TONELUCK
Appliance Switch

# D6 Door Switch
# Product Specifications

*File/Edition: D631M-AA1-01-SPC.001*

Description: Door Switch

Customer Name: Model No.: D6 (Series)

Customer P/N: Toneluck P/N: D631M-AA1-01

Representative: Project Code:

## Specifications Receipt Confirmation

Received by: _____ Title: _____

Signature: _____ Date: _____

Remark:

1. This product specification is considered as the technical agreement between the receiving customer and Toneluck. Any information on the general product catalog which is in conflict with or different from the corresponding information of this document is considered as invalid.

2. If customer issue purchase orders without confirmation by signature of this specification after receipt, such confirmation will be considered as granted upon receipt of the first purchase order.

Prepared by: Bink Wan 2022-05-16

Checked by: Genghong Guo 2022-05-16

Approved by: Jerry 2022-05-16

## 1. General Characteristics

1.1 Application: This specification is applied to the Door Switch for general applications.

1.2 Operating Temperature Range : -40°C to +85°C

1.3 Operating Relative Humidity : ≤95%RH at +40°C

1.4 Test Conditions : Unless otherwise specified, the atmospheric conditions are as following

Ambient Temperature : 5~35°C

Relative Humidity: 45~85%

Atmospheric Pressure : 86~106kPa (860~1060mbar)

## 2. Appearance, Structure & Dimensions

2.1 Appearance: The switch shall have good finishing, and no rust, crack or plating defects.

2.2 Structure & Dimensions : Refer to individual product drawing

2.3 Markings : Refer to individual product drawing

2.4 Approved by Standards: 16A 125/250VAC

1/3HP 125/250VAC (UL61058-1)

10(4)A 125/250VAC (ENEC)

## 3. Rating & Life

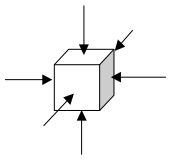
| Rating | Endurance with electrical load | Endurance without electrical load |
|---|---|---|
| 16A 125/250VAC | 6,000 cycles | 200,000 cycles |
| 1/3HP 125/250VAC | | |
| 10(4)A 125/250VAC | 50,000 cycles | |

## 4. Electrical Characteristics

| No. | Contents | Criteria | Test Method |
|---|---|---|---|
| 4.1 | Insulation Resistive | 100 MΩ min. | 500VDC voltage is applied between any two terminals and between any terminal and dead parts for 60±5s. |
| 4.2 | Dielectric Voltage | No dielectric break down occurs. | 1,000VAC, 50~60Hz voltage is applied between two non-connected terminals and 1,500VAC, 50~60Hz voltage is applied between any terminal and dead parts for 60±5s. |

**5. Mechanical Characteristics**

| No. | Contents | Criteria | Test Method |
|---|---|---|---|
| 5.1 | Operating Force | See outline drawing | Apply a force gauge on the top point of the plunger to actuate the switch vertically and slowly, the maximal reading while the plunger from free position to operating position. |
| 5.2 | Releasing Force | See outline drawing | Apply a force gauge on the top point of the plunger to actuate the switch vertically and slowly, the minimal reading while the plunger from operating position to releasing position. |
| 5.3 | Operating Position | See outline drawing | Operating the switch slowly till the COM-NO contacts close, in this moment, measure the distance from the plunger top point to the surface of mounting plane as the operating position. |
| 5.4 | Pre Travel | See outline drawing | The vertical distance through the top point of the plunger from its free position to operating position |
| 5.5 | Movement Differential Travel | See outline drawing | The vertical distance through the top point of the plunger from its operating position to releasing position |
| 5.6 | Terminal Strength | After test,<br>—no terminal looseness, damage and insulation breakage<br>—the electrical performance shall be satisfied with the requirements specified in section 4 | Apply axial force to each terminal without jerks<br>Push:96 N<br>Pull:88 N |
| 5.7 | Abnormally Push | After test,<br>—the switch shall be free from damage in construction | Install the switch into fixture and push the plunger inward with a force of 200N, and hold for 30 seconds. Repeat this action three times on each sample |

