

Compact limit switch in metal housing

D4C

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The 16 mm flat and compact size make the D4C range of limit switches very popular for all standard applications but especially where mounting space is limited or protruding housings may interfere with machine operation. The triple sealed construction, the rugged metal housing, the precisely manufactured movable parts and the optional protective features ensure longest operational life in standard, cold, outdoor or oily environments.

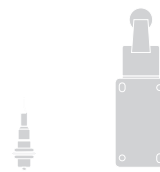
- 16 mm flat compact size
- rugged metal housing
- more than 10 million mechanical operations guaranteed
- models with M12 connector or oil resistant VCTF cable
- TÜV approved after EN60947-5-1 (cable types)



FULL SIZE











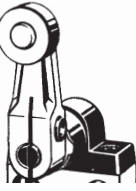
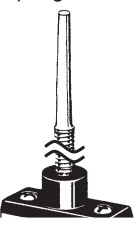
COMPACT



SPECIAL MODELS

Ordering Information

Actuator type	Load range (VDC) ^{†1}		Operation LED indicator		Connection method				Order code
	5 mW to 0.8 W (micro load)	0.8 W to 60 W max	No	Yes					
Plunger 	-	■	■	-		■		*2	D4CC-3001
			-	■		■			D4C-1201
	■	-					3 m		D4CC-4001
							3 m		D4C-3201
Sealed plunger 	-	■	■	-		■			D4CC-6201
			-	■		■			D4CC-3031
	■	-					3 m		D4C-1231
							3 m		D4CC-4031
Plunger with M14 mounting 	-	■	■	-		■			D4C-3231
			-	■		■			D4CC-6231
	■	-					3 m		D4CC-3041
							3 m		D4C-1241
Roller plunger 	-	■	■	-		■			D4CC-4041
			-	■		■			D4C-3241
	■	-					3 m		D4CC-6241
							3 m		D4CC-3002
Sealed roller plunger 	-	■	■	-		■			D4C-1202
			-	■		■			D4CC-4002
	■	-					3 m		D4C-3202
							3 m		D4CC-6202
	-	■	■	-		■			D4CC-3032
			-	■		■			D4C-1232
	■	-					3 m		D4CC-4032
							3 m		D4C-3232
									D4CC-6232





Actuator type	Load range (VDC) ^{*1}		Operation LED indicator		Connection method				Order code
	5 mW to 0.8 W (micro load)	0.8 W to 60 W max		Yes					
Roller plunger with M14 mounting 	-	■	■	-		■		*2	D4CC-3042
							3 m		D4C-1242
			-	■		■			D4CC-4042
							3 m		D4C-3242
Crossroller plunger 	-	■	■	-		■			D4C-6242
							3 m		D4CC-3003
			-	■		■			D4C-1203
							3 m		D4CC-4003
Sealed crossroller plunger 	-	■	■	-		■			D4C-3203
							3 m		D4C-6203
			-	■		■			D4CC-3033
							3 m		D4C-1233
Crossroller plunger with M14 mounting 	-	■	■	-		■			D4CC-4033
							3 m		D4C-3233
			-	■		■			D4C-6233
							3 m		D4CC-3043
Roller lever 	-	■	■	-		■			D4C-3043
							3 m		D4C-1243
			-	■		■			D4CC-4043
							3 m		D4C-3243
Coil spring 	-	■	■	-		■			D4C-6243
							3 m		D4CC-3020
			-	■		■			D4C-1220
							3 m		D4CC-4020
	-	■	■	-		■			D4C-3220
							3 m		D4C-6220
			-	■		■			D4CC-3050
							3 m		D4C-1250
	-	■	■	-		■			D4CC-4050
							3 m		D4C-3250
			-	■		■			D4C-6250
							3 m		D4C-6250

*1 See specifications for details on max. current per rated voltage and load type

*2 Pre-wired models with 30 cm PVC cable and M12 plug (pigtail) are available. Contact your OMRON representative.

Accessories

Cable connectors

Size	Shape	Type	Features	Material		Order code	
				Nut	Cable		
M12 		General purpose (screw)	3 wire (LED optionally)	Brass (CuZn)	PVC 2 m	XS2F-M12PVC3S2M	XS2F-M12PVC3A2M
			4 wire		PUR 2 m	XS2F-M12PUR3S2M	XS2F-M12PUR3A2M
					PVC 2 m	XS2F-M12PVC4S2M	XS2F-M12PVC4A2M
					PUR 2 m	XS2F-M12PUR4S2M	XS2F-M12PUR4A2M

Additional or spare actuators (Order separately)

Actuator type	Order code
Plunger	D4C-0001
Sealed plunger	D4C-0031
Plunger with M14 mounting	D4C-0041
Roller plunger	D4C-0002
Sealed roller plunger	D4C-0032
Roller plunger with M14 mounting	D4C-0042

Actuator type	Order code
Crossroller plunger	D4C-0003
Sealed crossroller plunger	D4C-0033
Crossroller plunger with M14 mounting	D4C-0043
Roller level	D4C-0020
Coil spring	D4C-0050

Model number legend

D4C
 1 2 3 4 5

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1 Connection method

Nothing: cable types

C: M12 connector types

2 Operation LED indicator, rated current and voltage

1: no indicator, 2 A 250 VAC/2 A 30 VDC (D4C- cable type only)

3: LED indicator, 2 A 30 VDC (D4C-cable type)

No indicator, 1 A 30 VDC (D4CC- M12 connector type)

4: LED indicator, 1 A 30 VDC (D4CC- M12 connector type only)

6: LED indicator 0.1 A 30 VDC (D4C- cable type only)

VAC only rated types with LED indicator are available. Contact your OMRON representative.

