

# Oil-resistant Limit Switches

## D4ER-□N

Preliminary Version

### Even Better Oil Resistance Than D4E-N Switches

- HNBR/fluororubber used for superior resistance to oil. Prevents infiltration of oil from moving sections.
- Fluorine resin cable that withstands cutting oils is provided as a standard feature.
- Models available with SmartClick connectors for each 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 C0920 Annex 1) \*



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.

Be sure to read *Safety Precautions* on page 11 to 12 and *Safety Precautions for All Limit Switches*.

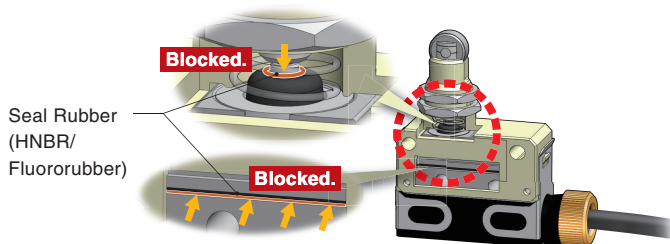
## Features

### HNBR/Fluororubber for Superior Resistance to Oil

Moving sections are protected from infiltration of oil.

New Rubber

#### Important Sealing Sections



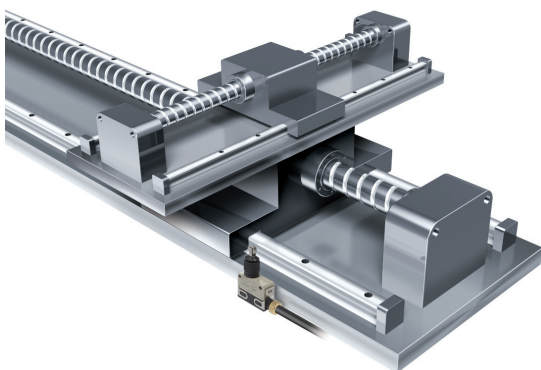
### Standard-feature Fluorine Resin Cable That Withstands Cutting Oils

In addition to prewired models, models are also available with prewired SmartClick connectors for easy connection.

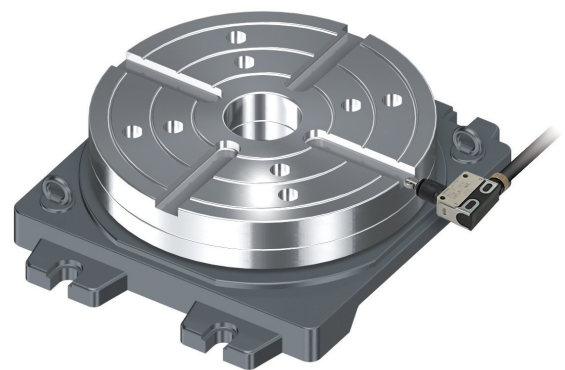
Fluororesin Sheath

## Applications

### Table Overrun Detection



### Table Position Detection



## 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
- 2: 0.1 A at 30 VDC

#### (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

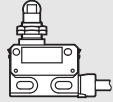
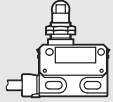
Model	D4ER-□N	D4E
Location of lead outlet		
Right-hand	D4ER-□□21N	D4E-□□21
Left-hand	D4ER-□□22N	D4E-□□23
Bottom	—	D4E-□□22

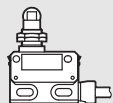
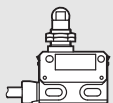
#### (4) Pre-wired Connector

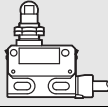
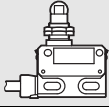







- DTK1EJ: Pre-wired connector (30-cm oil-resistant cable, M12 Smartclick connector)
- None : No connector (oil-resistance cable: 2 m)

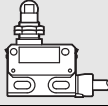
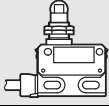







**Note:** D4ER-□N Switches are not available with operation indicators.

## Ordering Information

Type	Cable type	
	General-purpose	
	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	
		General-purpose	
		Right-hand	Left-hand
			
<b>Actuator</b>	<b>Model</b>	<b>Model</b>	
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
			
<b>Actuator</b>	<b>Model</b>	<b>Model</b>	
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

### Plug

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

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

# Specifications

## Approved Standards

Agency	Standard	File No.	Approved models
TÜV Rheinland	EN60947-5-1	R9551015, J9951016	Ask your OMRON representative for information on approved models.

