TOTAL PAGE : 10

Customer :

No. SW983525A

Date :

AEE-DS

Attention :

Your ref. No. :

Your Part No. :

# SPECIFICATION

ALPS' ;

MODEL : SRGPHJ3100

Spec. No. : SRGP-S-704,705

G2544295M

Order No. :

| RECEIPT STATUS |
|---|
| RECEIVED |
| By. Date |
| Signature |
| Name |
| Title |


ALPS ELECTRIC CO., LTD.

HEAD OFFICE
1-7, YUKIGAYA-OHTSUKA-CHO,
OHTA-KU, TOKYO 145 JAPAN


DSG' D

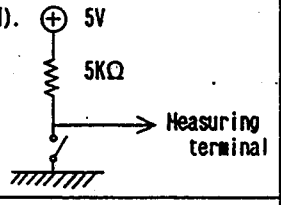
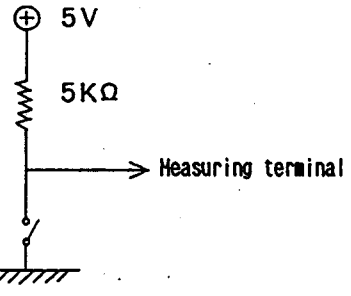
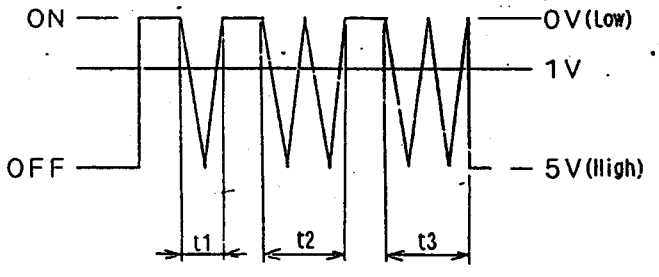
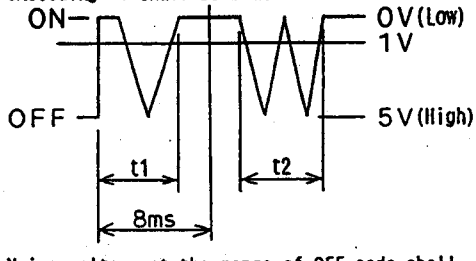
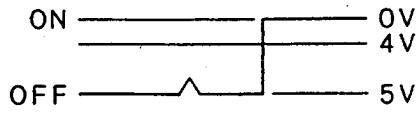
APP' D

ENG. DEPT DIVISION

Sales

| DOCUMENT No. | TITLE | |
|---|---|---|
| SRGP-S-704 | SRGP PRODUCT SPECIFICATIONS | Contact type Shuttle portion |
| BACKGROUND F2005421M | - | |

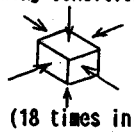
1. General
   1-1 Application
   This specification is applied to rotary switch SRGP type used in electronic equipment.
   1-2 Operating Temperature Range: -10~60℃
   1-3 Test Conditions
   The standard test conditions shall be 5~35℃ in temperature, 45~85% RH and 86~106kPa {860~1060mbar} in atmospheric pressure. Should any doubt arise in judgement, tests shall be conducted at 20±2℃, 65±5% RH and 86~106kPa {860~1060mbar}.
2. Appearauce, Construction and dimensions.
   2-1 Appearauce
   Switch shall have good finishing, and shall have no rust, crack or plating failure.
   2-2 Construction and dimensions
   As per product drawing.
   2-3 Marking As per priduct drawing.
3. Rating DC [5] V [10] mA(Resistive load)
4. Electrical performance

| | Items | Test conditions | Criterion |
|---|---|---|---|
| 4.1 | Output voltag | Measured at 5V DC. 1mA (Resistive load). (Measuring circuit )   | [4] V min. |
| 4.2 | Insulation resistance | Shall be measured by applying [100] V DC between all terminals and between the terminals and the frame for 1 minute ± 5 seconds. | [100] MΩ min. |
| 4.3 | Voltage proof | [100] V.AC (50~60Hz) shall be applied between all terminals and between the terminls and frame for 1 minute. | No dielectric breakdown shall occur. |
| 4.4 | Contact chattering and bouncing | Measured at the operation speed of 2 π rad./ 3sec, 5 V DC. 1 mA (Resistive load). (Measuring circuit )     Resolution of measurement shall be 200 μsec. | t1, t2 and t3 shall be defined the voltage fluctuation time exceeding 1V. Contact chatterin t1, t3 8ms. max. Contact bouncing t2 3ms. max. When 250μsec. interval less than 1V exists between each bouncings, the bouncings shall measured individually. When the voltage is less than 1V at the point after 8ms. from the point of OFF → ON or ON→OFF, subsequent voltage fluctuation exceeding 1V shall be measured as t2.   Noise voltage at the range of OFF code shall be 4V min.   |