| | | | |
|---|---|---|---|
| 5.8 | Vibration Proof | After test,<br>—Insulation Res.: 50MΩ min.<br>— Dielectric voltage shall be satisfied with the requirements specified in Section 4.2.<br>—Operating force variation: Within ±20% from initial value and within spec.<br>—No mechanical abnormality | Samples shall be fastened on a vibration test machine and tested under the conditions of the following:<br>-Vibration frequency range: 10~55 Hz<br>-Total amplitude: 1.5mm<br>-Sweep ratio: 10~55~10Hz approx. 1 min.<br>-Method of changing the sweep vibration frequency: logarithmic or linear<br>-Direction of vibration: Three directions perpendicular with each other, including the operating direction.<br>-Duration: 2 hours per direction, 6 hours totally. |
| 5.9 | Mechanical Shock | After test,<br>—Insulation Res.: 50MΩ min.<br>— Dielectric voltage shall be satisfied with the requirements specified in Section 4.2.<br>—Operating force variation: Within ±20% from initial value and within spec.<br>—No mechanical abnormality | Samples shall be fastened on a shock test machine and tested under the condition of the following:<br>-Acceleration: 300m/s$^2$(30G)<br>-Duration: 11ms<br>-Test Direction: 6 directions<br>  <br>-Number of shocks: 3 times per direction |

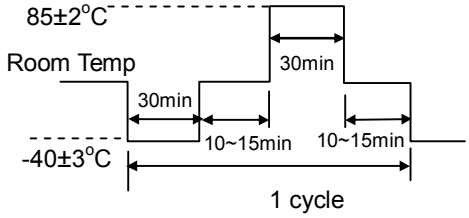
**6. Endurance Characteristics**

| No. | Contents | Criteria | Test Method |
|---|---|---|---|
| 6.1 | Endurance test without electrical load | After test,<br>—Insulation Res.: 50MΩ min.<br>— Dielectric voltage shall be satisfied with the requirements specified in Section 4.2.<br>—Operating force variation: Within ±30% from initial value.<br>—No mechanical abnormality | The test samples mounted normally on endurance test, 200,000 cycles operation shall be performed continuously at a rate of 30~60 cycles per minutes without electrical load. |

| | | | |
|---|---|---|---|
| 6.2 | Endurance test with electrical load(UL) | After test,<br>—No construction defect<br>—No dielectric breakdown as 1000 VAC between no-connected terminal and 1500 VAC between terminal and ground for 60±5 s | 1) According to UL1054, samples are to be mounted normally on endurance tester, 6,000 cycles operation shall be performed continuously at a rate of 6~10 cycles per minute with electrical load as 16A 125/250VAC |
| | | | 2) According to UL1054, samples are to be mounted normally on endurance tester, 6,000 cycles operation shall be performed continuously at a rate of 6~10 cycles per minute with electrical load as 1/3HP 125/250VAC |
| 6.3 | Endurance test with electrical load(ENEC) | —No construction defect<br>—No dielectric breakdown as 1125 VAC between terminal and ground for 60±5 s<br>— Insulation resistance more than 2 MΩ | According to IEC61058-1 ,Sample applied the following test<br>—mounting：normally<br>—ambient temp：half cycles at 85℃+5℃、half cycles at -40℃±3℃<br>—Load ：10(4)A 250VAC<br>—Cycles rate：15 times/ sec,2S OFF、2S ON，<br>—Total cycles:50000cycles |

