - 100 - A - B - FA - 2 - Y - J
 ① ② ③ ④ ⑤ ⑥ ⑦ ⑧ ⑨ ⑩ ⑪ ⑫ ⑬ ⑭ ⑮

Note) • To be entered item by item.

- ⑥ and ⑦: In the case of standard positions, no entry is required.

○ Code name

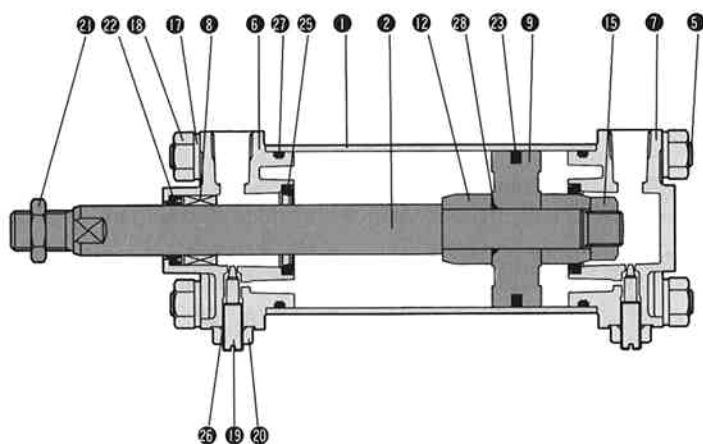
- ① Series name
- ② Mounting style
- ③ Bore
- ④ Cushion code
- ⑤ Stroke
- ⑥ Port position
- ⑦ Cushion valve position
- ⑧ Switch code
- ⑨ Number of switches
- ⑩ Rod end
- ⑪ With rod boot

DC7 PNEUMATIC CYLINDER

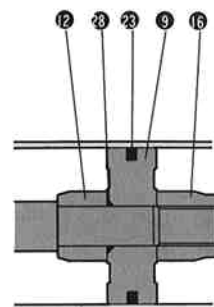
INTERNAL STRUCTURAL DRAWING/DOUBLE-ACTING SINGLE-ROD TYPE

● STANDARD TYPE ● IRON-PROXIMITY TYPE

Bore $\phi 40 \sim \phi 100$

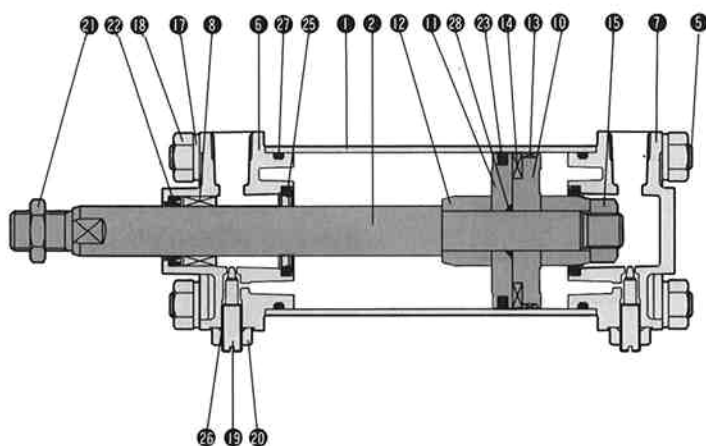


Bore $\phi 125 \cdot \phi 150$

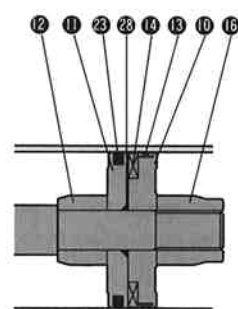


● MAGNETIC PROXIMITY TYPE

Bore $\phi 40 \sim \phi 100$

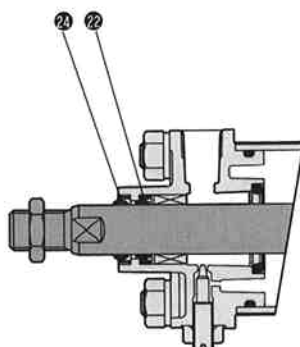


Bore $\phi 125$



● WITH HEAVY-DUTY SCRAPER

Bore $\phi 40 \sim \phi 150$



PNEUMATIC CYLINDER DC7

PARTS LIST

No.	Name	Material	Q'ty	No.	Name	Material	Q'ty
①	Cylinder tube	Aluminum alloy	1	⑬	Wear ring	Synthetic resin	1(2)
②	Piston rod	Mechanical structural carbon steel	1	⑭	Magnet	—	1
⑤	Tie rod	Mechanical structural carbon steel	4	⑮	Piston nut	General structural rolled steel	1
⑥	Rod cover	Die casting aluminum alloy	1	⑯	Cushion nut	Mechanical structural carbon steel	1
⑦	Head cover	Die casting aluminum alloy	1	⑰	Spring washer	Spring steel	8
⑧	Rod bushing	Oil impregnated sintered copper alloy	1	⑱	Tie rod nut	General structural rolled steel	8
⑨	Piston	Cast iron	1	⑲	Cushion valve	Mechanical structural carbon steel	2
⑩	Piston	Aluminum alloy	1	⑳	Cushion lock nut	General structural rolled steel	2
⑪	Packing housing	Aluminum alloy	1	㉑	Rod end lock nut	General structural rolled steel	1
⑫	Cushion ring	Mechanical structural carbon steel	2(1)	㉒	O-ring for piston rod	Nitrile rubber	1

※) Values in () apply to the bore of ϕ 125 or 150.

SEALS LIST

Name	⑫	⑲	⑳	㉑	㉒	㉓
	Rod seal	Piston seal	Scraper	Cushion seal	Cushion valve seal	O-ring for cover
	Nitrile rubber	Nitrile rubber	Nitrile rubber with metal ring	Nitrile rubber with metal ring	Nitrile rubber	Nitrile rubber
Bore	1	1	1	2	2	2
ϕ 40	DRP16	PWP40N	K2-16	CPF20	P8	G35
ϕ 50	DRP20	PWP50N	K2-20	CPF28	P8	G45
ϕ 63	DRP20	PWP63N	K2-20	CPF28	P8	G58
ϕ 80	DRP25	PWP80N	K2-25	CPF40	P10	G75
ϕ 100	DRP30	PWP100N	K2-30	CPF40	P10	G95
ϕ 125	DRP35	PWP125N	DKB35	CPF45	P16	G120
ϕ 150	DRP40	PWP150N	DKB40	PCS50	P16	G145

SEAL KIT ARRANGEMENT TYPE CODE

For order, specify the following code.

DC7 / PKS — 050

General-purpose type

DC7

DC7R

With heavy-duty scraper

DC7H

DC7HR

Cylinder bore (mm)

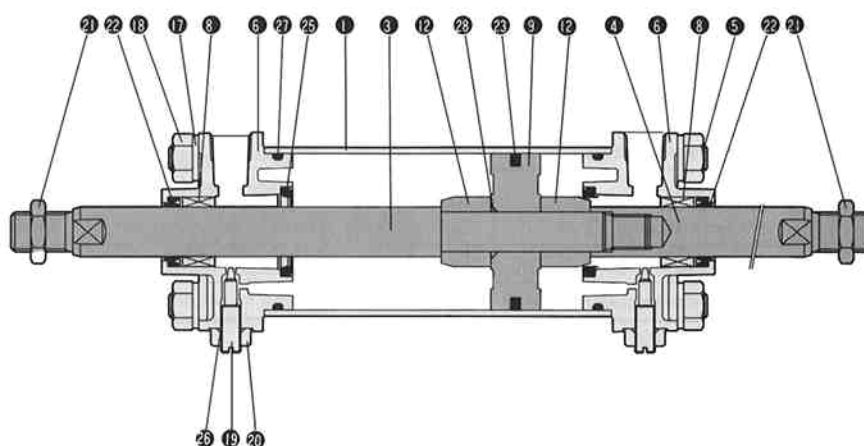
Seal kit code

DC7 PNEUMATIC CYLINDER

INTERNAL STRUCTURAL DRAWING/DOUBLE-ACTING DOUBLE-ROD TYPE

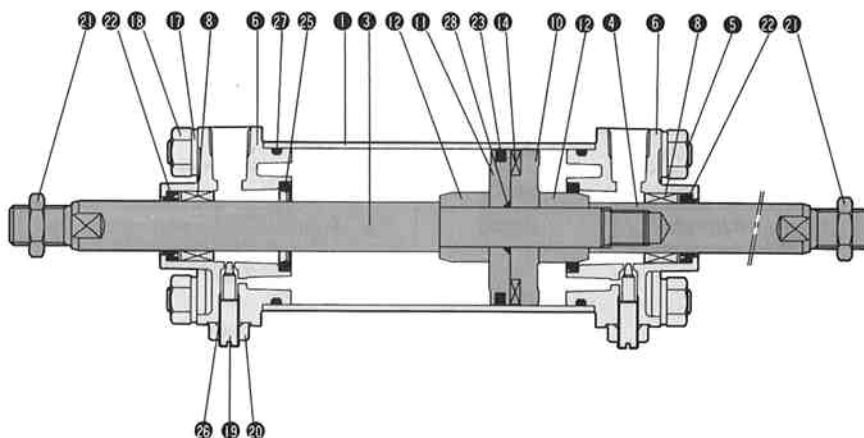
- STANDARD TYPE
- IRON PROXIMITY TYPE

Bore $\phi 40 \sim \phi 100$



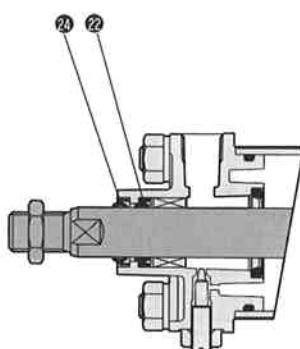
- MAGNETIC PROXIMITY TYPE

Bore $\phi 40 \sim \phi 125$



- WITH HEAVY-DUTY SCRAPER

Bore $\phi 40 \sim \phi 150$



PNEUMATIC CYLINDER DC7

PARTS LIST

No.	Name	Material	Q'ty
①	Cylinder tube	Aluminum alloy	1
③	Piston rod A	Mechanical structural carbon steel	1
④	Piston rod B	Mechanical structural carbon steel	1
⑤	Tie rod	Mechanical structural carbon steel	4
⑥	Rod cover	Die casting aluminum alloy	2
⑧	Bush	Oil impregnated sintered copper alloy	2
⑨	Piston	Cast iron	1
⑩	Piston	Aluminum alloy	1
⑪	Packing housing	Aluminum alloy	1

No.	Name	Material	Q'ty
⑫	Cushion ring	Sintered metal	2
⑬	Magnet	—	1
⑰	Spring washer	Spring steel	8
⑱	Tie rod nut	General structural rolled steel	8
⑲	Cushion valve	Mechanical structural carbon steel	2
⑳	Cushion lock nut	General structural rolled steel	2
㉑	Rod end lock nut	General structural rolled steel	2
㉒	O-ring for piston rod	Nitrile rubber	1

SEALS LIST

Name	⑫	⑲	⑳	㉑	㉒	㉓
	Rod seal	Piston seal	Scraper	Cushion seal	Cushion valve seal	O-ring for cover
	Nitrile rubber	Nitrile rubber	Nitrile rubber with metal ring	Nitrile rubber with metal ring	Nitrile rubber	Nitrile rubber
Bore	2	1	2	2	2	2
φ 40	DRP16	PWP40N	K2-16	CPF20	P8	G35
φ 50	DRP20N	PWP50N	K2-20	CPF28	P8	G45
φ 63	DRP20N	PWP63N	K2-20	CPF28	P8	G58
φ 80	DRP25	PWP80N	K2-25	CPF40	P10	G75
φ 100	DRP30	PWP100N	K2-30	CPF40	P10	G95
φ 125	DRP35	PWP125N	DKB35	CPF45	P16	G120
φ 150	DRP40	PWP150N	DKB40	PCS50	P16	G145

SEAL KIT ARRANGEMENT TYPE CODE

For order, specify the following code.

DC7D / PKS — 050

General-purpose type

DC7D

DC7RD

With heavy-duty scraper

DC7HD

DC7HRD

Cylinder bore (mm)

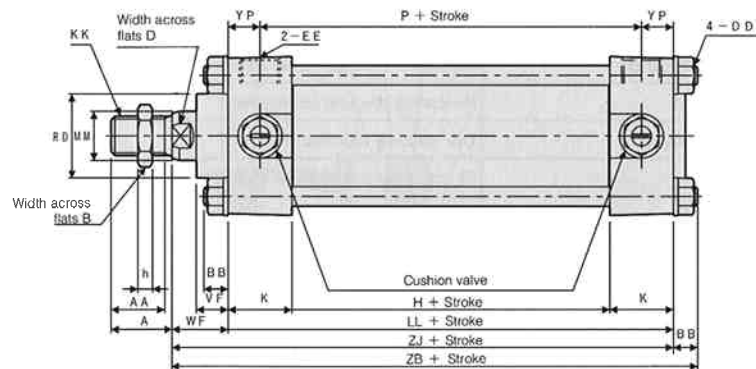
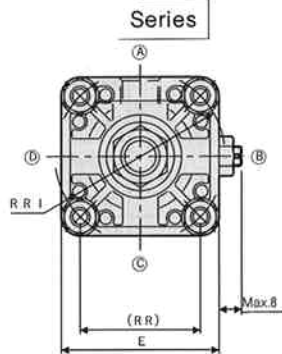
Seal kit code

DC7 PNEUMATIC CYLINDER

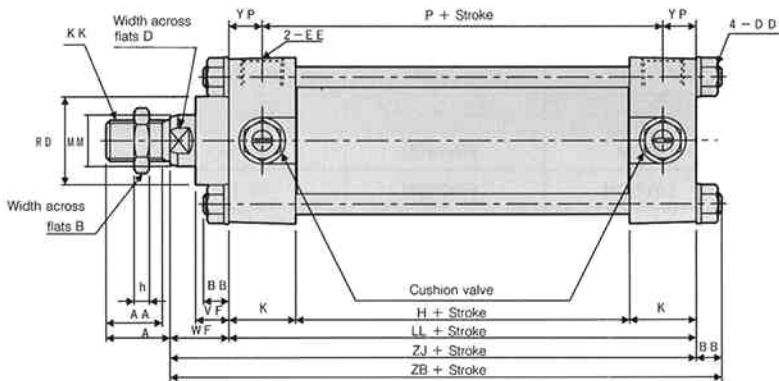
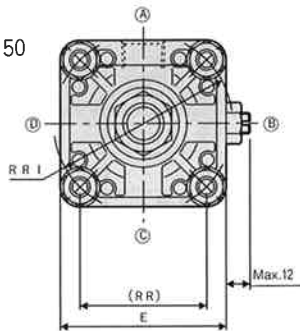
EXTERNAL DIMENSIONAL DRAWING/GENERAL-PURPOSE TYPE/TYPE SD (BASIC TYPE)

● Double-acting single-rod type DC7 SD Bore B Stroke

Bore: $\phi 40 \sim \phi 100$

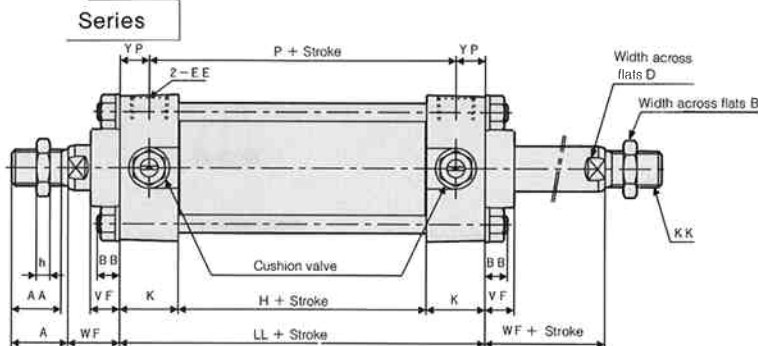


Bore: $\phi 125 \cdot \phi 150$



● Double-acting double-rod type DC7D SD Bore B Stroke

Bore: $\phi 40 \sim \phi 125$



DIMENSION TABLE

Unit: mm

Code Bore	A	AA	B	D	BB	DD	E	EE	H	K	KK	LL	MM	P	RD	RR	RR1	VF	WF	YP	ZB	ZJ	h
$\phi 40$	20	17	17	14	10	M 8×1.25	58	Rc1/4	38	22	M12×1.75	82	16	60	31.5	42.4	60	13	23	11	115	105	5
$\phi 50$	25	22	22	17	10	M 8×1.25	65	Rc3/8	36	26	M16×2	88	20	62	35	49.5	70	13	23	13	121	111	6
$\phi 63$	25	22	22	17	12	M10×1.5	79.5	Rc3/8	44	26	M16×2	96	20	70	35	59.4	84	15	30	13	138	126	6
$\phi 80$	35	31	27	21	15	M12×1.75	100.5	Rc1/2	50	32	M20×2.5	114	25	82	42.5	76.4	108	15	30	16	159	144	10
$\phi 100$	35	30	32	26	15	M12×1.75	116	Rc1/2	58	32	M24×3	122	30	90	46.5	91.9	130	15	30	16	167	152	10
$\phi 125$	45	39	41	32	20	M16×2	148.5	Rc1/2	62	34	M30×3.5	130	35	96	66	116.7	165	15	35	17	185	165	12
$\phi 150$	55	49	50	36	20	M16×2	172.5	Rc1/2	62	34	M36×4	130	40	96	71	134.4	190	15	35	17	185	165	15