3 Cable specification and length

Nothing: M12 connector models

2: 3 m oil resistant VCTF cable (other cable lengths are available)

4 Actuator

01: Plunger

02: Roller plunger

03: Crossroller plunger

20: Roller lever

31: Sealed plunger

32: Sealed roller plunger

33: Sealed crossroller plunger

41: Plunger with M14 mounting

42: Roller plunger with M14 mounting

43: Crossroller plunger with M14 mounting

50: Coil spring

Additional actuators (contact your OMRON representative for details and availability)

10: Bevel plunger

24: High sensitivity roller lever

27: Variable roller lever

29: Variable rod lever

60: Center roller lever

5 Specials (contact your OMRON representative for details and availability)

-C: Cold resistant models down to -40°C

-M: Models with oil drain hole (plunger types)

-P: Enhanced outdoor lifetime models (silicone rubber seal, higher grade stainless steel)

-B: Models with LED indicator where indicator turns ON when actuator is operated (standard is indicator turns OFF when actuator is operated)

-M1J/ -1EJ: Pre-wired models with M12 plug, 2 wires (NO) or 3 wires (NO+NC) connected and 0.3 m, 0.5 m or 1 m VCTF cable

(cUL) Models with UL approval (UL508: file nr E76675) and CSA approval (CSA C22.2 No. 14: file nr LR45746)

Specifications

Voltage and current rating

Model	Rated voltage	Rated current *1	Non-inductive load Resistive load				Inductive load				Inrush current		Applicable load range (5 to 30 VDC)
			Resistive load		Inductive load		Motor load						
			NC	NO	NC	NO	NC	NO	NC	NO	NC	NO	
D4C-1□□□	125 VAC		5 A	5 A	1.5 A	0.7 A	3 A	3 A	2.5 A	1.3 A	20 A max.	10 A max.	-
	250 VAC	2 A	5 A	5 A	1 A	0.5 A	2 A	2 A	1.5 A	0.8 A			
	8 VDC		5 A	5 A	2 A	2 A	5 A	4 A	3 A	3 A			0.8 W to 60 W
	14 VDC		5 A	5 A	2 A	2 A	4 A	4 A	3 A	3 A			
	30 VDC	2 A	4 A	4 A	2 A	2 A	3 A	3 A	3 A	3 A			
	125 VDC		0.4 A	0.4 A	0.05 A	0.05 A	0.4 A	0.4 A	0.05 A	0.05 A			-
	250 VDC		0.2 A	0.2 A	0.03 A	0.03 A	0.2 A	0.2 A	0.03 A	0.03 A			
D4C-3□□□	30 VDC	2 A	4 A	4 A	2 A	2 A	3 A	3 A	3 A	3 A			0.8 W to 60 W
D4CC-3□□□ D4CC-4□□□	30 VDC	1 A	1 A	1 A	1 A	1 A	1 A	1 A	1 A	1 A	5 A max.	2.5 A max	0.8 W to 30 W
D4C-6□□□	30 VDC	0.1 A	0.1 A	-		-					20 A max.	10 A max.	5 mW to 0.8 W

*1 For D4C- cable types these ratings are certified by TÜV Rheinland according to EN60947-5-1 (file no R9451333).

General specifications

		D4C- (cable types)	D4CC- (connector types)
Durability ^{*1}	Mechanical	10,000,000 operations min	
	Electrical	200,000 operations min	
Operating speed	Plunger	0.1 mm/s to 0.5 m/s	
	Roller lever	1 mm/s to 1 m/s	
Operating frequency	Mechanical	120 operations/min	
	Electrical	30 operations/min	
Rated frequency		50/60 Hz	
Insulation resistance		100 MΩ min (at 500 VDC)	
LED indicator		D4C-3_, D4C-6_, D4CC-4_: Operation indicator (yellow) Operation indicator turns OFF when the switch operates. ^{*2}	
Contact resistance (initial)		300 mΩ max	100 mΩ max
Dielectric strength		1,000 VAC, 50/60 Hz for 1 min between terminals of the same polarity 1,500 VAC, 50/60 Hz for 1 min between current-carrying metal part and ground, and between each terminal and non-current-carrying metal part	
Vibration resistance		Malfunction: 10 to 55 Hz, 1.5 mm double amplitude ^{*3}	
Shock resistance	Destruction	1,000 m/s ² min	
	Malfunction	500 m/s ² min	
Ambient temperature	Operating	-10°C to 70°C (with no icing)	
Ambient humidity	Operating	95% max.	
Degree of protection		IEC 60529: IP67	
Weight		Approx. 360 g	Approx. 120 g (for D4CC-1002)

*1 Values are acquired at 5° to 35°C operating temperature, 40% to 70% operating humidity

*2 Models where operation indicator turns ON when the switch operates are available by adding 'B' to the order code. Contact your OMRON representative for availability.

*3 Not valid for coil spring models D4C-_-50

Additional specifications after EN60947-5-1 (D4C- cable types only)

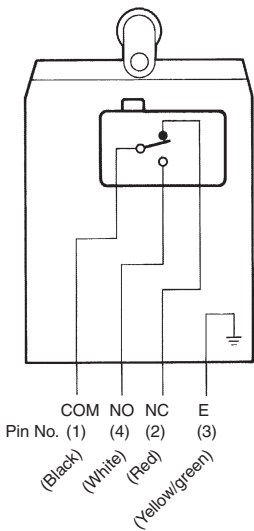
Rated insulation voltage	300 V
Switching overvoltage	1,000 VAC, 300 VDC max
Short circuit protective device	10 A fuse type gG (IEC269)
Conditional short circuit current	100 A
Conventional enclosed thermal current	5 A, 4 A, 0.5 A
Protection against electrical shock	Class I (with grounding wire)

