Free Mount Cylinder for Vacuum
Series ZCUK

How to Order

Basic ZCUK C 16 – 20 D

With auto switch ZCDUK C 16 – 20 D – A90 S

Built-in magnet

Style (Tubing method in vacuum side)/(Rod end shape)
- **C** — Cap piping/Male thread
- **D** — Cap piping/Pad direct mounting
- **Q** — Rod piping/Male thread
- **R** — Rod piping/Pad direct mounting

Bore size (mm)
- **10** — 10mm
- **16** — 16mm
- **20** — 20mm
- **25** — 25mm
- **32** — 32mm

Bore size—Stroke (mm)
- **10, 16** — 5, 10, 15, 20, 25, 30
- **20, 25, 32** — 5, 10, 15, 20, 25, 30, 40, 50

Acting
- **D** — Double acting

Auto switch

–	Without auto switch

Refer to the table below for auto switch model no.

Number of auto switches
- **–** — 2 pcs.
- **S** — 1 pc

Auto Switch Specifications

Refer to p. 3.9-5 for more detailed specifications.

Type	Special function	Electrical entry	Indicator light	Lead wire (output)	Load voltage DC	Load voltage DC	Load voltage AC	Auto-switch model Perp.	Auto-switch model In-line	Wire length* (m) 0.5 (–)	Wire length* (m) 3 (L)	Wire length* (m) 5 (Z)	Applicable load	
Reed switch	—	Grommet	Yes	2-wire	24V	5V 12V	100V or less	A90V	A90	●	●	–	IC	Relay PLC
						12V	100V	A93V	A93	●	●	–	–	
			No	3-wire (NPN)	–	5V	–	A96V	A96	●	●	–	IC	–
Solid state switch	—	Grommet	No	3-wire (NPN)	24V	12V	–	F9NV	F9N	●	●	–	–	Relay PLC
				3-wire (PNP)				F9PV	F9P	●	●	–		
				2-wire				F9BV	F9B	●	●	–		
	Diagnosis indication (2 colors)			3-wire (NPN)				F9NWV	F9NW	●	●	○		
				3-wire (PNP)				F9PWV	F9PW	●	●	○		
				2-wire				F9BWV	F9BW	●	●	○		

*Lead wire length symbol
- 0.5m ·····No symbol Ex.) A93
- 3m ·····L Ex.) A93L
- 5m ·····Z Ex.) F9NWZ

*○: Can be manufactured upon receipt of the order.
*"D-9□" auto-switches are also mountable (D-90, D-90A, D-93A and D-97).
Refer to p. 2.11-12 to 2.11-14 for details.

How to Order Vacuum Pad

● In case of rod end male thread

ZPT 02 U N – B4

Pad dia. (mm)
- **02** — ø2
- **04** — ø4
- **06** — ø6
- **08** — ø8
- **10** — ø10
- **13** — ø13
- **16** — ø16
- **20** — ø20
- **25** — ø25
- **32** — ø32
- **40** — ø40
- **50** — ø50

Pad Style (Application: Refer to table ①)
- **U** — Flat
- **C** — Flat with ribs
- **D** — Deep
- **B** — Bellows

Material
- **N** — NBR
- **S** — Silicon rubber
- **U** — Urethane rubber
- **F** — Fluorine rubber
- **GN** — Conductive NBR(ø2 to ø16)
- **GS** — Conductive silicon rubber(ø2 to ø16)

Vacuum entry(Mounting thread diameter)

	Symbol	thread dia.	ø2 to ø8	ø10 to ø16	ø20 to ø32	ø40, ø50
Female thread	B4	M4 X 0.7	●	–	–	–
	B5	M5 X 0.8	●	●	–	–
	B6	M6 X 1	–	●	●	–
	B8	M8 X 1.25	–	–	●	●
	B10	M10 X 1.25	–	–	●	●

Table ①Pad dia./Pad style

Dia. (mm) / Style	2	4	6	8	10	13	16	20	25	32	40	50
Flat	●	●	●	●	●	●	●	●	●	●	●	●
Flat with ribs	–	–	–	–	●	●	●	●	●	●	●	●
Deep	–	–	–	–	●	–	●	–	●	–	●	–
Bellows	–	–	●	●	●	●	●	●	●	●	●	●

Note) Refer to p. 3.9-4 for combination of cylinder and pad.

● In case of pad direct mounting

ZP 04 U N – X11

Pad dia. (mm)
- **02** — ø2
- **04** — ø4
- **06** — ø6
- **08** — ø8
- **10** — ø10
- **13** — ø13
- **16** — ø16
- **20** — ø20
- **25** — ø25
- **32** — ø32
- **40** — ø40
- **50** — ø50

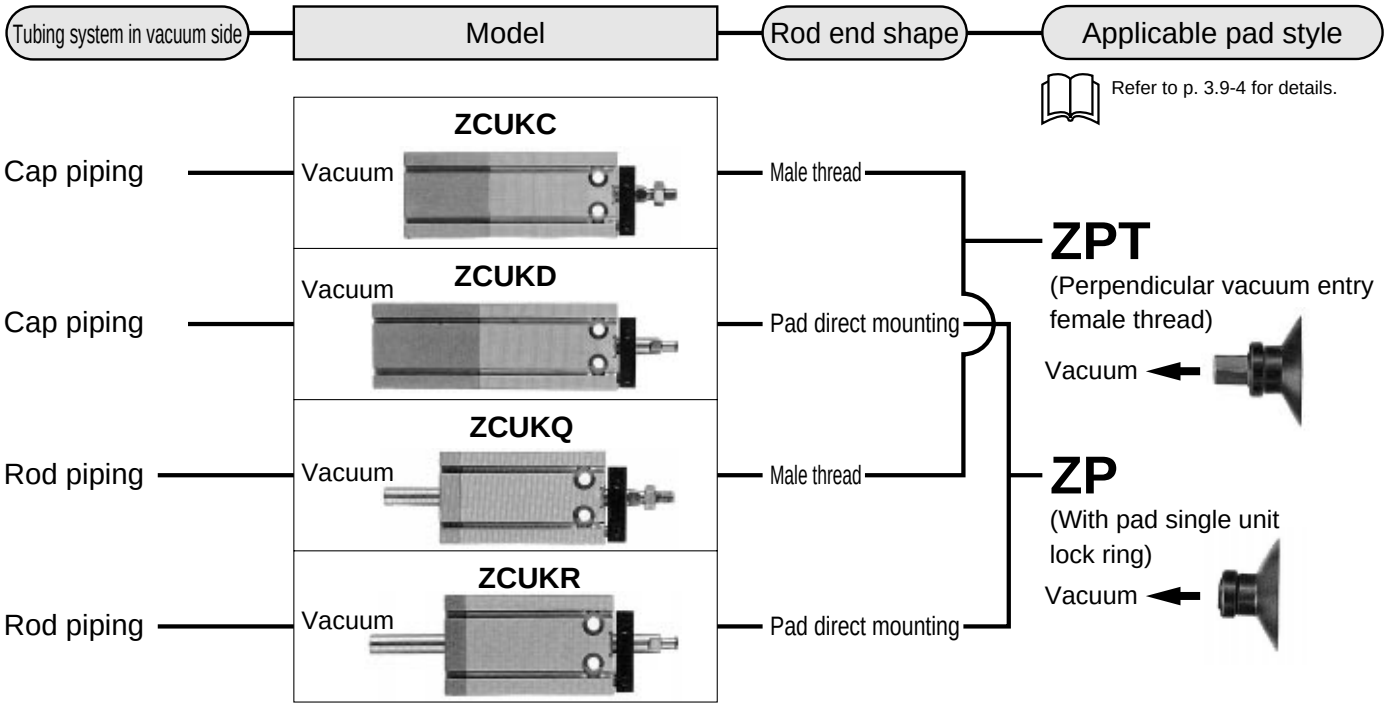
Suffix symbol

Symbol	Applicable cylinder
X11	ZC(D)UK D/R10
—	ZC(D)UK D/R16 to 32

Note) "-X11" Pad: ø2 to ø8 diameter and flat style only available.

Material
- **N** — NBR
- **S** — Silicon rubber
- **U** — Urethane rubber
- **F** — Fluorine rubber
- **GN** — Conductive NBR (ø2 to ø16)
- **GS** — Conductive silicon rubber (ø2 to ø16)

Pad style
- **U** — Flat
- **C** — Flat with ribs
- **D** — Deep
- **B** — Bellows (except "-X11")



⚠Precautions

Be sure to read before handling. Refer to p. 0-20 and 0-21 for Safety Instructions and common precautions on the products mentioned in this catalog, and refer to p. 3.0-2 for precautions on every series.

⚠ Caution

①**Do not place your finger in the clearence between the detent plate and the cylinder tube.**
Never insert your finger between the non-rotating plate and the cylinder tube to prevent it from being pinched when the piston rod retracts. If your finger is caught, it could injure your finger because the cylinder outputs a considerable amount of force.

②Make sure that rotational torque is not applied to the piston rod. If this is unavoidable, operate the cylinder within the allowable rotational torque listed in the table below.

