

# D4ER-□N

## Even Better Oil Resistance Than D4E-N Switches

- Material combining HNBR and fluororubber used for superior resistance to oil. Prevents ingress of cutting oil from moving sections.
- Fluororesin cable that withstands cutting oils is provided as standard.
- Pre-wired and connector cable models available. Smartclick connectors for easy connection.
- Minute load model with gold cladding is optimal for electronic control.
- Approved by EN (TÜV).
- Same mounting pitch as D4E-N Switches.
- IP67G degree of protection (JIS C 0920 Annex 1). \*

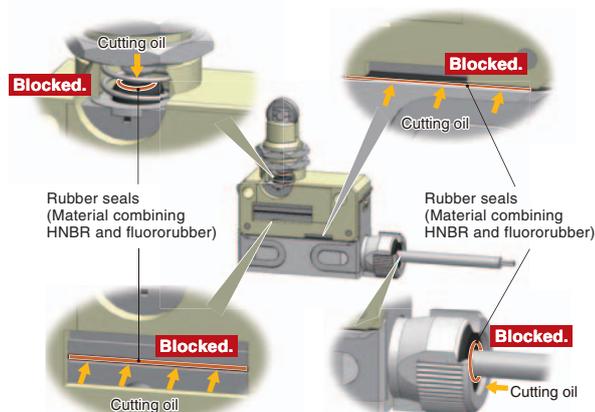
 Be sure to read *Safety Precautions* on pages 37 to 38 and *Safety Precautions for All Limit Switches*.

## Features

### Material Combining HNBR and Fluororubber for Superior Resistance to Oil

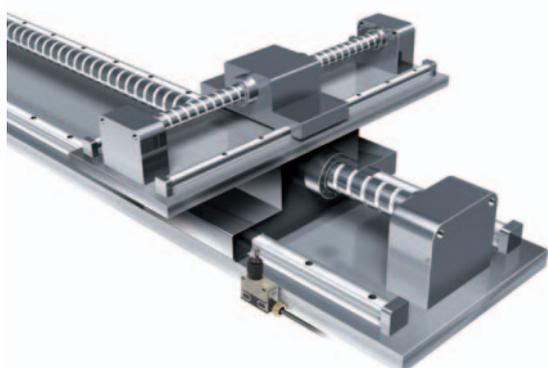
Moving sections are protected from ingress of cutting oil. Important Sealing Sections for Moving Parts

New Rubber Material



## Applications

### Table Overrun Detection



### Table Position Detection



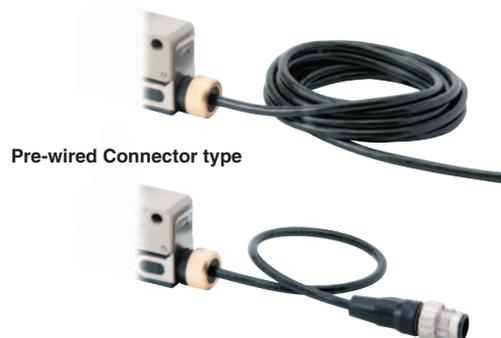
For the most recent information on models that have been certified for safety standards, refer to your OMRON website.

\* The IP67G is the degree of protection which is defined according to the JIS (Japanese Industrial Standards). The IP67 indicates the same level of protection as defined by the IEC, and the G indicates that a device has resistance to oil.

### Fluororesin Cable Provided as Standard to Withstand Cutting Oils

Fluororesin Sheath

In addition to prewired models, models are also available with prewired Smartclick connectors for easy connection. Cable type



# D4ER-□N

## Model Number Structure

### Model Number Legend (Not all combinations are possible. Ask your OMRON representative for details.)

D4ER-□□□□N□

(1)(2) (3) (4)

#### (1) Rated Current

- 1: 1 A at 30 VDC (Standard load)
- 2: 0.1 A at 30 VDC (Micro load)

#### (2) Actuator

- A: Roller plunger
- B: Crossroller plunger
- C: Plunger
- D: Sealed roller plunger
- E: Sealed crossroller plunger
- G: Roller lever
- L: Long roller plunger

#### (3) Terminals

- 21: Cable (right-hand)
- 22: Cable (left-hand)

**Note:** The terminal specifications in model numbers are not the same for D4ER-□N and D4E Switches.

#### Comparison of New and Old Terminal Models

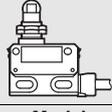
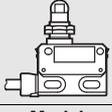
Model	D4ER-□N	D4E
Location of lead outlet		
Right-hand	D4ER-□□21N	D4E-□□21
Left-hand	D4ER-□□22N	D4E-□□23
Bottom	—	D4E-□□22

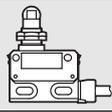
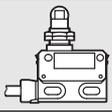
#### (4) Pre-wired Connector

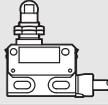
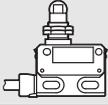
- DTK1EJ: Pre-wired connector (30-cm oil-resistant cable, M12 Smartclick connector)
- Blank : No connector (oil-resistant cable: 2 m)

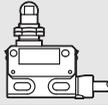
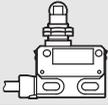
**Note:** D4ER-□N Switches are not available with operation indicators.