Operating characteristics

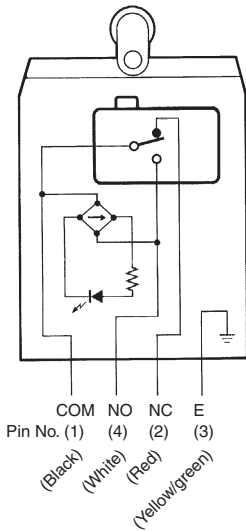
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Operating force (OF)	11.77 N max						17.65 N max			5.69 N max	1.47 N max
Release force (RF)	4.41 N min									1.47 N max	-
Pre-travel (PT)	1.8 mm max									25°	15°
Over travel (OT)	3 mm min									40°	-
Movement differential (MD)	0.2 mm max									3°	-
Operating position (OP)	15.7 ±1 mm	28.5±1 mm		31.2 ±1 mm	36.8±1 mm		24.9 ±1 mm	34.3±1 mm		-	-

Output circuit diagrams

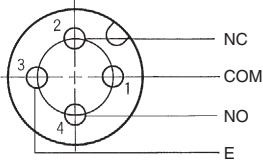
Without indicator



With indicator

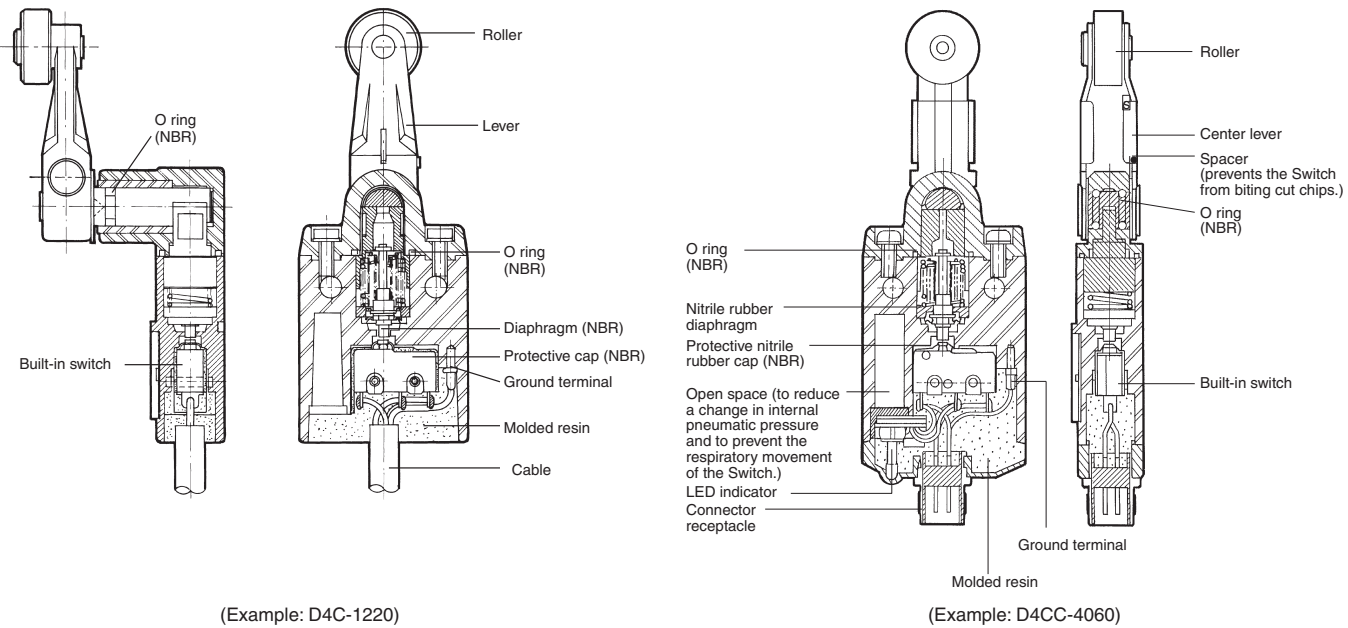


Connector pin arrangement



Note: Connection of LED indicator circuit to NO or NC depends on selected model:
- LED turns OFF when operated (standard)
- LED turns ON when operated (-B models)

Nomenclature

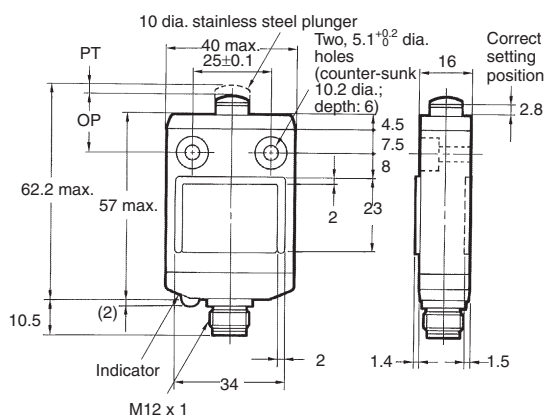
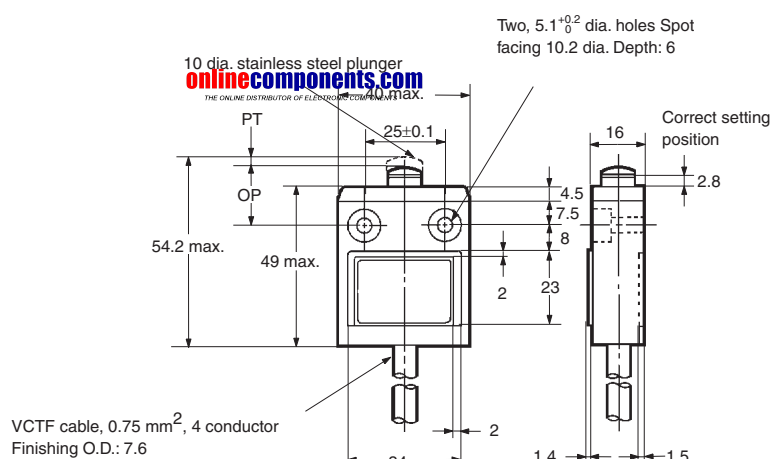
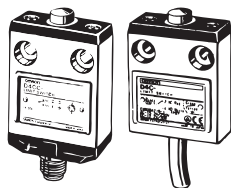