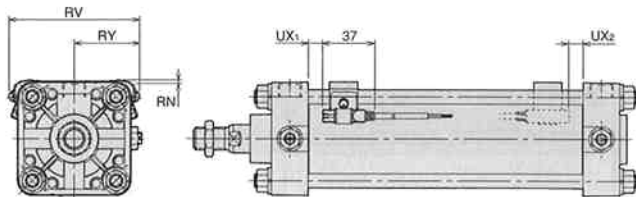
PNEUMATIC CYLINDER DC7

EXTERNAL DIMENSIONAL DRAWING/RELEVANT MODEL SWITCH SET

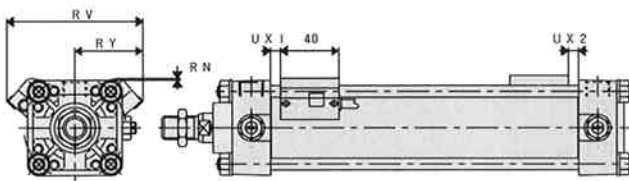
● Magnetic proximity type Bore $\phi 40 \sim \phi 125$ DC7R SD Bore B Stroke — Switch

Series

Switch Type AX/YR/YS (lead wire type)



Switch Type SR (lead wire type)

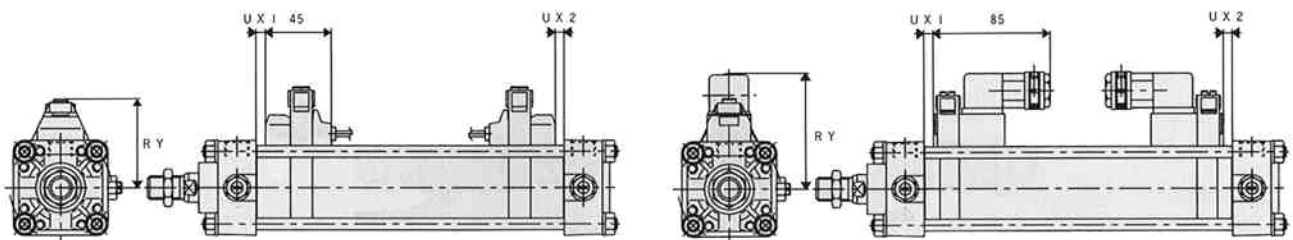


● Iron proximity type Bore $\phi 40 \sim \phi 150$ DC7 SD Bore B Stroke — Switch

Series

Switch type L3 (lead wire type)

Switch type L4 (terminal type)



DIMENSION TABLE

Unit: mm

Code Model Bore	RY					RV			RN			UX1					UX2				
	Magnetic proximity type			Iron proximity type		Magnetic proximity type			Magnetic proximity type			Magnetic proximity type				Iron proximity	Magnetic proximity type				Iron proximity
	AX	YS/YR	SR	L3	L4	AX	YS/YR	SR	AX	YS/YR	SR	AX	YR	YS	SR	L3/L4	AX	YR	YS	SR	L3/L4
φ 40	41	36	41	56	76	82	72	82	2	4	3	10	7	10	5	6	9	4	7	2	6
φ 50	43	40	45	61	81	86	40	90	2	5	3	10	6	9	4	5	7	3	6	1	5
φ 63	48	47	52	67	87	96	94	104	3	2	4	13	9	12	7	12	11	8	11	6	12
φ 80	58	55	59	77	98	116	110	118	3	0	0	17	13	16	11	17	14	10	13	8	17
φ 100	65	62	67	87	108	130	124	134	4	0	0	21	16	20	14	23	19	14	18	12	23
φ 125	77	73	78	100	120	154	146	156	2	0	0	22	15	21	14	28	22	15	21	14	28
φ 150	—	—	—	112	132	—	—	—	—	—	—	—	—	—	—	29	—	—	—	—	29

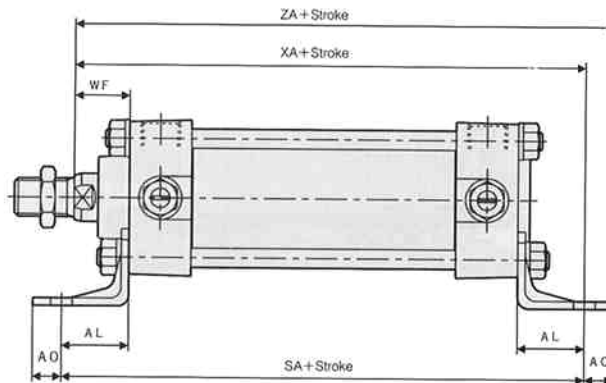
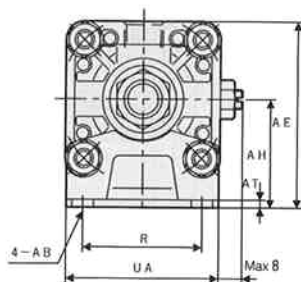
DC7 PNEUMATIC CYLINDER

EXTRNAL DIMENSIONAL DRAWING/GENERAL-PURPOSE TYPE/TYPE LB (AXIAL FOOT TYPE)

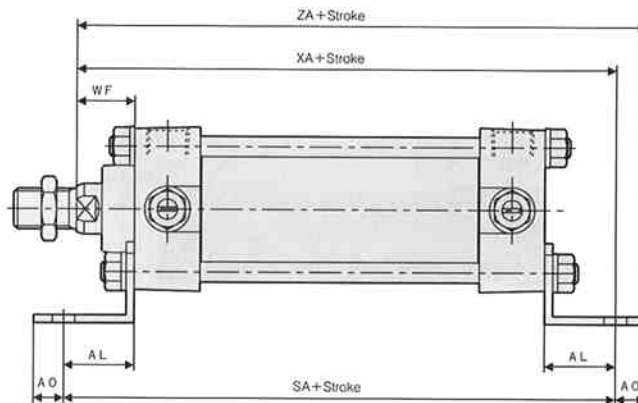
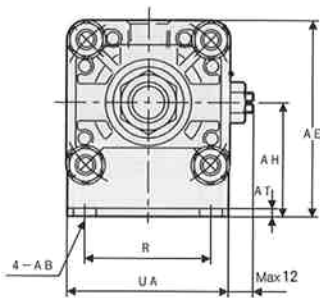
● Double-acting single-rod type DC7 LB Bore B Stroke

Series

Bore: $\phi 40 \sim \phi 100$



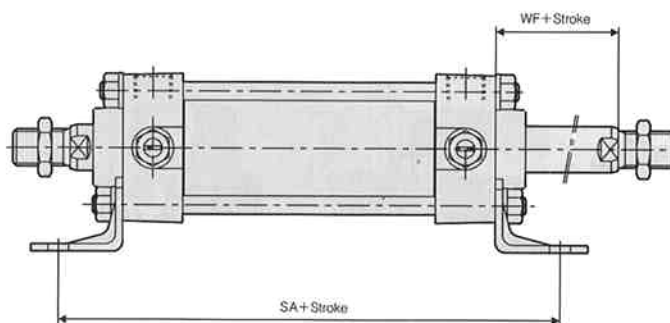
Bore: $\phi 125 \cdot \phi 150$



● Double-acting double-rod type DC7D LB Bore B Stroke

Series

Bore: $\phi 40 \sim \phi 150$



- For dimensions not shown above, refer to the drawing for the general-purpose type • Type SD (basic type).
- As for the cylinder with switch, refer to the drawing for the relevant model switch set.

DIMENSION TABLE

Unit: mm

Code Bore	AB	AE	AH	AL	AO	AT	R	SA	UA	WF	XA	ZA
$\phi 40$	$\phi 9$	69	40	28	12	3.2	42	138	57	23	133	145
$\phi 50$	$\phi 9$	77.5	45	28	12	3.2	50	144	64	23	139	151
$\phi 63$	$\phi 11$	90	50	35	15	3.2	59	166	80	30	161	176
$\phi 80$	$\phi 14$	115.5	65	45	20	4	76	204	101	30	189	209
$\phi 100$	$\phi 14$	133	75	45	20	4	92	212	116	30	197	217
$\phi 125$	$\phi 18$	164.5	90	50	25	6	117	230	150	35	215	240
$\phi 150$	$\phi 18$	191.5	105	50	25	6	134	230	174	35	215	240

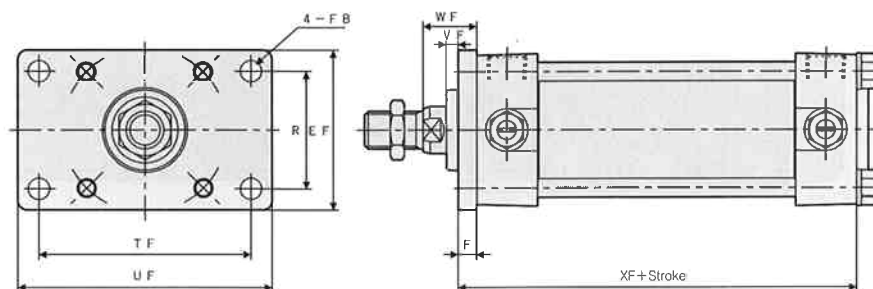
PNEUMATIC CYLINDER DC7

EXTERNAL DIMENSIONAL DRAWING/GENERAL-PURPOSE TYPE/TYPE FA (ROD SIDE FLANGE TYPE)

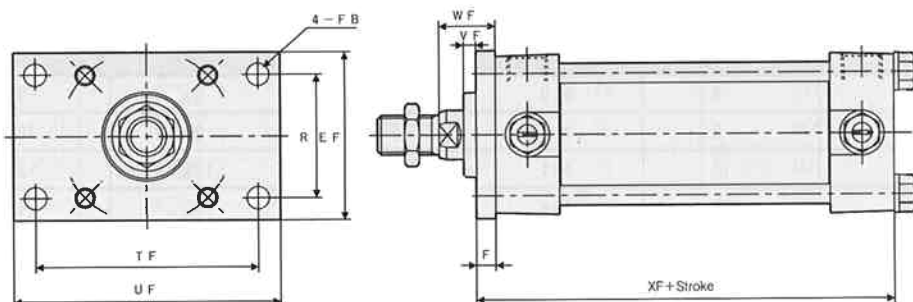
● Double-acting single-rod type DC7 FA B

Series

Bore: $\phi 40 \sim \phi 100$



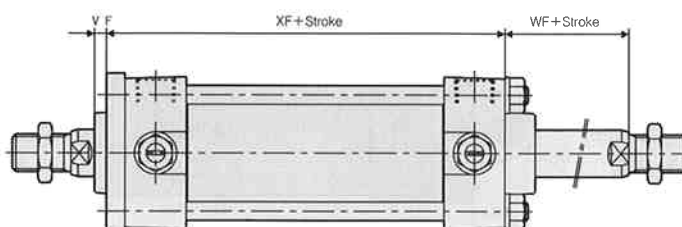
Bore: $\phi 125 \cdot \phi 150$



● Double-acting double-rod type DC7D FA B

Series

Bore: $\phi 40 \sim \phi 150$



- For dimensions not shown above, refer to the drawing for the general-purpose type • Type SD (basic type).
- As for the cylinder with switch, refer to the drawing for the relevant model switch set.

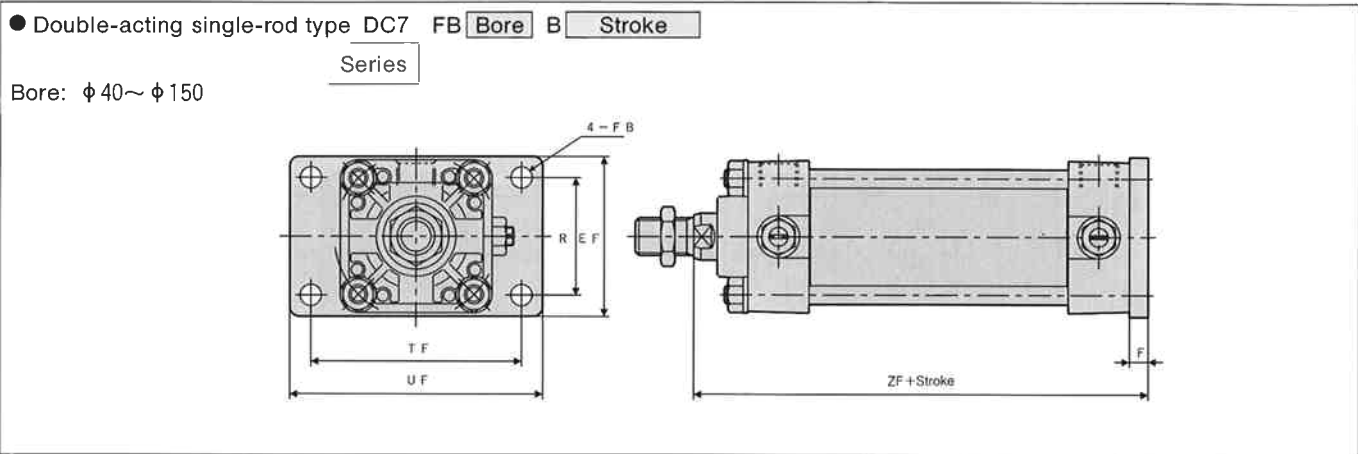
DIMENSION TABLE

Unit: mm

Bore	Code	EF	F	FB	R	TF	UF	VF	WF	XF
$\phi 40$		60	8	$\phi 9$	42	80	98	5	23	90
$\phi 50$		68	8	$\phi 9$	50	90	108	5	23	96
$\phi 63$		83	10	$\phi 11$	59	105	129	5	30	106
$\phi 80$		104	12	$\phi 14$	76	130	158	3	30	126
$\phi 100$		120	12	$\phi 14$	92	150	178	3	30	134
$\phi 125$		155	14	$\phi 18$	117	180	210	1	35	144
$\phi 150$		175	14	$\phi 18$	134	220	270	1	35	144

DC7 PNEUMATIC CYLINDER

EXTERNAL DIMENSIONAL DRAWING/GENERAL-PURPOSE TYPE/TYPE FB (HEAD SIDE FLANGE TYPE)



- For dimensions not shown above, refer to the drawing for the general-purpose type • Type SD (basic type).
- As for the cylinder with switch, refer to the drawing for the relevant model switch set.

DIMENSION TABLE

Unit: mm

Bore	Code	EF	F	FB	R	TF	UF	ZF
$\phi 40$		60	8	$\phi 9$	42	80	98	113
$\phi 50$		68	8	$\phi 9$	50	90	108	119
$\phi 63$		83	10	$\phi 11$	59	105	129	136
$\phi 80$		104	12	$\phi 14$	76	130	158	156
$\phi 100$		120	12	$\phi 14$	92	150	178	164
$\phi 125$		155	14	$\phi 18$	117	180	210	179
$\phi 150$		175	14	$\phi 18$	134	220	270	179

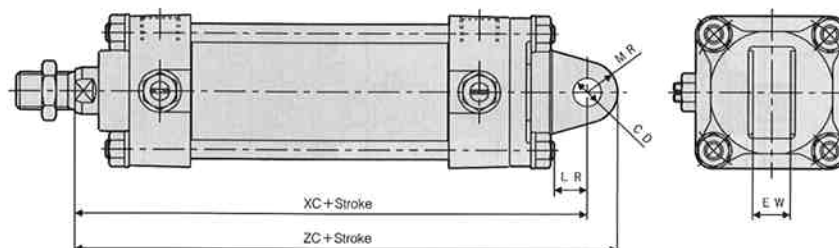
PNEUMATIC CYLINDER DC7

EXTERNAL DIMENSIONAL DRAWING/GENERAL-PURPOSE TYPE/TYPE CA (EYE TYPE)

● Double-acting single-rod type DC7 CA B

Series

Bore: $\phi 40 \sim \phi 150$



- For dimensions not shown above, refer to the drawing for the general-purpose type • Type SD (basic type).
- As for the cylinder with switch, refer to the drawing for the relevant model switch set.