## Ordering Information

Type	Cable type	
	Standard load	
	Right-hand	Left-hand
Actuator		
	Model	Model
Roller plunger	D4ER-1A21N	D4ER-1A22N
Crossroller plunger	D4ER-1B21N	D4ER-1B22N
Plunger	D4ER-1C21N	D4ER-1C22N
Sealed roller plunger	D4ER-1D21N	D4ER-1D22N
Sealed crossroller plunger	D4ER-1E21N	D4ER-1E22N
Roller lever	D4ER-1G21N	D4ER-1G22N
Long roller plunger	D4ER-1L21N	D4ER-1L22N

Type	Cable type	
	Micro load	
	Right-hand	Left-hand
Actuator		
	Model	Model
Roller plunger	D4ER-2A21N	D4ER-2A22N
Crossroller plunger	D4ER-2B21N	D4ER-2B22N
Plunger	D4ER-2C21N	D4ER-2C22N
Sealed roller plunger	D4ER-2D21N	D4ER-2D22N
Sealed crossroller plunger	D4ER-2E21N	D4ER-2E22N
Roller lever	D4ER-2G21N	D4ER-2G22N
Long roller plunger	D4ER-2L21N	D4ER-2L22N

Type	Pre-wired Connector type	
	Standard load	
	Right-hand	Left-hand
		
Model	Model	
Actuator		
Roller plunger	D4ER-1A21N-DTK1EJ	D4ER-1A22N-DTK1EJ
Crossroller plunger	D4ER-1B21N-DTK1EJ	D4ER-1B22N-DTK1EJ
Plunger	D4ER-1C21N-DTK1EJ	D4ER-1C22N-DTK1EJ
Sealed roller plunger	D4ER-1D21N-DTK1EJ	D4ER-1D22N-DTK1EJ
Sealed crossroller plunger	D4ER-1E21N-DTK1EJ	D4ER-1E22N-DTK1EJ
Roller lever	D4ER-1G21N-DTK1EJ	D4ER-1G22N-DTK1EJ
Long roller plunger	D4ER-1L21N-DTK1EJ	D4ER-1L22N-DTK1EJ

Type	Pre-wired Connector type	
	Micro load	
	Right-hand	Left-hand
		
Model	Model	
Actuator		
Roller plunger	D4ER-2A21N-DTK1EJ	D4ER-2A22N-DTK1EJ
Crossroller plunger	D4ER-2B21N-DTK1EJ	D4ER-2B22N-DTK1EJ
Plunger	D4ER-2C21N-DTK1EJ	D4ER-2C22N-DTK1EJ
Sealed roller plunger	D4ER-2D21N-DTK1EJ	D4ER-2D22N-DTK1EJ
Sealed crossroller plunger	D4ER-2E21N-DTK1EJ	D4ER-2E22N-DTK1EJ
Roller lever	D4ER-2G21N-DTK1EJ	D4ER-2G22N-DTK1EJ
Long roller plunger	D4ER-2L21N-DTK1EJ	D4ER-2L22N-DTK1EJ

### Connector Sockets

For models with connectors, select one of the specified Connector Sockets from the following table.

Applicable Limit Switches	Current type	Appearance	No. of conductors	Cable length	Socket
D4ER-□□21N-DTK1EJ D4ER-□□22N-DTK1EJ	DC	Straight, Smartclick Oil-resistant Connectors 	4	2 m	XS5FR-D423-D80-RB1
				5 m	XS5FR-D423-G80-RB1
				10 m	XS5FR-D423-J80-RB1

**Note:** Refer to the XS5□R on page 53 for connector details and for information on cables with connectors on both ends.

# D4ER-□N

## Specifications

### Approved Standards

Agency	Standard	File No.	Approved models
TÜV Rheinland	EN 60947-5-1	R9551015, J9951016	Ask your OMRON representative for information on approved models.
CCC	—	—	
UL	—	—	

### Ratings

Rated voltage	Standard load						Micro load	
	Non-inductive load (A)			Inductive load (A)			Non-inductive load (A)	
	Resistive load		Lamp load	Inductive load		Motor load	Resistive load	
	NC	NO	NC	NO	NC	NO	NC	NO
8 VDC	1		—		1			0.1
14 VDC	1		—		1			0.1
30 VDC	1		—		1			0.1

Inrush current	NC	10 A max.
	NO	10 A max.

- Note:** 1. The above current ratings are for a standard current.  
 2. Inductive loads have a power factor of 0.4 min. (AC) and a time constant of 7 ms max. (DC).  
 3. Lamp load has an inrush current of 10 times the steady-state current.  
 4. Motor load has an inrush current of 6 times the steady-state current.

Minimum applicable load	Standard load	Micro load
	160 mA at 5 VDC	1 mA at 5 VDC

### Approved Standard Ratings

TÜV (EN 60947-5-1)

D4ER-1 G 21 N  
 I II III

Model			Applicable category and ratings	Thermal current (Ithe)
I	II	III		
1	<input type="checkbox"/>	21/22	DC-12 1 A/30 VDC	1 A
2	<input type="checkbox"/>	21/22	DC-12 0.1 A/30 VDC	0.1 A

- Note:** 1. : Actuator variation of item II  
 2. DC-12 1 A/30 VDC means as follows:  
 Applicable category: DC-12  
 Rated operating current (I<sub>e</sub>): 1 A  
 Rated operating voltage (U<sub>e</sub>): 30 VDC

### Characteristics (Standard Load Model and Micro Load Model)

<b>Degree of protection</b>		IP67 (IEC 60529) and IP67G (JIS C 0920 Annex 1) *1 Passed OMRON's Oil-resistant Component Evaluation Standards *2 (Cutting oil type: specified in JIS K 2241:2000; Temperature: 35°C max.)
<b>Durability</b>	<b>Mechanical</b>	4,000,000 operations min.
	<b>Electrical</b>	500,000 operations min. (Standard load: 1 A at 30 VDC, resistive load/Micro load: 0.1 A at 30 VDC, resistive load) 4,000,000 operations min. (10 mA at 24 VDC, resistive load)
<b>Operating speed</b>		0.1 mm/sec to 0.5 m/sec
<b>Operating frequency</b>		Mechanical: 120 operations/min Electrical: 30 operations/min
<b>Insulation resistance</b>		100 MΩ min. (at 500 VDC) *3
<b>Contact resistance</b>		Standard load : D4ER-1□□□□□□: 15 mΩ max. (initial value for the built-in switch when tested alone) Micro load : D4ER-2□□□□□□: 50 mΩ max. (initial value for the built-in switch when tested alone)
<b>Dielectric strength</b>	<b>Between terminals of same polarity</b>	1,000 VAC, 50/60 Hz for 1 min
	<b>Between each terminal and noncurrent-carrying metal part</b>	1,500 VAC, 50/60 Hz for 1 min/Uimp at 2.5 kV (EN 60947-5-1)
<b>Rated insulation voltage (Ui)</b>		250 V
<b>Pollution degree (operating environment)</b>		3 (EN 60947-5-1)
<b>Short-circuit protective device (SCPD)</b>		10 A fuse (type gG or type gI, IEC 60269 approved)
<b>Conditional short-circuit current</b>		100 A (EN 60947-5-1)
<b>Conventional enclosed thermal current (Ithe)</b>		5 A (EN 60947-5-1)
<b>Protection against electric shock</b>		Class II (grounding not required with double insulation)
<b>Vibration resistance</b>	<b>Malfunction</b>	10 to 55 Hz, 1.5-mm double amplitude
	<b>Destruction</b>	1,000 m/s <sup>2</sup> max. (IEC 68-2-27)
<b>Shock resistance</b>	<b>Malfunction</b>	300 m/s <sup>2</sup> max. (IEC 68-2-27)
	<b>Destruction</b>	1,000 m/s <sup>2</sup> max. (IEC 68-2-27)
<b>Ambient operating temperature/Ambient storage temperature</b>		5°C to 70°C (with no icing or condensation)
<b>Ambient operating humidity</b>		35% to 95%RH (with no condensation)
<b>Weight</b>		(in case of roller plunger) Cable type (2 m): Approx. 140 g Pre-wired Connector type: Approx. 103 g