Dimensions

Pin plunger

D4C-□□01

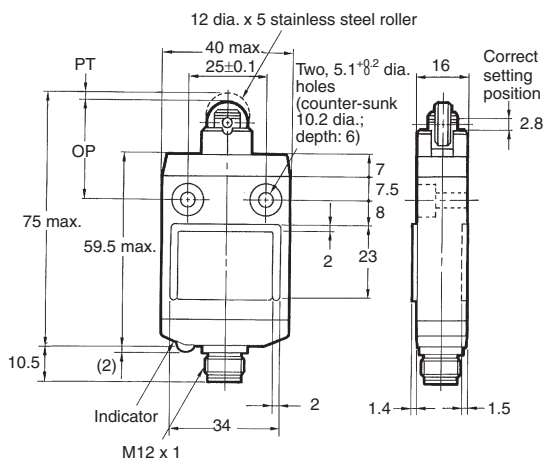
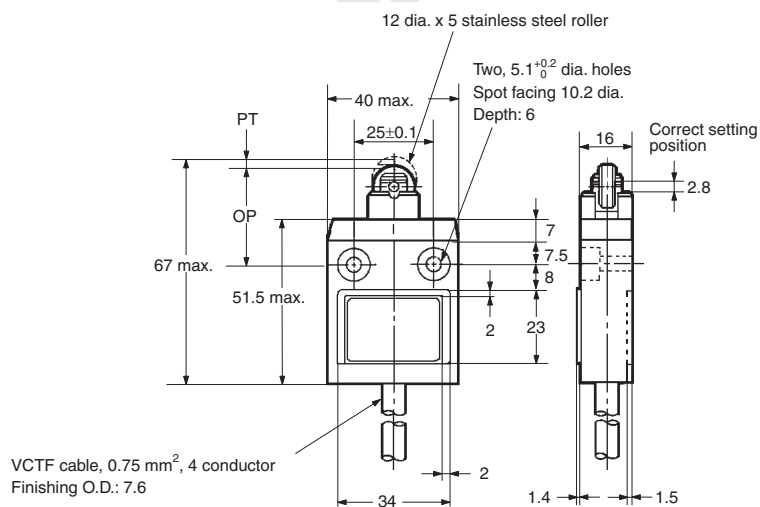
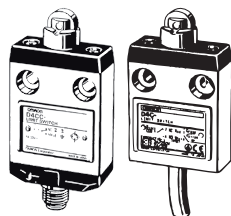
D4CC-□□01



Roller plunger

D4C-□□02

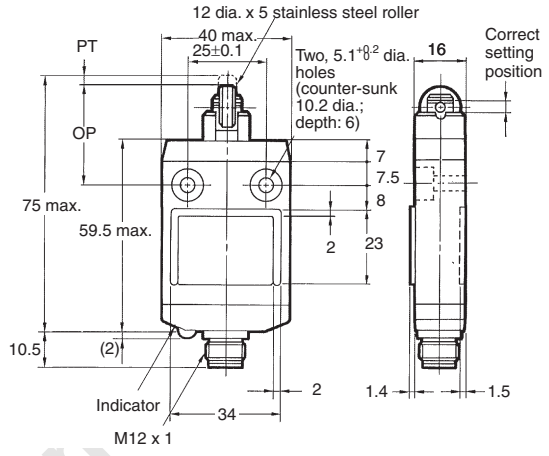
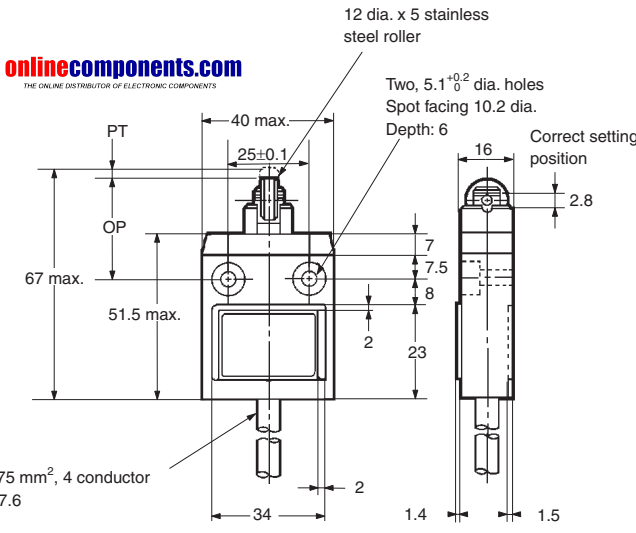
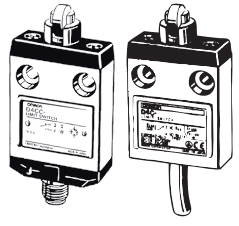
D4CC-□□02