| PAGE | SYMB | BACKGROUND | DATE | APPD. | CHKD. | DSGD. | PAGE | SYMB | BACKGROUND | DATE | APPD. | CHKD. | DSGD. |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| | | | | | | | | | | | APPD. | CHKD. | DSGD. |
| | | | | | | | | | | | Aug. 9'93 | Aug. 9'93 | Aug. 9 '93 |
| | | | | | | | | | | | H. Yoshizawa | M. Kiso | T. Saito |

| DOCUMENT No. SRGP-S-704 | TITLE SRGP PRODUCT SPECIFICATIONS | |
|---|---|---|

## 5. Mechanical performance

| | Items | Test conditions | Criterion |
|---|---|---|---|
| 5.1 | Rotation torque | | Shall be in accordance with indvidual specifications. |
| 5.2 | Step angle | | Shall be in accordance with indvidual specifications. |
| 5.3 | Control strength | A rotational torque of 0.6 N·m {6.12 kgf·cm} shall be applied to both end stops for 15 seconds.<br>A static load of 100 N {10.2 kgf} shall be applied in the push and pull directions of the shaft for 15 seconds.<br>A bending moment of 1 N·m {10.2 kgf·cm} shall be applied to the shaft for 15 seconds. | Shall be free from pronounced wobble, bending and mechanical abnormalities. |
| 5.4 | Shaft wobble<br>Radial | Measured when applying static load of 3N {306gf} to the vertical direction of the shaft. | Shuttle shaft : 0.2mm max. |
| | Axial | Measured when applying static load of 3N {306gf} to the axial direction of the shaft. | Shuttle shaft : 0.25mm max. |
| 5.5 | Vibration | The switch shall be secured to a testing machine by a regular mounting device and method, and shall be tested under the following conditions:<br>(1) Vibration frequency range:10~55 Hz<br>(2) Total amplitude: 1.5 mm<br>(3) Sweep ratio:10—55—10(Hz) approx. 1 min.<br>(4) Method of changing the sweep vibration frequency: logarithmic or linear<br>(5) Direction of vibration: Three vartical directions including the control axis<br>(6) Time: 2 hours each (6 hours in total) | Output voltage (4.1) :<br>4 V min.<br>Insulation resistance (4.2) :<br>100 MΩ min.<br>Voltage proof (4.3) :<br>100 V. AC. 1 minute.<br>Rotational torque: As per individual spec.<br>No abnormalities shall be recognized in appearance and construction. |
| 5.6 | Mechanical shock | The test shall be conducted under the following conditions and measured after test.<br>(1) Accereiation : 490m/s² { 50G }<br>(2) Duration : 11 ms.<br>(3) Test direction : 6 directions<br>(4) Number of shock : 3 times per direction (18 times in total)  | Output voltage (4.1) :<br>4 V min.<br>Rotational torque (5.1) :<br>Within specified value.<br>Shall be free from mechanical abnormalities. |
| 5.7 | Solderability | The test shall be conducted under following conditions and confirmed after test.<br>(1) Solder : H63A (JIS Z3282)<br>(2) Flux : Rosin flux (JIS K5902) having a nominal composition of 25% solids by weight of water white rosin in methyl alcohol solution.<br>(3) Soldering temperature : 230± 5℃<br>Immersing time : 3± 0.5 s<br>Flux immersing time shall be 5~10 seconds in normal temperature.<br>(4) Immersion depth : Immersion depth shall be at copper plating portion for P.C.B terminal after mounting. Thickness of P.C.Board : 1.6mm | More than 75% of immersed part shall be covered with solder. |
| 5.8 | Soldering heat resistance | The test shall be conducted under the following condition and measured after test.<br>(1) Solder : H63A (JIS Z3282)<br>(2) Flux : Rosin flux (JIS K5902) having a nominal composition of 25% solids by weight of water white rosin in methyl alcohol solution. | No abnormalities shall be recognized in appearance and construction.<br>The electrical performance requirements specified in item 4 shall be satisfied. |

(3) Temperature and immersing time

| | Temperature ( ℃) | Time (sec.) |
|---|---|---|
| Dip soldering | 260 ± 5 | 5 ± 1 |
| Manual soldering | 300 ±10 | 3 + 1 |

(4) Immersion depth : Immersion depth shall be at copper plating portion for P.C.B terminal after mounting.
Single sided phenolic printed wiring board (t1.6) shall be used for test.