**Note:** 1. The following values are initial values.

2. The following ratings may vary depending on the model. Contact your OMRON representative for further details.

\*1. The IP67G is the degree of protection which is defined according to the JIS (Japanese Industrial Standards).

The IP67 indicates the same level of protection as defined by the IEC, and the G indicates that a device has resistance to oil.

\*2. The Oil-resistant Component Evaluation Standards are OMRON's own durability evaluation standards.

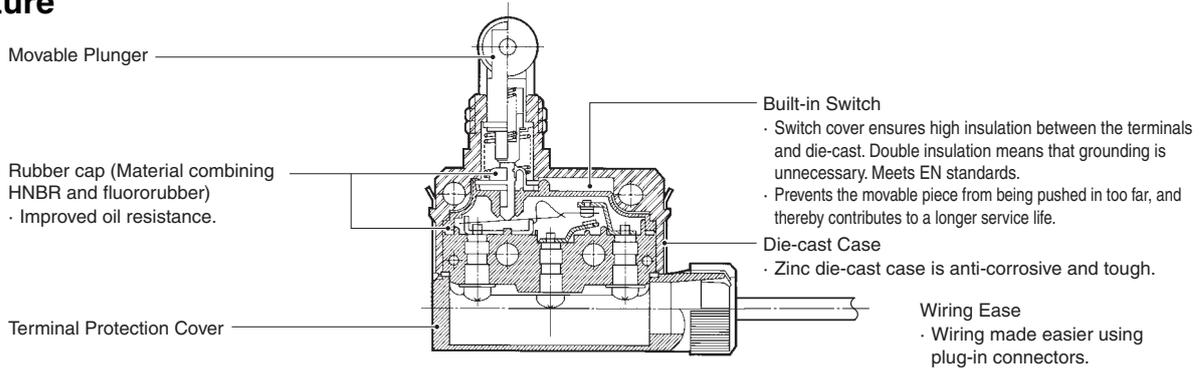
The Pre-wired Connector type meets the degree of protection when it is correctly connected with an XS5□R Oil-resistant Connector.

The degree of protection is not satisfied with the part where there is no XS5FR Oil-resistant Connector connected and cable wires are uncovered. And as for the Cable type, the degree of protection is not satisfied with the part where cable wires are uncovered.

\*3. This value represents the condition when the Switch is shipped from the factory.

# Structure and Nomenclature

## Structure



## Degree of Protection

The D4ER-□N uses rubber seals to provide a protective structure for the charged parts to achieve an IP rating of IP67G\* (JIS C 0920). The charged parts in the switching section are sealed with the two rubber seals shown in figure 1. The charged parts in the terminal section are sealed with the two rubber seals shown in figure 2. Material combining HNBR and fluororubber with excellent resistance to oil is used for the rubber seals.

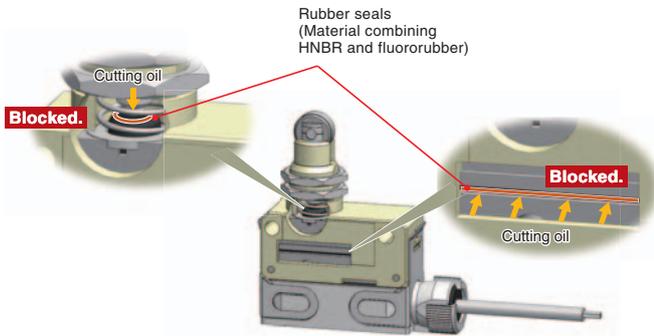


Figure 1. Switching Section Protective Structure

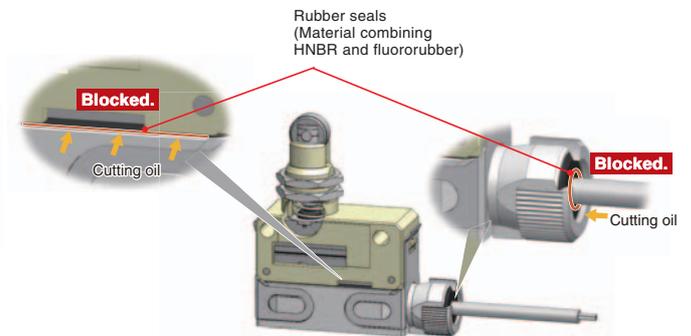
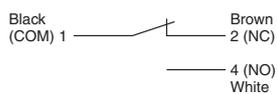


Figure 2. Terminal Section Protective Structure

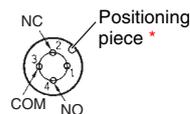
\* The various parts of IP67G have the following meanings: IP6□ indicates that dust will not enter the interior, IP□7 indicates protection against submersion in water, and IP□□G indicates resistance to oil.