Crossroller plunger

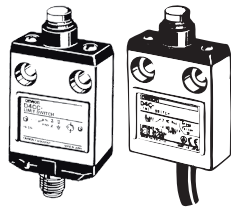
D4C-□□03

D4CC-□□003

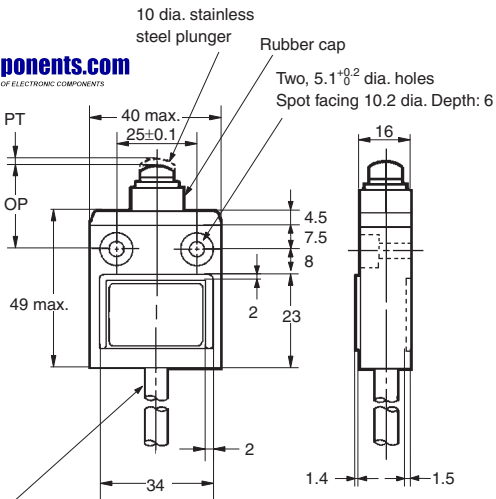


Sealed plunger

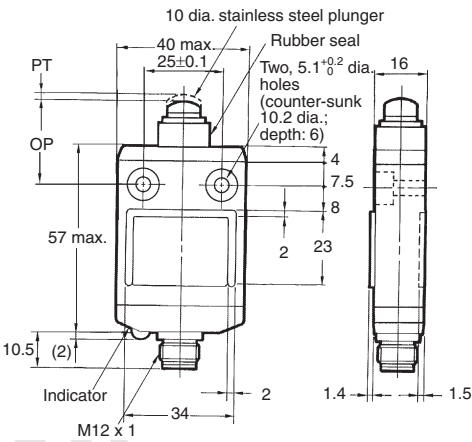
D4C-□□31
D4CC-□□31



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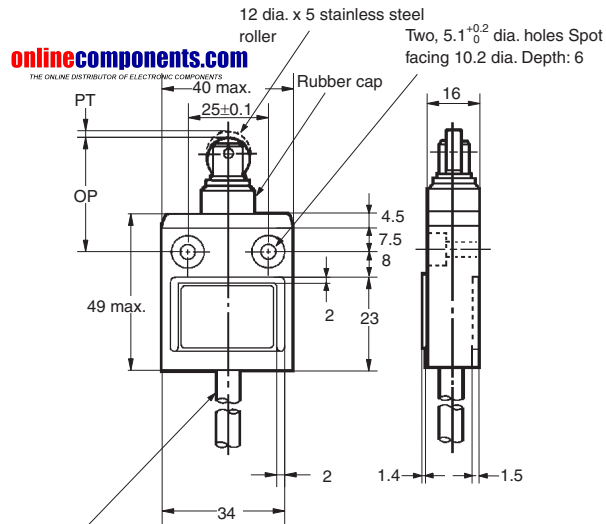
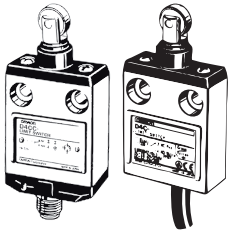


VCTF cable, 0.75 mm², 4 conductor
Finishing O.D.: 7.6

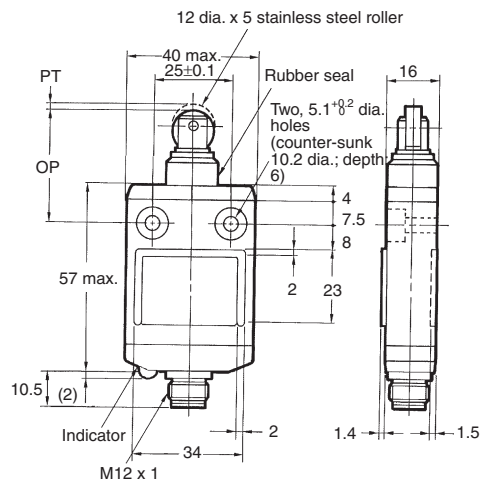


Sealed roller plunger

D4C-□□32
D4CC-□□32

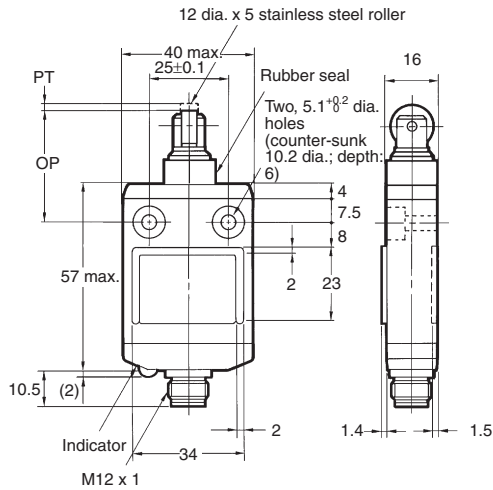
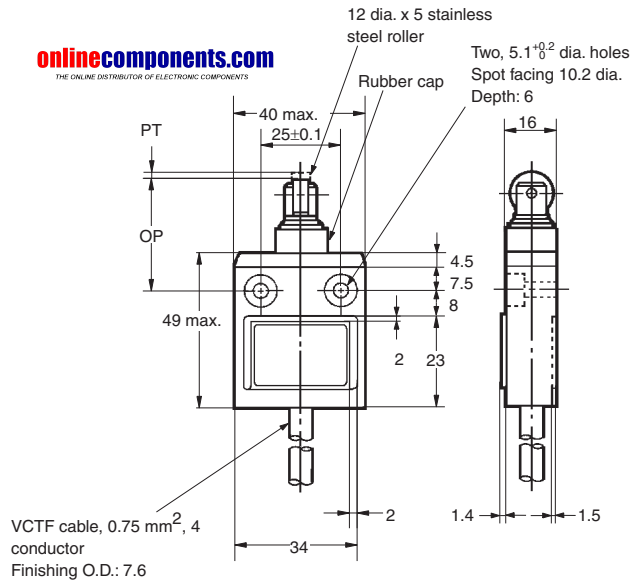
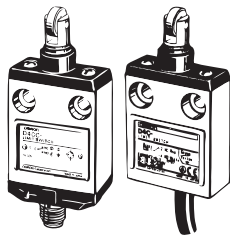