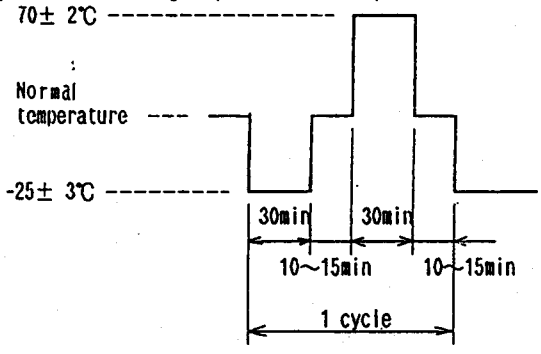
6. Durability

| | Items | Test conditions | Criterion |
|---|---|---|---|
| 6.1 | Operating life without load | 50,000 cycles of operation shall be performed continuously at a rate of1~1.2πrad / sec without load. | Output voltag (4.1) : [4] V min.<br>Insulation resistance (4.2) : [10] MΩ min<br>Voltage proof (4.3) : [100] V. AC<br>Operating torque (5.1) :<br>Within +30% or -30% of the specified value<br>Shall be free from abnormalities in appearance and construction.<br>Contact chattering and bouncing shall be comply with item 4.4. |
| 6.2 | Operating life with load | 50,000 cycles of operation shall be performed continuously at a rate of1~1.2πrad / sec with load of [10] mA [5] V DC. | |

7. Weather proof

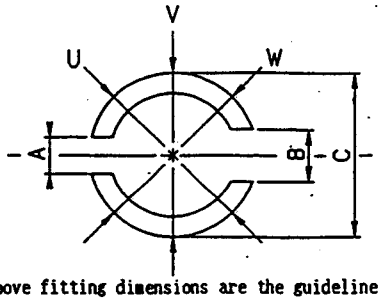
| | Items | Test conditions | Criterion |
|---|---|---|---|
| 7.1 | Cold proof | After testing at -20± 2℃ for 96 hours, the switch shall be allowed to stand under normal temperature and humidity conditions for 1 hour, and measurement shall be made within 1 hour after that. Water drops shall be eliminated. | Output voltag (4.1) : [4] V min.<br>Insulation resistance (4.2) : [100] MΩ min<br>Voltage proof (4.3) : [100] V. AC<br>Operating torque (5.1) :<br>Within +30% or -50% of the specified value<br>Shall be free from abnormalities in appearance and construction. |
| 7.2 | Dry heat | After testing at 85± 2℃ for 96 hours, the switch shall be allowed to stand under normal temperature and humidity conditions for 1 hour, and measurement shall be made within 1 hour after that. | Output voltag (4.1) : [4] V min.<br>Insulation resistance (4.2) : [100] MΩ min<br>Voltage proof (4.3) : [100] V. AC<br>Operating torque (5.1) :<br>Within +30% or -50% of the specified value<br>Shall be free from abnormalities in appearance and construction. |
| 7.3 | Damp heat | After testing at 40± 2℃, 90~95%RH for 96 hours, the switch shall be allowed to stand under normal temperature and humidity conditions for 1 hour, and measurement shall be made within 1 hour after that. Water drops shall be eliminated. | Output voltag (4.1) : [4] V min.<br>Insulation resistance (4.2) : [10] MΩ min.<br>Voltage proof (4.3) : [100] V. AC<br>Operating torque (5.1) :<br>Within +30% or -50% of the specified value<br>Shall be free from abnormalities in appearance and construction. |

| DOCUMENT No. | TITLE | |
|---|---|---|
| SRGP-S-704 | SRGP PRODUCT SPECIFICATIONS | |

| | Items | Test conditions | Criterion |
|---|---|---|---|
| 7.4 | Salt mist | Switch shall be exposed in the chamber of following conditions, Water drops shall be eliminated.<br>(1) Salt solution: 5 ± 1%<br>(2) Temperature: 35 ± 2℃<br>(3) Duration: 24±1 Hours | No remarkable corrosion shall be recognized in metal parts. |
| 7.5 | Temperature cycling | 5 cycles of following sequence shall be performed.<br>  | Output voltag (4.1) :<br>4 V min.<br>Insulation resistance (4.2) :<br>100 MΩ min.<br>Voltage proof (4.3) :<br>100 V. AC<br>Operating torque (5.1) :<br>Within +30% or -50% of the specified value<br>Shall be free from abnormalities in appearance and construction.<br>Contact chattering and bouncing shall comply with item 4.4. |
| 7.6 | Damp heat with load ( Silver migration ) | DC Voltage 1.5 times as much as rated voltage shall be applied continuously between adjacent terminals at 60 ± 2℃ and 90~95% RH. After 500-hour testing, the test piece shall be allowed to stand undernormal temperature and humidity conditions for 1 hour, then measurement shall be made within 1 hour after that. Water drops shall be eliminated. | Insulation resistance (applied voltage 50 V DC) : 10 MΩ min.<br>Voltage proof : No dielectric breakdown shall occur when 100V AC is applied for 1 minute. |

*Precautions in use

- Please refer to the test measurement circuit as the countermeasure for chattering and bouncing, when designing circuit and software.
- Use of water-soluble soldering flux shall be avoided because it may cause corrosion of the switch.
- Designing of knob fitting portion shall be as follows. If the fitting between knob and knob fitting portion of the shuttle rotor is conducted only dimension C with the clearance in A and B dimensions, the rotational operation may have trouble due to less clearance of up and down direction of shuttle rotor.