Allowable Rotational Torque

Bore size(mm)	ø10	ø16	ø20	ø25	ø32
Allowable rotational torque (N·m)	0.02	0.04	0.10	0.15	0.20

③To secre a workpiece to the end of the piston rod, tighten the workpiece onto the piston rod with the piston rod fully retracted so that torque is not applied to the piston rod.

④To install a cylinder, tighten it within the torque valves indicated in the table below.

Proper Tightening Torque

Bore size (mm)	Hexagon socket head bolt diameter(mm)	Proper tightening torque (Nm)
ø10	M3	1.08 ±10%
ø16	M4	2.45 ±10%
ø20, ø25	M5	5.10 ±10%

Specifications

Fluid	Air
Proof pressure	1.05MPa
Max. operating pressure	0.7MPa
Vacuum port pressure	–101kPa to 0.6MPa(1) (At vacuum release 0 to 0.6MPa)
Ambient and fluid temperature	Without auto-switch: –10°C to +70°C With auto-switch: –10°C to +60°C (No freezing)
Lubrication	Not required
Piston speed	50 to 500mm/s
Cushion	Rubber bumper at both sides
Stroke allowance	$^{+1.0}_{0}$
Thread tolerance	JIS 2 Class
Rod tip screw	With or without (Pad direct mounting)
Mounting	Basic type
Applicable pad	Refer to p.3.9-4 for details.

Note 1) For a cap style, supply pressure only when vacuum is released. That pressure should be less than the cylinder pressure.

Non-rotating Rod Accuracy (No load/At retraction of the rod at the locking plate side)

Tube bore size (mm)	ø10	ø16	ø20	ø25	ø32
Non-rotating piston rod accuracy	±0.8°		±0.5°		

Minimum Operating Pressure

(MPa)

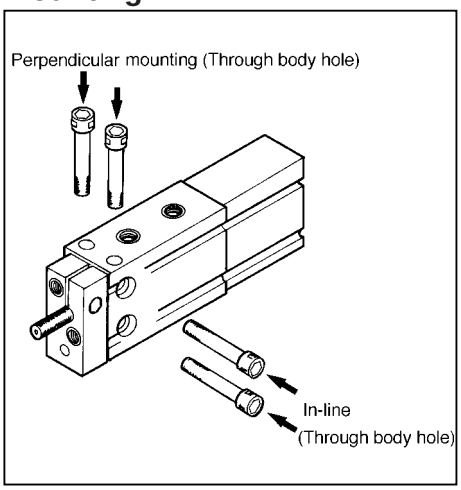
Tube bore size (mm)	ø10	ø16	ø20	ø25	ø32
Min. operating pressure (MPa)	0.13	0.13	0.11	0.11	0.11

Applicable Auto Switch Model

Model		Electrical entry		Indicator light
Reed switch	D-A90	Grommet	2 wire/In line	Unavailable
	D-A93			Available
	D-A96		3 wire/In line	
	D-A90V		2 wire/Perpendicular	Unavailable
	D-A93V			Available
	D-A96V		3 wire/Perpendicular	
Solid state switch	D-F9N		3 wire/NPN/In line	Available
	D-F9P		3 wire/PNP/In line	
	D-F9B		2 wire/In line	
	D-F9NW		3 wire/NPN/In line(2 color indicator)	
	D-F9PW		3 wire/PNP/In line (2 color indiator)	
	D-F9BW		2 wire/In line (2 color indicator)	
	D-F9NV		3 wire/NPN/Perpendicular	
	D-F9PV		3 wire/PNP/Perpendicular	
	D-F9BV		2 wire/Perpendicular	
	D-F9NWV		3 wire/NPN/Perpendicular (2 color indicator)	
	D-F9PWV		3 wire/PNP/Perpendicular (2 color indicator)	
	D-F9BWV		2 wire/Perpendicular (2 color indicator)	

"D-9□" auto switches are also mountable (D-90, D-90A, D-93A and D-97). Refer to p. 2.11-12 and 2.11-14 for details.

Mounting



Standard Stroke

(mm)

Cylinder bore (mm)	Double acting/Single rod, Non-rotating piston rod							
	Stroke (mm)							
	5	10	15	20	25	30	40	50
10	●	●	●	●	●	●	–	–
16	●	●	●	●	●	●	–	–
20	●	●	●	●	●	●	●	●
25	●	●	●	●	●	●	●	●
32	●	●	●	●	●	●	●	●

Min. Stroke for Mounting Auto switch

Applicable auto switch	No. of switches	
	1 pc.	2 pcs.
D-F9□ D-F9□V	5	5
D-F9□W D-F9□WV	5	10
D-A9□ D-A9□V	5	10

Theoretical Force/Double Acting Style

Unit: N

Cylinder bore (mm)	Rod dia. (mm)	Effective area (cm^2)	Operating pressure (MPa)		
			0.3	0.5	0.7
10	4	66.0	19.8	33	46.2
16	6	172	51.6	86	121
20	8	264	79.2	132	185
25	10	412	124	206	289
32	12	691	207	346	484

Cylinder/Applicable Pad

•In case of rod end male thread

Use series ZPT pad (vertical vacuum entry/female thread mounting).

Cylinder		Pad(ZPT02 to 50□□-B4 to 10)												
Model	Bore (mm)	Pad dia. (mm)												Thread dia.
		2	4	6	8	10	13	16	20	25	32	40	50	
ZCUKC ZCUKQ ZCDUKC ZCDUKQ	**10**	●	●	●	●	—	—	—	—	—	—	—	—	M4 X 0.7
	16	●	●	●	●	●	●	●	—	—	—	—	—	M5 X 0.8
	20	—	—	—	—	●	●	●	●	●	●	—	—	M6 X 1.0
	25	—	—	—	—	—	—	—	●	●	●	●	●	M8 X 1.25
	32	—	—	—	—	—	—	—	●	●	●	●	●	M10 X 1.25

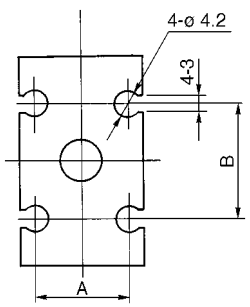
•In case of pad direct mounting

Use series ZP pad (single unit).

Cylinder		Pad (ZP02 to 50□□)											
Model	Bore (mm)	Pad dia. (mm)											
		2	4	6	8	10	13	16	20	25	32	40	50
ZCUKD ZCUKR ZCDUKD ZCDUKR	10(1)	●	●	●	●	—	—	—	—	—	—	—	—
	16	●	●	●	●	—	—	—	—	—	—	—	—
	20	—	—	—	—	●	●	●	—	—	—	—	—
	25	—	—	—	—	—	—	—	●	●	●	—	—
	32	—	—	—	—	—	—	—	—	—	—	●	●

Note 1) When using "ZC(D) UK$^{U}_{R}$10", use ZP02 to 08U∗ -X11. Pad shape is flat only.