**7. Weather Proof Characteristics**

| No. | Contents | Criteria | Test Method |
|---|---|---|---|
| 7.1 | Cold Proof | After test,<br>—Insulation Res.: 50MΩ min.<br>—Dielectric voltage shall be satisfied with the requirements specified in Section 4.2.<br>—No mechanical abnormality | After testing at –40±3°C for 96 hours, the samples are to recover under room circumstance for 1 hour, and measurement shall be made within 1 hour after recovery, water drops shall be eliminated. |
| 7.2 | Hot Proof | | After testing at 85±2°C for 96 hours, the samples are to recover under room circumstance for 1 hour, and measurement shall be made within 1 hour after recovery, water drops shall be eliminated. |
| 7.3 | Moisture Resistance | | After testing at 40±2°C,90~95%RH for 96 hours, the samples are to recover under room circumstance for 1 hour, and measurement shall be made within 1 hour after recovery, water drops shall be eliminated. |

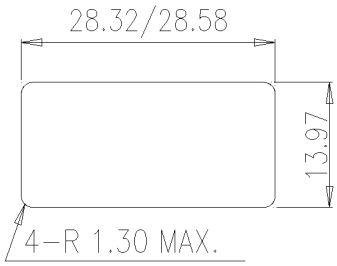
| | | | |
|---|---|---|---|
| 7.4 | Temperature Cycles | | After 5 cycles testing under the following conditions, the samples are to recover under room circumstance for 1 hour, and measurement shall be made within 1 hour after recovery, water drops shall be eliminated.<br>  |

Special Notes:

1. Switch Mounting

(1) Switch Mounting

- Please insert the switch into the mounting hole ,the switch will be automatic tighten by retaining clip
- Mounting Holes graphics, Show as below

| The graphics to mounting holes (suggested)<br>The material thickness include 1.14～2.54 mm | Notes of switch operation |
|---|---|
|  | ✓ Operation parts shall keep away from switch button, and enough spacing for motion is required.<br>✓ Please negotiate with us in advance if inertial lash company with operation.<br>✓ Please take into account the operating force when you specified the location of operating parts. |

(2) Insulated wire used in switches mounting
Please pay attention to the spacing between the metal mounting plane and insulated wire which matching terminal

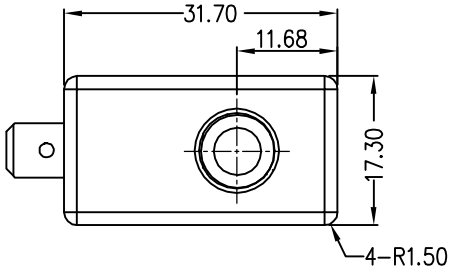
(3) Connecting wire to switch
Select suitable socket and wire to connect to switch, confirm it is tightened totally. (Refer to the spec. of the drawing)

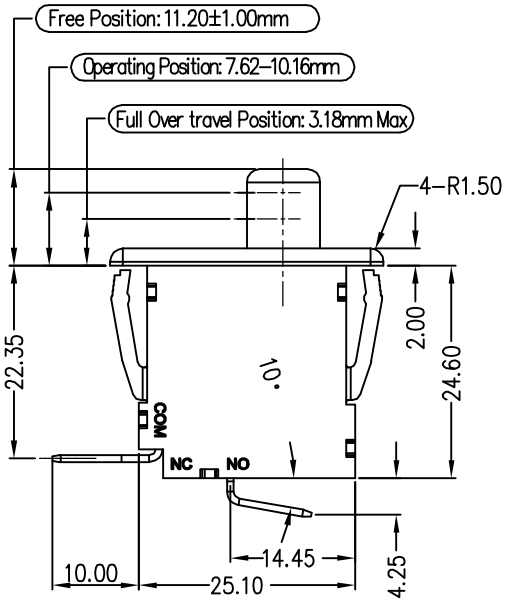
2. Deposition of switch

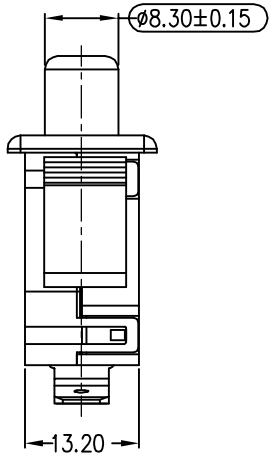
- Please keep away from polluted gas, organic gas (e.g. oil stave), dust and humidity.
- Storage temperature: 5~35°C, Humidity: ≤80%RH.