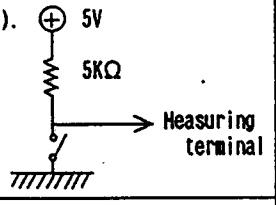
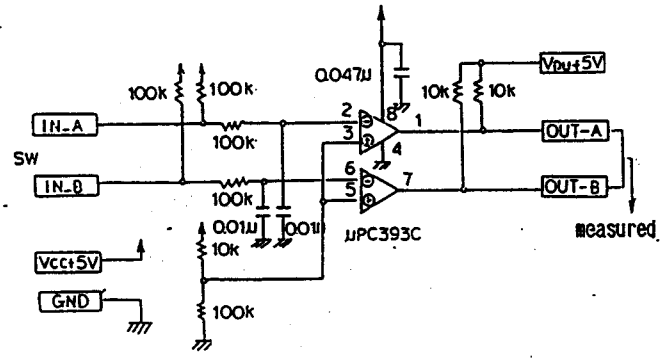
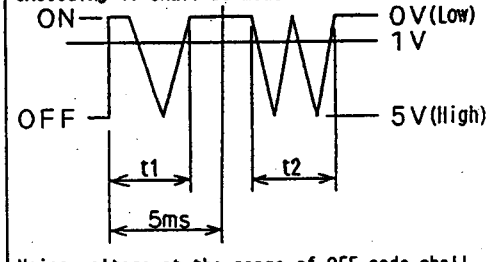
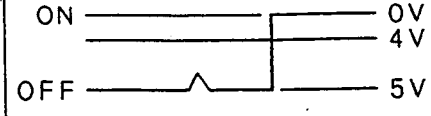

| | A | B | C |
|---|---|---|---|
| Fitting clearance | 0.05 MIN. | 0.05 MIN. | 0 MIN. |

Dimesion A and B shall be fit completly.
Dimension C shall be set considering insertion and pull-out force.
Fitting with U,V and W dimensions is recommended.

Above fitting dimensions are the guideline of safety use. Please contact us if your design differ from above.

| DOCUMENT No. | TITLE | Contact type |
|---|---|---|
| SRGP-S-705 | SRGP PRODUCT SPECIFICATIONS | Jog portion |
| BACKGROUND | - | |
| F2005421M | | |

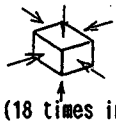
1. General
   1-1 Application
   This specification is applied to rotary switch SRGP type used in electronic equipment.
   1-2 Operating Temperature Range: -10~60℃
   1-3 Test Conditions
   The standard test conditions shall be 5~35℃ in temperature, 45~85% RH and 86~106kPa {860~1060mbar} in atmospheric pressure. Should any doubt arise in judgement, tests shall be conducted at 20±2℃, 65±5% RH and 86~106kPa {860~1060mbar}.
2. Appearauce, Construction and dimensions.
   2-1 Appearauce
   Switch shall have good finishing, and shall have no rust, crack or plating failure.
   2-2 Construction and dimensions
   As per product drawing.
   2-3 Marking As per priduct drawing.
3. Rating DC [5] V [10] mA(Resistive load)
4. Electrical performance

| | Items | Test conditions | Criterion |
|---|---|---|---|
| 4.1 | Output voltag | Heasured at 5V DC. 1mA (Resistive load). (Heasuring circuit )   | [4] V min. |
| 4.2 | Insulation resistance | Shall be measured by applying [100] V DC between all terminals and between the terminals and the frame for 1 minute ± 5 seconds. | [100] MΩ min. |
| 4.3 | Voltage proof | [100] V.AC (50~60Hz) shall be applied between all terminals and between the terminls and frame for 1 minute. | No dielectric breakdown shall occur. |
| 4.4 | Contact chattering and bouncing | Heasured at the operation speed of 2 π rad./ 3sec, 5 V DC. 1 mA (Resistive load). (Heasuring circuit )   | t1, t2 and t3 shall be defined the voltage fluctuation time exceeding 1V.<br>Contact chatterin t1, t3 5ms. max.<br>Contact bouncing t2 5ms. max.<br>When 250μsec. interval less than 1V exists between each bouncings, the bouncings shall measured individually.<br><br>When the voltage is less than 1V at the point after 5ms. from the point of OFF → ON or ON→OFF, subsequent voltage fluctuation exceeding 1V shall be measured as t2.  <br>Noise voltage at the range of OFF code shall be 4V min.   |

