

Small Safety Limit Switch

D4F

A Smaller Limit Switch than Ever Previously Produced. Ideal for Applications to Small-scale Machinery and Equipment

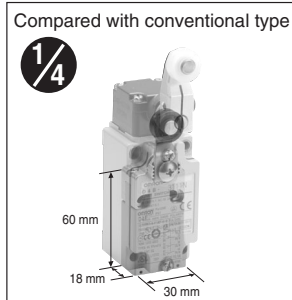
- A noticeable reduction to 1/4 the size of OMRON's conventional model.
- High-sensitivity safety limit switch.
- Built-in switches with two- or four-contact construction are available.
- Degree of protection: IP67 (EN60947-5-1)
- Patent and design pending.



Features

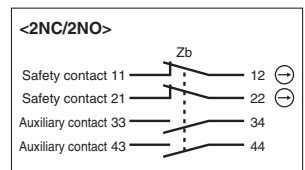
A Dramatic Reduction in Size

The volume is reduced to one quarter of the volume of our company's conventional types of limit switches (30 (W) × 18 (L) × 60 mm (H)). Optimal for the downsizing of machinery and equipment.



Four-contact Construction is Available

D4F models of two-contact construction (1NC/1NO and 2NC) and those of four-contact construction (2NC/2NO and 4NC) are available. The auxiliary contact can be used for monitoring input of control circuits and indicator lighting.

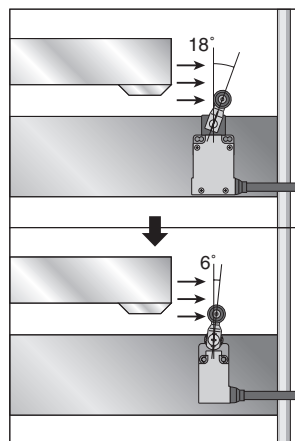


High-sensitivity and Space-saving

The conventional types of limit switches with a direct opening mechanism required 18 degrees for a movement until operation because its direct opening point is long (Our company's conventional types of limit switches).

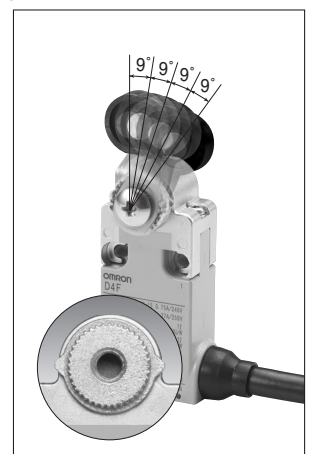
The D4F requires 6 degrees to respond.

On the table that allows machine tools etc. to move at an increasing speed, the moment the dog pushes the actuator, the D4F responds. With the development of smaller versions of machines, the D4F saves space and fits in a smaller space.



Positioning in Steps of 9 Degrees

For a roller lever type of switch, grooves are incised on the body and the cam of the actuator, to allow positioning in steps of 9 degrees.



Standards and EC Directives

- Conforms to the following EC Directives:
 - Machinery Directive
 - Low Voltage Directive
 - EN60204-1
 - EN1088
 - EN50047
 - EN81
 - EN115
 - GS-ET-15
 - JIS C 8201-5-1

Approved Standards

Agency	Standards	File No.
TÜV Product service	EN60947-5-1 (Direct opening: approved)	(See note 1.)
UL (See note 2.)	UL508 CSA C22.2 No.14	E76675

- Note: 1. Contact your Omron sales representative.
 2. Approval has been obtained for CSA C22.2 No. 14 under UL.

Ordering Information

Model Number Legend

D4F-

1	2	3	4

- | | | | |
|---|---|--|--|
| 1. Built-in Switch
1: 1NC/1NO (slow-action)
2: 2NC (slow-action)
3: 2NC/2NO (slow-action)
4: 4NC (slow-action) | 2. Actuator
02: Roller plunger
(Metallic roller)
20: Roller lever
(Metallic lever, resin roller) | 3. Cable Length
1: 1 m
3: 3 m
5: 5 m | 4. Pull-outing direction of cable
R: Horizontal
D: Vertical |
|---|---|--|--|

List of Models

Actuator	Cable length	Cable direction	Built-in switch			
			1NC/1NO (slow-action)	2NC (slow-action)	2NC/2NO (slow-action)	4NC (slow-action)
Roller lever (Metallic lever, resin roller) 	1 m	Horizontal	D4F-120-1R	D4F-220-1R	D4F-320-1R	D4F-420-1R
		Vertical	D4F-120-1D	D4F-220-1D	D4F-320-1D	D4F-420-1D
	3 m	Horizontal	D4F-120-3R	D4F-220-3R	D4F-320-3R	D4F-420-3R
		Vertical	D4F-120-3D	D4F-220-3D	D4F-320-3D	D4F-420-3D
	5 m	Horizontal	D4F-120-5R	D4F-220-5R	D4F-320-5R	D4F-420-5R
		Vertical	D4F-120-5D	D4F-220-5D	D4F-320-5D	D4F-420-5D
Roller plunger (Metallic roller) 	1 m	Horizontal	D4F-102-1R	D4F-202-1R	D4F-302-1R	D4F-402-1R
		Vertical	D4F-102-1D	D4F-202-1D	D4F-302-1D	D4F-402-1D
	3 m	Horizontal	D4F-102-3R	D4F-202-3R	D4F-302-3R	D4F-402-3R
		Vertical	D4F-102-3D	D4F-202-3D	D4F-302-3D	D4F-402-3D
	5 m	Horizontal	D4F-102-5R	D4F-202-5R	D4F-302-5R	D4F-402-5R
		Vertical	D4F-102-5D	D4F-202-5D	D4F-302-5D	D4F-402-5D

 Preferred items

Specifications

Approved Standard Ratings

UL/CSA (UL508, CSA C22.2 No. 14)

TÜV (EN60947-5-1)

Item	Utilization category	AC-15	DC-13
Rated operating current (Ie)		0.75 A	0.27 A
Rated operating voltage (Ue)		240 V	250 V

Note: Use a 10-A fuse type gI or gG that conforms to IEC269 as a short-circuit protection device.