Switch Groove Location

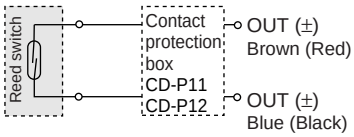


Bore size	A	B
10	10.3	13
16	15	18
20	21	23
25	27	25
32	35	27

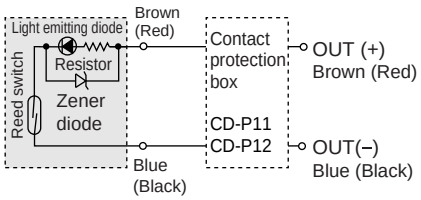
Auto Switch Specifications

Auto Switch Internal Circuit

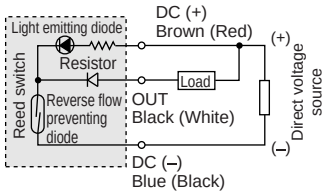
D-A90
D-A90V



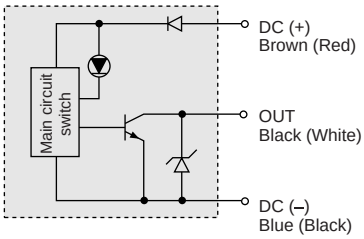
D-A93/D-A93V



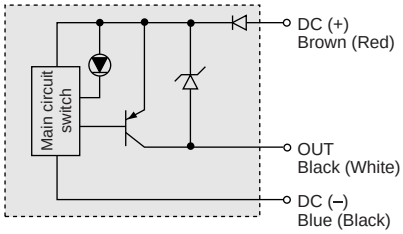
D-A96/D-A96V



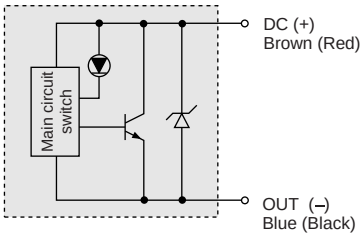
D-F9N/D-F9NV



D-F9P/D-F9PV

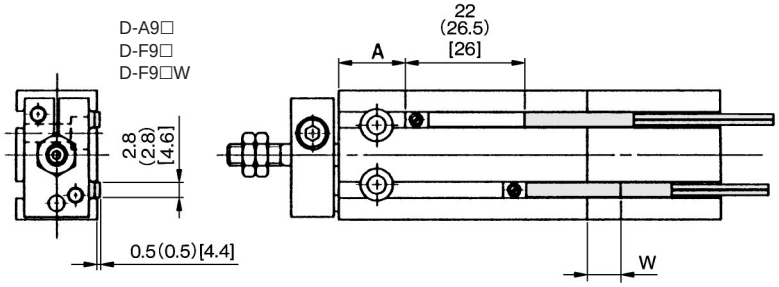


D-F9B/D-F9BV



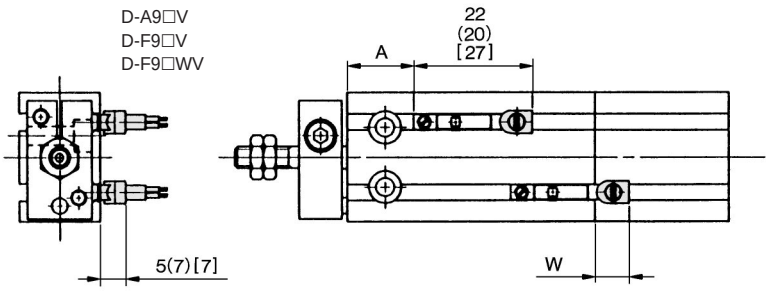
Auto Switch Setting Position

D-A9□
D-F9□
D-F9□W



( ): Dimensions for "D-F9B" and "D-F9P"
[ ]: Dimensions for "D-F9□W"

D-A9□V
D-F9□V
D-F9□WV



( ): Dimensions for "D-F9□V"
[ ]: Dimensions for "D-F9□WV"

Bore size (mm)	D-A9□/D-A9□V			D-F9B/D-F9P			D-F9N			D-F9□V			D-F9□W			D-F9□VW		
	A	B	W	A	B	W	A	B	W	A	B	W	A	B	W	A	B	W
6	13	5.5	–3.5	17.5	10	5	17.5	10	0.5	17.5	10	–1.5	16.5	9	3.5	16.5	9	4.5
10	12	9	–7.5	16.5	13.5	1	16.5	13.5	–3.5	16.5	13.5	–5.5	15.5	12.5	–0.5	15.5	12.5	0.5
16	15.5	11	–9.5	20	15.5	–1	20	15.5	–5.5	20	15.5	–7.5	19	14.5	–2.5	19	14.5	–1.5
20	19.5	14.5	–13	24	19	–4.5	24	19	–9	24	19	–11	23	18	–6	23	18	–5
25	22	16	–14.5	27.5	20.5	–6	27.5	20.5	–10.5	27.5	20.5	–12.5	25.5	19.5	–7.5	25.5	19.5	–6.5
32	23	18	–16.5	28.5	22.5	–8	28.5	22.5	–12.5	28.5	22.5	–14.5	26.5	21.5	–9.5	26.5	21.5	–8.5

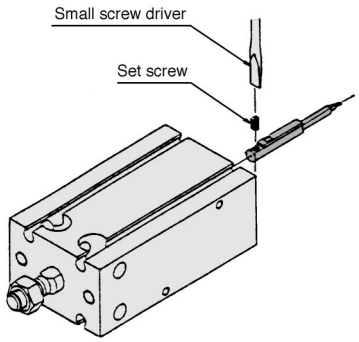
Notes)1.With the W type, the negative dimentions indicated in the table are for installing on the left side of the reference position indicated in the drawing above.
2.In the case of the 5mm stroke and the 10mm stroke types, due to the operation range, there are times in which the switch might not turn OFF or 2 switches will turn ON simultaneously. To set the position, place the switch 1 to 4mm outside the values indicatad in the above table and inspect to make sure that the switch operates correctly.

Auto Switch Specifications

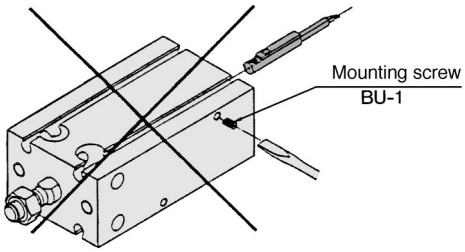
How to Mount Auto Switches

Mounting

D-A9□, F9□, A9□V, F9□V



•To tighten the auto switch monting screws, use a watchmaker's screwdriver with a grip diameter of 5 to 6mm.
•Tighten the screws to a torque of approximately 0.10 to 0.20 N·m.



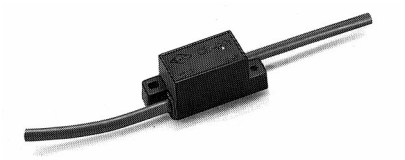
•Do not install using BU-1 (mounting screws used exclusively for D-9□ model auto switch). (Failure to observe this precaution could cause the auto switch to break.)

Contact Protection Box

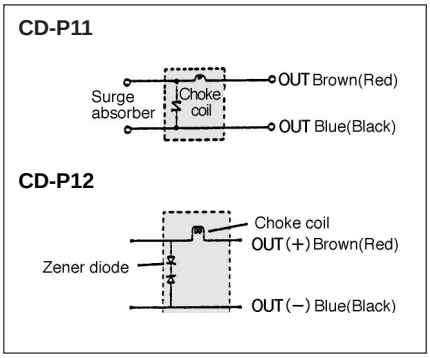
The D-A9□ and D-A9□V model switches are not provided with a built-in contact protection circurt.
①The operating load is an inductive load.
②The length of writing to the load exceeds 5 meters.
③The load voltage is 100VAC.
Use a contact protection box if any one of the conditions given above applies.

Part No.	CD-P11		CD-P12
Load voltage	AC100V	AC200V	DC24V
Max. Load current	25mA	12.5mA	50mA

∗Lead wire length: Switch side 0.5m
Load side 0.5m

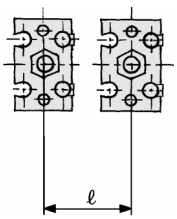


Contact protection box/ Internal circuit



Precautions for installing an auto switch close to a cylinder

If the mounting pitch of a free-mount cylinder with D-A9□, D-F9□ type auto switch is less than the dimensions indcated in the table below, the auto switch could malfunction. Therefore, make sure to provide a greater clearance. If use under the dimensions indicated below is unavoidable, it is necessary to provide a shield. To do so, affix a steel plate or a magnetic shield plate (MU-S025) to the corresponding position of the cylinder that is placed near the auto switch. (Contact SMC for further details.) If a shield plate is not used, it could cause the auto switch to malfunction.



Bore size(mm)	Mounting pitch ℓ(mm)
10	20
16	33
20	40
25	46
32	56

Weight Table

Basic/With auto switch

Unit:g

Model	Bore size (mm)	Cylinder stroke(mm)							
		5	**10**	**15**	**20**	**25**	**30**	**40**	**50**
ZC(D)UKC	**10**	63 (68)	69 (79)	75 (85)	81 (91)	87 (97)	93 (103)	—	—
	16	103 (128)	115 (145)	127 (157)	139 (169)	151 (181)	163 (193)	—	—
	20	180 (214)	204 (244)	228 (267)	252 (292)	276 (316)	300 (340)	348 (388)	396 (436)
	25	304 (358)	343 (402)	382 (441)	421 (480)	460 (519)	499 (558)	577 (636)	655 (714)
	32	514 (587)	574 (652)	634 (712)	694 (772)	754 (832)	814 (892)	934 (1012)	1054 (1132)
ZC(D)UKQ	**10**	49 (54)	53 (63)	57 (67)	61 (71)	65 (75)	69 (79)	—	—
	16	79 (104)	86 (116)	93 (123)	100 (130)	107 (137)	114 (144)	—	—
	20	145 (179)	159 (198)	173 (212)	187 (226)	201 (240)	215 (254)	243 (282)	271 (310)
	25	259 (313)	279 (338)	299 (358)	319 (378)	339 (398)	359 (418)	399 (458)	439 (498)
	32	421 (494)	451 (529)	481 (559)	511 (589)	541 (619)	571 (649)	631 (709)	691 (769)

( ): D-A90

SMC Information

SMC Corporation
1-16-4 Shinbashi, Minato-ku,
Tokyo 105-8659, Japan
URL: http://www.smcworld.com

'03-E503 Issued: December, 2003
D-YGA P-80(YGA)

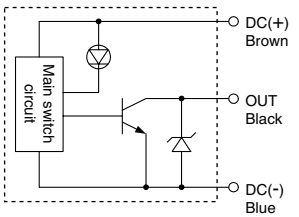
Solid-state Auto Switches for Direct Mounting
Series D-M9N(V)/D-M9P(V)/D-M9B(V)

Grommet

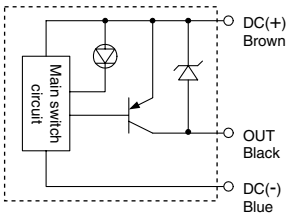
- Reduced load currents for two-wire model (2.5 to 40 mA)
- Compliance with lead-free requirements
- Use of UL-approved lead wires (style 2844)

Internal circuits

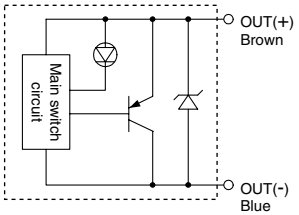
D-M9N/M9NV



D-M9P/M9PV



D-M9B/M9BV



Auto Switch Specifications

PLC: Programmable Logic Controller

D-M9□/D-M9□V (with Indicator light)						
Model number	**D-M9N**	**D-M9NV**	**D-M9P**	**D-M9PV**	**D-M9B**	**D-M9BV**
Electrical entry	In-line	Perpendicular	In-line	Perpendicular	In-line	Perpendicular
Wiring	Three-wire				Two-wire	
Output	NPN		PNP		—	
Applicable load	Integrated circuit, relay and PLC				24 V DC relay and PLC	
Power voltage	5, 12, or 24 V DC (4.5 to 28 V DC)				—	
Current consumption	10 mA or less				—	
Load voltage	28 V DC or less		—		24 V DC (10 to 28 V DC)	
Load current	40 mA or less				2.5 to 40 mA	
Internal voltage drop	0.8 V or less				4 V or less	
Leakage current	100 μA max. at 24 V DC				0.8 mA or less	
Indicator light	Red LED lights when ON.					