VCTF cable, 0.75 mm², 4 conductor
Finishing O.D.: 7.6



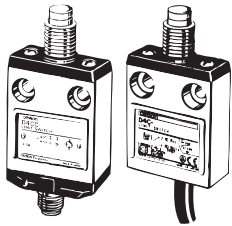
Sealed crossroller plunger

D4C-□□33
D4CC-□□33

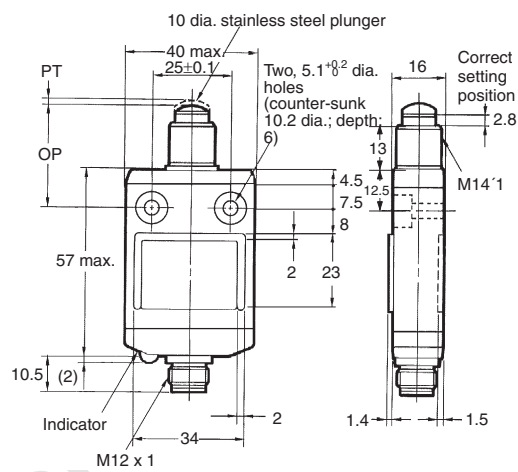
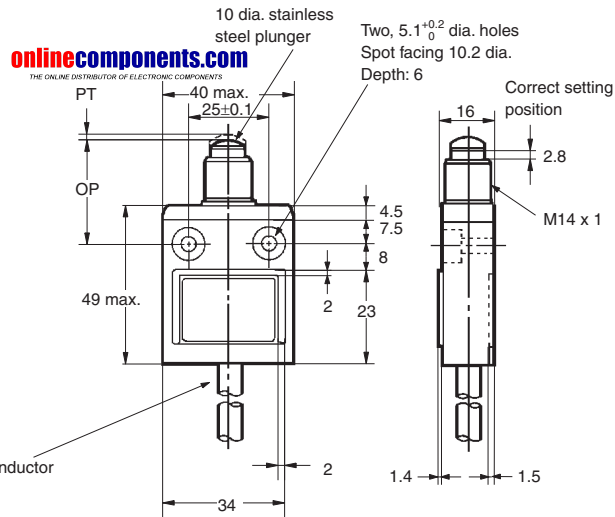


Pin plunger with M14 mounting

D4C-□□41
D4CC-□□41

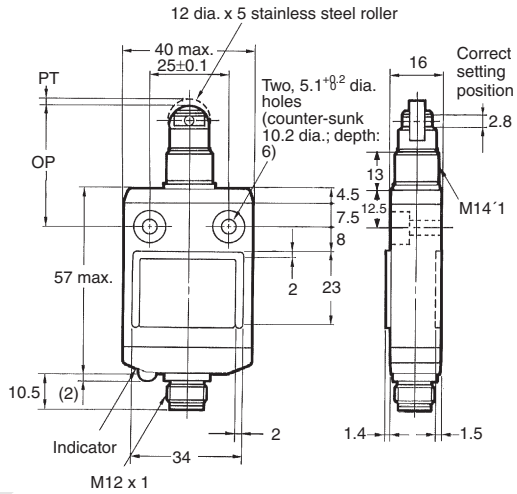
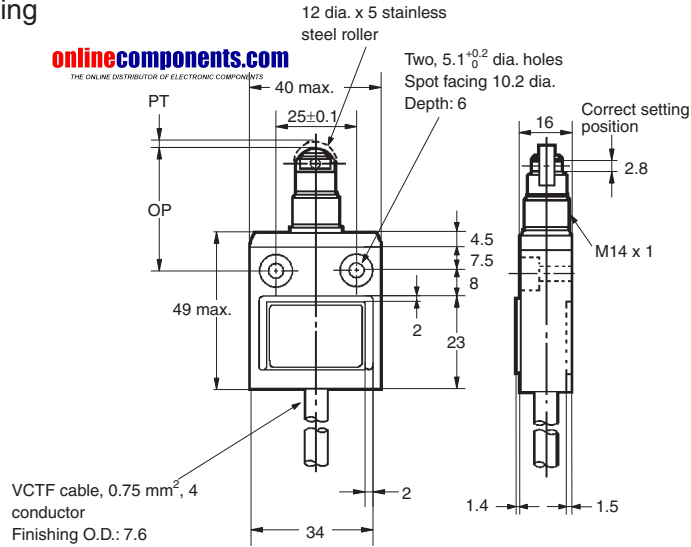
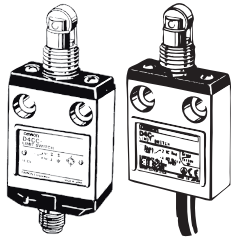


