Customer:

ALPS ELECTRIC EUROPA GMBH

No. SW9453.3.5 A

Date:

Attention:

Your ref. No.:

Your Part No.: STSRBM161

402003

SPECIFICATIONS

ALPS' :

MODEL: SRBM16

Spec. No.:

Sample No.: F370898IM
SRBM16N-K20

RECEIPT STATUS
RECEIVED
By. Date
Signature
Name
Title

ALPS ELECTRIC CO., LTD.

DSG' D T. Saito

APP' D T.Maruyama

ENG. DEPT. DIVISION

Sales

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

SRBM-S-501	SRBM PRODUCT SPECIFICATIONS	

1. General

1.1 Application This specification is applied to low current circuit (Secondary circuit)rotary switch used for 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. Appearance, construction and dimensions

2.1 Appearance Switch shall have good finishing, and shall have no rust, crack or plating failures.

2.2 Construction and dimensions Per individual product drawing

2.3 Markings Per individual product drawing

3. Rating 16 V DC 0.1 A (Resistive load)

4. Electrical performance

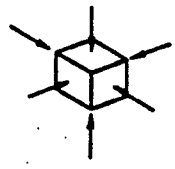
	Items	Test conditions	Criterion
4.1	Contact resistance	Shall be measured at 1kHz±200Hz (20mV MAX , 50mA MAX) or 1A, 5V DC by voltage drop method.	50 mΩ MAX
4.2	Insulation resistance	Test voltage : 100 V DC, measured after 1 minute±5 seconds. Applied position : Between all terminals Between terminals and ground (frame)	100 MΩ MIN.
4.3	Voltage proof	Test voltage : 100 V AC (50~60Hz, cut-off current 2 mA). Applied position : Between all terminals Between terminals and ground (frame)	No dielectric breakdown shall occur.
4.4	Capacitance	Shall be measured at 1MHz ± 10kHz Between all terminals Between terminals and ground (frame) Between all circuits	— pF MAX
4.5	Changeover timing		As per individual product drawing.

5. Mechanical performance

	Items	Test conditions	Criterion
5.1	Operating torque		As per individual product drawing.
5.2	Changeover angle		As per individual product drawing.
5.3	Terminal strength	A static load of 5 N { 510 kgf} shall be applied to the tip of terminal in a desired direction for one minute. The number of tests shall be once per terminal.	Shall be free from terminal looseness, and damage and breakage of terminal holding portion. Terminals may be bent after test, electrical performance requirement specified in item 4 shall be satisfied.
5.4	Mounting strength (Applied to center nut mounting type)	Switch shall be mounted at 1 N·m { 10.2 kgf·cm} by normal mounting method.	Shall be free from damage of bushing thread portion. There shall be no abnormalities in axis rotation and caulking portion.
5.5	Control strength	A rotational torque of 0.5 N·m { 5.1 kgf·cm} shall be applied to both end stops for 15 seconds. A static load of 100 N { 10.2 kgf} shall be applied in the push and pull directions of the shaft for 15 seconds. 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.
5.6	Wobble of actuator	Run-out (P-P) shall be measured by applying a static load of 5N { 510gf } to the shaft.	Unit : mm Measuring position at mounting surface / Run-out (P-P) / Mounting dimension 10 / 0.17 MAX / 15 15 / 0.25 / 20 20 / 0.35 / 25 25 / 0.42 / 30 30 / 0.80 / 35 MIN Amplitude of double shaft and inside shaft shall be twice the above.
5.7	Vibration	Switch shall be secured to a testing machine by a regular mounting device and method. (1) Vibration frequency range : 10~55Hz (2) Total amplitude : 1.5mm (3) Sweep ratio : 10-55-10(Hz) Approx. 1 minute (4) Method of changing the sweep vibration frequency : Logarithmic or linear (5) Direction of vibration : Three vertical directions including actuator. (6) Time : 2 hours each (6 hours in total)	Contact resistance (Item 4.1) : 100 mΩ MAX Insulation resistance (Item 4.2) : 100 MΩ MIN Voltage proof (Item 4.3) : Apply 100 V AC for 1 minute. No dielectric breakdown shall occur. Operating torque (Item 5.1) : Within specified value. No abnormalities shall be recognized in appearance and construction.

PAGE	SYMB	DATE	APPD	CHKD	DSGD	APPD.	CHKD.	DSGD.	TITLE
						M. Ezure	S. Ishibashi	Jun. 8'93 T. Saito	DRAWING NO. (1/3)