DIMENSION TABLE

Unit: mm

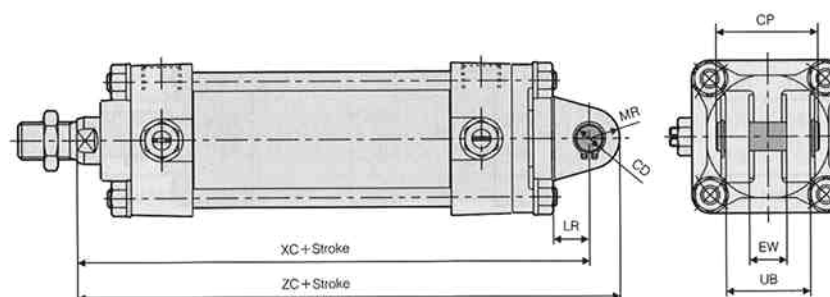
Bore	Code	CD	EW	MR	LR	XC	ZC
$\phi 40$		$\phi 12H9$	$16_{-0.3}^{+0.1}$	R13	14	135	148
$\phi 50$		$\phi 12H9$	$16_{-0.3}^{+0.1}$	R13	15	144	157
$\phi 63$		$\phi 12H9$	$16_{-0.3}^{+0.1}$	R15	18	166	181
$\phi 80$		$\phi 18H9$	$25_{-0.3}^{+0.1}$	R20	23	191	211
$\phi 100$		$\phi 18H9$	$28_{-0.3}^{+0.1}$	R20	23	208	228
$\phi 125$		$\phi 20H9$	$35_{-0.3}^{+0.1}$	R22	25	228	250
$\phi 150$		$\phi 25H9$	$40_{-0.3}^{+0.1}$	R27	30	240	267

EXTERNAL DIMENSIONAL DRAWING/GENERAL-PURPOSE TYPE/TYPE CB (CLEVIS TYPE)

● Double-acting single-rod type DC7 CB B

Series

Bore: $\phi 40 \sim \phi 150$



- For dimensions not shown above, refer to the drawing for the general-purpose type • Type SD (basic type).
- As for the cylinder with switch, refer to the drawing for the relevant model switch set.

DIMENSION TABLE

Unit: mm

Bore	Code	CD	CP	EW	MR	UB	XC	LR	ZC
$\phi 40$		$\phi 12h9$	44	$16_{+0.1}^{+0.3}$	R13	36	135	14	148
$\phi 50$		$\phi 12h9$	44	$16_{+0.1}^{+0.3}$	R13	36	144	15	157
$\phi 63$		$\phi 12h9$	44	$16_{+0.1}^{+0.3}$	R15	36	166	18	181
$\phi 80$		$\phi 18h9$	64	$25_{+0.1}^{+0.3}$	R20	55	191	23	211
$\phi 100$		$\phi 18h9$	71	$28_{+0.1}^{+0.3}$	R20	62	208	23	228
$\phi 125$		$\phi 20h9$	86	$35_{+0.1}^{+0.3}$	R22	77	228	25	250
$\phi 150$		$\phi 25h9$	97	$40_{+0.1}^{+0.3}$	R27	88	240	30	267

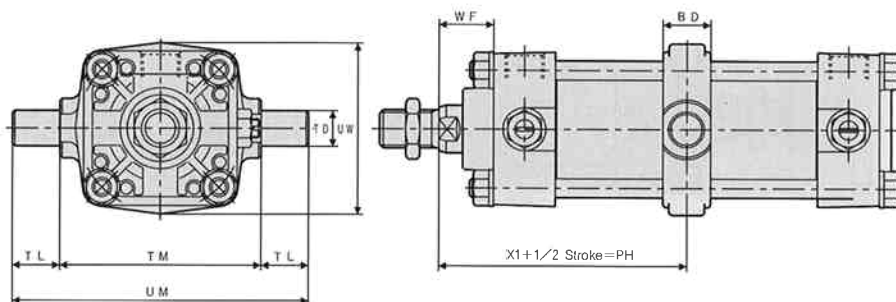
DC7 PNEUMATIC CYLINDER

EXTERNAL DIMENSIONAL DRAWING/GENERAL-PURPOSE TYPE/TYPE TC (INTERMEDIATE TRUNNION TYPE)

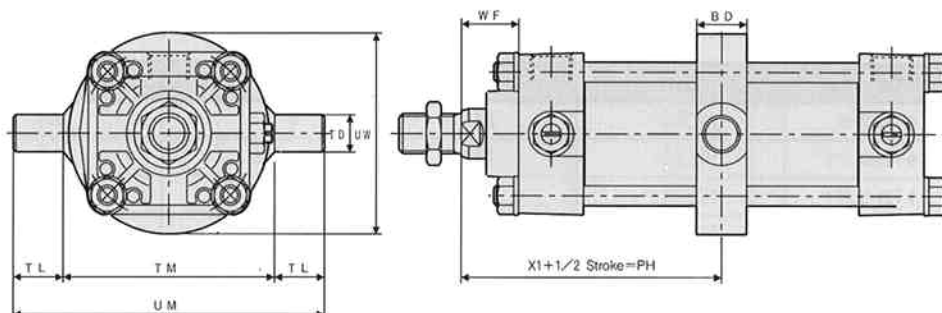
● Double-acting single-rod type DC7 TC Bore B Stroke

Series

Bore: $\phi 40 \sim \phi 100$



Bore: $\phi 125 \cdot \phi 150$

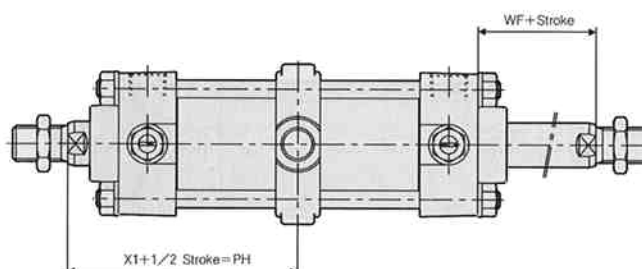


● When Type T (rod trunnion type) of DC4/6 series is used, give instructions at the minimum dimension PH.

● Double-acting double-rod DC7D TC Bore B Stroke

Series

Bore: $\phi 40 \sim \phi 150$



- For dimensions not shown above, refer to the drawing for the general-purpose type • Type SD (basic type).
- As for the cylinder with switch, refer to the drawing for the relevant model switch set.

DIMENSION TABLE

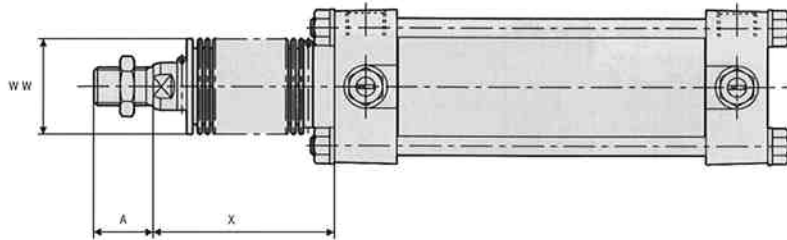
Unit: mm

Bore	Code	BD	TD	TL	TM	UM	UW	WF	XI	MIn. PH
$\phi 40$		20	$\phi 15f7$	20	85	125	62	23	64	55
$\phi 50$		20	$\phi 15f7$	20	85	125	72	23	67	59
$\phi 63$		25	$\phi 18f7$	25	110	160	90	30	78	69
$\phi 80$		30	$\phi 25f7$	30	140	200	112	30	87	77
$\phi 100$		30	$\phi 25f7$	30	162	222	135	30	91	77
$\phi 125$		38	$\phi 30f7$	35	205	275	190	35	100	88
$\phi 150$		38	$\phi 30f7$	35	235	305	220	35	100	88

PNEUMATIC CYLINDER DC7

WITH RELEVANT PART/BOOT

● Boot



Bore	Code	WW	A
φ 40		41	20
φ 50		46	25
φ 63		46	25
φ 80		56	35
φ 100		61	35
φ 125		81	45
φ 150		86	55

• For dimensions not shown above, refer to the drawing for the general-purpose type • Type SD (basic type).

DIMENSION TABLE

Unit: mm

Bore	Code	Stroke	0	51	76	101	126	151	176	201	226	251	276	301	326	351	376	401	426	451	476
			50	75	100	125	150	175	200	225	250	275	300	325	350	375	400	425	450	475	500
φ 40	X	Other than Type FA	55	65	75	82	90	97	105	112	120	127	135	142	150	157	165	172	180	187	195
		Type FA	50	60	70	77	85	92	100	107	115	122	130	137	145	152	160	167	175	182	190
φ 50	X	Other than Type FA	56	66	76	83	91	98	106	113	121	128	136	143	151	158	166	173	181	188	196
		Type FA	51	61	71	78	86	93	101	108	116	123	131	138	146	153	161	168	176	183	191
φ 63	X	Other than Type FA	60	70	80	87	95	102	110	117	125	132	140	147	155	162	170	177	185	192	200
		Type FA	56	66	76	83	91	98	106	113	121	128	136	143	151	158	166	173	181	188	196
φ 80	X	Other than Type FA	62	67	77	82	87	92	97	102	109	117	122	127	134	142	147	152	157	162	167
		Type FA	60	65	75	80	85	90	95	100	107	115	120	125	132	140	145	150	155	160	165
φ 100	X	Other than Type FA	63	68	78	83	88	93	98	103	110	118	123	128	135	143	148	153	158	163	168
		Type FA	60	65	75	80	85	90	95	100	107	115	120	125	132	140	145	150	155	160	165
φ 125	X	Other than Type FA	68	73	78	83	88	93	98	103	108	113	118	123	128	133	138	143	148	153	158
		Type FA	69	74	79	84	89	94	99	104	109	114	119	124	129	134	139	144	149	154	159
φ 150	X	Other than Type FA	70	75	80	85	90	95	100	105	110	115	120	125	130	135	140	145	150	155	160
		Type FA	71	76	81	86	91	96	101	106	111	116	121	126	131	136	141	146	151	156	161

Note) • Dimension Table shows dimension of general-purpose type with nylon tarpaulin or chloroprene mounted. In the case of CONEX, the mounting dimensions change. Inquire with us.

• When it is intended to mount a dust cover on the typewith a powerful scraper, inquire with us.

Name	Material	Heat resistance
Nylon tarpaulin	Nylon cloth with vinyl coating	80°C
Chloroprene	Nylon cloth with chloroprene coating	100°C
CONEX	CONEX cloth with silicone coating	200°C

Note) • Heat resistance shows the heat resistance temperature of the dust cover, not that of the cylinder body.

• CONEX is a registered trademark of TEIJIN, COPR.

• Boots is dispatched with installed cylinders.

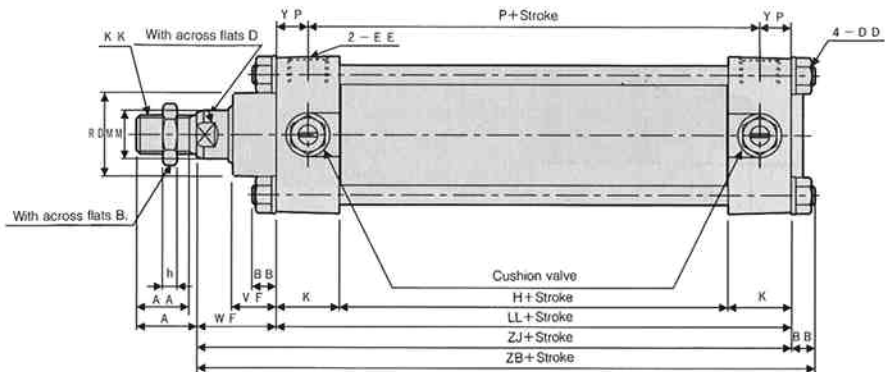
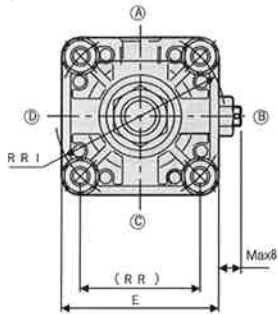
DC7H PNEUMATIC CYLINDER

EXTERNAL DIMENSIONAL DRAWING/WITH HEAVY-DUTY SCRAPER/TYPE SD (BASIC TYPE)

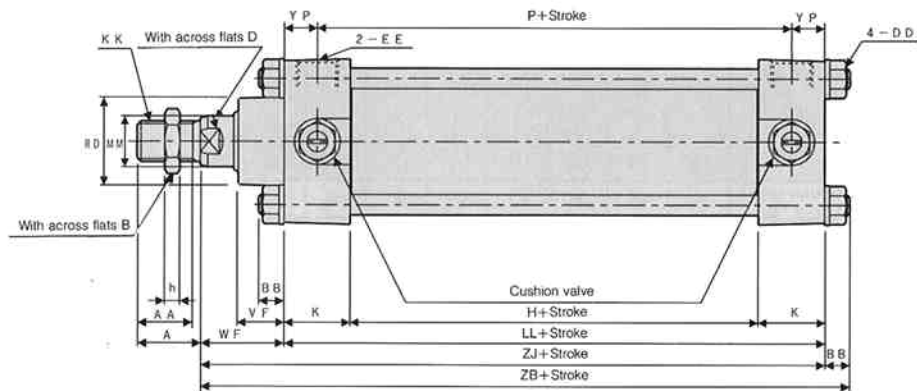
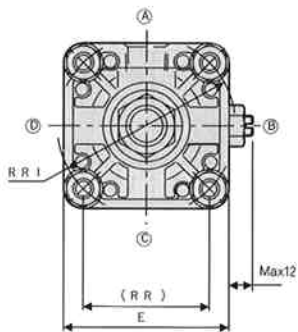
- Double-acting single-rod type DC7H SD **Bore** B **Stroke**

Series

Bore: $\phi 40 \sim \phi 100$



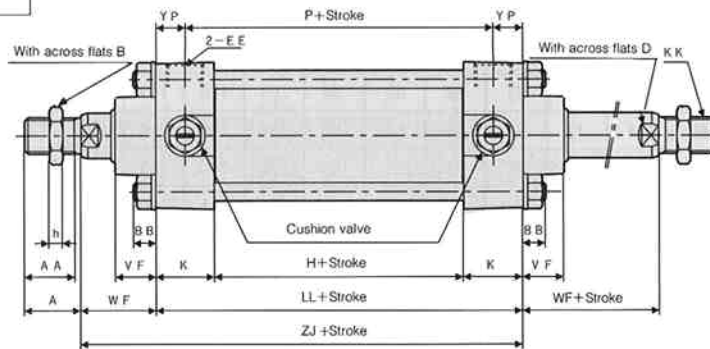
Bore: $\phi 125 \cdot \phi 150$



- Double-acting double-rod type DC7HD SD B

Series

Bore: $\phi 40 \sim \phi 125$



- As for the cylinder with switch, refer to the drawing for the relevant model switch set.

DIMENSION TABLE

Unit: mm

Code Bore	A	AA	B	D	BB	DD	E	EE	H	K	KK	LL	MM	P	RD	RR	RR1	VF	WF	YP	ZB	ZJ	h
φ 40	20	17	17	14	10	M 8×1.25	58	Rc1/4	38	22	M12×1.75	82	16	60	31.5	42.4	60	18	31	11	123	113	5
φ 50	25	22	22	17	10	M 8×1.25	65	Rc3/8	36	26	M16×2	88	20	62	35	49.5	70	18	33	13	131	121	6
φ 63	25	22	22	17	12	M10×1.5	79.5	Rc3/8	44	26	M16×2	96	20	70	35	59.4	84	21	40	13	148	136	6
φ 80	35	31	27	21	15	M12×1.75	100.5	Rc1/2	50	32	M20×2.5	114	25	82	42.5	76.4	108	21	40	16	169	154	10
φ 100	35	30	32	26	15	M12×1.75	116	Rc1/2	58	32	M24×3	122	30	90	46.5	91.9	130	21	40	16	177	162	10
φ 125	45	39	41	32	20	M16×2	148.5	Rc1/2	62	34	M30×3.5	130	35	96	66	116.7	165	25	50	17	200	180	12
φ 150	55	49	50	36	20	M16×2	172.5	Rc1/2	62	34	M36×4	130	40	96	71	134.4	190	25	50	17	200	180	15

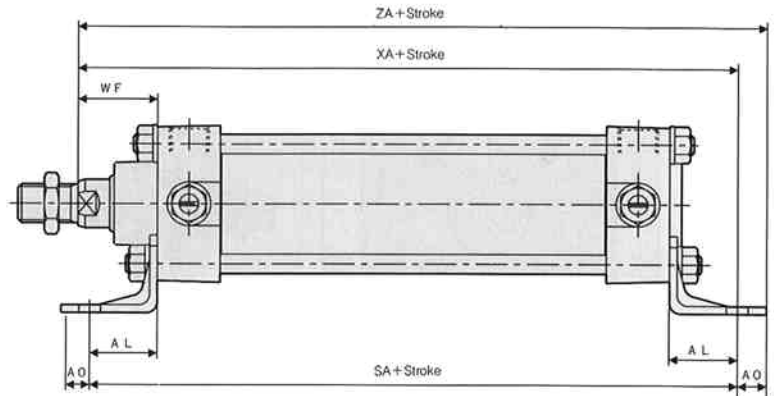
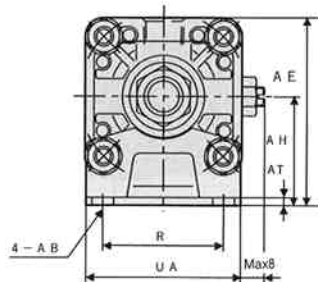
PNEUMATIC CYLINDER DC7H

EXTERNAL DIMENSIONAL DRAWING/WITH HEAVY-DUTY SCRAPER/TYPE LB (AXIAL FOOT TYPE)

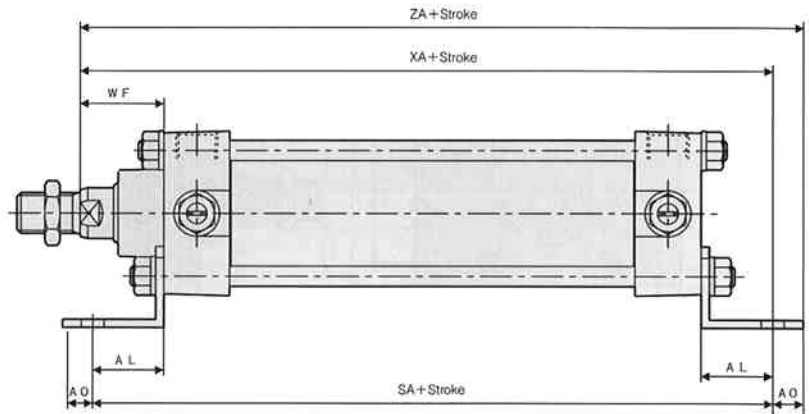
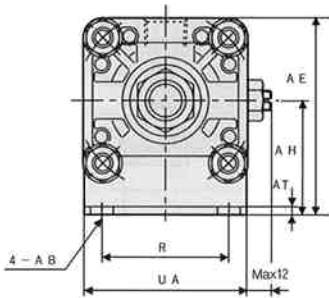
- Double-acting single-rod type DC7H LB Bore B Stroke

Series

Bore: $\phi 40 \sim \phi 100$



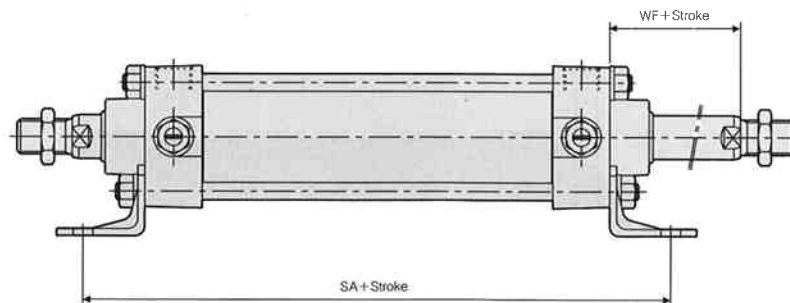
Bore: $\phi 125 \cdot \phi 150$



- Double-acting double-rod type DC7HD LB Bore B Stroke

Series

Bore: $\phi 40 \sim \phi 125$



- For dimensions not shown above, refer to the drawing for the type with heavy-duty scraper • Type SD (basic type).
- As for the cylinder with switch, refer to the drawing for the relevant model switch set.