## Ratings

Rated voltage	Standard load						Micro load	
	Non-inductive load (A)				Inductive load (A)		Non-inductive load (A)	
	Resistive load		Lamp load		Inductive 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 (EN60947-5-1)

D4ER-1 G 21 N  
 I II III

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

- 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

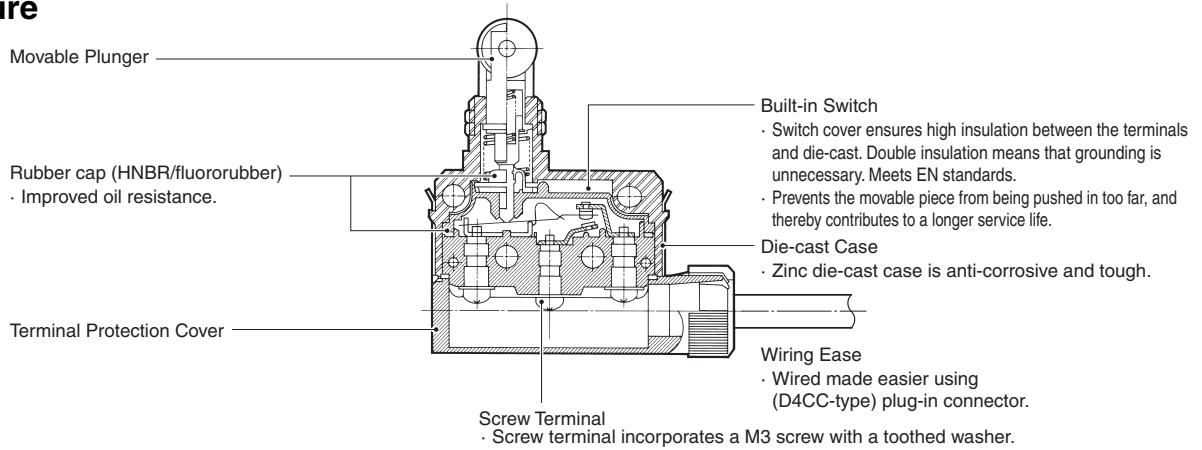
## Characteristics

<b>Degree of protection</b>		IP67 (IEC 60529) and IP67G (JIS C0920 Annex 1) *
<b>Durability</b>	<b>Mechanical</b>	4,000,000 operations min.
	<b>Electrical</b>	500,000 operations min. (1 A at 30VDC, 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>Rated frequency</b>		50/60 Hz
<b>Insulation resistance</b>		100 MΩ min. (at 500 VDC)
<b>Contact resistance</b>		15 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 non-current-carrying metal part</b>	1,500 VAC, 50/60 Hz for 1 min/Uimp at 2.5 kV (EN60947-5-1)
<b>Rated insulation voltage (U<sub>i</sub>)</b>		250V
<b>Pollution degree (operating environment)</b>		3 (EN60947-5-1)
<b>Short-circuit protective device (SCPD)</b>		10 A fuse (type gG or gI, IEC60269 approved)
<b>Conditional short-circuit current</b>		100 A (EN60947-5-1)
<b>Conventional enclosed thermal current (I<sub>the</sub>)</b>		5 A (EN60947-5-1)
<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>Shock resistance</b>	<b>Destruction</b>	1,000 m/s <sup>2</sup> max. (IEC68-2-27)
	<b>Malfunction</b>	300 m/s <sup>2</sup> max. (IEC68-2-27)
<b>Ambient operating temperature</b>		+5°C to +80°C (with no icing)
<b>Ambient operating humidity</b>		35% to 95%RH (with no condensation)
<b>Weight</b>		(in case of roller plunger) Cable type (2m): 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.  
 \* 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.

