

**SPECIFICATIONS**

**OF**

**TILT SWITCH**

**MODEL NAME : D7E-3**

OUTLINE DRAWING NO. 6421363-0

WRITTEN: Y. Kamihashi July 1, 1997

CHECKED: S. Mori July 1, 1997

APPROVED: N. Ashikaga July 1, 1997

**OMRON CORPORATION**

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**1. CONSTRUCTION**

1-1 Outline dimensions	DRWG. No. 6 4 2 1 3 6 3 - 0
1-2 Switching mechanism	To output the ON/OFF signal by mechanical switching of the internal switch contact by moving a ball inside with the tilt.
1-3 Enclosure rating	IP67 ( Only internal switch )
1-4 Operating angle	Operate with the tilt of 50 to 80 degrees.(ON→OFF) Angle : degree when tilting gradually (approx. 1 degree/s) from the horizontal.
1-5 Returning angle	Return with the tilt of more than 25 degrees Angle : degree when returning gradually(approx. 1 degree/s) from operating condition
1-6 Permissible mounting level	1 degree max. from the horizontal
1-7 Contact form	Single pole single throw (NC contacts / slow action)
1-8 Terminal	#187 quick connect /solder terminal (thickness=0.5mm)
1-9 Mounting	Pitch: 30mm 2 screws(M3) Height of the product : 5.3mm (Please refer to drawing in detail.)
1-10 Soldering	Soldering iron : temperature $350 \pm 10^{\circ}\text{C}$ , 3 second max.

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**2. ELECTRICAL CHARACTERISTICS**

**2-1 Ratings**

5VDC, 0.1mA to 30VDC, 100mA (Resistive load)

**2-2 Insulation resistance and dielectric strength**

Measuring parts	Insulation resistance (250 VDC Megger)	Dielectric* strength (50 to 60 Hz 1 min.)
Between each terminal ** of the same polarity	100 M Ω min.	250 VAC

\* Leak current is 1mA max.

\*\* To measure off condition

**2-3 Contact resistance**

100 m Ω max. (Initial value)

**3. MECHANICAL CHARACTERISTICS**

**3-1 Vibration during transporting**

Must be free from any malfunctions both electrically and mechanically

Condition      Vibration                      : 200 Gal (1cycle : 0.5 seconds)

Vibration direction : in the 2 axial directions

Time : Total 50 hours

**3-2 Shock**

Must be free from any malfunctions both electrically and mechanically

Condition      Acceleration                : 980 m/s<sup>2</sup> (100G) 3 times

Shock direction : in the three axial directions

**3-3 Shock during transporting**

Must be free from any malfunctions both electrically and mechanically

The box which packaged switches are dropped from 50±1cmm high toward a composite plate.  
(thickness 30mm min.)

**3-4 Terminal strength**

Must be free from any malfunctions both electrically and mechanically (Refer to Note2.)

Apply force to the terminal, 78.4N vertically and 49N horizontally ,1 minute each.

#### 4. ENVIRONMENT CHARACTERISTICS

##### 4-1 Operating temperature and humidity

Temperature :  $-25^{\circ}\text{C}$  to  $+60^{\circ}\text{C}$  (No icing and condensation)

Humidity : 45 to 95 %RH

##### 4-2 Storage temperature and humidity

Temperature :  $-25^{\circ}\text{C}$  to  $+60^{\circ}\text{C}$  (No icing and condensation)

Humidity : 45 to 95 %RH

#### 5. ENDURANCE CHARACTERISTICS

##### 5-1 Salt spray

The switch is sprayed with  $5 \pm 0.5\%$  salt water for 96 hours.

No remarkable corrosion is allowed and must be free from any malfunctions both electrically and mechanically

Contact resistance should be  $100 \Omega$  max. (To measure after salt is removed by water and the switch dries well.)