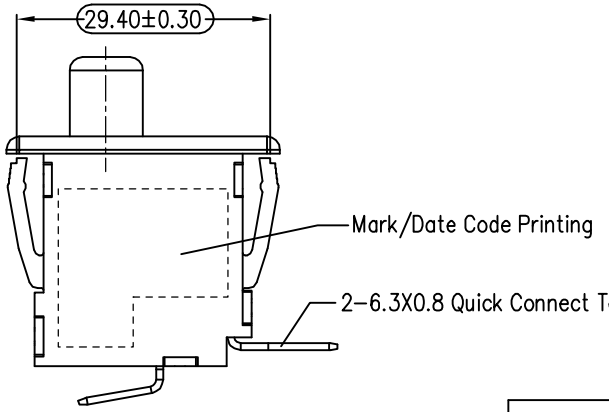
| OUTLINE | File/Edition: | D631M-AA1-01.004 |
|---|---|---|

| | |
|---|---|
| XX.XX | CONTROL DIMENSION |
| △ | CRITICAL CHARACTERISTIC |

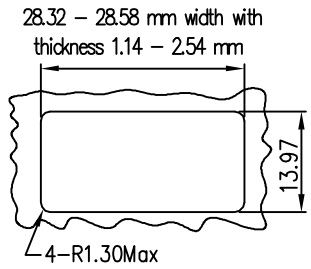


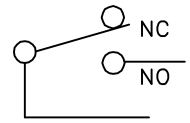




Panel Hole Detail(Reference)




Circuit Diagram




| Mechanical Characteristics: | |
|---|---|
| Item | Criteria |
| Free Position | 11.20±1.00mm |
| Operating Force | 500gf Max |
| Releasing Force | 100gf Min. |
| Operating Position | 7.62-10.16mm |
| Movement Differential Travel | 1.14mm Max. |
| Pre Travel | 3.18mm Max. |
| Over Travel | 4.45mm Min. |
| Full Overtravel Position | 3.18mm Max. |

| Electrical Characteristics: | | |
|---|---|---|
| Ratings | | Operating Life |
| 16A 125/250VAC;1/3HP 125/250VAC; | | 6,000 cycles with load(cULus) |
| 10(4)A 125/250VAC | | 50,000 cycles with load(ENEC,CQC) |
| Insulation Resistance: | | 100MaMin Initial. |
| Dielectric: | 1000VAC(50~60HZ) - between non-connected terminals | |
| | 1500VAC(50~60HZ) - between terminals and ground - between terminals and non-live-metal parts | |

| Other Spec. : | |
|---|---|
| Operating Life Without Load: | 200,000 cycles. |
| Operating Temperature Range: | -40℃~+85℃ |
| Colour Of The Switch: | White |

| Material List | |
|---|---|
| Switch Base | Thermoplastics UL94 V-0 |
| Switch Cover | Thermoplastics UL94 V-0 |
| Terminals | Copper Alloy, Silver plated |
| Actuator | Thermoplastics UL94 V-2 |
| Contacts | Silver Alloy |

**MASS PRODUCTION RELEASE**

| | | | | | | | | | | |
|---|---|---|---|---|---|---|---|---|---|---|
| Project Ref: | D6 Door Switch | | | Tolerance Unless Otherwise Specified | | | | | | |
| Part No: | D631M-AA1-01 | | | ~3 | >3~10 | >10~30 | >30~80 | >80~180 | Angle | |
| Drawing No: | - - - | Eng Ver | A2 | ±0.20 | ±0.30 | ±0.40 | ±0.60 | ±0.80 | ±3° | |
| Drafted by: | LiShuang | Date: | 2010-12-23 | Unit: mm | | Size: A4 | | Scale: | | |
| Checked by: | HeShiying | Date: | 2010-12-23 | THIRD ANGLE | | TONELUCK Switches & Control Solutions | | | | |
| Approved by: | RayXu | Date: | 2010-12-23 | | | | | | | |