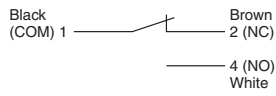
# Structure and Nomenclature

## Structure

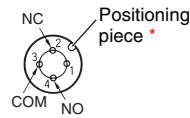


## Contact Form

### Cable type



### Pre-wired Connector type



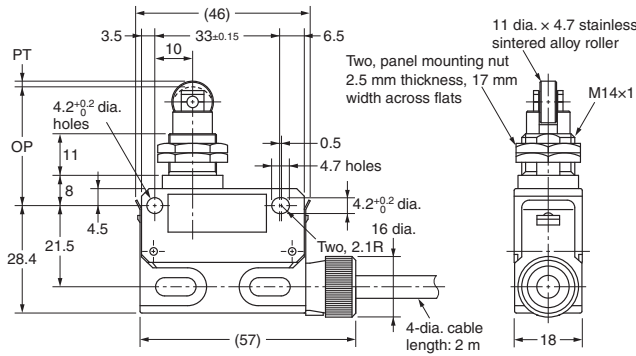
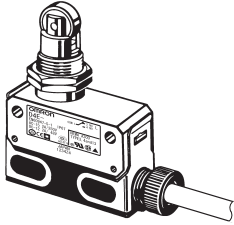
\* The position of the positioning piece is not always the same. If using an L-shaped connector causes problems in application, use a straight connector.

# Dimensions and Operating Characteristics

(Unit: mm)

## Cable type

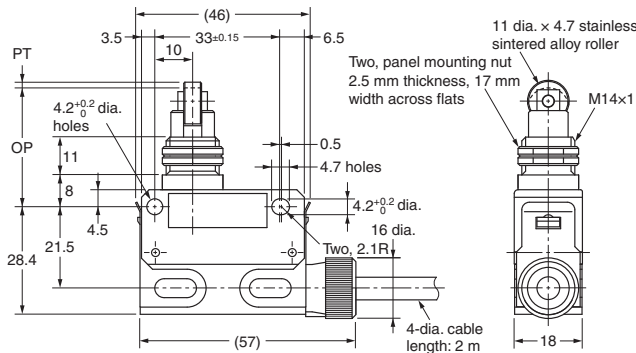
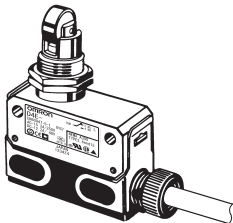
### Roller Plunger D4ER-1A21N \* D4ER-2A21N \*



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

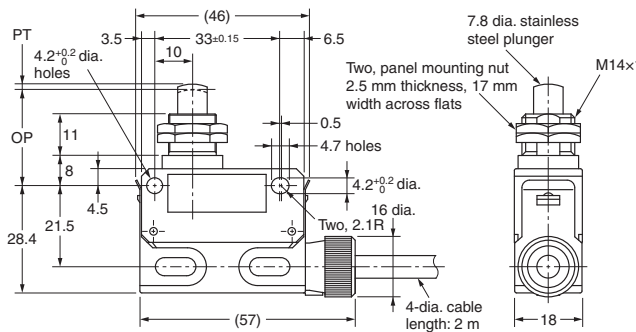
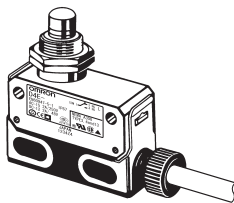
### Cross Roller Plunger D4ER-1B21N \* D4ER-2B21N \*