| | | | | | | | | | | | | | | | APPD. | CHKD. | DSGD. |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| | | | | | | | | | | | | | | | Aug.9.'99 | Aug.9.'99 | Aug.9.'99 |
| | | | | | | | | | | | | | | | H. Yoshizawa | M. Kise | T. Sai |
| PAGE | SYMB | BACKGROUND | DATE | APPD. | CHKD. | DSGD. | PAGE | SYMB | BACKGROUND | DATE | APPD. | CHKD. | DSGD. | | | | |

| DOCUMENT No. | TITLE | |
|---|---|---|
| SRGP-S-705 | SRGP PRODUCT SPECIFICATIONS | |

5. Mechanical performance

| | Items | Test conditions | Criterion |
|---|---|---|---|
| 5.1 | Rotation torque | | Shall be in accordance with indvidual specifications. |
| 5.2 | Step angle | | Shall be in accordance with indvidual specifications. |
| 5.3 | Control strength | ~~A rotational torque of ____ N·m {____ kgf·cm} shall be applied to both end stops for 15 seconds.~~<br>A static load of 100 N {10.2 kgf} shall be applied in the push and pull directions of the shaft for 15 seconds.<br>A bending moment of 1 N·m {10.2 kgf·cm} shall be applied to the shaft for 15 seconds. | Shall be free from pronounced wobble, bending and mechanical abnormalities. |
| 5.4 | Shaft wobble<br>Radial | Measured when applying static load of 3N (306gf) to the vertical direction of the shaft. | Shuttle shaft : 0.15mm max. |
| | Axial | Measured when applying static load of 3N (306gf) to the axial direction of the shaft. | Shuttle shaft : 0.3mm max. |
| 5.5 | Vibration | The switch shall be secured to a testing machine by a regular mounting device and method, and shall be tested under the following conditions:<br>(1) Vibration frequency range:10~55 Hz<br>(2) Total amplitude: 1.5 mm<br>(3) Sweep ratio:10—55—10(Hz) approx. 1 min.<br>(4) Method of changing the sweep vibration frequency: logarithmic or linear<br>(5) Direction of vibration: Three vartical directions including the control axis<br>(6) Time: 2 hours each (6 hours in total) | Output voltage (4.1) :<br>4 V min.<br>Insulation resistance (4.2) :<br>100 MΩ min.<br>Voltage proof (4.3) :<br>100 V. AC. 1 minute.<br>Rotational torque: As per individual spec.<br>No abnormalities shall be recognized in appearance and construction. |
| 5.6 | Mechanical shock | The test shall be conducted under the following conditions and measured after test.<br>(1) Accereiation : 490m/s² { 50G }<br>(2) Duration : 11 ms<br>(3) Test direction : 6 directions<br>(4) Number of shock : 3 times per direction (18 times in total)  | Output voltage (4.1) :<br>4 V min.<br>Rotational torque (5.1) :<br>Within specified value.<br>Shall be free from mechanical abnormalities. |
| 5.7 | Solderability | The test shall be conducted under following conditions and confirmed after test.<br>(1) Solder : H63A (JIS Z3282)<br>(2) Flux : Rosin flux (JIS K5902) having a nominal composition of 25% solids by weight of water white rosin in methyl alcohol solution.<br>(3) Soldering temperature : 230± 5℃<br>Immersing time : 3± 0.5 s<br>Flux immersing time shall be 5~10 seconds in normal temperature.<br>(4) Immersion depth : Immersion depth shall be at copper plating portion for P.C.B terminal after mounting.<br>Thickness of P.C.Board : 1.6mm | More than 75% of immersed part shall be covered with solder. |
| 5.8 | Soldering heat resistance | The test shall be conducted under the following condition and measured after test.<br>(1) Solder : H63A (JIS Z3282)<br>(2) Flux : Rosin flux (JIS K5902) having a nominal composition of 25% solids by weight of water white rosin in methyl alcohol solution. | No abnormalities shall be recognized in appearance and construction.<br>The electrical performance requirements specified in item 4 shall be satisfied. |

(3) Temperature and immersing time

| | Temperature ( ℃) | Time (sec.) |
|---|---|---|
| Dip soldering | 260 ± 5 | 5 ± 1 |
| Manual soldering | 300 ±10 | 3 $^{+1}_{0}$ |

(4) Immersion depth : Immersion depth shall be at copper plating portion for P.C.B terminl after mounting.
Single sided phenolic printed wiring board (t1.6) all be used for test.