• Lead wire: oil-proof heavy-duty vinyl cable
2.7 x 3.2 with elliptic cross-section, 0.15 mm^2, two cores (D-M9B),
or three cores (D-M9N and D-M9P)

Solid state switch specifications

Leakage current	3-wire: 100 μA or less; 2-wire: 0.8 mA max.
Operating time	1 ms or less
Impact resistance	1000 m/s^2
Insulation resistance	50 MΩ or more at 500 V DC (between lead wire and case)
Withstand voltage	1000 V AC for 1 min. (between lead wire and case)
Ambient temperature	−10°C to 60°C
Enclosure	IEC529 standard IP67, JIS C 0920 watertight construction

Weight

Unit: g

Model		D-M9N(V)	D-M9P(V)	D-M9B(V)
Lead wire length (m)	0.5	8	8	7
	3	41	41	38
	5	68	68	63

How to Order

Standard Model Number

D-M9 N V L

Series Model Number

Wiring and output

N	3-wire, NPN
P	2-wire, PNP
B	2-wire

Electrical entry

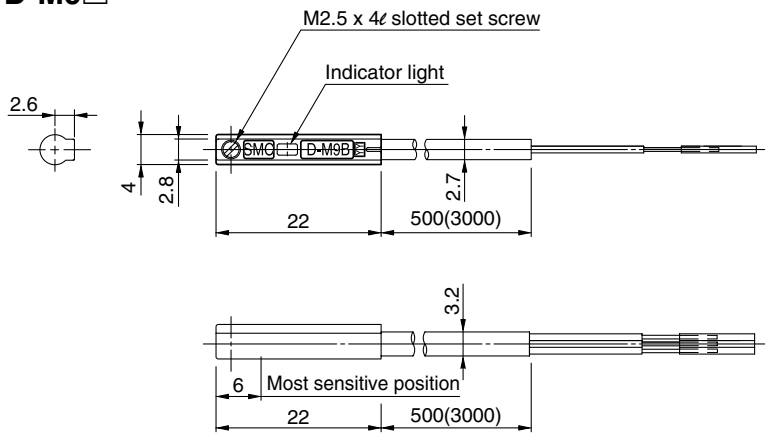
Nil	In-line
V	Perpendicular

Lead wire length

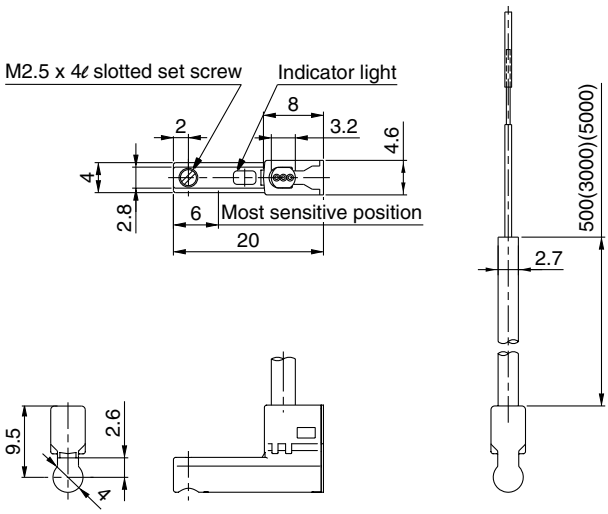
Nil	0.5m
L	3m
Z	5m

Auto Switch Dimensions

D-M9□



D-M9□V



⚠ Specific Product Precautions

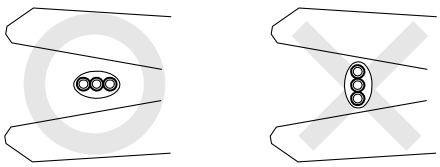
Be sure to read before handling. Contact SMC when the required specification is out of range.

Handling

⚠ Caution

Observe the following precautions when handling the product.

- The D-M9 series of auto switches is not overcurrent-protected.
  Faulty wiring or short circuit may result in breakage or burning-out of the switch.
- When stripping the cable clad, be careful about the orientation of the cable being stripped.
  The insulator may be accidentally torn or damaged depending on the orientation, as shown on the right.



● We recommend the following tools

Manufacturer	Product name	Product number
VESSEL	Wire stripper	No 3000G
Tokyo Ideal	Strip master	45-089

∗ The stripper for the round shape cords (ø2.0) is for a 2-wire style.

● Please do not attach the switch with any other screws than those already attached to the auto switch body.

The operation range is shorter than that of the conventional models.

If the auto switch replaces the conventional model, it may not function depending on its application because the operation range is shorter. Refer to the examples below.

- **In an application where at the end, the stopping position shifting range is larger than the operation range.**
  For example, pushing a work against something, or pressing a work into a hole, or clamping a work.
- **In an application where the auto switch is used to detect an intermediate stopping position. (Detecting time is shortened.)**

Note) Please contact SMC for the operation range details for each actuator.

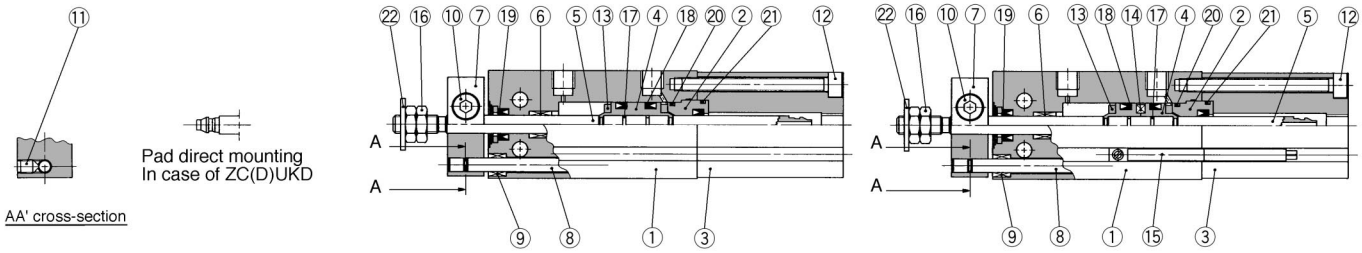
The switch is damaged instantly when a load is shortened since short circuit protection is not built-in. Pay special attention to avoid reversing the connection of the brown lead of the power supply line and the black output line connection.

Construction

Cap piping/Male thread: ZC(D)UKC

ø10

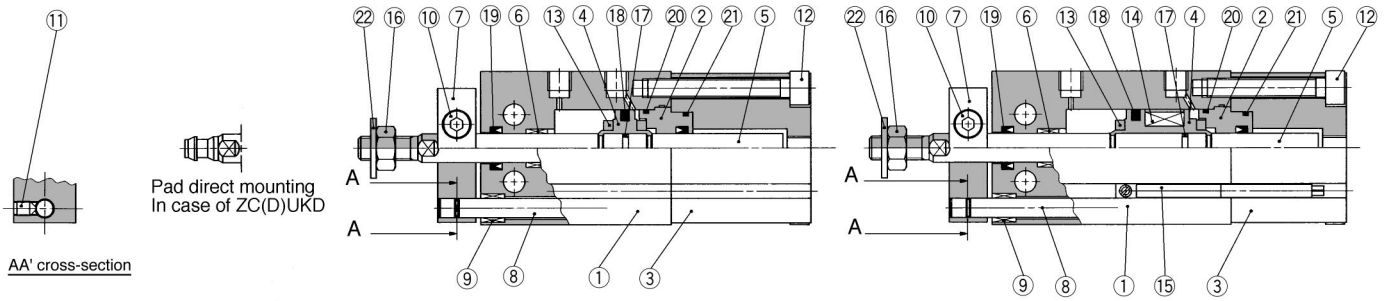
With auto switch



Refer to series CUK for outside color of the piston rod, tube and cap.