VCTF cable, 0.75 mm², 4 conductor
Finishing O.D.: 7.6



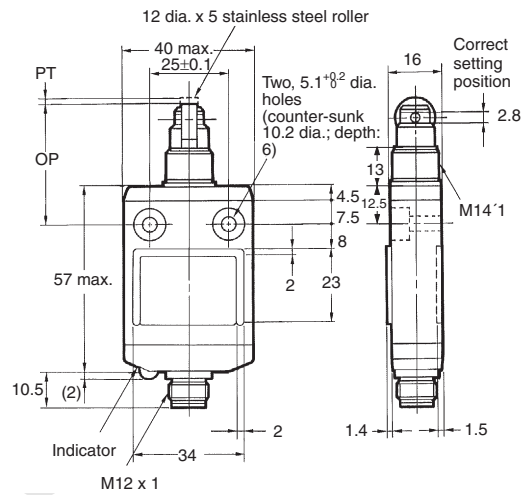
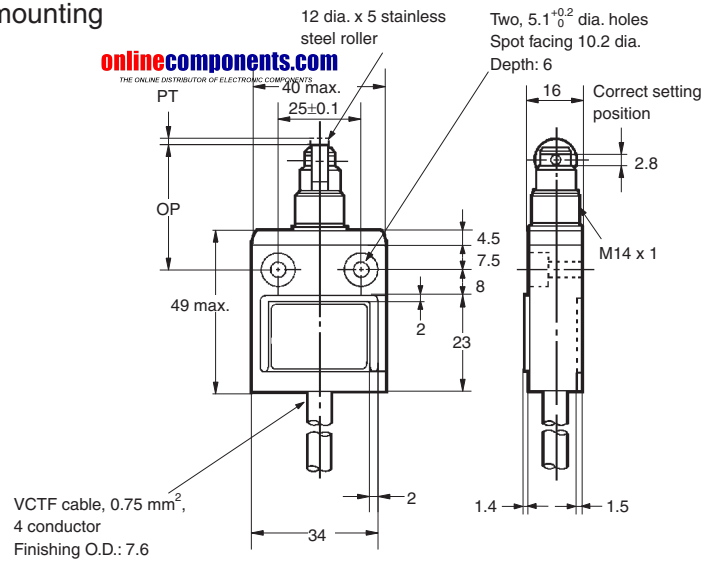
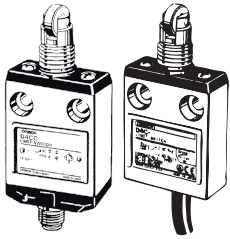
Roller plunger with M14 mounting

D4C-□□42
D4CC-□□42



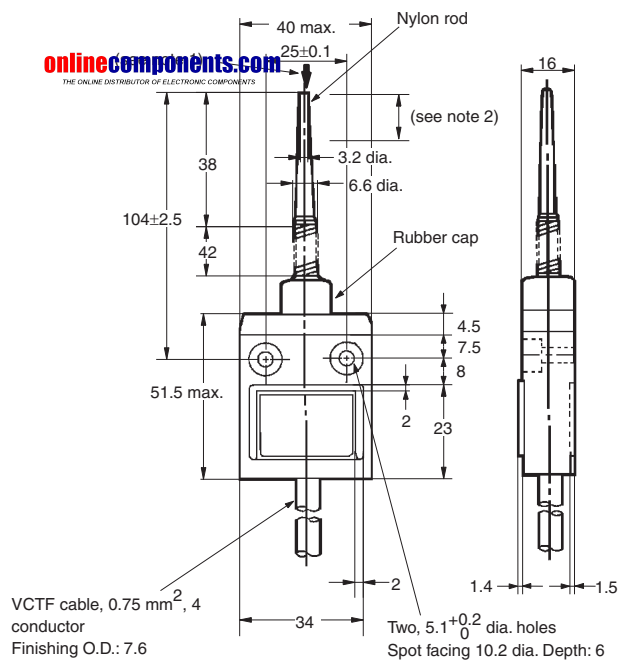
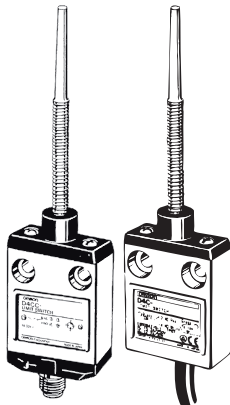
Crossroller plunger with M14 mounting

D4C-□□43
D4CC-□□43

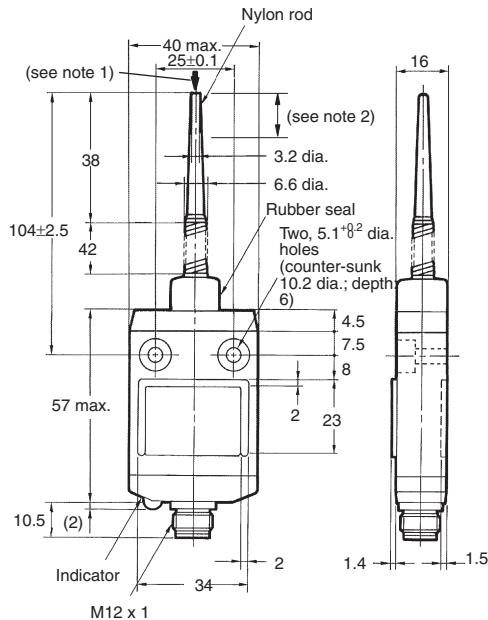


Coil spring

D4C-□□50
D4CC-□□50

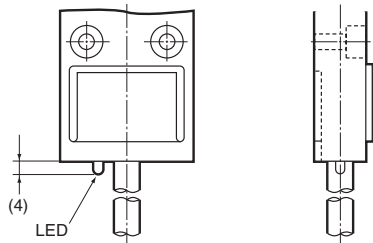


- Note:**
1. Operation is possible in any direction except in parallel to the axis.
 2. The ideal range for operation is between the tip of the rod and 1/3 of the length of the actuator.



Models with LED indicator

The dimensions of the LED indicator for models equipped with one are shown below.



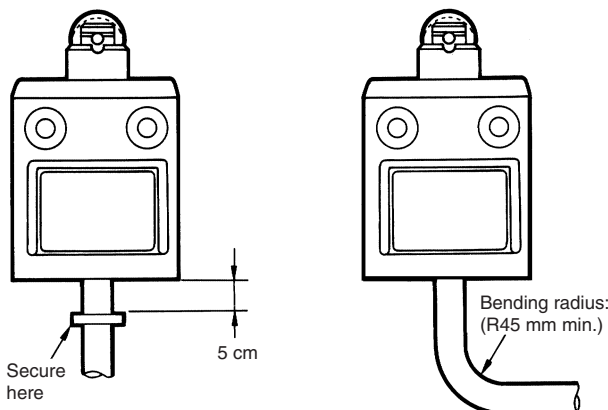
Precautions

Correct Use

Handling

The bottom of the Switch at the cable outlet is resin-molded. Secure the cable at a point 5 cm from the Switch bottom to prevent exertion of excess force on the cable.