##### 5-2 Moisture Endurance

Must be free from any malfunctions both electrically and mechanically after the switch is left in a temperature of  $40 \pm 2^{\circ}\text{C}$  and humidity of 90 to 98%RH for 240 hours.(To measure after the switch dries well.)

##### 5-3 Oil Endurance

Change of weight must be 20% max. after the switch is dipped in Gasoline 1 at  $20 \pm 5^{\circ}\text{C}$  for 24 hours.

##### 5-4 Heat Endurance

Must be free from any malfunctions both electrically and mechanically after the switch is left in a temperature of  $70 \pm 5^{\circ}\text{C}$  for 96 hours.

##### 5-5 Cold Endurance

Must be free from any malfunctions both electrically and mechanically after the switch is left in a temperature of  $-35 \pm 5^{\circ}\text{C}$  for 96 hours.

##### 5-6 High temperature/humidity

Must be free from any malfunctions both electrically and mechanically after the switch is left in a temperature of  $70 \pm 2^{\circ}\text{C}$  and humidity of 90 to 98%RH for 240 hours.

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**5-7 Corrosive gas**

H<sub>2</sub>S : 3±1ppm, SO<sub>2</sub> : 10±3ppm, 40°C, 75%RH, 96 hours

Must be free from any malfunctions both electrically and mechanically after the switch is left under above condition.

**6. ELECTRICAL SERVICE LIFE**

Must be free from any malfunctions both electrically and mechanically after 5,000 operations under the rated resistive load of 30VDC, 100mA at a frequency of 10 to 20 operations per minute.

**7. OTHERS****Note1.**

1) If mounting surface is warped, there is a possibility that switch performance might be changed because of switch deformation when it's mounted. (Warp of mounting surface : 0.3mm max.)

Use two M3 screws with spring washers to mount the switch.

Tighten the screws to a torque of 0.4N to 0.6N·m (4 to 6kgf·cm).

2) Do not set the switch where its mechanically characteristics is affected badly, like door opening, car passage and other vibration and shock.

3) Do not put the switch in direct sunshine.

4) Mechanical deterioration caused by water cleaning, water covered, leak of oil and other organic solvent. Is not guaranteed by us.

**Note2.**

To be evaluated as "free from any malfunctions both electrically and mechanically" the switch must satisfy following requirements.

- |                          |   |
|--------------------------|---|
| 1) Operating angle       | More than ± 20% of specified range is not acceptable  |
| Releasing angle          | More than ± 20% of specified range is not acceptable  |
| 2) Contact resistance    | 1 Ω max.  |
| 3) Insulation resistance | 10MΩ min. (250VDC meggar)                             |
| 4) Dielectric strength   | 250VAC 50/60Hz for 1 minute (Leak current : 1mA max.) |