ø16 to ø32

With auto switch



Refer to series CUK for outside color of the piston rod, tube and cap.

Component Parts

No.	Description	Material	Notes
①	Cylinder tube	Aluminum alloy	Hard anodized
②	Rod cover B	Alumimum bearing alloy	Chromated
③	Cap	Aluminum alloy	Hard anodized
④	Piston	Aluminum alloy	Chromated
⑤	Piston rod	Stainless steel	
⑥	Bush	Oil impregnated sintered metal	
⑦	Plate	Aluminum alloy	Black anodized
⑧	Guide rod	Stainless steel	
⑨	Bush	Oil impregnated sintered metal	
⑩	Hexagon set screw	Carbon steel	Black zinc chromated
⑪	Hexagon socket head cap screw	Carbon steel	Black zinc chromated
⑫	Hexagon set screw	Carbon steel	Nickel plated

Component Parts

No.	Description	Material	Notes
⑬	Damper	Urethane	
⑭	Magnet	Magnetic material	
⑮	Auto switch	–	
⑯	Rod end nut	Carbon steel	Nickel plated
⑰	Piston gasket	NBR	
⑱	Piston seal	NBR	
⑲	Rod seal		
⑳	Gasket		
㉑	Gasket for cap		
㉒	Seal washer	Rolled steel/NBR	

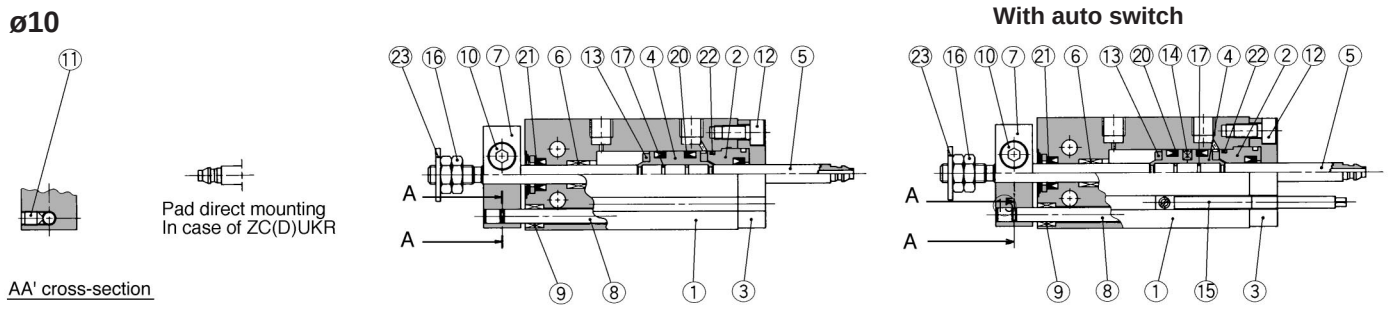
Replacement Parts

No.	Description	Material	Bore size/Part No.				
			ø10	**ø16**	**ø20**	**ø25**	**ø32**
⑱	Piston seal	NBR	MYP-10A	PPD-16	PPD-20	PPD-25	PPD-32
⑲	Rod seal		MYR-4	DYR-6K	DYR-8K	DYR-10SK	DYR-12
⑳	Gasket		ø10 X ø8 X ø1	ø16 X ø14 X ø1	C18	C22	C29
㉑	Gasket for cap		ø11 X ø9 X ø1	ø15 X ø13 X ø1	C16	C18	C22
㉒	Seal washer	Rolled steel/NBR	WCS4 X 0.7	WCS5 X 0.8	WCS6 X 1	WCS8 X 1	WCS10 X 1

Construction

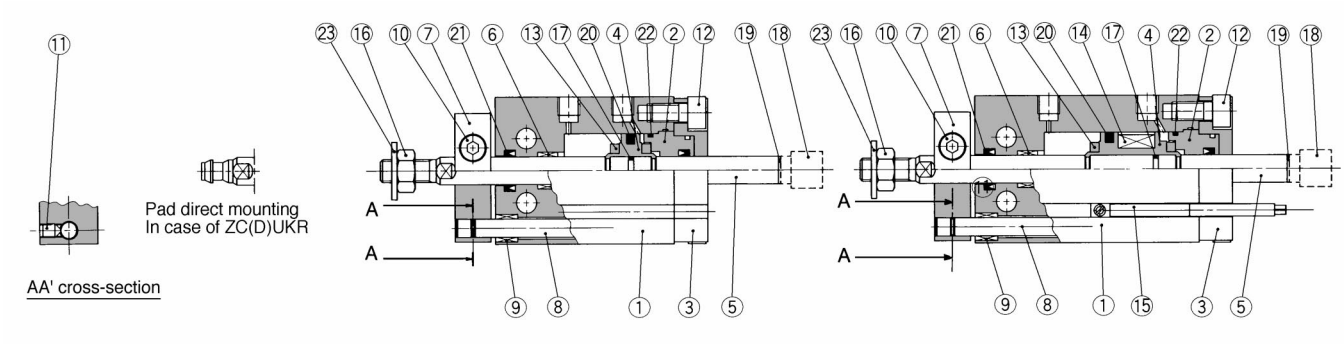
Rod piping/Male thread: ZC(D)UKQ

ø10



Refer to series CUK for outside color of the piston rod, tube and cap.

ø16 to ø32



Refer to series CUK for outside color of the piston rod, tube and cap.

Component Parts

No.	Description	Material	Notes
①	Cylinder tube	Aluminum alloy	Hard anodized
②	Rod cover B	Aluminum bearing alloy	Chromated
③	Rod cover retainer plate	Aluminum alloy	Hard anodized
④	Piston	Aluminum alloy	Chromated
⑤	Piston rod	Stainless steel	
⑥	Bush	Oil impregnated sintered metal	
⑦	Plate	Aluminum alloy	Black anodized
⑧	Guide rod	Stainless steel	
⑨	Bush	Oil impregnated sintered metal	
⑩	Hexagon set screw	Carbon steel	Black zinc chromated
⑪	Hexagon socket head cap screw	Carbon steel	Black zinc chromated
⑫	Hexagon set screw	Carbon steel	Nickel plated

Component Parts

No.	Description	Material	Notes
⑬	Damper	Urethane	
⑭	Magnet	Magnetic material	
⑮	Auto switch	—	
⑯	Rod end nut	Carbon steel	Nickel plated
⑰	Piston gasket	NBR	
⑱	Socket	Carbon steel	ø16 only
⑲	Gasket	NBR	ø16 only
⑳	Piston seal		
㉑	Rod seal		
㉒	Gasket		
㉓	Seal washer	Rolled steel/NBR	

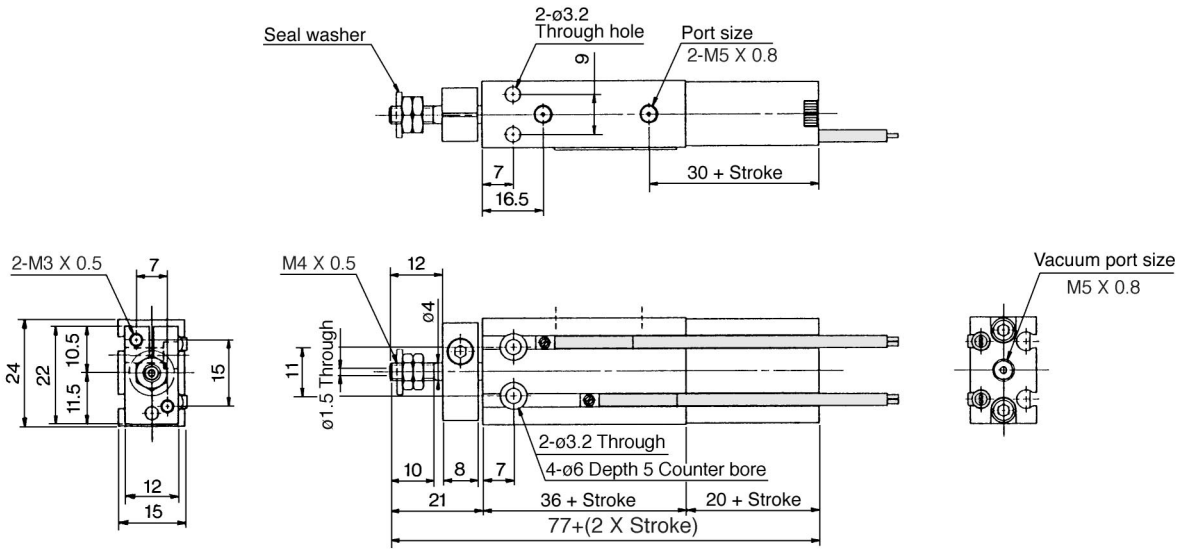
Replacement Parts

No.	Description	Material	Bore size/Part No.				
			ø10	ø16	ø20	ø25	ø32
⑳	Piston seal	NBR	MYP-10A	PPD-16	PPD-20	PPD-25	PPD-32
㉑	Rod seal		MYR-4	DYR-6K	DYR-8K	DYR-10SK	DYR-12
㉒	Gasket		ø10 X ø8 X ø1	ø16 X ø14 X ø1	C18	C22	C29
㉓	Seal washer	Rolled steel/NBR	WCS4 X 0.7	WCS5 X 0.8	WCS6 X 1	WCS8 X 1	WCS10 X 1