DIMENSION TABLE

Unit: mm

Code Bore	AB	AE	AH	AL	AO	AT	R	SA	UA	WF	XA	ZA
$\phi 40$	$\phi 9$	69	40	28	12	3.2	42	138	57	31	141	153
$\phi 50$	$\phi 9$	77.5	45	28	12	3.2	50	144	64	33	149	161
$\phi 63$	$\phi 11$	90	50	35	15	3.2	59	166	80	40	171	186
$\phi 80$	$\phi 14$	115.5	65	45	20	4	76	204	101	40	199	219
$\phi 100$	$\phi 14$	133	75	45	20	4	92	212	116	40	207	227
$\phi 125$	$\phi 18$	164.5	90	50	25	6	117	230	150	50	230	255
$\phi 150$	$\phi 18$	191.5	105	50	25	6	134	230	174	50	230	255

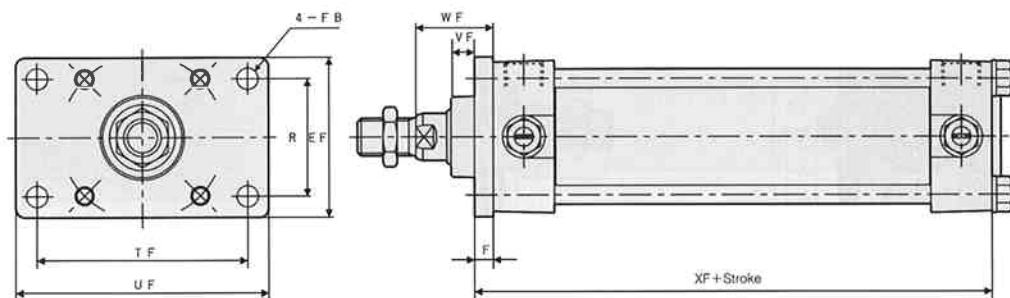
DC7H PNEUMATIC CYLINDER

EXTERNAL DIMENSIONAL DRAWING/WITH HEAVY-DUTY SCRAPER/TYPE FA (ROD SIDE FLANGE)

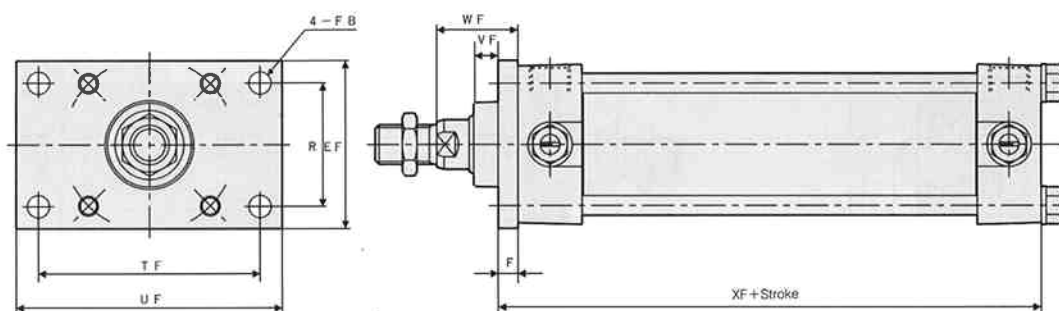
● Double-acting single-rod type DC7H FA Bore B Stroke

Series

Bore: $\phi 40 \sim \phi 100$



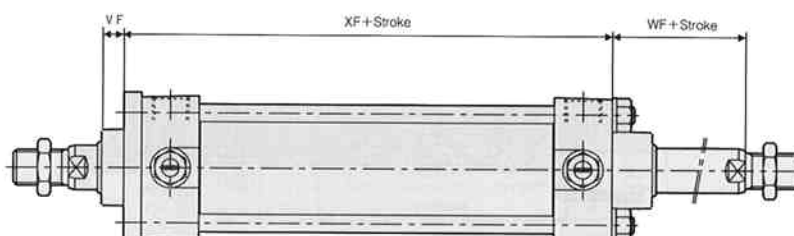
Bore: $\phi 125 \cdot \phi 150$



● Double-acting double-rod type DC7HD FA Bore B Stroke

Series

Bore: $\phi 40 \sim \phi 150$



- For dimensions not shown above, refer to the drawing for the type with heavy-duty scraper • Type SD (basic type).
- As for the cylinder with switch, refer to the drawing for the relevant model switch set.

DIMENSION TABLE

Unit: mm

Bore	Code	EF	F	FB	R	TF	UF	VF	WF	XF
$\phi 40$		60	8	$\phi 9$	42	80	98	10	31	90
$\phi 50$		68	8	$\phi 9$	50	90	108	10	33	96
$\phi 63$		83	10	$\phi 11$	59	105	129	11	40	106
$\phi 80$		104	12	$\phi 14$	76	130	158	9	40	126
$\phi 100$		120	12	$\phi 14$	92	150	178	9	40	134
$\phi 125$		155	14	$\phi 18$	117	180	210	11	50	144
$\phi 150$		175	14	$\phi 18$	134	220	270	11	50	144

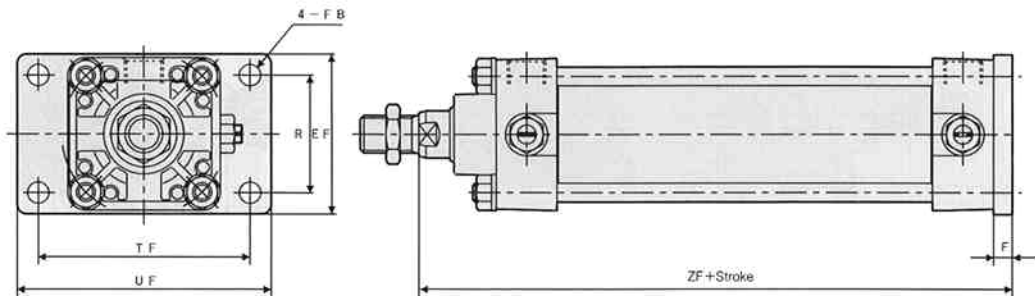
PNEUMATIC CYLINDER DC7H

EXTERNAL DIMENSIONAL DRAWING/WITH HEAVY-DUTY SCRAPER/TYPE FB (HEAD SIDE FLANGE)

● Double-acting single-rod type DC7H FB Bore B Stroke

Series

Bore: $\phi 40 \sim \phi 150$



- For dimensions not shown above, refer to the drawing for the type with heavy-duty scraper • Type SD (basic type).
- As for the cylinder with switch, refer to the drawing for the relevant model switch set.

DIMENSION TABLE

Unit: mm

Bore	Code	EF	F	FB	R	TF	UF	ZF
$\phi 40$		60	8	$\phi 9$	42	80	98	121
$\phi 50$		68	8	$\phi 9$	50	90	108	129
$\phi 63$		83	10	$\phi 11$	59	105	129	146
$\phi 80$		104	12	$\phi 14$	76	130	158	166
$\phi 100$		120	12	$\phi 14$	92	150	178	174
$\phi 125$		155	14	$\phi 18$	117	180	210	194
$\phi 150$		175	14	$\phi 18$	134	220	270	194

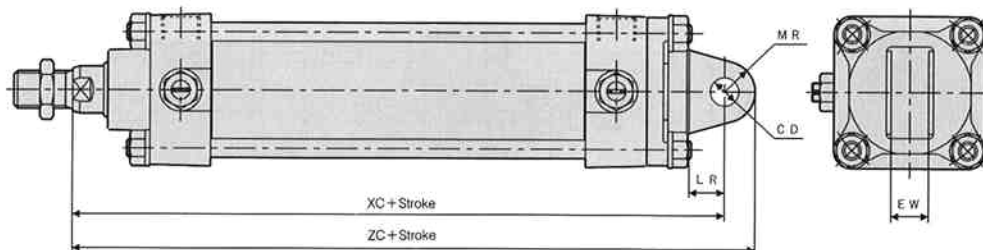
DC7H PNEUMATIC CYLINDER

EXTERNAL DIMENSIONAL DRAWING/WITH HEAVY-DUTY SCRAPER/TYPE CA (EYE TYPE)

● Double-acting single-rod type DC7H CA Bore B Stroke

Series

Bore: $\phi 40 \sim \phi 150$



- For dimensions not shown above, refer to the drawing for the type with heavy-duty scraper • Type SD (basic type).
- As for the cylinder with switch, refer to the drawing for the relevant model switch set.

DIMENSION TABLE

Unit: mm

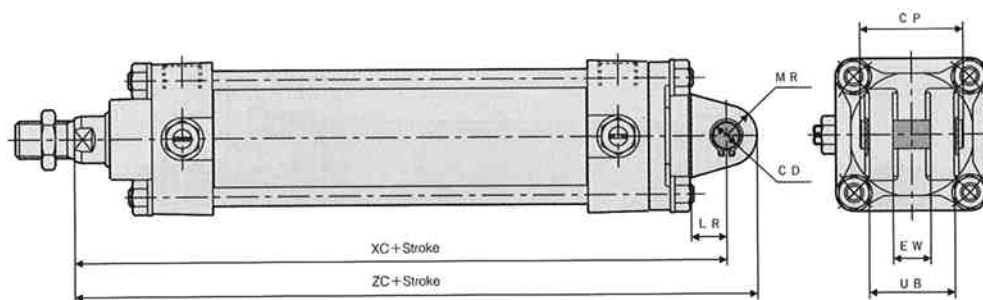
Bore	Code	CD	EW	MR	LR	XC	ZC
$\phi 40$		$\phi 12H9$	$16_{-0.3}^{-0.1}$	R13	14	143	156
$\phi 50$		$\phi 12H9$	$16_{-0.3}^{-0.1}$	R13	15	154	167
$\phi 63$		$\phi 12H9$	$16_{-0.3}^{-0.1}$	R15	18	176	191
$\phi 80$		$\phi 18H9$	$25_{-0.3}^{-0.1}$	R20	23	201	221
$\phi 100$		$\phi 18H9$	$28_{-0.3}^{-0.1}$	R20	23	218	238
$\phi 125$		$\phi 20H9$	$35_{-0.3}^{-0.1}$	R22	25	243	265
$\phi 150$		$\phi 25H9$	$40_{-0.3}^{-0.1}$	R27	30	255	282

EXTERNAL DIMENSIONAL DRAWING/WITH HEAVY-DUTY SCRAPER/TYPE CB (CLEVIS TYPE)

● Double-acting single-rod type DC7H CB Bore B Stroke

Series

Bore: $\phi 40 \sim \phi 150$



- For dimensions not shown above, refer to the drawing for the type with heavy-duty scraper • Type SD (basic type).
- As for the cylinder with switch, refer to the drawing for the relevant model switch set.

DIMENSION TABLE

Unit: mm

Bore	Code	CD	CP	EW	MR	UB	XC	LR	ZC
$\phi 40$		$\phi 12h9$	44	$16_{+0.1}^{+0.3}$	R13	36	143	14	156
$\phi 50$		$\phi 12h9$	44	$16_{+0.1}^{+0.3}$	R13	36	154	15	167
$\phi 63$		$\phi 12h9$	44	$16_{+0.1}^{+0.3}$	R15	36	176	18	191
$\phi 80$		$\phi 18h9$	64	$25_{+0.1}^{+0.3}$	R20	55	201	23	221
$\phi 100$		$\phi 18h9$	71	$28_{+0.1}^{+0.3}$	R20	62	218	23	238
$\phi 125$		$\phi 20h9$	86	$35_{+0.1}^{+0.3}$	R22	77	243	25	265
$\phi 150$		$\phi 25h9$	97	$40_{+0.1}^{+0.3}$	R27	88	255	30	282

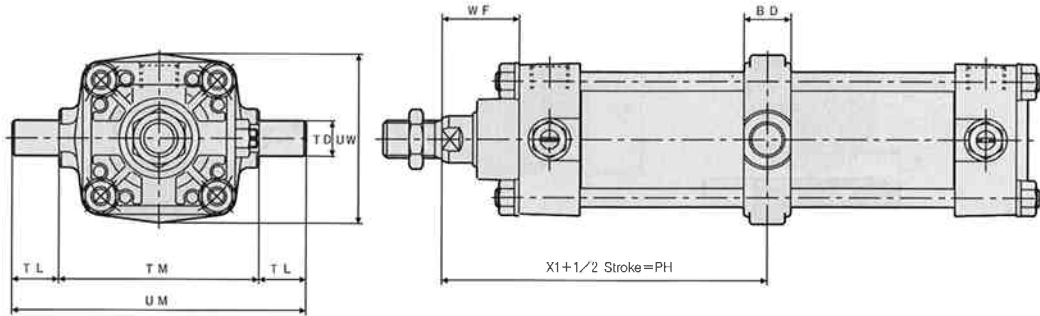
PNEUMATIC CYLINDER DC7H

EXTERNAL DIMENSIONAL DRAWING/WITH HEAVY-DUTY SCRAPER/TYPE TC (INTERMEDIATE TRUNNION TYPE)

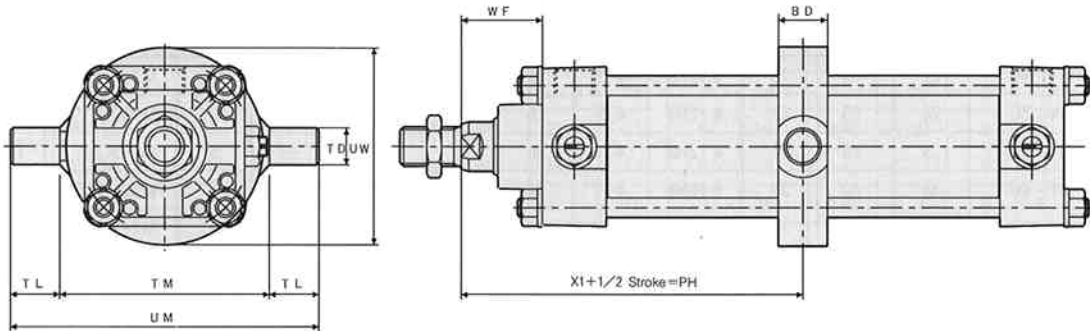
- Double-acting single-rod type DC7H TC Bore B Stroke

Series

Bore: $\phi 40 \sim \phi 100$



Bore: $\phi 125 \cdot \phi 150$

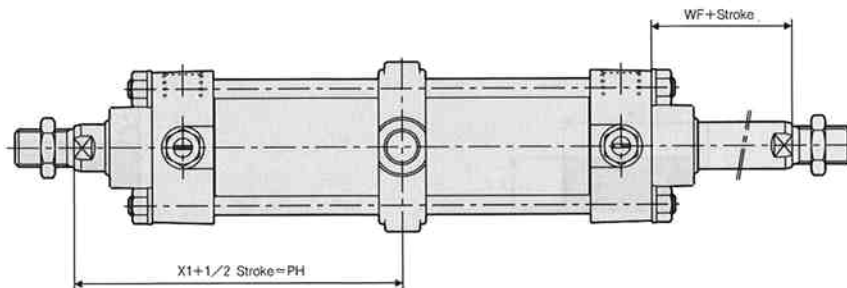


When Type T (rod trunnion type) of DC4/6 series is used, give instructions at the minimum dimension PH.