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

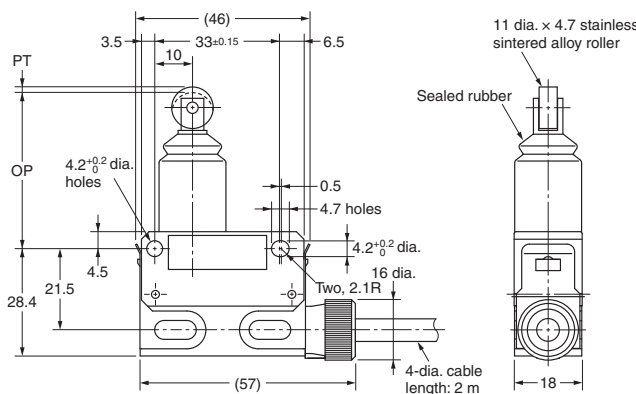
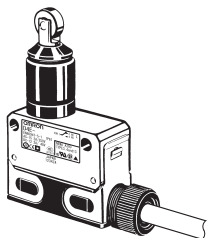
### Plunger D4ER-1C21N \* D4ER-2C21N \*



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

### 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

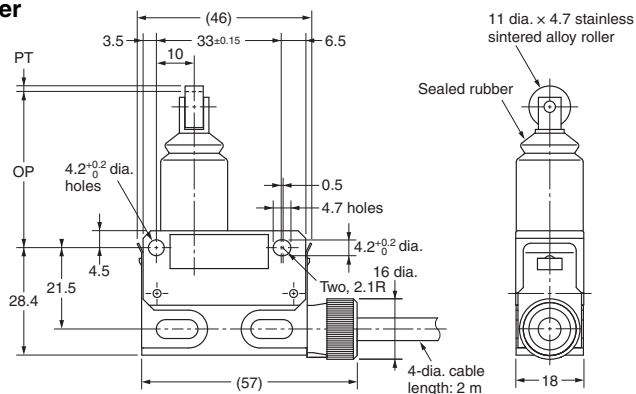
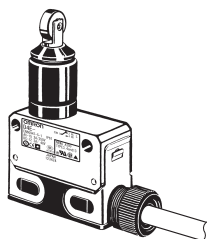
( ) :Reference Value

**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 \*

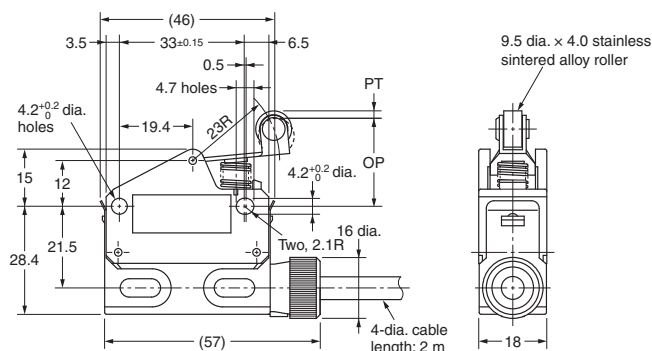
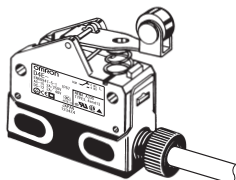


OF	max.	11.77 N
RF	min.	4.90 N
PT	max.	1.5 mm
OT	min.	3 mm
MD		(0.1 mm)
OP		41.3±0.8 mm

( ) :Reference Value

**Roller Lever**

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

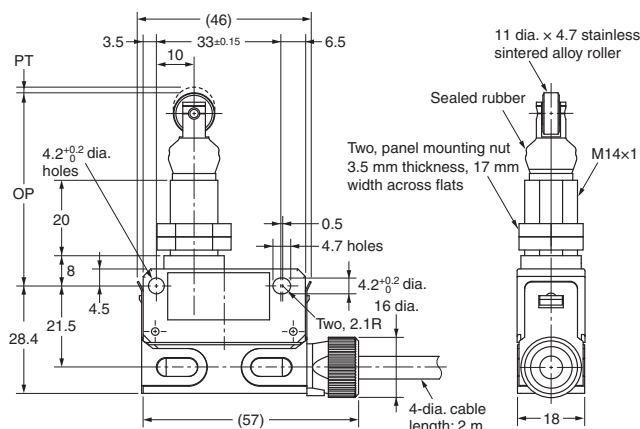
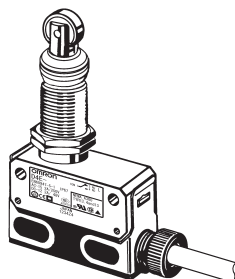