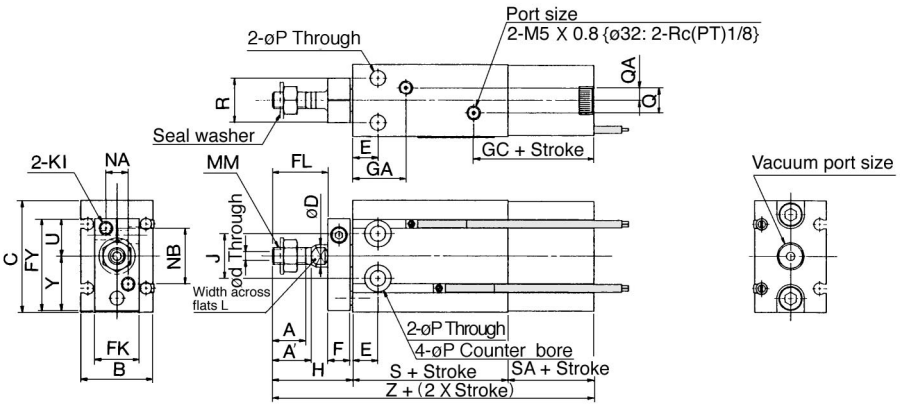
Vacuum Piping: Cap Piping/Rod End Shape: Male Thread

ZC(D)UKC Cylinder bore — Stroke D

ø10



ø16 to ø32



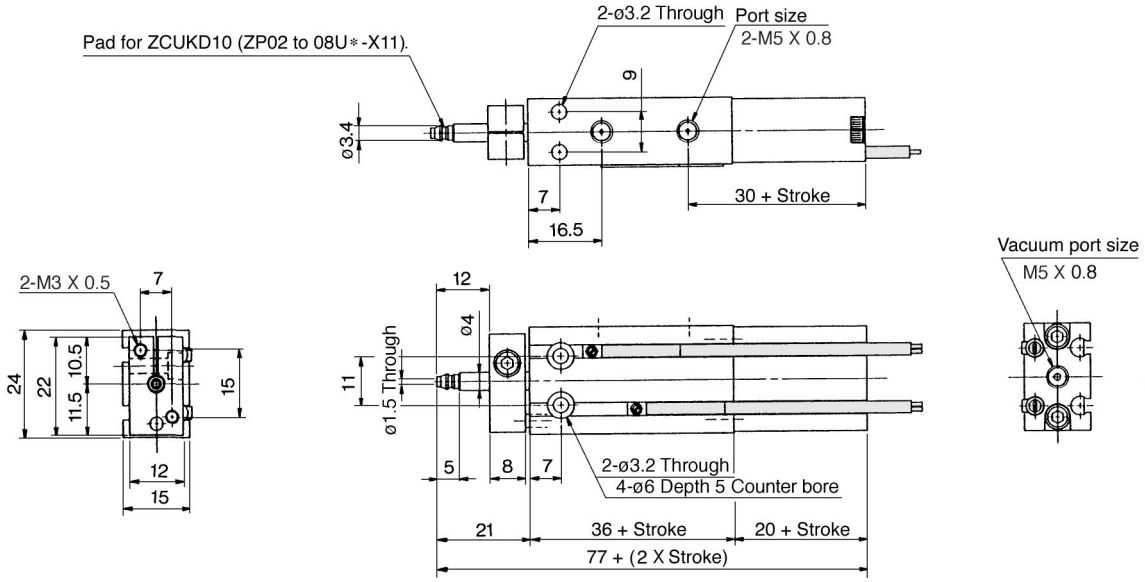
Model	Port size		Stroke range (mm)	A	A'	B	C	ød	øD	E	F	FK	FL	FY	GA	GC
	Air port	Vacuum port														
ZC(D)UKC16	M5 X 0.8	M5 X 0.8	5 to 30	11	12.5	20	32	2	6	7	8	13	17	28	16.5(1)	31
ZC(D)UKC20	M5 X 0.8	Rc(PT)1/8	5 to 50	12	14	26	40	3	8	9	8	16	20	33	19	33.5
ZC(D)UKC25	M5 X 0.8	Rc(PT)1/8	5 to 50	15.5	18	32	50	4	10	10	10	20	22	43.5	21.5	34
ZC(D)UKC32	Rc(PT)1/8	Rc(PT)1/8	5 to 50	19.5	22	40	62	5	12	11	12	24	29	51.5	23	35

Model	H	J	KI	L	MM	NA	NB	øP	Q	QA	R	S	SA	øT	U	Y	Z
ZC(D)UKC16	26	14	M4 X 0.7	5	M5 X 0.8	6	18	4.5	4	2	12	30(40)	19.5	7.6 Depth 6.5	12.5	15.5	75.5(85.5)
ZC(D)UKC20	29	16	M4 X 0.7	6	M6 X 1.0	8	20	5.5	9	4.5	16	36(46)	21	9.3 Depth 9	13.5	19.5	86(96)
ZC(D)UKC25	33	20	M5 X 0.8	8	M8 X 1.25	10	28	5.5	9	4.5	20	40(50)	21	9.3 Depth 8	19	24.5	94(104)
ZC(D)UKC32	42	24	M5 X 0.8	10	M10 X 1.25	12	32	6.6	13.5	4.5	24	42(52)	22	11 Depth 11.5	21	30.5	106(116)

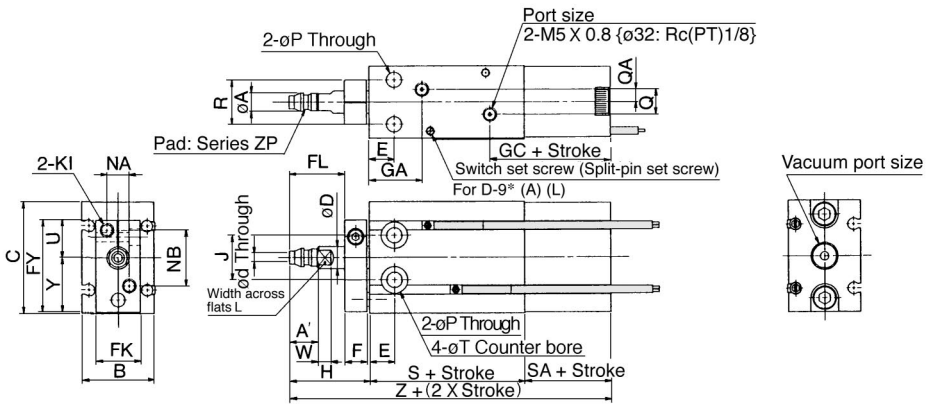
( ): In case of a mounted auto switch. Note 1) In case of ZCUKC16-5D: 14.5mm.

Vacuum Piping: Cap Piping/Rod End Shape: Pad Direct Mounting
ZC(D)UKD Cylinder bore—Stroke D

ø10



ø16 to ø32



Model	Port size		Stroke range (mm)	øA	A'	B	C	ød	øD	E	F	FK	FL	FY	GA	GC
	Air port	Vacuum port														
ZC(D)UKD16	M5 X 0.8	M5 X 0.8	5 to 30	5	7	20	32	2	6	7	8	13	17	28	16.5(1)	31
ZC(D)UKD20	M5 X 0.8	Rc(PT)1/8	5 to 50	6.6	8	26	40	3	8	9	8	16	20	33	19	33.5
ZC(D)UKD25	M5 X 0.8	Rc(PT)1/8	5 to 50	8	9	32	50	4	10	10	10	20	22	43.5	21.5	34
ZC(D)UKD32	Rc(PT)1/8	Rc(PT)1/8	5 to 50	11.5	10.5	40	62	5	12	11	12	24	29	51.5	23	35