## Contact Form

### Cable type



### Pre-wired Connector type



\* The position of the positioning piece is not always the same. If using an L-shaped connector causes problems in application, use a straight connector.

# D4ER-□N

## Dimensions and Operating Characteristics

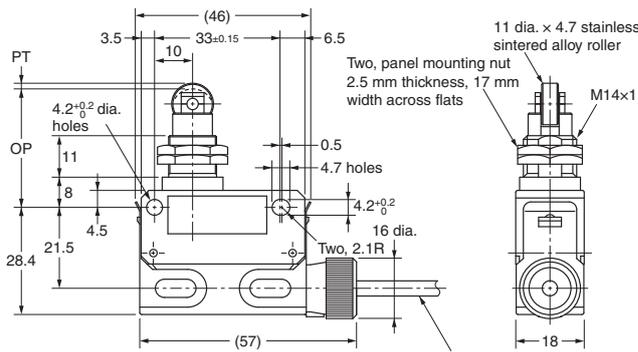
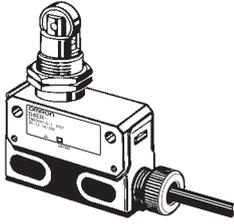
(Unit: mm)

### Cable type

#### Roller Plunger

D4ER-1A21N \*

D4ER-2A21N \*



Operating force	OF	max.	11.77 N
Release force	RF	min.	4.90 N
Pretravel	PT	max.	1.5 mm
Overtravel	OT	min.	3 mm
Movement Differential	MD		(0.1 mm)
Operating Position	OP		31.4±0.8 mm

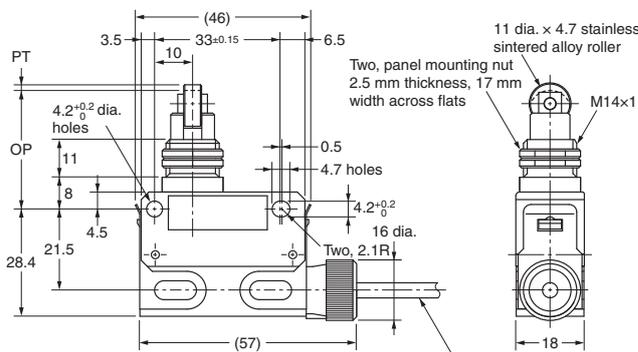
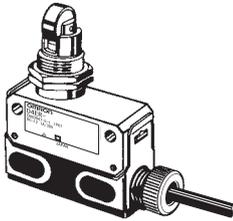
( ): Reference Value

4-dia. fluoro-insulated round cable with 3 conductors  
(conductor cross section: 0.2 mm<sup>2</sup> (AWG25), insulator diameter: 1.2 mm),  
standard length: 2 m

#### Cross Roller Plunger

D4ER-1B21N \*

D4ER-2B21N \*



OF	max.	11.77 N
RF	min.	4.90 N
PT	max.	1.5 mm
OT	min.	3 mm
MD		(0.1 mm)
OP		31.4±0.8 mm

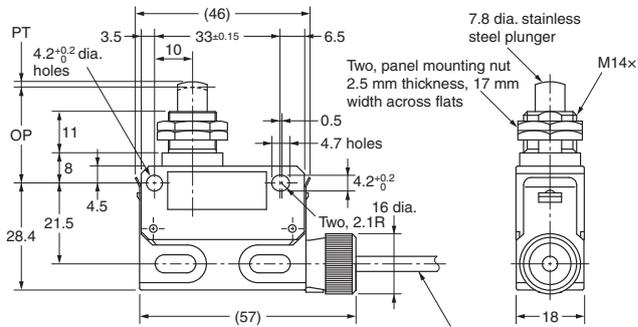
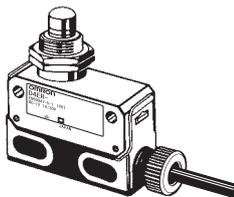
( ): Reference Value

4-dia. fluoro-insulated round cable with 3 conductors  
(conductor cross section: 0.2 mm<sup>2</sup> (AWG25), insulator diameter: 1.2 mm),  
standard length: 2 m

#### Plunger

D4ER-1C21N \*

D4ER-2C21N \*



OF	max.	11.77 N
RF	min.	4.90 N
PT	max.	1.5 mm
OT	min.	3 mm
MD		(0.1 mm)
OP		25.4±0.8 mm

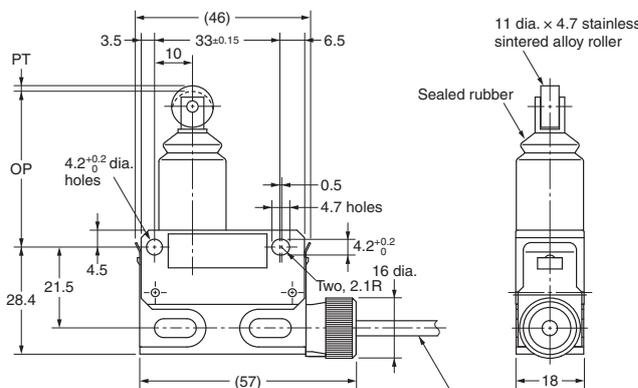
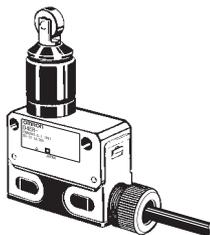
( ): Reference Value

4-dia. fluoro-insulated round cable with 3 conductors  
(conductor cross section: 0.2 mm<sup>2</sup> (AWG25), insulator diameter: 1.2 mm),  
standard length: 2 m

#### Sealed Roller Plunger

D4ER-1D21N \*

D4ER-2D21N \*



OF	max.	11.77 N
RF	min.	4.90 N
PT	max.	1.5 mm
OT	min.	3 mm
MD		(0.1 mm)
OP		41.3±0.8 mm