- Double-acting double-rod type DC7HD TC Bore B Stroke

Series

Bore: $\phi 40 \sim \phi 150$



- For dimensions not shown above, refer to the drawing for the type with heavy-duty scraper • Type SD (basic type).
- As for the cylinder with switch, refer to the drawing for the relevant model switch set.

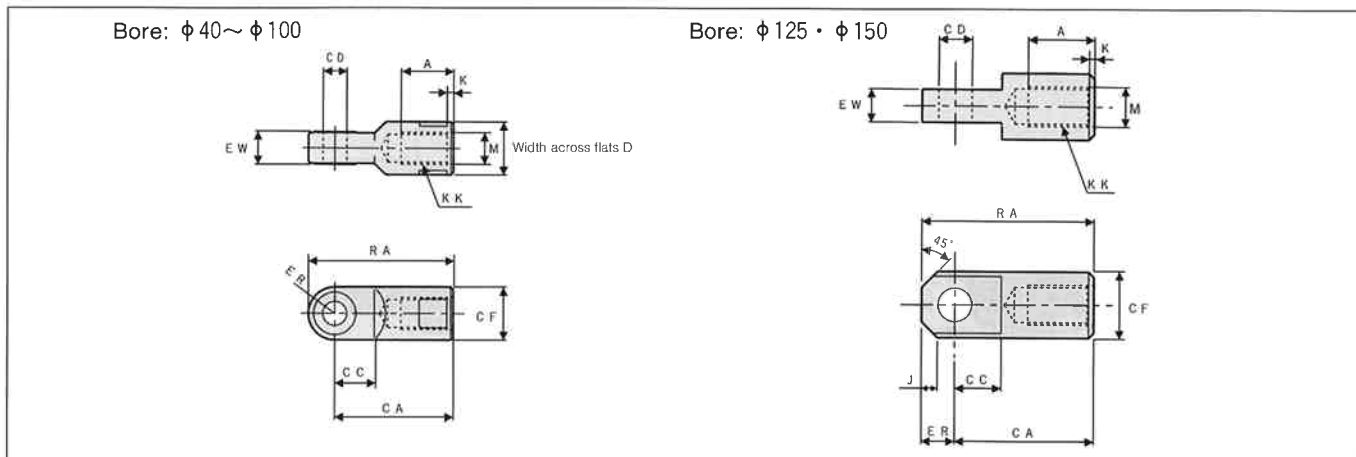
DIMENSION TABLE

Unit: mm

Bore	Code	BD	TD	TL	TM	UM	UW	WF	XI	Min. PH
$\phi 40$		20	$\phi 15f7$	20	85	125	62	31	72	63
$\phi 50$		20	$\phi 15f7$	20	85	125	72	33	77	69
$\phi 63$		25	$\phi 18f7$	25	110	160	90	40	88	78.5
$\phi 80$		30	$\phi 25f7$	30	140	200	112	40	97	87
$\phi 100$		30	$\phi 25f7$	30	162	222	135	40	101	87
$\phi 125$		38	$\phi 30f7$	35	205	275	190	50	115	103
$\phi 150$		38	$\phi 30f7$	35	235	305	220	50	115	103

DC7 PNEUMATIC CYLINDER

ATTACHMENT/ROD END EYE (TYPE T)

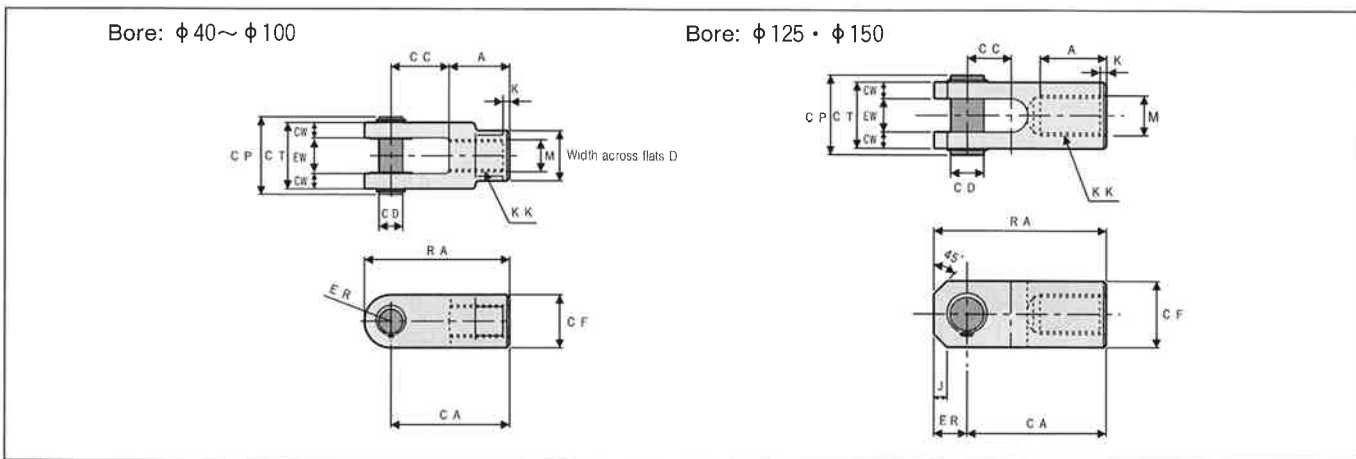


DIMENSION TABLE

Unit: mm

Bore	Code	Part type	A	CA	CC	CD	CF	D	ER	EW	J	K	KK	M	RA
$\phi 40$		RY- 40	22	55	18	$\phi 10H8$	$\phi 20$	20	10	$10^{+0.1}_{-0.3}$	—	3	M12×1.75	$12^{+0.3}_{+0.1}$	65
$\phi 50$		RY- 50	28	65	22	$\phi 12H8$	$\phi 26$	26	13	$16^{+0.1}_{-0.3}$	—	5	M16×2	$16^{+0.3}_{+0.1}$	78
$\phi 63$		RY- 50	28	65	22	$\phi 12H8$	$\phi 26$	26	13	$16^{+0.1}_{-0.3}$	—	5	M16×2	$16^{+0.3}_{+0.1}$	78
$\phi 80$		RY- 80	35	80	24	$\phi 16H8$	$\phi 32$	32	16	$20^{+0.1}_{-0.3}$	—	5	M20×2.5	$20^{+0.3}_{+0.1}$	96
$\phi 100$		RY-100	40	90	30	$\phi 18H8$	$\phi 40$	40	20	$25^{+0.1}_{-0.3}$	—	5	M24×3	$24^{+0.3}_{+0.1}$	110
$\phi 125$		RY-125	50	105	35	$\phi 25H8$	$\phi 50$	—	25	$25^{+0.1}_{-0.3}$	12	5	M30×3.5	$30^{+0.3}_{+0.1}$	130
$\phi 150$		RY-150	60	125	40	$\phi 30H8$	$\phi 60$	—	30	$30^{+0.1}_{-0.3}$	15	5	M36×4	$36^{+0.3}_{+0.1}$	155

ATTACHMENT/ROD END CLEVIS (TYPE Y) WITH PIN



DIMENSION TABLE

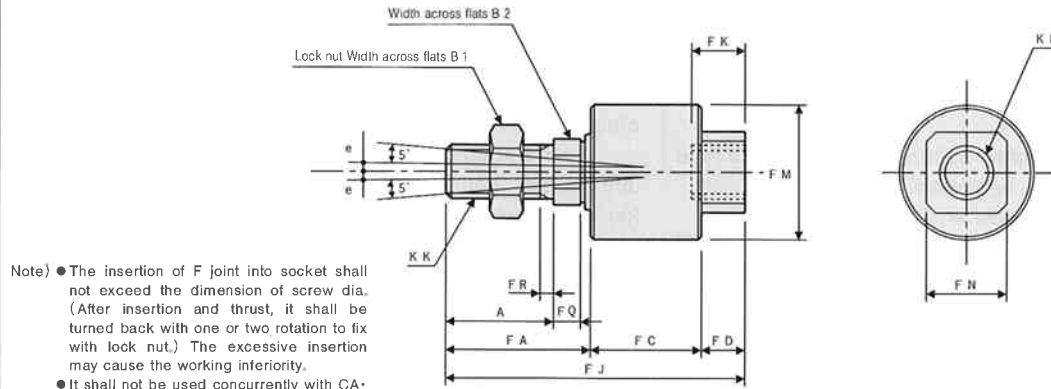
Unit: mm

Bore	Code	Part type	A	CA	CC	CD	CF	CP	CT	CW	D	ER	EW	K	KK	M	RA
$\phi 40$		RU- 40	31	55	24	$\phi 10h9$	$\phi 18$	28.5	20	5	18	10	$10^{+0.3}_{+0.1}$	3	M12×1.75	$12^{+0.3}_{+0.1}$	65
$\phi 50$		RU- 50	33	65	32	$\phi 12h9$	$\phi 26$	40.5	32	8	26	13	$16^{+0.3}_{+0.1}$	5	M16×2	$16^{+0.3}_{+0.1}$	78
$\phi 63$		RU- 50	33	65	32	$\phi 12h9$	$\phi 26$	40.5	32	8	26	13	$16^{+0.3}_{+0.1}$	5	M16×2	$16^{+0.3}_{+0.1}$	78
$\phi 80$		RU- 80	44	80	36	$\phi 16h9$	$\phi 32$	48.5	40	10	32	16	$20^{+0.3}_{+0.1}$	5	M20×2.5	$20^{+0.3}_{+0.1}$	96
$\phi 100$		RU-100	46	90	44	$\phi 18h9$	$\phi 38$	59	50	12.5	38	20	$25^{+0.3}_{+0.1}$	5	M24×3	$24^{+0.3}_{+0.1}$	110
$\phi 125$		RU-125	50	105	33	$\phi 25h9$	$\phi 50$	60	50	12.5	—	25	$25^{+0.3}_{+0.1}$	5	M30×3.5	$30^{+0.3}_{+0.1}$	130
$\phi 150$		RU-150	60	125	40	$\phi 30h9$	$\phi 60$	70	60	15	—	30	$30^{+0.3}_{+0.1}$	5	M36×4	$36^{+0.3}_{+0.1}$	155

PNEUMATIC CYLINDER DC7

ATTACHMENT/ROD END FOATING JOINT (TYPE F)

Bore: $\phi 40 \sim \phi 150$



DIMENSION TABLE

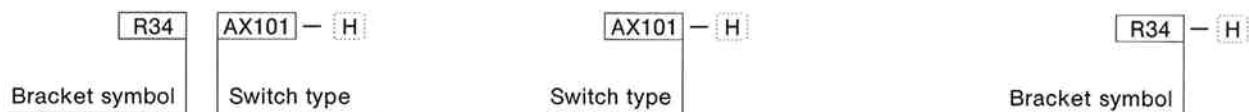
Unit: mm

Bore	Code	Part type	A	B1	B2	e	FA	FC	FD	FJ	FK	FM	FN	FQ	FR	KK
$\phi 40$		RFS-12	22.5	17	13	1	31.5	25.5	11	68	13.5	$\phi 32$	$\square 19$	7	3.5	M12×1.75
$\phi 50$		RFS-16	30	22	17	1.5	41	33	13	87	16	$\phi 40$	$\square 24$	8	4	M16×2
$\phi 63$		RFS-16	30	22	17	1.5	41	33	13	87	16	$\phi 40$	$\square 24$	8	4	M16×2
$\phi 80$		RFS-20	37	27	21	2	50	42	15	107	21	$\phi 50$	$\square 30$	9	5	M20×2.5
$\phi 100$		RFS-24	44	32	24	2.5	61	49	18	128	24	$\phi 64$	$\square 36$	12	6	M24×3
$\phi 125$		RFS-30	55	41	32	2.5	75	62	21	158	30	$\phi 76$	$\square 46$	14	7	M30×3.5
$\phi 150$		RFS-36	65	50	36	3	89	80	23	192	36	$\phi 88$	$\square 55$	18	8	M36×4

DC7 PNEUMATIC CYLINDER

Code

- Code for arrangement of switches and bracket assemblies
- Code for arrangement of switches
- Code for arrangement of brackets



RELEVANT PART/SWITCH · BRACKET ASSEMBLY CODE

Switch type	Bore	Assy type		Switch single unit type		Bracket type
		Contact	No contact	Contact	No contact	
AX	φ 40~φ 50	R33AX1 * *	R32AX2 * *	AX1 * *	AX2 * *	R33
	φ 63	R34AX1 * *	R33AX2 * *			R34
	φ 80·φ 100	R35AX1 * *	R34AX2 * *			R35
	φ 125	R36AX1 * *	R35AX2 * *			R36
YR·YS	φ 40~φ 50	R18YR * * *-A	R09YS * * *-A	YR * * *-A	YS * * *-A	R18-A
	φ 63	R12YR * * *-A	R18YS * * *-A			R12-A
	φ 80·φ 100	R14YR * * *-A	R12YS * * *-A			R14-A
	φ 125	R15YR * * *-A	R14YS * * *-A			R15-A
SR	φ 40~φ 50	R28SR * * *-A	-	SR405-A	-	R28-A
	φ 63	R02SR * * *-A				R02-A
	φ 80·φ 100	R03SR * * *-A				R03-A
	φ 125	R04SR * * *-A				R04-A
L3·L4	φ 40	L * - * * *-A40-S-A	-	L * - * * *	-	A40-S-A
	φ 50	L * - * * *-A50-S-A				A50-S-A
	φ 63	L * - * * *-A63-S-A				A63-S-A
	φ 80	L * - * * *-A80-S-A				A80-S-A
	φ 100	L * - * * *-A100-S-A				A100-S-A
	φ 125	L * - * * *-A125-S-A				A125-S-A
	φ 150	L * - * * *-A150-S-A				A150-S-A

Symbol/code for arrangement of switches

■ Contact

General purpose type

Code rear wiring

AF : AX101(with 1.5m cord)

AG : AX105(with 5m cord)

AH : AX111(with 1.5m cord)

AJ : AX115(with 5m cord)

AE : AX125(with 5m cord/no lamp)

AK : AX11A(connector type/AC)

AL : AX11B(connector type/DC)

C : YR101(with 1.5m cord)

U : YR105(with 5m cord)

S : SR405(with 5m cord)

Iron proximity type

FA : L3-101(with 1m cord)

FB : L3-105(with 5m cord)

FC : L3-241(with 1m cord)

FD : L3-245(with 5m cord)

FM : L4-100(Terminal type)

FN : L4-24(Terminal type)

■ No contact

General purpose type

● 2-wire, 1-LED type

Code rear wiring

BE : AX201(with 1.5m cord)

BF : AX205(with 5m cord)

● 2-wire, 2-LED type

Code rear wiring

CE : AX211(with 1.5m cord)

CF : AX215(with 5m cord)

A : YS211(with 1.5m cord)

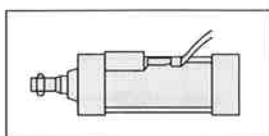
B : YS215(with 5m cord)

MAGNETIC PROXIMITY TYPE (WITH CONTACT)

HANDLING INSTRUCTIONS

PRECAUTIONS FOR WIRING

- For wiring, works shall be conducted by cutting off surely the power supply of electric circuit at the connection side.
 - During the works, workers may receive the electric shock. Switch and load may also be damaged.
- Do not apply loads such as bending, pulling, torsion, etc. to the switch cord. Especially in order that loads are not applied to the switch cord end, the switch cord shall be fixed on the tie rod. (Refer to figure.)
 - The disconnection of cord may be caused. Especially if loads are applied to the cord end, the electric circuit base of switch may be damaged.
 - Even in case that it is fixed on tie rod, do not tighten too much. It may cause the disconnection of cord.
- The bending radius shall be widened as much as possible.
 - It may cause the disconnection of cord. The cord dia. shall be doubled or more.
- In case that the distance to the connection end is long, the cord shall be fixed at the interval of about 20cm so that the cord shall not be loosened.
- For protection, the cord shall be put in metal pipe because it may be stepped directly or buried beneath the device in case that it is set on the ground.
 - Sheath may be damaged, thereby causing the broken wire and short circuit.
- The distance from switch to load and power supply shall be set at less than 10m.
 - If it is set at over 10m, the inrush current generates in switch when used, and the switch may be damaged. The measures for inrush current shall be set upon referring to "precautions for protection of contact."
- The cord shall not be bundled with high pressure wire, power source of other electrical appliances and cable for power supply or wired nearby.
 - The wrong working of switch and load may be caused as noise from high pressure wire, power source and cable for power source enter the switch cord. It is recommended that it shall be protected by shield pipe, etc.



PRECAUTIONS FOR CONNECTION

- The power supply to switch shall surely be cut off.
 - During the works, workers may be affected by electricity. Switch and loads may also be damaged.
- Loads that exceed the operating voltage, current and contact capacity of switch shall not be used.
 - If the voltage and current specifications are mistaken, the working inferiority and damage may be caused.
- Do not connect the power supply directly with switch. It shall surely be connected via the specific loads of small relay, programmable controller, etc.
 - The short circuit is caused and switch is damaged by fire.
 - For relay, only one of the following codes or equivalents shall be used.