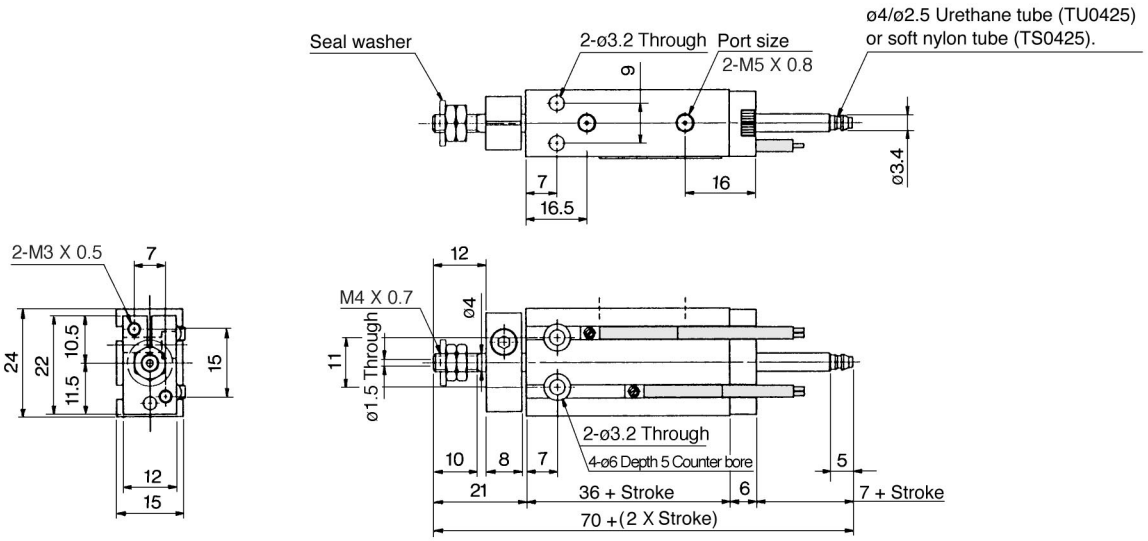
Model	H	J	KI	L	NA	NB	øP	Q	QA	R	S	SA	øT	U	W	Y	Z
ZC(D)UKD16	26	14	M4 X 0.7	5	6	18	4.5	4	2	12	30(40)	19.5	7.6 Depth 6.5	12.5	3.5	15.5	75.5(85.5)
ZC(D)UKD20	29	16	M4 X 0.7	6	8	20	5.5	9	4.5	16	36(46)	21	9.3 Depth 8	13.5	5	19.5	86(96)
ZC(D)UKD25	33	20	M5 X 0.8	8	10	28	5.5	9	4.5	20	40(50)	21	9.3 Depth 9	19	5	24.5	94(104)
ZC(D)UKD32	42	24	M5 X 0.8	10	12	32	6.6	13.5	4.5	24	42(52)	22	11 Depth 11.5	21	5	30.5	106(116)

( ): In case of a mounted auto switch. Note 1) In case of ZCUKD16-5D: 14.5mm.

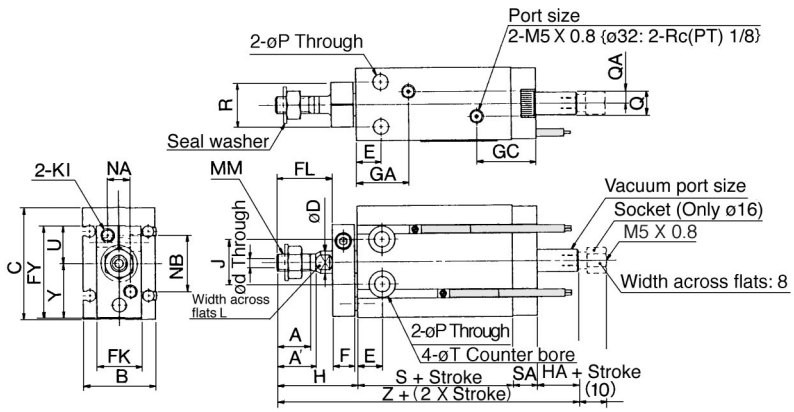
Vacuum Piping: Rod Piping/Rod End Shape: Male Thread

ZC(D)UKQ Cylinder bore–Stroke D

ø10



ø16 to ø32

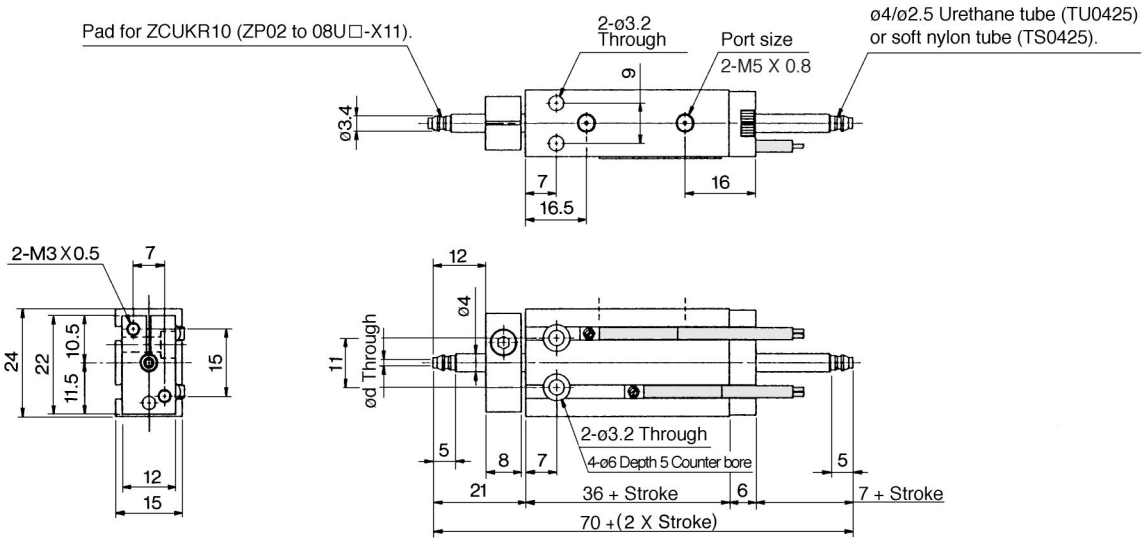


Model	Port size		Stroke range (mm)	A	A'	B	C	ød	øD	E	F	FK	FL	FY	GA	GC
	Air port	Vacuum port														
ZC(D)UKQ16	M5 X 0.8	M5 X 0.8(2)	5 to 30	11	12.5	20	32	2	6	7	8	13	17	28	16.5(1)	19
ZC(D)UKQ20	M5 X 0.8	M5 X 0.8	5 to 50	12	14	26	40	3	8	9	8	16	20	33	19	21.5
ZC(D)UKQ25	M5 X 0.8	M5 X 0.8	5 to 50	15.5	18	32	50	4	10	10	10	20	22	43.5	21.5	22
ZC(D)UKQ32	Rc(PT)1/8	Rc(PT)1/8	5 to 50	19.5	22	40	62	5	12	11	12	24	29	51.5	23	23

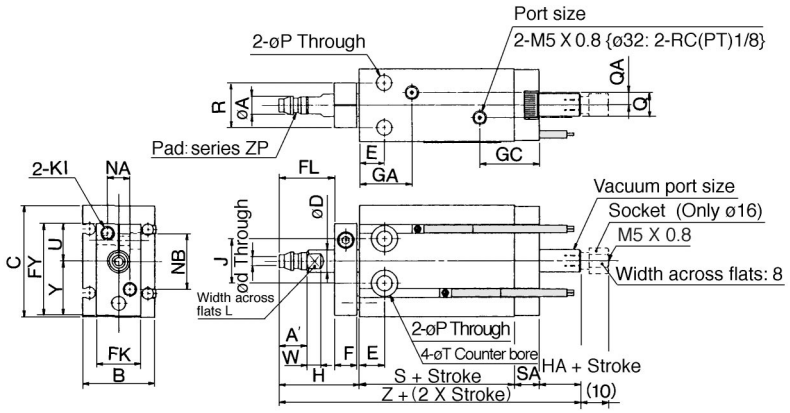
Model	H	HA	J	KI	L	MM	NA	NB	øP	Q	QA	R	S	SA	øT	U	Y	Z
ZC(D)UKQ16	26	5	14	M4 X 0.7	5	M5 X 0.8	6	18	4.5	4	2	12	30(40)	7.5	7.6 Depth 6.5	12.5	15.5	68.5(78.5)
ZC(D)UKQ20	29	5	16	M4 X 0.7	6	M6 X 1.0	8	20	5.5	9	4.5	16	36(46)	9	9.3 Depth 8	13.5	19.5	79(89)
ZC(D)UKQ25	33	5	20	M5 X 0.8	8	M8 X 1.25	10	28	5.5	9	4.5	20	40(50)	9	9.3 Depth 9	19	24.5	87(97)
ZC(D)UKQ32	42	5	24	M5 X 0.8	10	M10 X 1.25	12	32	6.6	13.5	4.5	24	42(52)	10	11 Depth 11.5	21	30.5	99(109)

( ): In case of a mounted auto switch. Note 1) In case of ZCUKQ16-5D: 14.5mm. Note 2) In case of socket equipped type.