OF	max.	3.92 N
RF	min.	0.78 N
PT	max.	2 mm
OT	min.	4 mm
MD		(0.3 mm)
OP		23.1±0.8 mm

( ) :Reference Value

**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

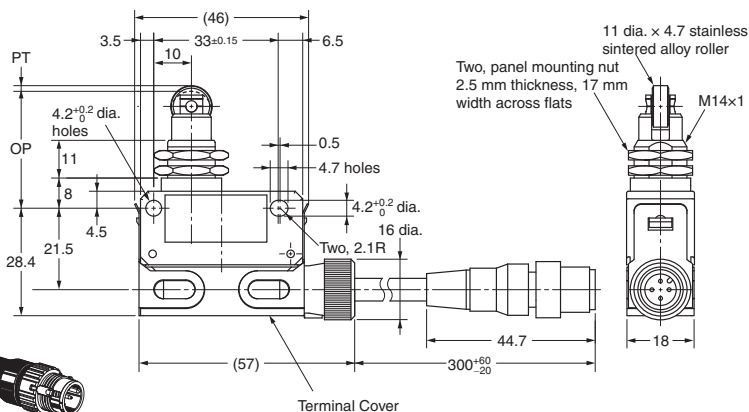
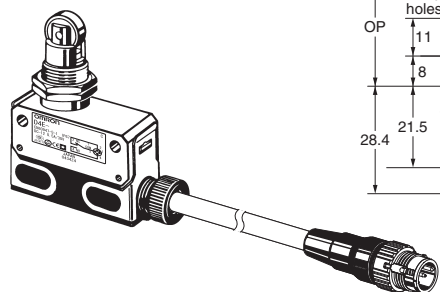
( ) :Reference Value

**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

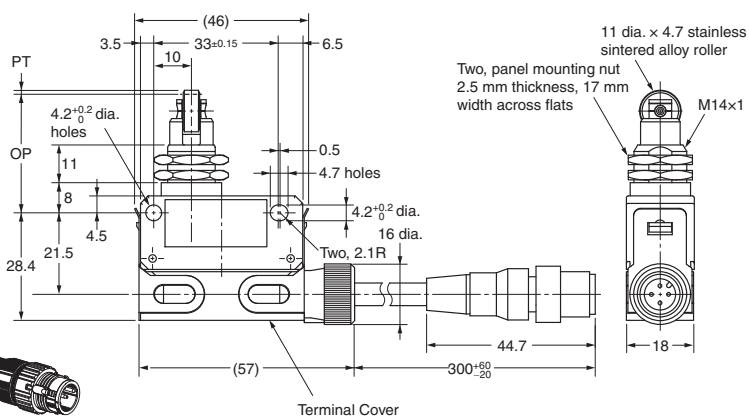
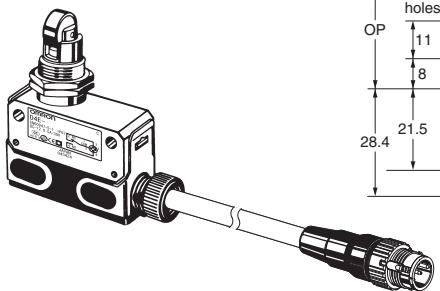
Roller Plunger  
 D4ER-1A21N-DTK1EJ  
 D4ER-2A21N-DTK1EJ