( ): Reference Value

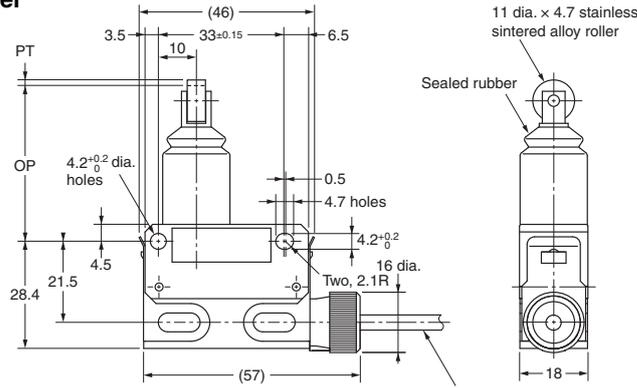
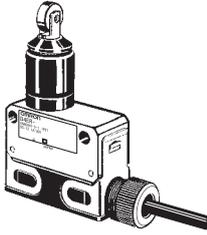
4-dia. fluoro-insulated round cable with 3 conductors  
(conductor cross section: 0.2 mm<sup>2</sup> (AWG25), insulator diameter: 1.2 mm),  
standard length: 2 m

**Note:** Unless otherwise specified, a tolerance of ±0.4 mm applies to all dimensions.

\* Only the model with a terminal specification of 21 is shown. The cable is attached to the left side for models with a terminal specification of 22.

**Sealed Cross Roller Plunger**

D4ER-1E21N \*  
D4ER-2E21N \*



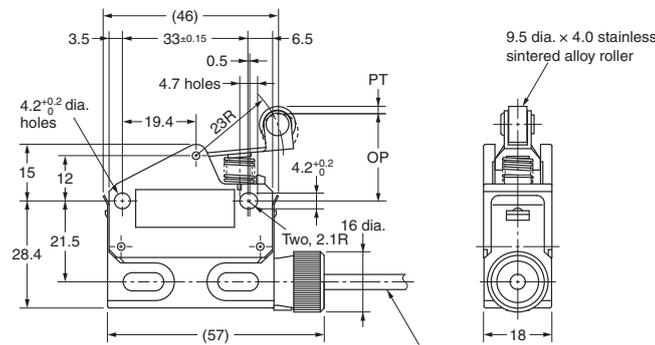
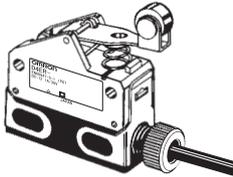
OF	max.	11.77 N
RF	min.	4.90 N
PT	max.	1.5 mm
OT	min.	3 mm
MD		(0.1 mm)
OP		41.3±0.8 mm

( ): Reference Value

4-dia. fluoro-insulated round cable with 3 conductors  
(conductor cross section: 0.2 mm<sup>2</sup> (AWG25), insulator diameter: 1.2 mm),  
standard length: 2 m

**Roller Lever**

D4ER-1G21N \*  
D4ER-2G21N \*



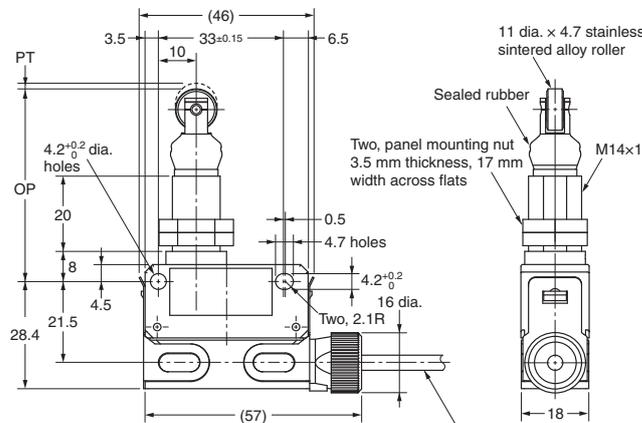
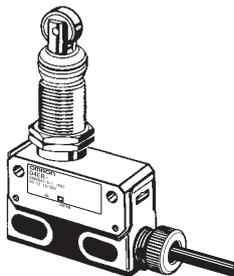
OF	max.	3.92 N
RF	min.	0.78 N
PT	max.	2 mm
OT	min.	4 mm
MD		(0.3 mm)
OP		23.1±0.8 mm

( ): Reference Value

4-dia. fluoro-insulated round cable with 3 conductors  
(conductor cross section: 0.2 mm<sup>2</sup> (AWG25), insulator diameter: 1.2 mm),  
standard length: 2 m

**Long Roller Plunger**

D4ER-1L21N \*  
D4ER-2L21N \*



OF	max.	11.77 N
RF	min.	4.90 N
PT	max.	1.5 mm
OT	min.	3 mm
MD		(0.1 mm)
OP		51±0.8 mm

( ): Reference Value

4-dia. fluoro-insulated round cable with 3 conductors  
(conductor cross section: 0.2 mm<sup>2</sup> (AWG25), insulator diameter: 1.2 mm),  
standard length: 2 m

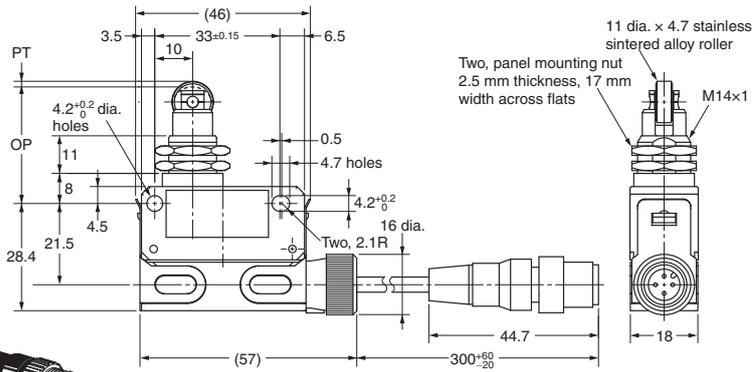
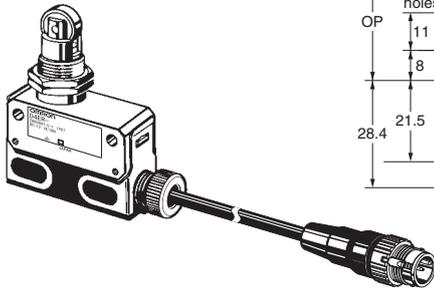
**Note:** Unless otherwise specified, a tolerance of ±0.4 mm applies to all dimensions.