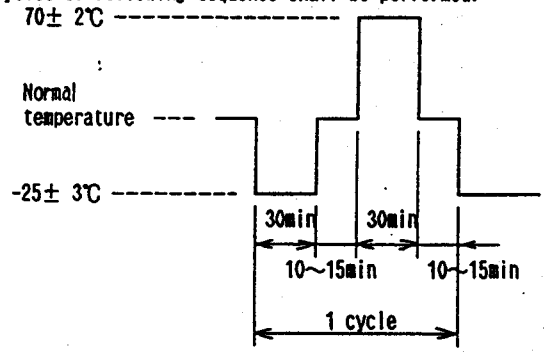
6. Durability

| | Items | Test conditions | Criterion |
|---|---|---|---|
| 6.1 | Operating life without load | 100,000 cycles of operation shall be performed continuously at a rate of1~1.2 πrad / sec without load. | Output voltag (4.1) : [4] V min.<br>Insulation resistance (4.2) : [10] HΩ min<br>Voltage proof (4.3) : [100] V. AC<br>Operating torque (5.1) :<br>Within +30% or -30% of the specified value<br>Shall be free from abnormalities in appearance and construction.<br>Contact chattering and bouncing shall be comply with item 4.4. |
| 6.2 | Operating life with load | 100,000 cycles of operation shall be performed continuously at a rate of1~1.2 πrad / sec with load of [10] mA [5] V DC. | |

7. Weather proof

| | Items | Test conditions | Criterion |
|---|---|---|---|
| 7.1 | Cold proof | After testing at -20± 2℃ for 96 hours, the switch shall be allowed to stand under normal temperature and humidity conditions for 1 hour, and measurement shall be made within 1 hour after that. Water drops shall be eliminated. | Output voltag (4.1) : [4] V min.<br>Insulation resistance (4.2) : [100] HΩ min<br>Voltage proof (4.3) : [100] V. AC<br>Operating torque (5.1) :<br>Within +30% or -50% of the specified value<br>Shall be free from abnormalities in appearance and construction. |
| 7.2 | Dry heat | After testing at 85± 2℃ for 96 hours, the switch shall be allowed to stand under normal temperature and humidity conditions for 1 hour, and measurement shall be made within 1 hour after that. | Output voltag (4.1) : [4] V min.<br>Insulation resistance (4.2) : [100] HΩ min<br>Voltage proof (4.3) : [100] V. AC<br>Operating torque (5.1) :<br>Within +30% or -50% of the specified value<br>Shall be free from abnormalities in appearance and construction. |
| 7.3 | Damp heat | After testing at 40± 2℃, 90~95%RH for 96 hours, the switch shall be allowed to stand under normal temperature and humidity conditions for 1 hour, and measurement shall be made within 1 hour after that. Water drops shall be eliminated. | Output voltag (4.1) : [4] V min.<br>Insulation resistance (4.2) : [10] HΩ min.<br>Voltage proof (4.3) : [100] V. AC<br>Operating torque (5.1) :<br>Within +30% or -50% of the specified value<br>Shall be free from abnormalities in appearance and construction. |

| DOCUMENT No. SRGP-S-705 | TITLE SRGP PRODUCT SPECIFICATIONS | |
|---|---|---|

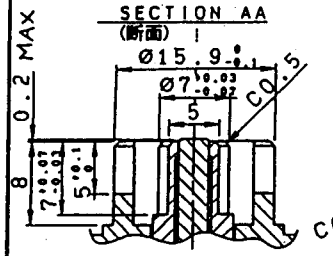
| | Items | Test conditions | Criterion |
|---|---|---|---|
| 7.4 | Salt mist | Switch shall be exposed in the chamber of following conditions. Water drops shall be eliminated.<br>(1) Salt solution: 5 ± 1%<br>(2) Temperature: 35 ± 2℃<br>(3) Duration: 24±1 Hours | No remarkable corrosion shall be recognized in metal parts. |
| 7.5 | Temperature cycling | 5 cycles of following sequence shall be performed.<br>  <br> | Output voltag (4.1) :<br>4 V min.<br>Insulation resistance (4.2) :<br>100 MΩ min.<br>Voltage proof (4.3) :<br>100 V. AC<br>Operating torque (5.1) :<br>Within +30% or -50% of the specified value<br>Shall be free from abnormalities in appearance and construction.<br>Contact chattering and bouncing shall comply with item 4.4. |
| 7.6 | Damp heat with load (Silver migration) | DC Voltage 1.5 times as much as rated voltage shall be applied continuously between adjacent terminals at 60 ± 2℃ and 90~95% RH. After 500-hour testing, the test piece shall be allowed to stand under normal temperature and humidity conditions for 1 hour, then measurement shall be made within 1 hour after that. Water drops shall be eliminated. | Insulation resistance (applied voltage 50 V DC) : 10 MΩ min.<br>Voltage proof : No dielectric breakdown shall occur when 100V AC is applied for 1 minute. |

*Precautions in use

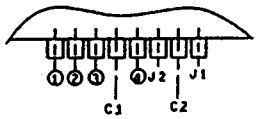
・Please refer to the test measurement circuit as the countermeasure for chattering and bouncing, when designing circuit and software.