When bending the cable, provide a bending radius of 45 mm min. so as not to damage the cable insulation or sheath. Excessive bending may cause fire or leakage current.



Connections

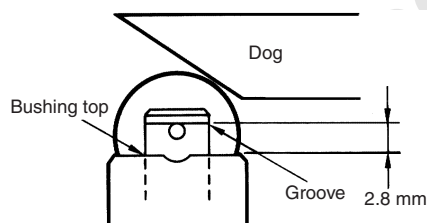
Be sure to connect a fuse with a breaking current 1.5 to 2 times larger than the rated current to the Limit Switch in series in order to protect the Limit Switch from damage due to short-circuiting.

When using the Limit Switch for the EN ratings, use the gI or gG 10-A fuse.

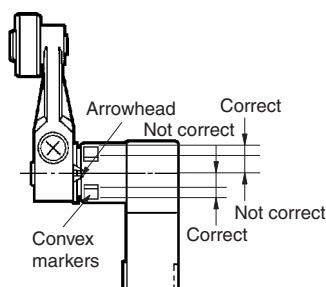
Operation

Operation method, shapes of cam and dog, operating frequency, and overtravel have a significant effect on the service life and precision of a Limit Switch. For this reason, the dog angle must be 30° max., the surface roughness of the dog must be 6.3S min. and hardness must be Hv400 to 500.

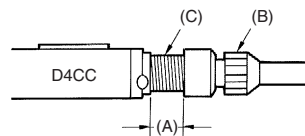
To allow the plunger-type actuator to travel properly, adjust the dog and cam so that the plunger groove fits the bushing top.



To allow the roller lever-type actuator to travel properly, adjust the dog and cam so that the arrow head is positioned between the two convex markers as shown below.

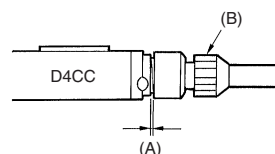


Plug tightening



Connect the plug connector (B) to the connector threads of the D4CC. Then firmly turn the plug connector by hand so that the connector threaded portion (C) will be completely covered by the plug connector (B) so that space (A) will be almost 0. Do not use any tools, such as pliers, to tighten the plug connector, otherwise the plug connector may become damaged. Make sure, however, that the plug connector is tightened securely, otherwise the rated degree of protection of the D4CC may not be maintained. Furthermore, the plug connector may be loosened by vibration.

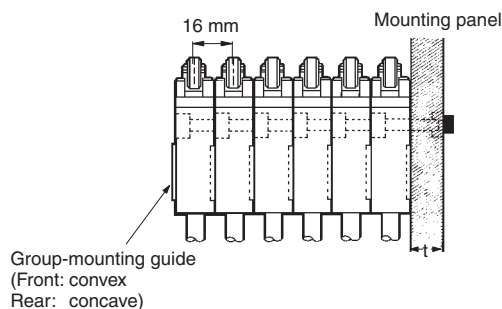
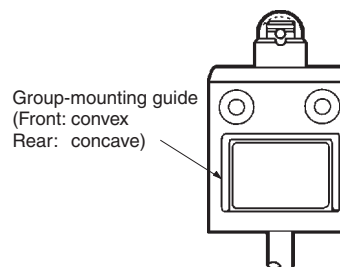
Properly tightened connector



Mounting

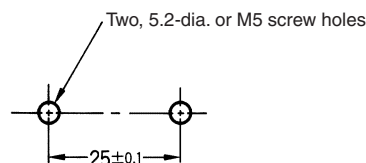
A maximum of 6 Switches may be group-mounted. In this case, pay attention to the mounting direction so that the convex part of the group-mounting guide on one Switch fits into the concave part of the guide on the other Switch as shown in the figure below. For group mounting, the mounting panel must have a thickness (t) of 6 mm min.

Group mounting



If the mounting panel is warped or has protruding parts, a malfunction may result. Make sure that the mounting panel is not warped and has even surfaces.

Mounting Holes



Use a Switch with a rubber cap when using the plunger type in an environment where malfunction is possible due to environmental conditions such as dust or cutting chips which may not allow resetting.

Do not expose the Switch to water exceeding 70°C or use it in steam.
When the D4C is used in a circuit of a device to be exported to Europe, classified as Overvoltage Class III as specified in IEC664, provide a contact protection circuit.
Tighten each screw to a torque according to the following table.

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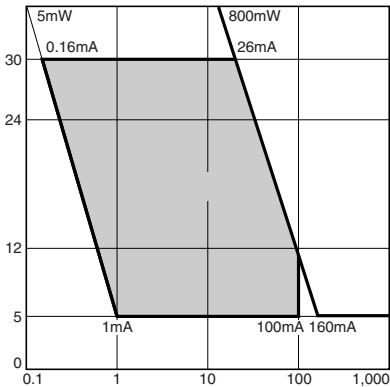
No.	Type	Torque
1	M5 Allen-head bolt	4.90 to 5.88 N·m
2	M3.5 head mounting screw	0.78 to 0.88 N·m
3	M5 Allen-head bolt	4.90 to 5.88 N·m

By removing the two screws from the head, the head direction can be rotated 180°. After changing the head direction, re-tighten to the torque specified above. Be careful not to allow any foreign substance to enter the Switch.

Micro-load Models (D4C-6)

Switching Range

Micro-load models can be used for switching in the range shown below.



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