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

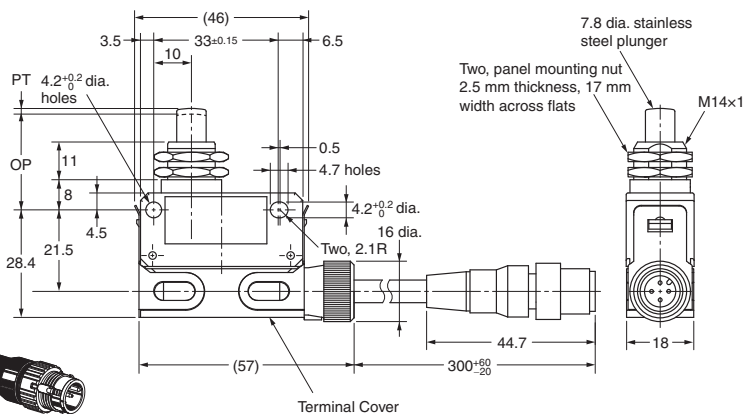
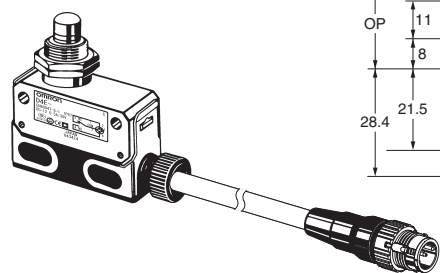
Cross Roller Plunger  
 D4ER-1B21N-DTK1EJ  
 D4ER-2B21N-DTK1EJ



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



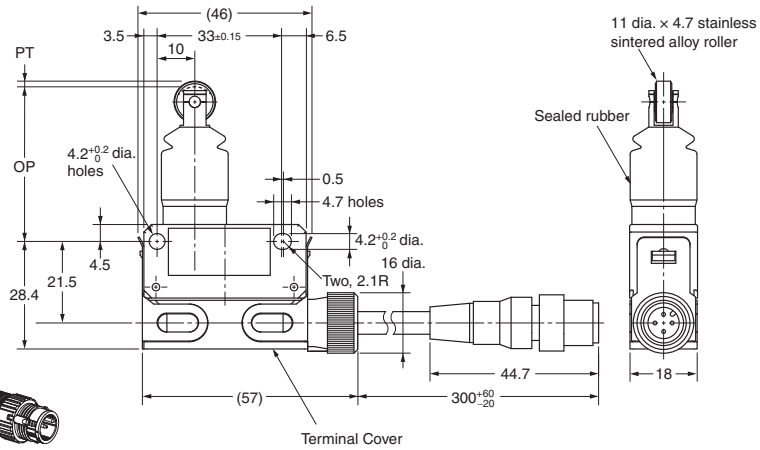
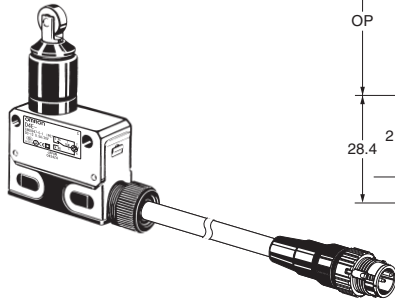
OF	max.	11.77 N
RF	min.	4.90 N
PT	max.	1.5 mm
OT	min.	3 mm
MD		(0.1 mm)
OP		25.4±0.8 mm

( ) :Reference Value

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



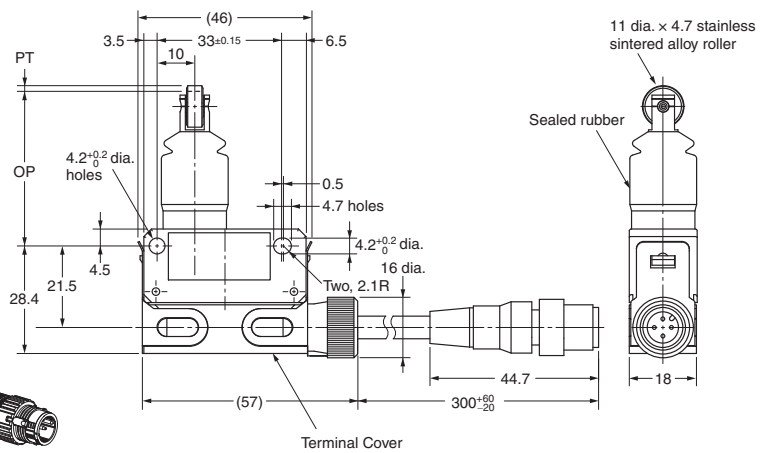
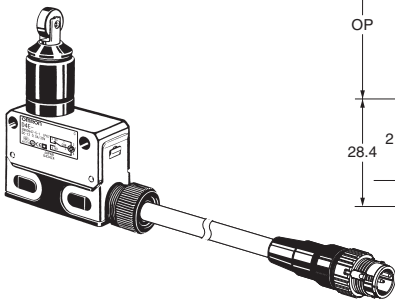
**Sealed Roller Plunger**  
**D4ER-1D21N-DTK1EJ**  
**D4ER-2D21N-DTK1EJ**