・Use of water-soluble soldering flux shall be avoided because it may cause corrosion of the switch.

SECTION AA
(断面)

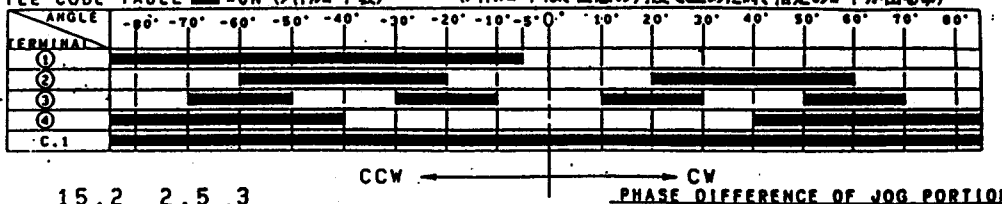


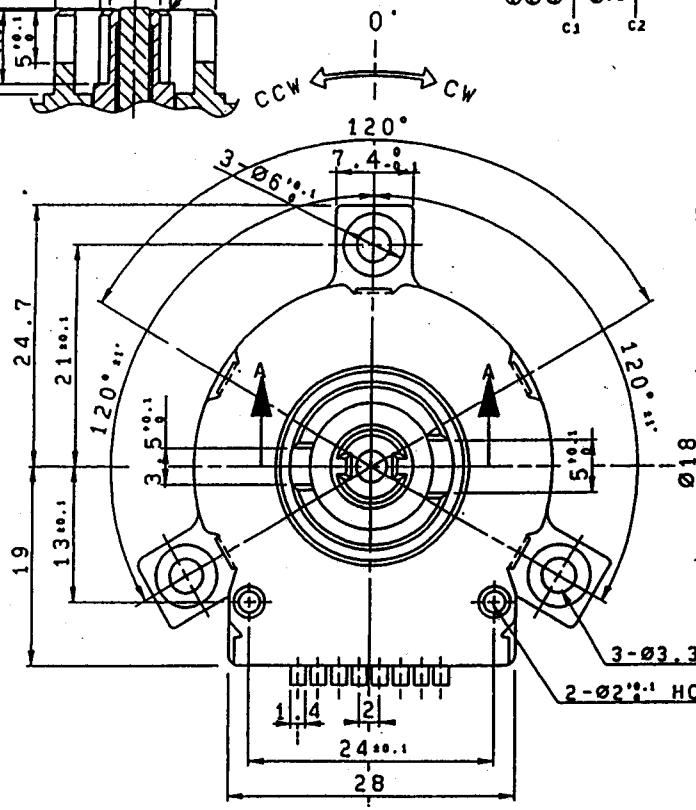

TERMINAL ARRANGEMENT SEE DIRECTION "A"
(端子配列) (A方向より見る)