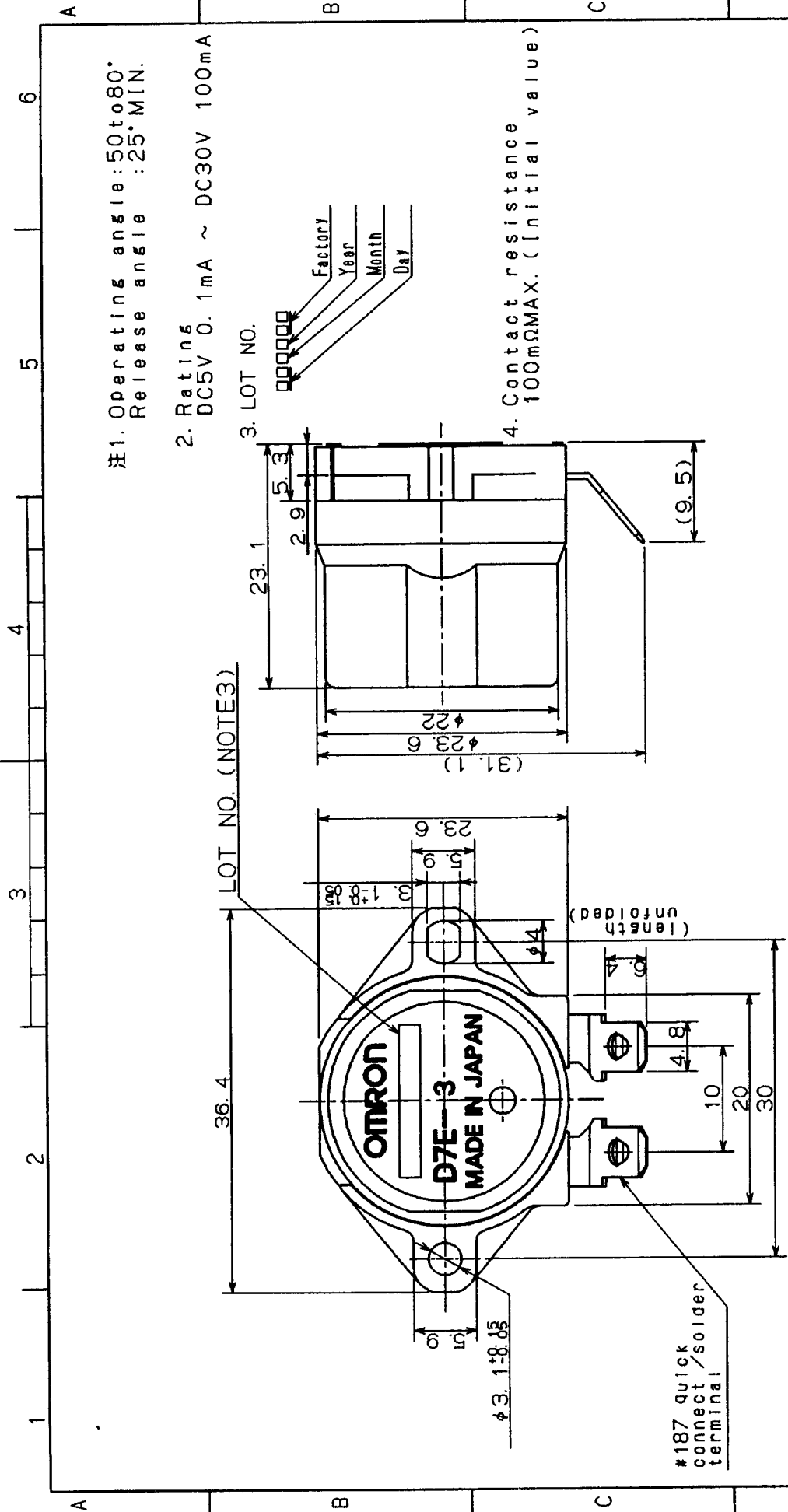
**Note3.**

This specification is invalid if we receive no approval or no order replacement of yours within a year since this is submitted. In a case of service parts, we will replace with new specifications.

**Note4.**

Others not included in this specifications are subjects to change without notice

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注1. Operating angle: 50 to 80°  
Release angle: 25° MIN.

2. Ratings  
DC5V 0.1mA ~ DC30V 100mA

3. LOT NO.

Factory  
Year  
Month  
Day

4. Contact resistance  
100Ω MAX. (initial value)

LOT NO. (NOTES)

#187 quick connect/solder terminal

MATERIAL		SCALE	
FINISH		2:1	
TOLERANCES UNLESS SPECIFIED	DESIGNED	CHECKED	APPROVED
±0.4	Y. Kobayashi	S. Mori	M. Ashikaga
	July 1, 1997	July 1, 1997	July 7, 1997
SYM	DATE	E/C CONTENTS	E/C NO.
SIGN		SHEET	
		1/1	
		DRWG NO.	
		6421363-0 A	
		DESIGNED FOR	
		THE MODEL D7E-3	
		TILT SWITCH	
		OUTLINE DRAWING	

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