\* Only the model with a terminal specification of 21 is shown. The cable is attached to the left side for models with a terminal specification of 22.

## Pre-wired Connector type

### Roller Plunger

D4ER-1A21N-DTK1EJ \*  
D4ER-2A21N-DTK1EJ \*

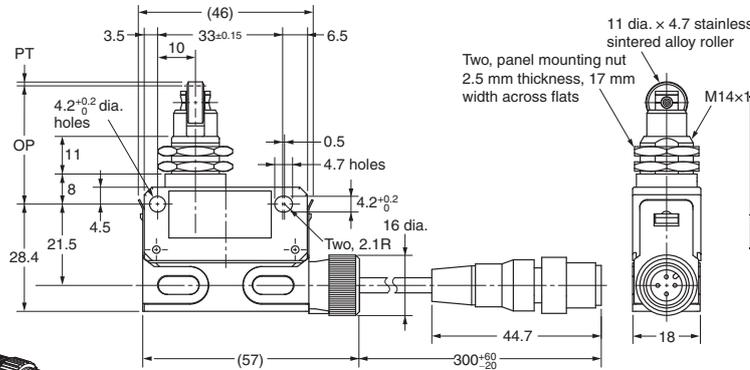
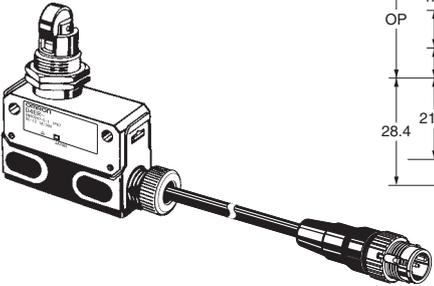


OF	max.	11.77 N
RF	min.	4.90 N
PT	max.	1.5 mm
OT	min.	3 mm
MD		(0.1 mm)
OP		31.4±0.8 mm

( ): Reference Value

### Cross Roller Plunger

D4ER-1B21N-DTK1EJ \*  
D4ER-2B21N-DTK1EJ \*

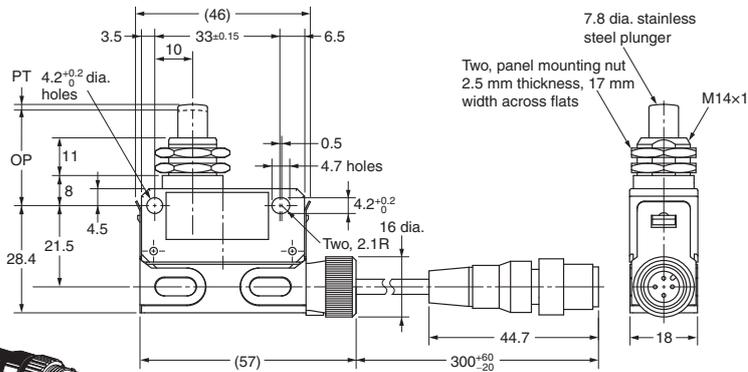
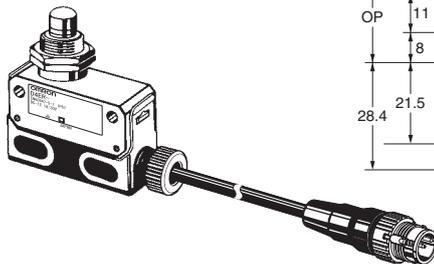


OF	max.	11.77 N
RF	min.	4.90 N
PT	max.	1.5 mm
OT	min.	3 mm
MD		(0.1 mm)
OP		31.4±0.8 mm

( ): Reference Value

### Plunger

D4ER-1C21N-DTK1EJ \*  
D4ER-2C21N-DTK1EJ \*



OF	max.	11.77 N
RF	min.	4.90 N
PT	max.	1.5 mm
OT	min.	3 mm
MD		(0.1 mm)
OP		25.4±0.8 mm

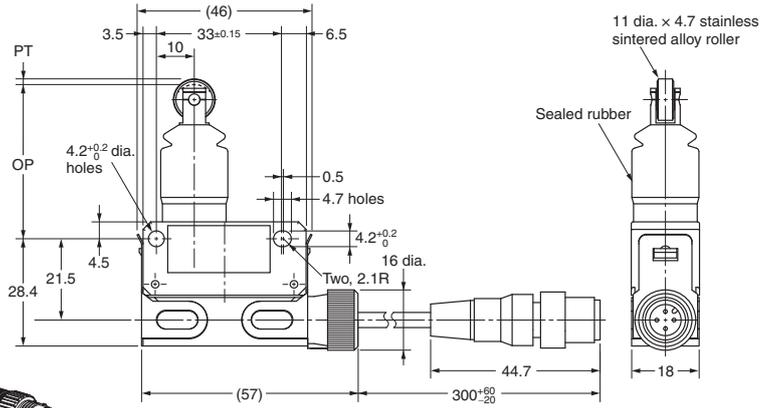
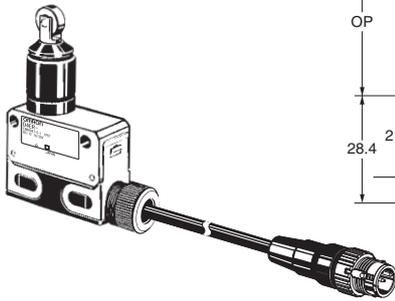
( ): Reference Value

Note: 1. Unless otherwise specified, a tolerance of ±0.4 mm applies to all dimensions.

2. The location of the positioning piece on the connector is not always the same.

\* Only the model with a terminal specification of 21 is shown. The cable is attached to the left side for models with a terminal specification of 22.