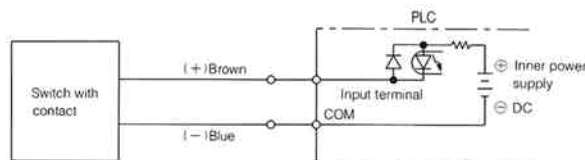
OMRON : MY type
FUJI ELECTRIC : HH-5 type
IDEC IZUMI CORP. : RY type
Matsushita Electric Works Ltd. : HC type

- Do not connect correctly according to the coloring of lead wire.
 - If power is supplied without correcting the wrong wiring, the switch is damaged. And loads may also be damaged. Even if it is the instantaneous short circuit, the damage of electric circuit in switch may be caused.

<Connection Method>

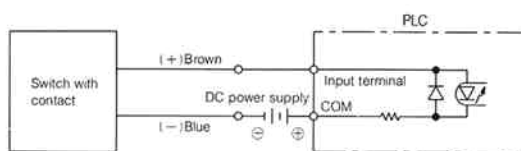
1. Basic Connection

- In case of connection with PLC (programmable controller).
 - In case that the power source is contained in PLC.



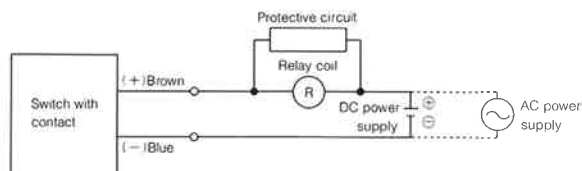
- The above diagram shows the examples for connection in case of PLC of DC input type. (Details shall be confirmed in the handling instructions for PLC.)
- Although it is similar even in case of PLC of AC input type, "precautions for protection of contact" shall fully be read.

- In case that the power source is not contained in PLC.



- The above diagram shows the examples for connection in case of PLC of DC input type. (Details shall fully be confirmed in the handling instructions.)
- Although it is similar even in case of PLC of AC input type, "precautions for protection of contact" shall fully be read.

- In case of connection with small relay.



- As to the protective circuit, "precautions for protection of contact" shall fully be read.

MAGNETIC PROXIMITY TYPE (WITH CONTACT)

2. In Case Of Plural Connection

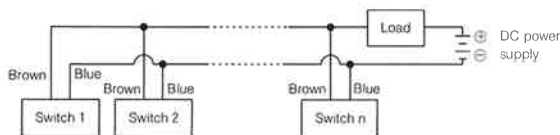
- As there is the case in which it can not be used in the combination with load, the plural connection of switch (series, parallel connection) shall be avoided.

1) Parallel connection

It is the circuit as shown in the following diagrams.

- In the combination with loads, the indicating lamp may not light.
- For the switch with leakage current, it is noted that the leakage current of switch output may increase according to the number of switches.

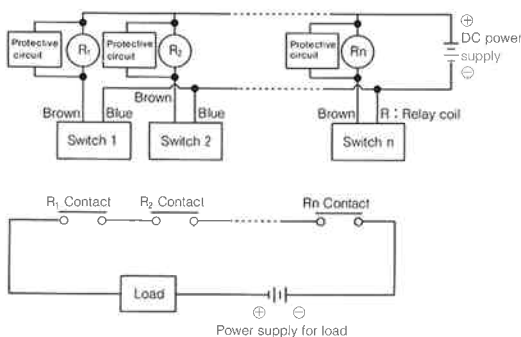
There are cases, in which loads may work or may not return owing to the leakage current.



- It shall be set for sum of leakage current < return current value of load.
- It is also similar in case of AC power supply.

2) Connection in series

The circuit shown in the following diagrams is recommended. The contact of small relay is connected in series with small relay provided for each switch.



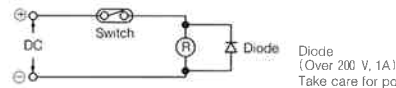
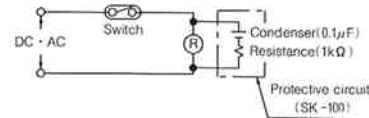
- It shall be noted that inner voltage drop of switch output increases according to the number of switches if switches are connected in series. If the inner voltage drop increases, loads may not work.
- In case that switches are connected in series, it shall be set at the sum of inner voltage drop < working voltage value of load.
- Even in case of AC power supply, it is similar.
- The protective circuit shall surely be connected at both end of relay coil.

PRECAUTIONS FOR CONTACT PROTECTION

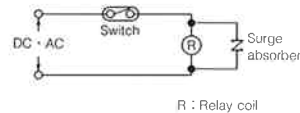
- In case that the induction loads (small relay, solenoid valve, etc.) are connected.

As the surge voltage generates with switch OFF, the protective circuit shall surely be provided at the load side as shown in the diagram below for the protection of contact.

- If there is no protective circuit shown in the diagram below, the internal electric circuit of switch may be damaged by surge voltage.



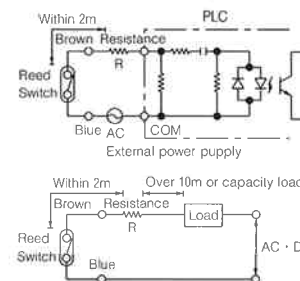
Diode
(Over 200 V, 1A)
Take care for polarity + - of power supply



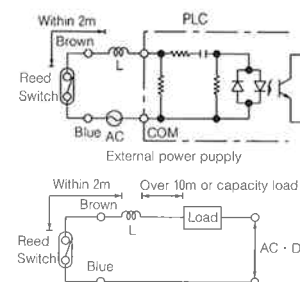
Surge absorber
DC24V Vanster voltage approx. 30V
DC48V Vanster voltage approx. 60V
AC100V Vanster voltage approx. 180V
AC200V Vanster voltage approx. 360V

R : Relay coil

- As shown in diagram, the protective circuit shall surely be provided as the inrush current generates with switch ON in case that the switch cord is extended over 10m or that it is connected to PLC (programmable controller) and capacity load (condenser, etc.).



R : Inrush current restriction resistance
R = Large resistance in the allowable range of circuit at load side shall be used.
Note) • If the resistance is large too much, load may not work.
• It shall be wired near switch as much as possible. (Within 2m)



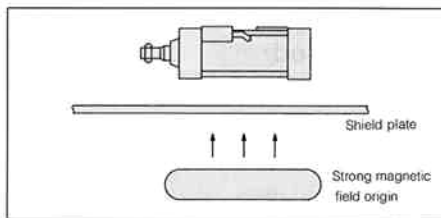
L : Choke coil
L = About 2mH or equivalent
Note) • It shall be wired near switch as much as possible. (Within 2m)

MAGNETIC PROXIMITY TYPE (WITH CONTACT)

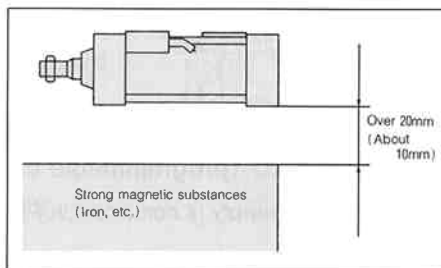
HANDLING INSTRUCTIONS

PRECAUTIONS FOR INSTALLATION

1. Do not use in such locations where chips • cutting oil are directly applied to cylinder and switch.
 - The cord is cut off by chips, and cutting oil enters inside of switch, thereby causing the short circuit of electric circuit and the working inferiority of switch.
2. Provide iron plates as magnetic shield in locations with the strong ambient magnetic field.
 - Affected by the magnetic field, the wrong working of switch may be caused.



3. Do not move strong magnetic substances (iron, etc.) near the cylinder body and switch. As a rule, such materials shall be kept away over 20mm. In case of the compact cylinder, it shall be kept away over 10mm.
 - Affected by strong magnetic substances, the wrong working of switch may be caused.



DETECTABLE CYLINDER PISTON SPEED

- When switch is set at the intermediate position, keep the cylinder speeds lower than 300mm/sec to ensure the response of load relay.
- If the piston speed is too fast, the switch actuating time is short and loads of relay may not work although switch will actuate.

The detectable cylinder piston speed shall be set with the following formula as reference.

$$\text{Detectable Piston Speed (mm/s)} = \frac{\text{Switch Actuating Range (mm)}}{\text{Load Working Time (ms)}} \times 1000$$

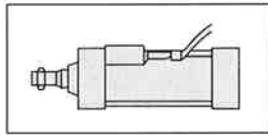
Note : Refer to the load working time of relay of various companies.

MAGNETIC PROXIMITY TYPE (WITH NO CONTACT/3-WIRE TYPE)

HANDLING INSTRUCTIONS

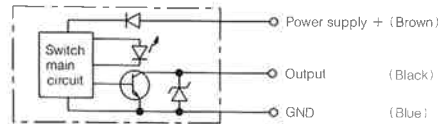
PRECAUTIONS FOR WIRING

- For wiring, works shall be conducted by cutting off surely the power supply of electric circuit at the connection side.
 - During the works, workers may receive the electric shock. Switch and load may also be damaged.
- Do not apply loads such as bending, pulling, torsion, etc. to the switch cord. Especially in order that loads are not applied to the switch cord end, the switch cord shall be fixed on the tie rod. (Refer to figure.)
 - The disconnection of cord may be caused. Especially if loads are applied to the cord end, the electric circuit base of switch may be damaged.
 - Even in case that it is fixed on tie rod, do not tighten too much. It may cause the disconnection of cord.
- The bending radius shall be widened as much as possible.
 - It may cause the disconnection of cord. The cord dia. shall be doubled or more.
- In case that the distance to the connection end is long, the cord shall be fixed at the interval of about 20cm so that the cord shall not be loosened.
- For protection, the cord shall be put in metal pipe because it may be stepped directly or buried beneath the device in case that it is set on the ground.
 - Sheath may be damaged, thereby causing the broken wire and short circuit.
- The distance from switch to load and power supply shall be set at less than 10m.
 - If it is set at over 10m, the inrush current generates in switch when used, and the switch may be damaged. The measures for inrush current shall be set upon referring to "precautions for protection of output circuit."
- The cord shall not be bundled with high pressure wire, power source of other electrical appliances and cable for power source or not wired nearby.
 - The wrong working of switch and load may be caused as noise from high pressure wire, power source and cable for power source enter the switch cord. It is recommended that it shall be protected by shield pipe, etc.



- According to the coloring of lead wire, it shall correctly be connected. The works shall be conducted by cutting off surely the power supply of electric circuit device at the connection side when it is connected.

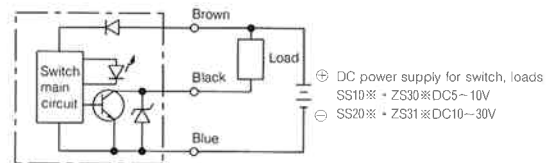
- The short circuit of wrong wiring and loads may cause the damage of switch and electric circuit at load side. Even if it is instantly short circuit, the main circuit and output circuit may be damaged by fire. In addition, the works in power supply may cause the damage of electric circuit at switch, load sides.



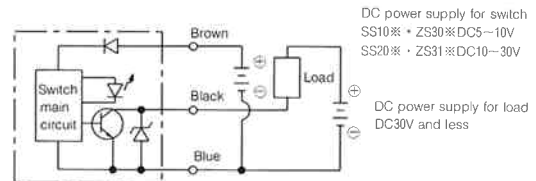
<Connection Method>

1. Basic Circuit

- In case that power supply of switch and loads is the same.

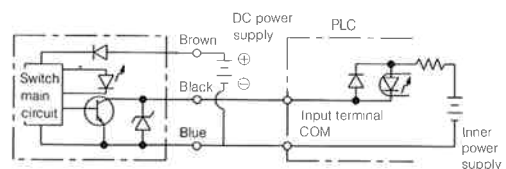


- In case that the power supply of switch and loads is different.



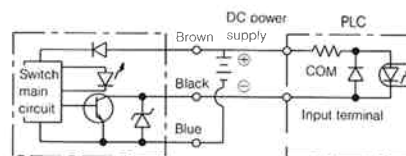
2. Connection With PLC (programmable controller)

- In case that the power supply is contained in PLC.



- For details, the handling instructions for applied PLC shall fully be confirmed.

- In case that the power supply is not contained in PLC.



- For details, the handling instructions for applied PLC shall fully be confirmed.

PRECAUTIONS FOR CONNECTION

- Do not connect the power supply directly with switch. It shall surely be connected through the specific loads of small relay, programmable controller, etc.
 - For circuit, the short circuit is caused, and switch is damaged by fire.
- The voltage, current specifications of applied switch, power supply and loads shall fully be confirmed.
 - If the voltage, power supply specifications are mistaken, the working inferiority and damage of switch may be caused.

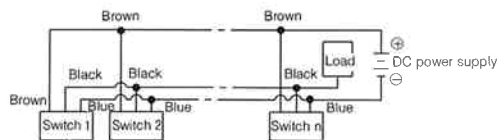
MAGNETIC PROXIMITY TYPE (WITH NO CONTACT/3-WIRE TYPE)

3.In Case Of Plural Connection

As there is the case, in which it can not be used in the combination with load, the plural connection of switch (series, parallel connection) shall be avoided.

1)Parallel connection

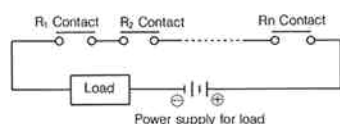
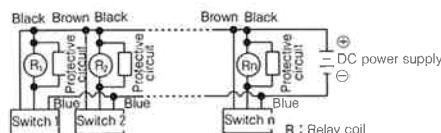
- The switch working situation can be confirmed by the indicating lamp of switch. But, it is noted that the leakage current of switch output may increase according to the number of switches. There are cases, in which loads may work or may not return owing to the leakage current.



It shall be set for sum of leakage current < return current value of loads.

2)Series connection

- The series connection of fellow switches can not be conducted.
- As shown in the following diagram for circuit, the fellow contacts of small relay shall be conducted in series through small relay. In case that PC is used, the program shall be worked out in order that fellow contacts in PC are connected in series.



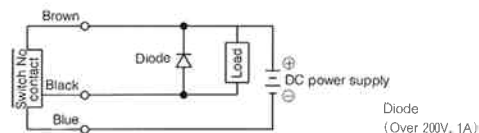
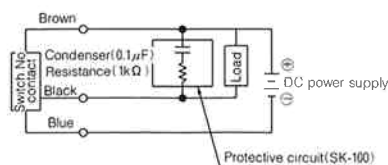
- The protective circuit shall surely be connected at both end of relay coil.

PRECAUTIONS FOR PROTECTION OF OUTPUT CIRCUIT

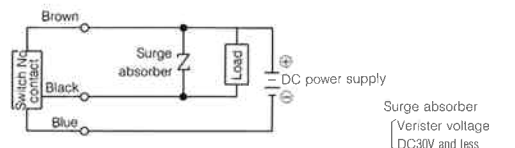
1.In case that induction loads (small relay, solenoid valve, etc.) are connected for use.

As surge voltage is generated with switch at OFF, the protective circuit shall surely be provided at the load side.

- If there is no protective circuit shown in the following diagram, the internal electric circuit of switch may be damaged by surge voltage.



Diode
(Over 200V, 1A)

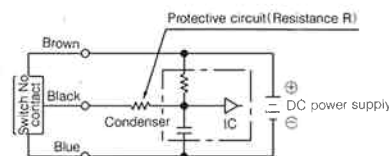


Surge absorber
(Varistor voltage
DC30V and less)

2.In case that the capacity load (condenser, etc.) is connected or that it is extended over 10m.

As the inrush current is generated with switch at ON, the protective circuit shall surely be provided near switch (within 2m from switch) as shown in the following diagram.

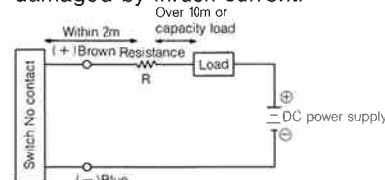
- If there is no protective circuit as shown in the following diagram, the internal electric circuit of switch may be damaged by inrush current.



Note) The value of R (Ω) shall be set to exceed the value computed by the following formula.

$$R = \frac{V}{0.2} (\Omega) \quad V : \text{Power supply voltage}$$

- If there is no protective circuit shown in the following diagram, the internal electric circuit of switch may be damaged by inrush current.

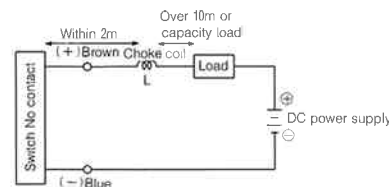


R : Inrush current restriction resistance

R = Large resistance as much as possible in the allowable range of circuit at load side shall be used.

Note) • If the resistance is too much large, load may not work.

- It shall be wired near switch as much as possible. (Within 2m)



L : Choke coil

L = About 2mH or equivalent.

Note) • It shall be wired near switch as much as possible. (Within 2m)

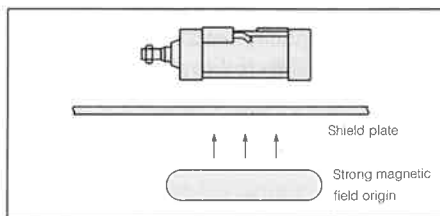
- In case that noise is mixed with the power supply as the electrical environment is worsened, the noise filter shall be inserted in the power supply line.