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**

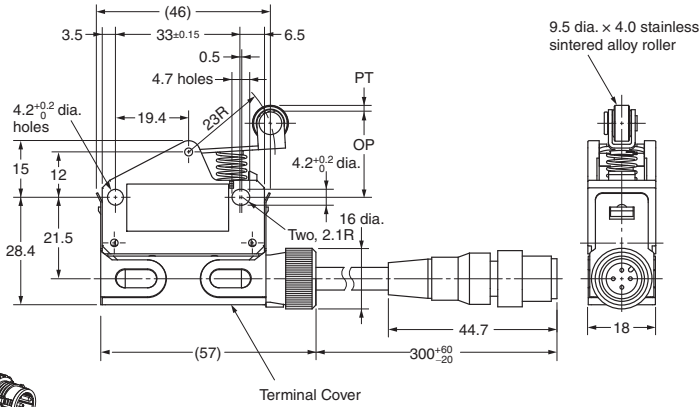
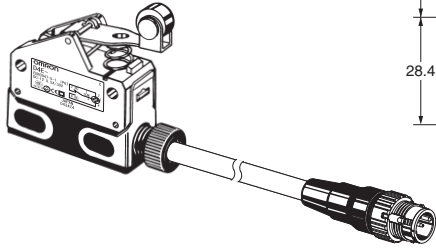


OF	max.	11.77 N
RF	min.	4.90 N
PT	max.	1.5 mm
OT	min.	3 mm
MD		(0.1 mm)
OP		41.3±0.8 mm

( ) :Reference Value

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

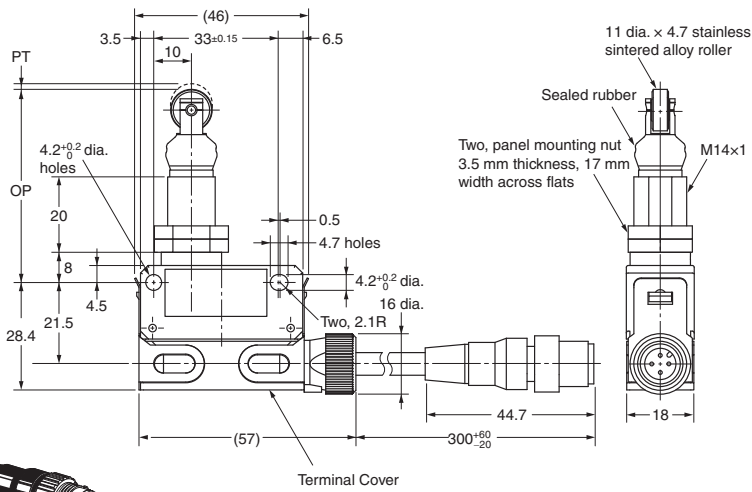
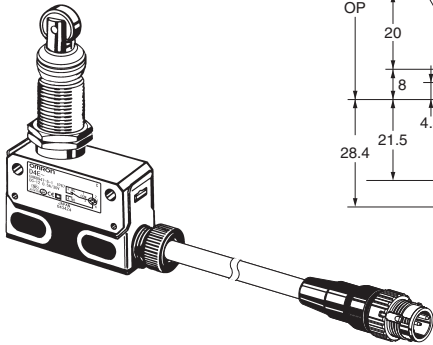
**Roller Lever**  
**D4ER-1G21N-DTK1EJ**  
**D4ER-2G21N-DTK1EJ**



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  $\pm 0.4$  mm applies to all dimensions.
  2. 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.
  3. The location of the positioning piece on the connector is not always the same.