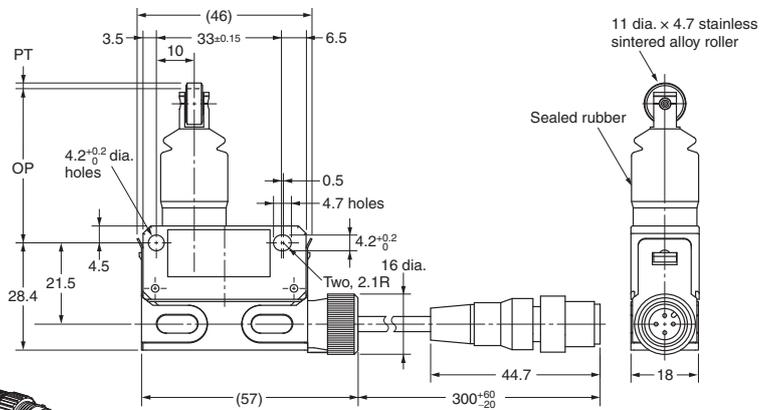
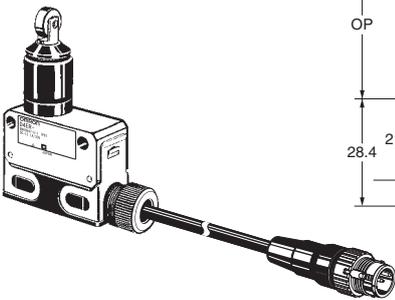
**Sealed Roller Plunger**  
**D4ER-1D21N-DTK1EJ \***  
**D4ER-2D21N-DTK1EJ \***



OF	max.	11.77 N
RF	min.	4.90 N
PT	max.	1.5 mm
OT	min.	3 mm
MD		(0.1 mm)
OP		41.3±0.8 mm

( ): Reference Value

**Sealed Cross Roller Plunger**  
**D4ER-1E21N-DTK1EJ \***  
**D4ER-2E21N-DTK1EJ \***



OF	max.	11.77 N
RF	min.	4.90 N
PT	max.	1.5 mm
OT	min.	3 mm
MD		(0.1 mm)
OP		41.3±0.8 mm

( ): Reference Value

**Note:** 1. Unless otherwise specified, a tolerance of ±0.4 mm applies to all dimensions.  
 2. The location of the positioning piece on the connector is not always the same.

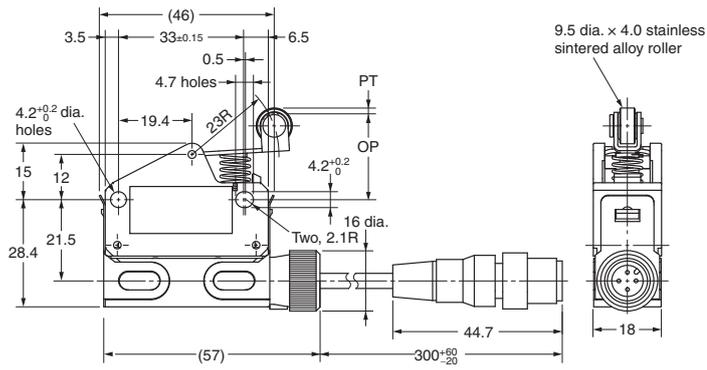
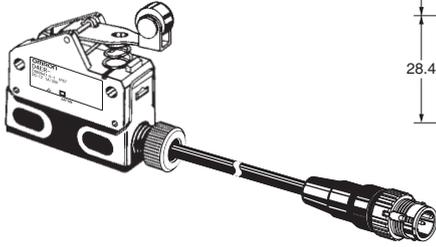
\* Only the model with a terminal specification of 21 is shown. The cable is attached to the left side for models with a terminal specification of 22.

# D4ER-□N

## Roller Lever

D4ER-1G21N-DTK1EJ \*

D4ER-2G21N-DTK1EJ \*



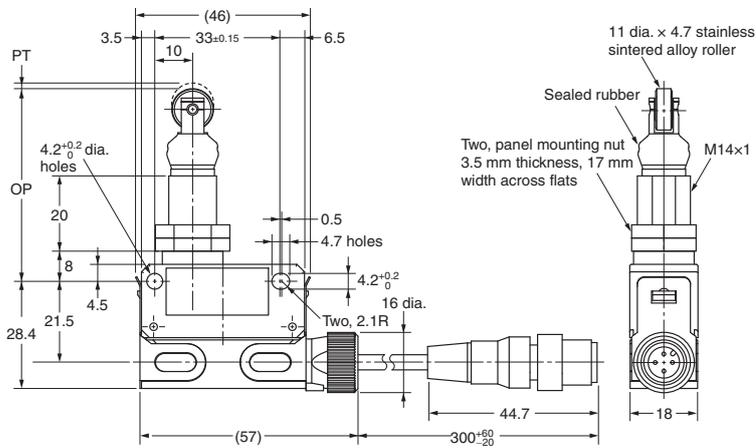
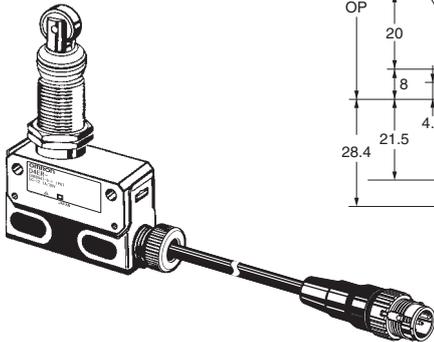
OF	max.	3.92 N
RF	min.	0.78 N
PT	max.	2 mm
OT	min.	4 mm
MD		(0.3 mm)
OP		23.1±0.8 mm

( ): Reference Value

## Long Roller Plunger

D4ER-1L21N-DTK1EJ \*

D4ER-2L21N-DTK1EJ \*



OF	max.	11.77 N
RF	min.	4.90 N
PT	max.	1.5 mm
OT	min.	3 mm
MD		(0.1 mm)
OP		51±0.8 mm

( ): Reference Value

**Note:** 1. Unless otherwise specified, a tolerance of ±0.4 mm applies to all dimensions.

2. The location of the positioning piece on the connector is not always the same.

\* Only the model with a terminal specification of 21 is shown. The cable is attached to the left side for models with a terminal specification of 22.