ø10



ø16 to ø32



Model	Port size		Stroke range (mm)	øA	A	B	C	ød	øD	E	F	FK	FL	FY	GA	GC
	Air port	Vacuum port														
ZC(D)UKR16	M5 X 0.8	M5 X 0.8(2)	5 to 30	5	7	20	32	2	6	7	8	13	17	28	16.5(1)	19
ZC(D)UKR20	M5 X 0.8	M5 X 0.8	5 to 50	6.6	8	26	40	3	8	9	8	16	20	33	19	21.5
ZC(D)UKR25	M5 X 0.8	M5 X 0.8	5 to 50	8	9	32	50	4	10	10	10	20	22	43.5	21.5	22
ZC(D)UKR32	Rc(PT)1⁄8	Rc(PT)1⁄8	5 to 50	11.5	10.5	40	62	5	12	11	12	24	29	51.5	23	23

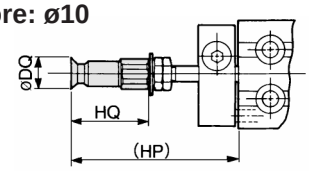
Model	H	HA	J	KI	L	NA	NB	øP	Q	QA	R	S	SA	øT	U	W	Y	Z
ZC(D)UKR16	26	5	14	M4 X 0.7	5	6	18	4.5	4	2	12	30(40)	7.5	7.6 Depth 6.5	12.5	3.5	15.5	68.5(78.5)
ZC(D)UKR20	29	5	16	M4 X 0.7	6	8	20	5.5	9	4.5	16	36(46)	9	9.3 Depth 8	13.5	5	19.5	79(89)
ZC(D)UKR25	33	5	20	M5 X 0.8	8	10	28	5.5	9	4.5	20	40(50)	9	9.3 Depth 9	19	5	24.5	87(97)
ZC(D)UKR32	42	5	24	M5 X 0.8	10	12	32	6.6	13.5	4.5	24	42(52)	10	11 Depth 11.5	21	5	30.5	99(109)

( ): In case of a mounted auto switch. Note 1) In case of ZCUKR16-5D: 14.5mm. Note 2) In case of socket equipped type.

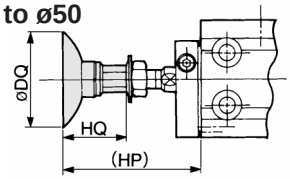
Dimensions of Pad Mounted Model

Rod end shape: Male thread

Tube bore: ø10



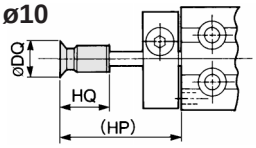
Tube bore: ø16 to ø50



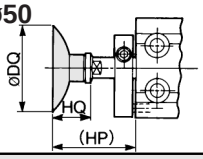
Model	Dia.(mm)	Flat/Flat with ribs												Deep				Bellows										Applicable pad model
		2	4	6	8	10	13	16	20	25	32	40	50	10	16	25	40	6	8	10	13	16	20	25	32	40	50	
ZC(D)UKC10 ZC(D)UKQ10	øDQ	2.6	4.8	7	9	–	–	–	–	–	–	–	–	–	–	–	–	7	9	–	–	–	–	–	–	–	–	**ZPT□□□-B4**
	HQ	19.5	19.5	19.5	19.5	–	–	–	–	–	–	–	–	–	–	–	–	20.5	20.5	–	–	–	–	–	–	–	–	
	HP	36.5	36.5	36.5	36.5	–	–	–	–	–	–	–	–	–	–	–	–	37.5	37.5	–	–	–	–	–	–	–	–	
ZC(D)UKC16 ZC(D)UKQ16	øDQ	2.6	4.8	7	9	12	15	18	–	–	–	–	–	12	18	–	–	7	9	12	15	18	–	–	–	–	–	**ZPT□□□-B5**
	HQ	19.5	19.5	19.5	19.5	21	21	21.5	–	–	–	–	–	24	25	–	–	20.5	20.5	25	27.5	29	–	–	–	–	–	
	HP	41.5	41.5	41.5	41.5	44	42	42.5	–	–	–	–	–	45	46	–	–	42.5	42.5	46	48.5	50	–	–	–	–	–	
ZC(D)UKC20 ZC(D)UKQ20	øDQ	–	–	–	–	12	15	18	23	28	35	–	–	12	18	28	–	–	–	12	15	18	22	27	34	–	–	**ZPT□□□-B6**
	HQ	–	–	–	–	21	21	21.5	23	23	23.5	–	–	24	25	29	–	–	–	25	27.5	29	32.5	33	38	–	–	
	HP	–	–	–	–	44	44	44.5	46	46	46.5	–	–	47	48	52	–	–	–	48	50.5	52	55.5	56	61	–	–	
ZC(D)UKC25 ZC(D)UKQ25	øDQ	–	–	–	–	–	–	–	23	28	35	43	53	–	–	28	43	–	–	–	–	–	22	27	34	43	53	**ZPT□□□-B8**
	HQ	–	–	–	–	–	–	–	29	29	29.5	32	33	–	–	35	42.5	–	–	–	–	–	38.5	39	44	47.5	51.5	
	HP	–	–	–	–	–	–	–	54	54	54.5	57	58	–	–	60	67.5	–	–	–	–	–	63.5	64	69	72.5	76.5	
ZC(D)UKC32 ZC(D)UKQ32	øDQ	–	–	–	–	–	–	–	23	28	35	43	53	–	–	28	43	–	–	–	–	–	22	27	34	43	53	**ZPT□□□-B10**
	HQ	–	–	–	–	–	–	–	32	32	32.5	35	36	–	–	38	45.5	–	–	–	–	–	41.5	42	47	50.5	54.5	
	HP	–	–	–	–	–	–	–	64	64	64.5	67	68	–	–	70	77.5	–	–	–	–	–	73.5	74	79	82.5	86.5	

Rod end shape: Pad Direct mounting

Tube bore: ø10



Tube bore: ø16 to ø50

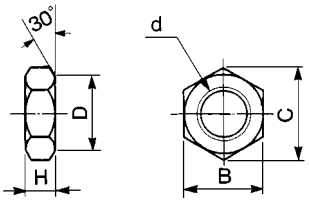


Model	Dia. (mm)	Flat/Flat with ribs												Deep				Bellows										Applicable pad model
		2	4	6	8	10	13	16	20	25	32	40	50	10	16	25	40	6	8	10	13	16	20	25	32	40	50	
ZC(D)UKD10 ZC(D)UKR10	øDQ	2.6	4.8	7	9	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	**ZP□U□-X11**[Note]
	HQ	10	10	10	10	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	
	HP	26	26	26	26	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	
ZC(D)UKD16 ZC(D)UKR16	øDQ	2.6	4.8	7	9	–	–	–	–	–	–	–	–	–	–	–	–	7	9	–	–	–	–	–	–	–	–	**ZP□□□**
	HQ	12	12	12	12	–	–	–	–	–	–	–	–	–	–	–	–	13	13	–	–	–	–	–	–	–	–	
	HP	31	31	31	31	–	–	–	–	–	–	–	–	–	–	–	–	32	32	–	–	–	–	–	–	–	–	
ZC(D)UKD20 ZC(D)UKR20	øDQ	–	–	–	–	12	15	18	–	–	–	–	–	12	18	–	–	–	–	12	15	18	–	–	–	–	–	**ZP□□□**
	HQ	–	–	–	–	12	12	12.5	–	–	–	–	–	15	16	–	–	–	–	16	18.5	20	–	–	–	–	–	
	HP	–	–	–	–	33	33	33.5	–	–	–	–	–	36	37	–	–	–	–	37	39.5	41	–	–	–	–	–	
ZC(D)UKD25 ZC(D)UKR25	øDQ	–	–	–	–	–	–	–	23	28	35	–	–	–	–	28	–	–	–	–	–	–	22	27	34	–	–	**ZP□□□**
	HQ	–	–	–	–	–	–	–	14	14	14.5	–	–	–	–	20	–	–	–	–	–	–	23.5	24	29	–	–	
	HP	–	–	–	–	–	–	–	38	38	38.5	–	–	–	–	44	–	–	–	–	–	–	47.5	48	53	–	–	
ZC(D)UKD32 ZC(D)UKR32	øDQ	–	–	–	–	–	–	–	–	–	–	43	53	–	–	–	43	–	–	–	–	–	–	–	–	43	53	**ZP□□□**
	HQ	–	–	–	–	–	–	–	–	–	–	18.5	19.5	–	–	–	29	–	–	–	–	–	–	–	–	34	38	
	HP	–	–	–	–	–	–	–	–	–	–	50	51	–	–	–	60.5	–	–	–	–	–	–	–	–	65.5	69.5	

Note) ZP□U□-X11: Flat style only.

Accessary Dimensions (Attached only to a rod end male thread type.)

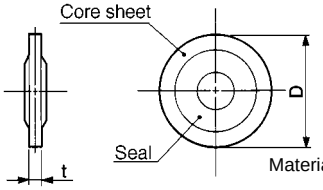
Rod end nut



Material: Carbon steel

Parts No.	Applicable cylinder bore (mm)	d	H	B	C	D
NTP-010	10	M4 X 0.7	2.4	7	8.1	6.8
NTJ-015A	16	M5 X 0.8	4	8	9.2	7.8
NT-015A	20	M6 X 1.0	5	10	11.5	9.8
NT-02	25	M8 X 1.25	5	13	15.0	12.5
NT-03	32	M10 X 1.25	6	17	19.6	16.5

Seal washer



Material: Core sheet — Rolled steel
Seal — NBR

Parts No.	Applicable cylinder bore (mm)	t	D
WCS4 X 0.7	10	1.2	11.5
WCS5 X 0.8	16	1.2	12.5
WCS6 X 1	20	1.2	14.0
WCS8 X 1	25	1.6	15.5
WCS10 X 1	32	1.6	18.0