MAGNETIC PROXIMITY TYPE (WITH NO CONTACT/3-WIRE TYPE)

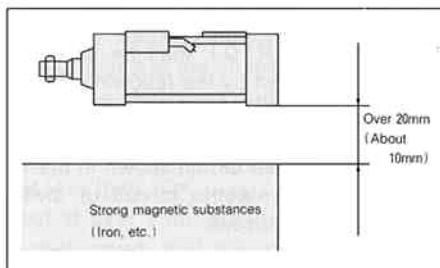
HANDLING INSTRUCTIONS

PRECAUTIONS FOR INSTALLATION

1. Do not use in such locations where chips·cutting oil are directly applied to cylinder and switch.
 - The cord is cut off by chips, and cutting oil enters inside of switch, thereby causing the short circuit of electric circuit and the working inferiority of switch.
2. Provide iron plates as magnetic shield in locations with the strong ambient magnetic field.
 - Affected by the magnetic field, the wrong working of switch may be caused.



3. Do not move strong magnetic substances (iron, etc.) near the cylinder body and switch. As a rule, such materials shall be kept away over 20mm. In case of the compact cylinder, it shall be kept away over 10mm.
 - Affected by strong magnetic substances, the wrong working of switch may be caused.



DETECTABLE CYLINDER PISTON SPEED

- When switch is set at the intermediate position, keep the cylinder speeds lower than 300mm/sec to ensure the response of load relay.
- If the piston speed is too fast, the switch actuating time is short and loads of relay may not work although switch will actuate.

The detectable cylinder piston speed shall be set with the following formula as reference.

$$\text{Detectable Piston Speed (mm/s)} = \frac{\text{Switch Actuating Range (mm)}}{\text{Load Working Time (ms)}} \times 1000$$

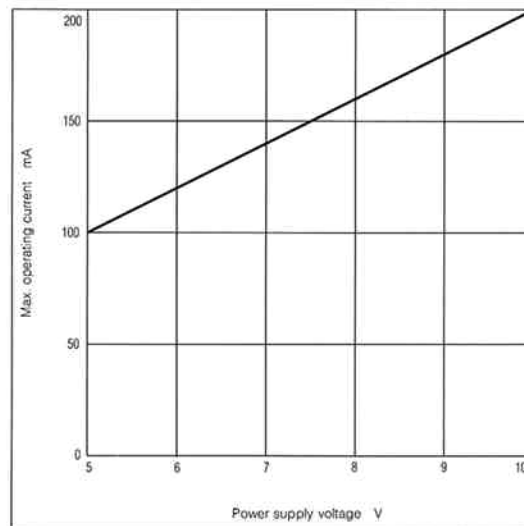
Note : Refer to the load working time of relay of various companies.

OTHER PRECAUTIONS

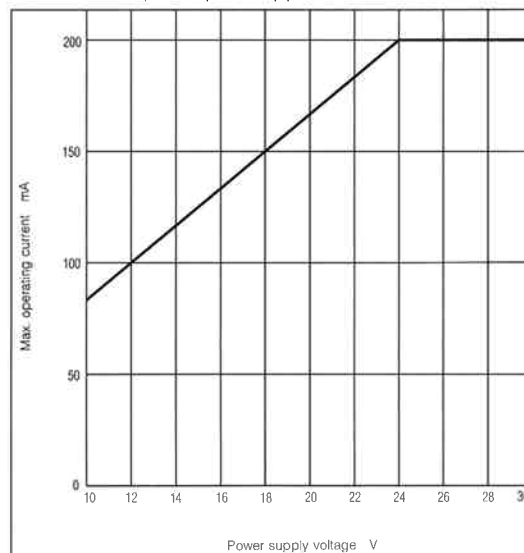
- It is noted that the max. consumption current • max. operating current are changed according to the power supply voltage.

Power Supply Voltage-Max. Operating Current Characteristic Diagram

- For DC5~10V (SS101, SS105)(ZS201 • ZS205 • ZS301 • ZS305)



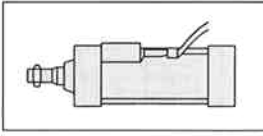
- For DC10~30V (SS201, SS205)(ZS211 • ZS215 • ZS311 • ZS315)



MAGNETIC PROXIMITY TYPE (WITH NO CONTACT/2-WIRE, 2-LAMP TYPE)

HANDLING INSTRUCTIONS

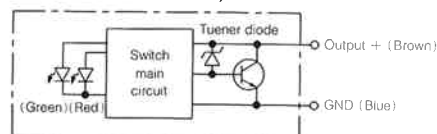
PRECAUTIONS FOR WIRING

- For wiring, works shall be conducted by cutting off surely the power supply of electric circuit at the connection side.
 - During the works, workers may receive the electric shock. Switch and load may also be damaged.
- Do not apply loads such as bending, pulling, torsion, etc. to the switch cord. Especially in order that loads are not applied to the switch cord end, the switch cord shall be fixed on the tie rod. (Refer to figure.)
 
 - The disconnection of cord may be caused. Especially if loads are applied to the cord end, the electric circuit base of switch may be damaged.
 - Even in case that it is fixed on tie rod, do not tighten too much. It may cause the disconnection of cord.
- The bending radius shall be widened as much as possible.
 - It may cause the disconnection of cord. The cord dia. shall be doubled or more.
- In case that the distance to the connection end is long, the cord shall be fixed at the interval of about 20cm so that the cord shall not be loosened.
- For protection, the cord shall be put in metal pipe because it may be stepped directly or buried beneath the device in case that it is set on the ground.
 - Sheath may be damaged, thereby causing the broken wire and short circuit.
- The distance from switch to load and power supply shall be set at less than 10m.
 - If it is set at over 10m, the inrush current generates in switch when used, and the switch may be damaged. The measures for inrush current shall be set upon referring to "precautions for protection of contact."
- The cord shall not be bundled with high pressure wire, power source of other electrical appliances and cable for power supply or wired nearby.
 - The wrong working of switch and load may be caused as noise from high pressure wire, power source and cable for power source enter the switch cord. It is recommended that it shall be protected by shield pipe, etc.

PRECAUTIONS FOR CONNECTION

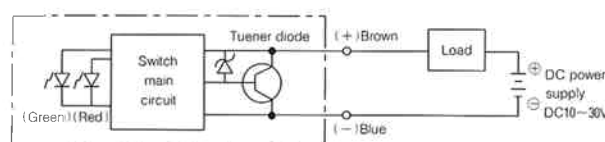
- Do not connect the power supply directly with switch.
 - It shall surely be connected through the specific loads of small relay, programmable controller, etc.
 - For circuit, the short circuit is caused, and switch is damaged by fire.
- The voltage, current specifications of applied switch, power supply and loads shall fully be confirmed.
 - If the voltage, power supply specifications are mistaken, the working inferiority and damage of switch may be caused.
- According to the coloring of lead wire, it shall correctly be connected. The works shall be conducted by cutting off surely the power supply of electric circuit device at the connection side when it is connected.

- The short circuit of wrong wiring and loads may cause the damage of switch and electric circuit at load side. Even if it is instantly short circuit, the main circuit and output circuit may be damaged by fire. In addition, the works in power supply may cause the damage of electric circuit at switch, load sides.



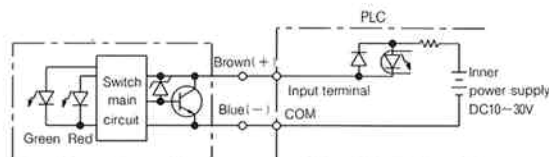
<Connection Method>

1. Basic Circuit



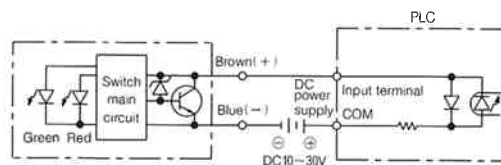
2. Connection With PLC (Programmable Controller)

- In case that the power supply is contained in PLC.



Note) For details, the handling instructions for applied PLC shall fully be confirmed.

- In case that the power supply is not contained in PLC.



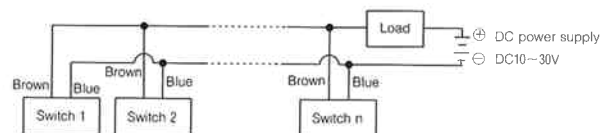
Note) For details, the handling instructions for applied PLC shall fully be confirmed.

3. In Case Of Plural Connection

As there is the case, in which it can not be used in the combination with load, the plural connection of switch (series, parallel connection) shall be avoided.

1) Parallel connection

- The switch working situation can be confirmed by the indicating lamp of switch. But, it is noted that the leakage current of switch output may increase according to the number of switches. There are cases, in which loads may work or may not return owing to the leakage current.



It shall be set for sum of leakage current < return current value of load.

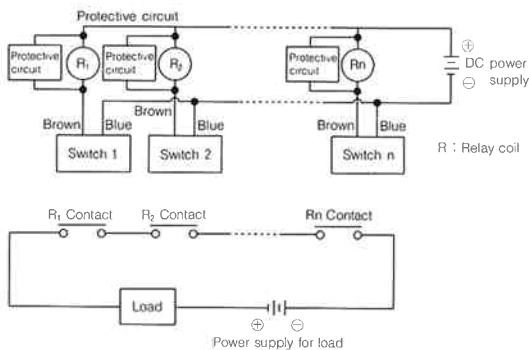
MAGNETIC PROXIMITY TYPE (WITH NO CONTACT/2-WIRE, 2-LAMP TYPE)

HANDLING INSTRUCTIONS

2) Series connection

- The series connection of fellow switches can not be conducted.

As shown in the following diagram for circuit, the fellow contacts of small relay shall be conducted in series through small relay. In case that PC is used, the program shall be worked out in order that fellow contacts in PC are connected in series.



Note) The protective circuit shall surely be connected at both end of relay coil.

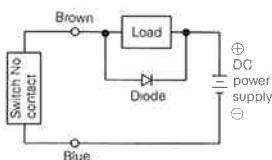
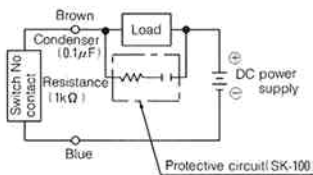
For the protective circuit and the connection method, refer to "PRECAUTIONS FOR PROTECTION OF OUTPUT CIRCUIT".

PRECAUTIONS FOR PROTECTION OF OUTPUT CIRCUIT

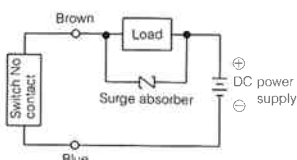
- In case that induction loads (small relay, solenoid valve, etc.) are connected for use.

As surge voltage is generated with switch at OFF, the protective circuit shall surely be provided at the load side.

- If there is no protective circuit shown in the following diagram, the internal electric circuit of switch may be damaged by surge voltage.



Diode
(Over 200V, 1A)

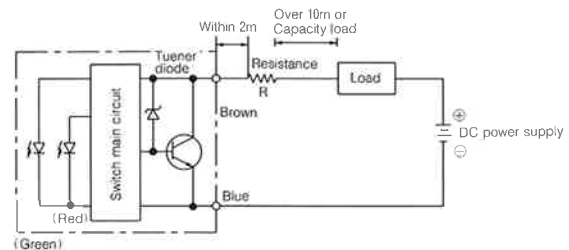


Surge absorber
(Verister voltage
DC30V and less)

- In case that the capacity load (condenser, etc.) is connected or that it is extended over 10m.

As the inrush current is generated with switch at ON, the protective circuit shall surely be provided near switch (within 2m from switch) as shown in the following diagram.

- If there is no protective circuit as shown in the following diagram, the internal electric circuit of switch may be damaged by inrush current.

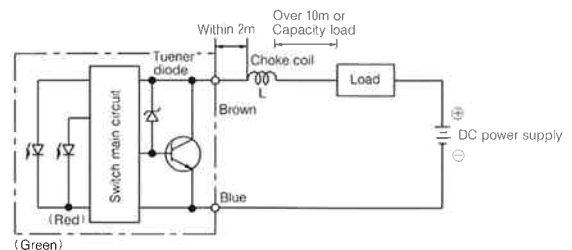


R : Inrush current restriction resistance

R = The large resistance as much as possible in the allowable range of circuit at load side shall be used.

Note) • If the resistance is too large, load may not work.

- It shall be wired near switch as much as possible. (Within 2m)



L : Choke coil

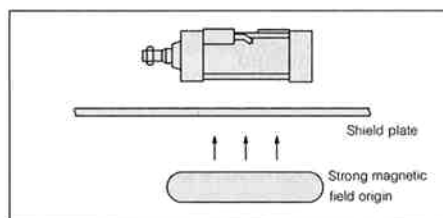
L = About 2mH or equivalent

Note) • It shall be wired near switch as much as possible. (Within 2m)

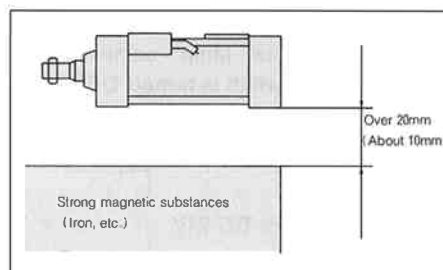
MAGNETIC PROXIMITY TYPE (WITH NO CONTACT/2-WIRE, 2-LAMP TYPE)

PRECAUTIONS FOR INSTALLATION

1. Do not use in such locations where chips·cutting oil are directly applied to cylinder and switch.
 - The cord is cut off by chips, and cutting oil enters inside of switch, thereby causing the short circuit of electric circuit and the working inferiority of switch.
2. Provide iron plates as magnetic shield in locations with the strong ambient magnetic field.
 - Affected by the magnetic field, the wrong working of switch may be caused.



3. Do not move strong magnetic substances (iron, etc.) near the cylinder body and switch. As a rule, such materials shall be kept over 20mm from the switch. In case of the compact cylinder, it shall be kept over 10mm.
 - Affected by strong magnetic substances, the wrong working of switch may be caused.



DETECTABLE CYLINDER PISTON SPEED

- When switch is set at the intermediate position, keep the cylinder speeds lower than 300mm/s to ensure the response of load relay.
- If the piston speed is too fast, the switch actuating time is short and loads of relay may not work although switch will actuate.

The detectable cylinder piston speed shall be set with the following formula as reference.

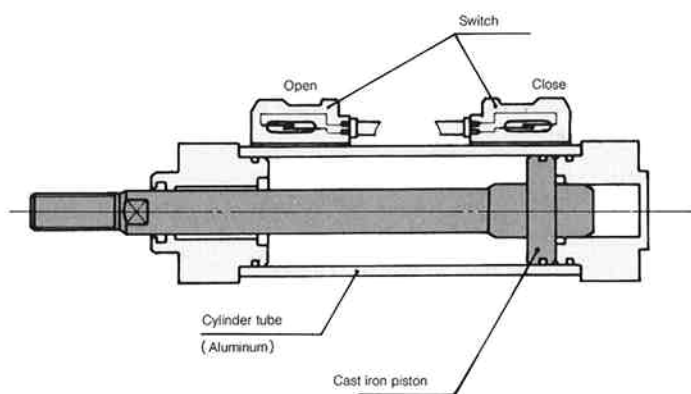
$$\text{Detectable Piston Speed (mm/s)} = \frac{\text{Switch Actuating Range (mm)}}{\text{Load Working Time (ms)}} \times 1000$$

Note : Refer to the load working time of relay of various companies.

Switch Type L3·L4 IRON PROXIMITY TYPE (WITH CONTACT)

HANDLING INSTRUCTIONS

Construction and operation

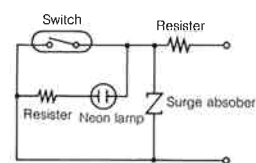


DESCRIPTION

This switch set combines a reed switch and permanent magnet. A magnetic balance reed switch with normally open contacts is mounted on the outside of a non-magnetic (aluminum alloy) cylinder barrel. The magnetic (cast iron) piston moves, and when it approaches the reed switch, the magnetic balance of the switch is upset, the switch contacts close and the piston position is detected.

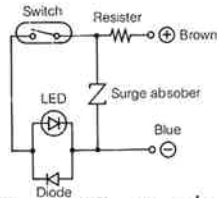
Reed switch internal circuit diagram

For AC 100V and AC 200V

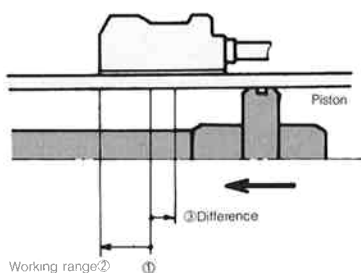


The lamp comes on when the switch is turned OFF.

For DC 24V



The lamp comes on when the switch is turned ON.



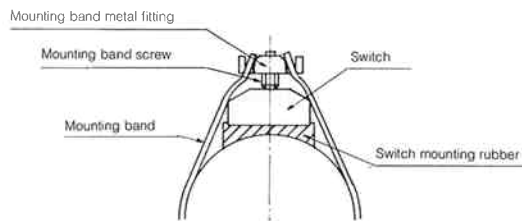
Difference	3mm max.
Working range	10mm min.