C300

Rated voltage	Carry current	Current		Volt-amperes	
		Make	Break	Make	Break
120 VAC	2.5 A	15 A	1.5 A	1,800 VA	180 VA
240 VAC		7.5 A	0.75 A		

Q300

Rated voltage	Carry current	Current		Volt-amperes	
		Make	Break	Make	Break
125 VDC	2.5 A	0.55 A	0.55 A	69 VA	69 VA
250 VDC		0.27 A	0.27 A		

Characteristics

Degree of protection (See note 1.)	IP67 (EN60947-5-1)
Durability (See note 2.)	Mechanical: 10,000,000 times min. Electrical: 1,000,000 times min. (4-mA resistive load at 24 VDC, 4 circuits) 150,000 times min. (1-A resistive load at 125 VAC, 2 circuits / 4-mA resistive load at 24 VDC, 2 circuits) (See note 3.)
Operating speed	1 mm/s to 0.5 m/s
Operating frequency	Mechanical: 120 operations/minute Electrical: 30 operations/minute
Insulation resistance	100 MΩ min. (at 500 VDC) between terminals of the same polarities, between terminals of different polarities, between current-carrying metal parts and grounds, and between each terminal and non-current carrying metal parts
Minimum applicable load (See note 4.)	4-mA resistive load at 24 VDC, 4 circuits (Level N reference value)
Contact resistance (See note 5.)	300 mΩ max. (initial value with 1-m cable), 500 mΩ max. (initial value with 3-m cable), 700 mΩ max. (initial value with 5-m cable)
Dielectric strength	Between terminals of same polarities: Uimp 2.5 kV (EN60947-5-1) Between terminals of different polarities: Uimp 4 kV (EN60947-5-1) Between current-carrying metal parts and grounds: Uimp 4 kV (EN60947-5-1) Between each terminal and non-current carrying metal parts: Uimp 4 kV (EN60947-5-1)
Conditional short-circuit current	100 A (EN60947-5-1)
Pollution degree (operating environment)	3 (EN60947-5-1)
Conventional free air thermal current (Ith)	2.5 A (EN60947-5-1)
Protection against electric shock	Class I (with a ground wire)
Vibration resistance	Malfunction 10 to 55 Hz, 0.75-mm single amplitude
Shock resistance	Destruction 1,000 m/s ² min.
	Malfunction 300 m/s ² min.
Ambient temperature	Operating: -30°C to 70°C (with no icing)
Ambient humidity	Operating: 95% max.
Cable	UL2464 No. 22 AWG, finishing O.D.: 8.3 mm
Weight	Approx. 190 g (D4F-102-1R, with 1-m cable) Approx. 220 g (D4F-120-1R, with 1-m cable)

- Note:
- The degree of protection shown above is based on the test method specified in EN60947-5-1. Be sure to confirm in advance the sealing performance under the actual operating environment and conditions.
 - Durability values are calculated at an operating temperature of 5°C to 35°C, and an operating humidity of 40% to 70%. Contact your OMRON sales representative for more detailed information on other operating environments.
 - When the ambient temperature is 35°C or higher, do not apply 1 A at 125 VAC to more than two circuits.
 - The value will vary depending on factors such as the switching frequency, the ambient environment, and the reliability level. Be sure to confirm correct operation with the actual load before application.
 - The contact resistance was measured with 0.1 A at 5 to 8 VDC with a fall-of-potential method.

Operating Characteristics

Slow-action (1NC/1NO, 2NC, 2NC/2NO, and 4NC)

Operating Characteristics	Model	D4F-□20-□R D4F-□20-□D	D4F-□02-□R D4F-□02-□D
Operating force max.: OF (See note 1.)		5 N	12 N
Release force min.: RF (See note 2.)		0.5 N	1.5 N
Pretravel: PT1 (11-12 and 21-22) : PT1 (31-32 and 41-42) : PT2 (See note 3.)		6±3° (NC) 9±3° (NC) (12°) (NO)	1 mm max. (NC) 1.3 mm max. (NC) (1.2 mm) (NO)
Overtravel min.: OT		40°	3.2 mm
Operating position: OP (11-12 and 21-22) : OP (31-32 and 41-42)		— —	29.4±1 mm 29±1 mm
Total travel: TT (See note 3.)		(55°)	(4.5 mm)
Min. direct opening travel: DOT (See note 4.)		18°	1.8 mm
Min. direct opening force: DOF		20 N	20 N

- Note:
- The OF value is the maximum load that opens an NC contact (11-12, 21-22, 31-32, 41-42).
 - The RF value is the minimum load that closes an NC contact (11-12, 21-22, 31-32, 41-42).
 - The PT2 and TT values are reference values.
 - The D4F is used in accordance with EN81 and EN115 at a minimum DOT of 30° and 2.8 mm.