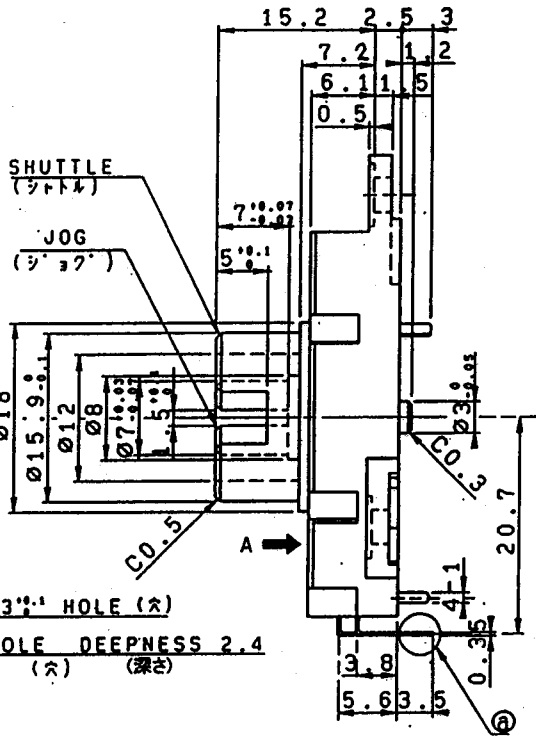


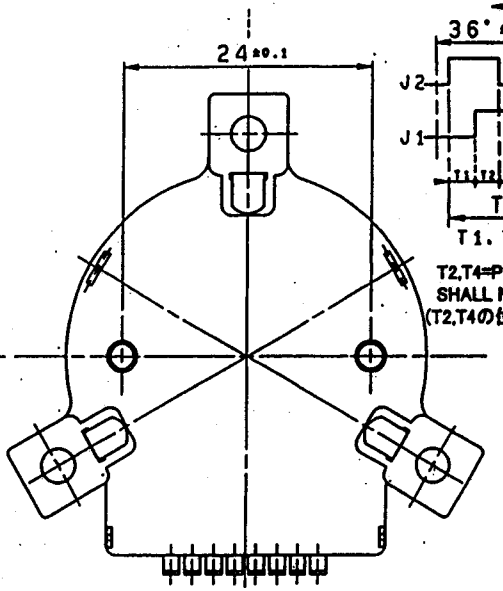

SHUTTLE CODE TABLE ■=ON (シャトルコード表)

SHUTTLE CODE SHALL AS SPECIFIED AT ANY POSITION
(シャトルコードは、任意の角度で止めた時、指定のコードが出る事)

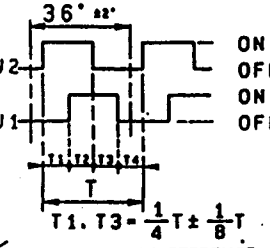


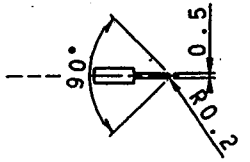




PHASE DIFFERENCE OF JOG PORTION
(ジョグ部位相差) CW → 1-CYCLE (周期) CCW




T2,T4=PHASE DIFFERENCE SHALL NOT BE REVERSED
(T2,T4の位相差の逆転のなき事)

DETAIL OF ⓐ
(詳細)




7. THE ALPS MARK AND DATE CODE SHALL BE MARKED ON THE SWITCH BODY.
(スイッチ本体にALPSマーク、製造暦番を表示すること。)

6. DEFLECTION OF CENTER AT THE STOP POSITION OF OUTER SHAFT SHALL BE WITHIN 2° .SHAFT WOBBLE SHALL BE WITHIN 2°
(シャトル部の静止位置でのセンターずれ2° 以内 遊びは2° 以内)

5. DEFLECTION OF CENTER DETENT OF JOG SWITCH SHALL BE ±3°
(ジョグ部のクリックセンターの位置ずれは ±3° )

4. CODE SHALL NOT BE CHANGED AT THE END STOP POSITION OF SHUTTLE
(コードは操作部がストッパーに当った位置でも変化のないこと。)

3. PHASE DIFFERNCENCE OF JOG SHAFT SHALL BE 10PULSES.(WITH DETENT)
(ジョグ部は位相差タイプで10パルス) (クリック付)

2. FULL ROTATION ANGLE OF SHUTTLE SHAFT SHALL BE 160±3°
(シャトル部の全回転角度は160±3° )

1. ROTATIONAL TORQUE…SHUTTLE SHAFT:30±20mN·m{306±204gf·cm} (MOMENTARY+WITH CENTER DETENT)
(回転トルク) (シャトル部回転トルク) (モーメンタリー+センタークリック)
JOG SHAFT:5mN·m{51gf·cm} MAX. (ENDLESS)
(ジョグ部回転トルク) (エンドレス)

NOTES (注記)
ROTATIONAL TORQUE OF SHUTTLE SHALL BE MEASURED AT IMMEDIATELY BEFORE THE STOPPER POSITION.
(シャトル部回転トルクは、ストッパーにあたる直前にて測定する。)

| TOLERANCES UNLESS OTHERWISE SPEC. | |
|---|---|
| BASIC DIMENSIONS | TOLERANCES |
| UP TO 4 | ±0.2 |
| OVER 4 UP TO 16 | ±0.3 |
| OVER 16 UP TO 63 | ±0.4 |
| ABOVE 63 TO 250 | ±0.5 |
| ABOVE 250 | ±0.7 |
| ANGULAR DIMENSIONS | ±3° |

| ZONE | SYMB | DATE | APPD | CHKD | DSGD |
|---|---|---|---|---|---|

ALPS ELECTRIC CO., LTD.

| UNIT | SCALE | MODEL NO. (機種) |
|---|---|---|
| mm | 2/1 | SRGPHJ3100 |

| APPD. | CHKD. | DSGD. | TITLE |
|---|---|---|---|
| Dec.15,'97 H. Yoshizawa | Dec.15,'97 H. Yoshizawa | Dec.15,'97 M. Kise | PRODUCT DRAWING (製品図) |

DOCUMENT NO.

AEM