As shown in the Diagram, the switch contacts close at position ① when the piston advances in the arrow direction. The contacts remain closed until position ②. The length from position ① to position ② is called the working range.

If the piston arrives at position ① and the switch contacts close, the contacts will remain closed until the piston backs up to position ③. This is called the difference. The working range and difference are as given in the above Table.

IRON PROXIMITY TYPE (WITH CONTACT) Switch Type L3·L4

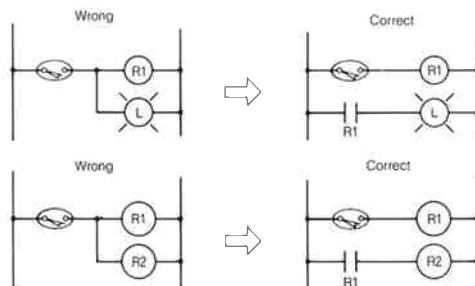
Switch detection position setting method and operation check



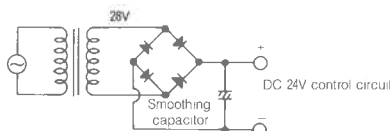
Determine the cylinder stroke (piston position) where setting is intended, and slide the switch along the cylinder tube. The switch indicator lamp goes out at AC 100V and AC 200V and comes on at DC 24V. Fix the switch at that position securely with the mounting band. The proper tightening torque of the mounting band is 0.8N·m (8.2 Kgf·cm).

PRECAUTIONS

1. There are 3 types of rated voltage: DC24V, AC100V and AC200V. (Always connect the switch to the power source over a load.)
2. Switch contact capacity is low, as shown in specifications, so be sure to consider the rated capacity of the load.
3. When directly driving a relay with the reed switch, use a relay with capacity less than the reed switch capacity, i.e. the Omron Electronics Co. MY type, Fuji Electronic Co., Ltd. HH-5 type, Tokyo Electric Co. MPM type or Matsushita Electric Works Ltd. HC type.
4. Only one of the above relays can be driven with a single reed switch. When using two or more relays, wire as shown below.



5. Taking into consideration the voltage regulation of $\pm 10\%$ of power supply voltage and the voltage drop due to switch internal resistance, we recommend using a smoothing condenser and setting secondary transformer voltage for the current operation power source (obtained through a rectification circuit) at about 28V — 15% higher than 24V.

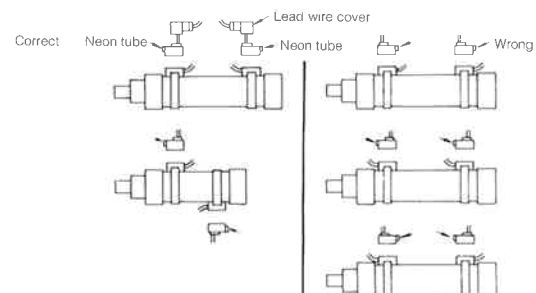


6. Reed switch reliability

In conventional systems, the contacts of a limit are mechanically opened and closed through the impact of a dog working at high speed, but this method clearly has problems in terms of mechanical wear. Our reed switch is based on the proximity switch principle, and since it is never touched, it has a long service life. Limit switches are also susceptible to cumulative adhesion of dust, water, foreign matter and fiber scraps, but our

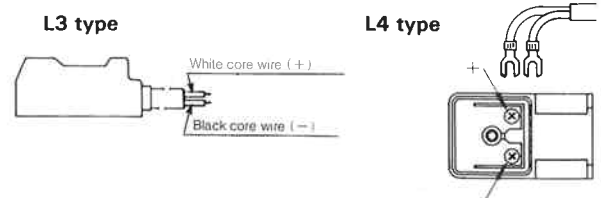
reed switch is sealed in an iron case filled with plastic and therefore is resistant against dust, moisture and oil. The reed switch is equipped with an internal surge voltage absorption circuit to prevent electrical sparking at switch contacts. The switch is also equipped with an induction surge prevention circuit with a maximum 50m lead wire.

7. When directly lighting up an indicator lamp with the reed switch, be especially careful about the rated voltage of the lamp.
8. When setting the reed switch at the stroke middle position and actuating a relay when the piston passes, if piston speed is too high, the reed switch will actuate, but only for a short time, and the relay may not go off. Therefore, in this case, keep cylinder operation speed below 500mm/sec.
9. Consult with us about use in locations with a great deal of ambient magnetism.
10. Switch mounting directionality
Due to the snap action of the reed switch housed in the limit switch, mount in the direction shown below.



11. Polarity of DC24V switches is as follows:

Positive → White core wire (L3) or + mark (L4)
Negative → Black core wire (L3) or — mark (L4)
The LED will not light up if polarity is reversed.



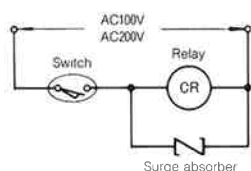
As shown above, switch sets use high reliability reed switches designed to prevent mechanical and electrical trouble.

Switch Type L3·L4 IRON PROXIMITY TYPE (WITH CONTACT)

12. Safer surge current absorption circuit

If current and supply voltage are low, and the load is not inductive, there is almost no accompanying electrical discharge. But if a circuit containing an inductive load (miniature relay etc.) is opened and closed with the switch, accumulated energy is expended instantaneously between the switch contacts, and this results in arcing, sparking and fusion of the contact materials. The switches of our switch sets are equipped with surge current absorption circuits to prevent such contact damage. However, in order to further increase safety and reliability of the entire device, we recommend using, if possible, the spark killers shown in the following table as load side contact protection.

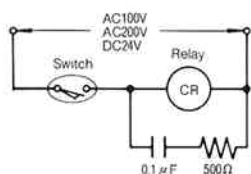
a) Using surge absorber



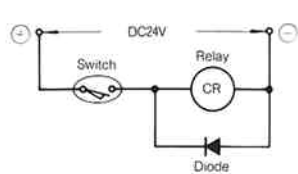
Use the following types of surge absorber.

Manufacturer	Model	Product name
Matsushita Electronic Components Co., Ltd.	ERZ-C10DK221 (for AC100V)	Surge absorber
	ERZ-C10DK431 (for AC200V)	Surge absorbar
Fuji Electronic Co., Ltd.	ENB221D-10A (for AC100V)	Z lap
	ENB401D-10A (for AC200V)	Z lap

b) Using CR circuit



c) Using diode (24V)



14. Lead wire length

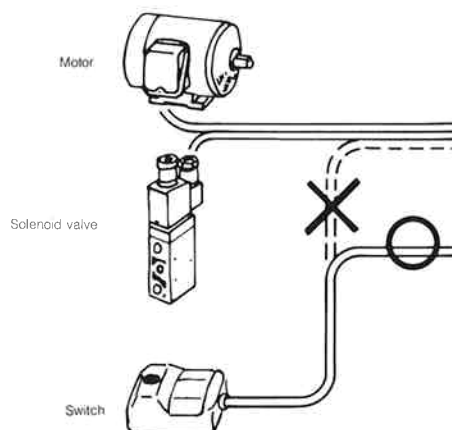
In general if a reed switch has a lead wire of length greater than 10m, the charge accumulated through the stray capacitance of the wire will result in rush current and contact fusion during switch actuation. Our reed switches have lead wires of length up to 50m and are equipped with induction surge prevention circuits to prevent the influence of stray capacitance. However, we recommend the following wire as a better method when using long lead wires.

a) We recommend using twisted pair shielded wiring.



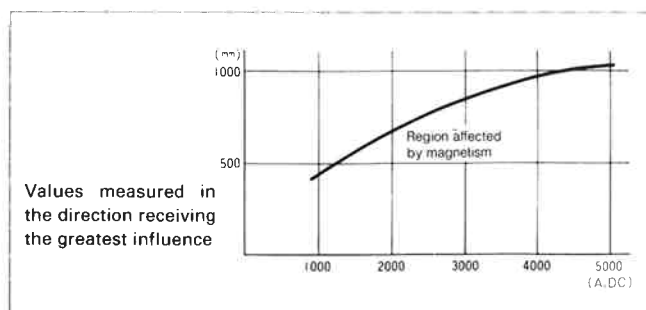
Twisted pair shielded wire is formed of two signal wires twisted together and is effective in cancelling induction current.

b) In order to prevent induction current, we recommend using shielded wire or special wire tubing wherever possible in the wiring of other electrical equipment.



13. Magnetic characteristics of reed switches

A reed switch is a combination of a permanent magnet and reed switch, and therefore is sensitive to external magnetic fields. In tests under a direct current magnetic field, there was no influence at positions greater than 1m from a DC5000A linear magnetic field. The switch is influenced to different extents depending on its direction, but the distances at which direct current shows an influence are as shown in the following graph.

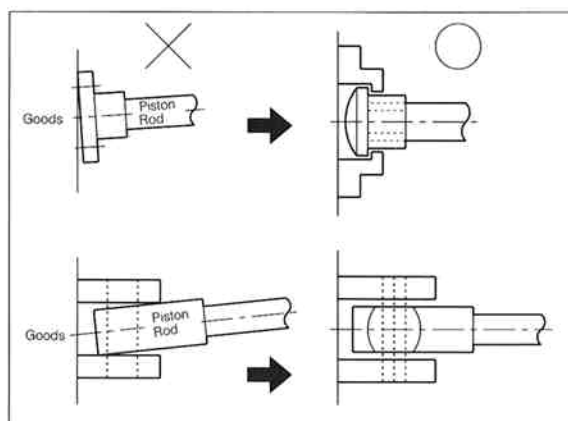


HANDLING PROCEDURE AND PRECAUTIONS

MOUNTING OF ROD IN CASE OF FIXED METAL FITTING (TYPE LB, FA, FB)

The moving direction of goods driven by a cylinder must coincide with the axial center of the moving piston rod at all times. Use of spherical bearings and floating joints is a preferable mounting method. If the axial center is deviated, leak or unstable operation is caused due to early wear of the bush or the rod packing. To check the mis-alignment of the axial center, be sure to align the center after measuring the mis-centering of the rod and the goods mounting area in both positions of the piston rod fully advanced and retreated. Then, connect the goods to the cylinder. In a test run, move the cylinder at the minimum operating pressure (piston speed: About 50 mm/s) to check that the cylinder operates smoothly. Conduct the same check for operation of the cylinder-to-goods connecting fitting.

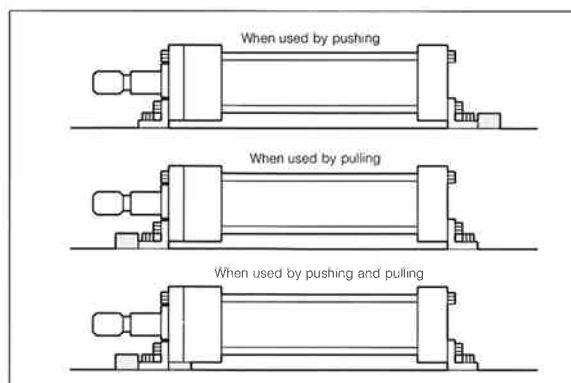
〈Easy centering method〉



When the cylinder body is fixed, the rigidity of the mounting area member has a large effect on the cylinder performance. Namely, if the rigidity of the mounting area member is insufficient, distortion of the mounting area member is caused by thrust of the cylinder, resulting in pinch between the piston rod and the bushing. This leads to early wear of them or break of the piston rod threads.

MOUNTING OF CYLINDER BODY WITH METAL FITTING TYPE LB

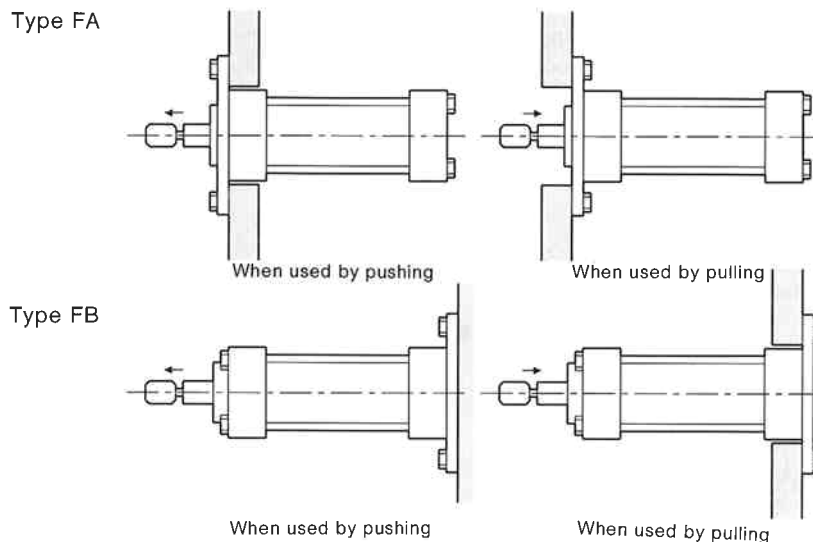
In the case of cylinders Type LA or LB, it is mounted with a locking bolt of the metal fitting Type L. But, it can be said complete, because it moves in the axial direction when it is exposed to a load. In such a case, therefore, set stoppers on the mounting base side as shown below.



HANDLING PROCEDURE

MOUNTING OF CYLINDER BODY WITH METAL FITTING TYPE FA, FB

In consideration of the loading direction, fix the cylinder according a method shown below.



[Note] Connection of a fixed type cylinder to an oscillating arm is basically undesirable. But, if it cannot be avoided, machine an oblong hole in the arm, and be careful so that no lateral load is applied to the piston rod. At that time, sufficient care has to be taken of the strength of the oblong hole sliding area as well as the sliding resistance.

MOUNTING OF CYLINDER BODY WITH OSCILLATING TYPE METAL FITTING (TYPE CA, CB, TC)

In the case of a movable cylinder mounted on a flat surface, be sure to connect the rod tip connecting metal fitting with a pin or the like and mount the cylinder body so that it may move on a flat surface. In addition, conduct the same centering of the flat surface in the right angle direction that for the fixed type. Install spherical bearings and others as necessary.

Be sure to apply a lubricating oil to the connecting metal fitting bearing.

Minimize the gap between the clevis or trunnion and the mating bearing. Also, align the axial center so that no bending moment is applied to the area between the bearing and the pin.

In the case of a cylinder of long stroke mounted horizontally, the clevis type with the support point located at the cylinder end adversely affects the bearing and the packing because of application of own weight of the rod, tube, etc.

Use a trunnion type which has the support point on the front side.

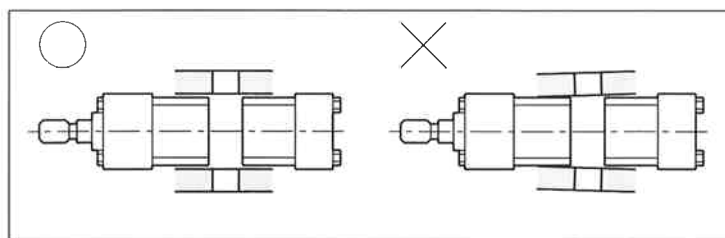
● Metal fitting Type CA, CB

Use a pin of the specified size.

● Metal fitting Type TC

Mount the mating side metal fitting so that it forms a right angle to the trunnion boss. If it is mounted on an inclined position, the boss bearing will suffer from unilateral wear, leading to pronounced reduction of the service life.

«Mounting of example of trunnion bearing»



HANDLING PROCEDURE

PRECAUTIONS ON PIPING WORK

Be careful so as not to allow infiltration of dust and pipecuttings in to the piping.

In piping, determine the size to allow supply of sufficient volume of air.

As to the pressure source air, use clean air having passed a throw cooling system (after-cooler) or filter.

INSTALLATION PLACE AND OPERATING ENVIRONMENT

Use the cylinder in an indoor environment. Do not use it in a place with much dust or violent vibration.

Environment	Countermeasures
Exposure to cloud of sand, dust, earth and sand, chips, weld spatter, etc.	Protection of rod
Exposure to rainwater, water, seawater, oil, chemicals, etc.	Rust prevention, review of part material
Direct sunlight (ozone), damp, etc.	Rust prevention, review of part material
High temperature, low temperature, freezing	Review of part material
High magnetic field	Magnetic shield
Vibration	Vibration-isolating measures

For any unclear details, inquire with us.

OTHER PRECAUTIONS

When welding in the mounthing work, be careful so that no current passes to the cylinder. If the current passes, arcspark is generated in the area between the rod and the bushing or the piston and the tube, possibly damaging cylinder parts.

When oiling is made using a lubricator, use the turbine oil ISOVG32 or equivalent oil. Some kinds of oils swell packings to induce leak.

Once the cylinder is used after lubrication, do not discontinue lubrication. When grease sealed in is washed out, early wear or seizure is caused.

Do not use the cylinder in frozen a state. If it is operated in a frozen state, break of packing or marring of the sliding area is caused.

Absorption of impact with a cushion is limited. The cushion mechanism incorporated in the cylinder is installed so that the cylinder is not broken. Concerning inertia force which cannot be absorbed by the cushion mechanism, take external setting of an inertia absorber or countermeasures on the pneumatic circuit into consideration.