## Safety Precautions

Refer to *Safety Precautions for All Limit Switches* on your OMRON website for general precautions.

### Warning Indications

<b>Precautions for Safe Use</b>	<b>Supplementary comments on what to do or avoid doing, to use the product safely.</b>
<b>Precautions for Correct Use</b>	<b>Supplementary comments on what to do or avoid doing, to prevent failure to operate, malfunction or undesirable effect on product performance.</b>

### Precautions for Safe Use

- Protective structure  
Do not use the product with degrade protective structure such as swelling and crack in housing and/or sealing components. Otherwise cutting oil or other substance may enter the product, resulting in a risk of corruption or burning.
- Do not disassemble or remodel the switch in any case, or the switch will not operate normally.
- The durability of the Switch greatly varies with switching conditions. Before using the Switch, be sure to test the Switch under actual conditions. Make sure that the number of switching operations is within the permissible range.
- If an actuator is kept pressed for an extended period of time, the actuator will deteriorate quickly and faulty reset of the Switch may occur. Check the Switch periodically and replace it when necessary.

### Precautions for Correct Use

- The following conditions shall be observed if you use the product under an environment using cutting oil that may affect product's life and/or performance.
  - Usage under the cutting oil condition designated by the specification
  - Usage under the cutting oil dilution ration recommended by its manufacturer
  - Usage in oil or water is prohibited
 Impact on the product life may differ depending on the oil you use. Before using the cutting oil, make sure that it should not cause deterioration or degradation of sealing components.
- The D4ER-□□□□N-DTK1EJ can be used in conditions of cutting oil use described in the specifications. The oil resistance may not be ensured when the products are not mated to XS5□R Connectors, so use the products correctly.
- When mating the products to XS2 or other M12 Connectors, tighten the lock to a torque of 0.39 to 0.49 N·m.
- To protect the Switch from damage due to short-circuits, be sure to connect a quick-response fuse with a breaking current 1.5 to 2 times larger than the rated current in series with the Switch.
- Do not connect lead wires directly to the terminals. Use crimp terminals and attached them securely.
- The switch is intended for indoor use only. Do not use the switch outdoor, or the switch will malfunction.
- Do not use the switch in the atmosphere of hazardous gases (H<sub>2</sub>S, SO<sub>2</sub>, NH<sub>3</sub>, HNO<sub>3</sub>, Cl<sub>2</sub>, etc.) or high temperature and humidity, or it will cause the imperfect closing of the contacts or the breakage thereof stemming from corrosion.
- When storing the Switch, do not subject it to hazardous gases (H<sub>2</sub>S, SO<sub>2</sub>, NH<sub>3</sub>, HNO<sub>3</sub>, Cl<sub>2</sub>, etc.), dust, dirt, high temperature, or high humidity.
- Do not use the switch under any of the conditions mentioned below.
  - Locations subject to severe temperature changes
  - Locations where the interior of a protective door may come into direct contact with cutting chips, metal filings, or chemicals
  - Locations subject to high humidity or condensation
  - Locations subject to severe vibration
  - Locations subject to detergents, thinners, or other solvents
  - Locations where flammable or explosive gases are present
- If the Switch is not turned ON and OFF for an extended period of time, contact oxidation may reduce the contact reliability. Continuity failure may result in an accident.
- Do not drop the Switch. Doing so may prevent it from functioning to its full capacity.
- Do not place an excessive load on the Switch.
- Be sure to keep the load current less than the rated value.
- Do not supply electric power when wiring. Otherwise electric shock may result.
- Setting the stroke close to the operating position (OP) or releasing position (RP) will cause unstable contact. If the full stroke is set to the total travel position (TTP), the actuator or Switch may be damaged due to the inertia of the dog. Therefore, adjust the stroke with the mounting panel or the dog.
- The body of the Switch is protected from the ingress of dirt, water, and other foreign matter, but the head is not protected from water or fine foreign matter. You must take measures to prevent water and fine foreign matter from entering the head. Not providing sufficient protection may result in accelerated wear or damage.
- Perform inspections and tests to confirm the operating characteristics, insulation resistance, dielectric strength, and contact resistance of the Switch if it is left in a location that does not meet the storage conditions, if it is subjected to condensation, if it is dropped, or if it is stored for more than one year.
- The user of the system must not attempt to perform maintenance and repairs. Contact the manufacturer of the system concerning maintenance and repairs.

- Make sure that the dog does not strike the actuator of the Switch at an angle. If a load is placed on the actuator at an angle, the actuator may be deformed or damaged or the rotary shaft may be deformed or damaged.
- Do not normally leave the Switch in oil or water. Water or oil may enter the Switch.
- Perform scheduled, periodic inspections.

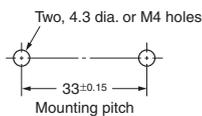
## Handling

- Be sure to connect a fuse with a breaking current 1.5 to 2 times 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 under the EN ratings, use a gI or gG 10-A fuse that conforms to IEC 60269.

## Mounting

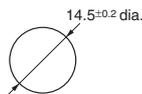
- Use M4 screws to mount the Switch. Use washers or other means to prevent the screws from becoming loose and tighten the screws to a torque of 1.18 to 1.37 N·m.

### Mounting Holes



- When mounting the panel mount-type Switch with screws on a side surface, remove the hexagonal nuts from the actuator.
- When mounting the panel mount type on a panel, tighten the hexagonal nuts of the actuator to a torque less than 7.85 N·m. The two nuts can be attached at the top or bottom and from either side.

### Mounting Hole



- Operating method, shape of cam or dog, operating frequency, and the overtravel (OT) have significant effect on the service life and precision of the Limit Switch. Make sure that the shape of the cam or dog is smooth enough.
- If the Limit Switch is used in a normally open condition (NO), sufficiently press the actuator to 70% to 100% of the value specified for the OT.
- Do not change the operating position by remodeling the actuator.
- Do not bend the cable to a radius that is smaller than 25 mm.

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