SRBM-S-501 | SRBM PRODUCT SPECIFICATIONS

	Items	Test conditions	Criterion
5.8	Mechanical shock	Switch shall be measured after following test. (1) Mounting method : Normal mounting method (2) Acceleration : 490m/s² (50G) (3) Duration : 11ms (4) Test direction : 6 directions (5) Number of shock : 3 times per direction (18 times in total) 	Contact resistance (Item 4.1) : 100 mΩ MAX Operating torque (Item 5.1) : Within specified value. Shall be free from mechanical abnormalities.
5.9	Solderability	Switch shall be checked after following test. (1) Solder : H63A (JIS Z 3282) (2) Flux : Rosin flux (JIS K 5902) having a nominal composition of 25% solids by weight of water white rosin in methyl alcohol (JIS K 1501)solution. (3) Soldering temperature : 230±5℃ Immersing time : 3±0.5 s Flux immersing time shall be 5~10 seconds in normal temperature. (4) Immersion depth : Immersion depth shall be at copper plating portion for P.C.B. terminal after mounting. Thickness of P.C. board : 1.6 mm	More than 75% of immersed part shall be covered with solder.
5.10	Soldering heat resistance	Switch shall be measured after following test. (1) Solder : H63A (JIS Z 3282) (2) Flux : Rosin flux (JIS K 5902) having a nominal composition of 10% solids by weight of water white rosin in methyl alcohol (JIS K 1501)solution. (3) Temperature and immersing time Dip soldering: Temperature (℃) 260± 5, Time (s) ※ 5 MAX ※ Auto-dip soldering shall be applied up to twice. After first testing, temperature shall be back to normal. (4) Immersion depth : Immersion depth shall be at copper plating portion for P.C.B. terminal after mounting. Thickness of P.C. board (Single sided copper clad P.C.B.) : 1.6mm	No abnormalities shall be recognized in appearance. The electrical performance requirements specified in Item 4 shall be satisfied.

6. Durability

	Items	Test conditions	Criterion
6.1	Operating life without load	10,000 cycles of operation shall be performed continuously at a rate of 1~1.2π rad/s without load.	Contact resistance (Item 4.1) : 100 mΩ MAX Insulation resistance (Item 4.2) : 100 MΩ MIN Voltage proof (Item 4.3) : Apply 100 V AC for 1 minute. No dielectric breakdown shall occur. Operating torque (Item 5.1) : Within ±30 % of specified value. No abnormalities shall be recognized in appearance and construction.
6.2	Operating life with load	10,000 cycles of operation shall be performed continuously at a rate of 1~1.2π rad/s with load of 16 A, 0.1 V DC.	Contact resistance (Item 4.1) : 150 mΩ MAX Insulation resistance (Item 4.2) : 100 MΩ MIN Voltage proof (Item 4.3) : Apply 100 V AC for 1 minute. No dielectric breakdown shall occur. Operating torque (Item 5.1) : Within ±30 % of specified value. No abnormalities shall be recognized in appearance and construction.

PAGE	STND	DATE	APPD	CHKD	DSGD	APPD.	CHKD.	DSGD.	TITLE
						M. Kino	S. Takeuchi	Jun. 8'93 T. Saito	DRAWING NO. (2/3)

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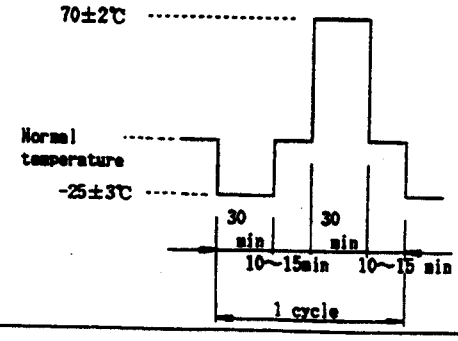
7. Weather proof

	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 then measurement shall be made within 1 hour. Water drops shall be removed.	Contact resistance (Item 4.1) : 100 mΩ MAX Insulation resistance (Item 4.2) : 100 MΩ MIN Voltage proof (Item 4.3) : Apply 100 V AC for 1 minute. No dielectric breakdown shall occur. Operating torque (Item 5.1) : Within ±10 % of specified value. No abnormalities shall be recognized 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.	Contact resistance (Item 4.1) : 100 mΩ MAX Insulation resistance (Item 4.2) : 100 MΩ MIN Voltage proof (Item 4.3) : Apply 100 V AC for 1 minute. No dielectric breakdown shall occur. Operating torque (Item 5.1) : Within ±10 % of specified value. No abnormalities shall be recognized in appearance and construction.
7.3	Damp heat	After testing at 40±2℃ and 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 removed.	Contact resistance (Item 4.1) : 100 mΩ MAX Insulation resistance (Item 4.2) : 10 MΩ MIN Voltage proof (Item 4.3) : Apply 100 V AC for 1 minute. No dielectric breakdown shall occur. Operating torque (Item 5.1) : Within ±10 % of specified value. No abnormalities shall be recognized in appearance and construction.
7.4	Salt mist	Switch shall be checked after following test. (1) Temperature : 35±2℃ (2) Salt solution : 5±1% (Solids by weight) (3) Duration : 24±1 h After the test, salt deposit shall be removed in running water.	No remarkable corrosion shall be recognized in metal part.
7.5	Temperature cycling	After 5 cycles of following conditions, 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 removed. 	Contact resistance (Item 4.1) : 100 mΩ MAX Insulation resistance (Item 4.2) : 100 MΩ MIN Voltage proof (Item 4.3) : Apply 100 V AC for 1 minute. No dielectric breakdown shall occur. Operating torque (Item 5.1) : Within ±10 % of specified value. No abnormalities shall be recognized in appearance and construction.

Precaution in use

1. Note that if the load is applied to the terminals during soldering they might suffer deformation and defects in electrical performance.
2. Use of water-soluble soldering flux shall be avoided because it may cause corrosion of the switch.

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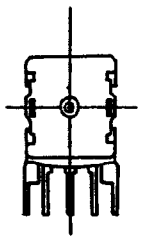
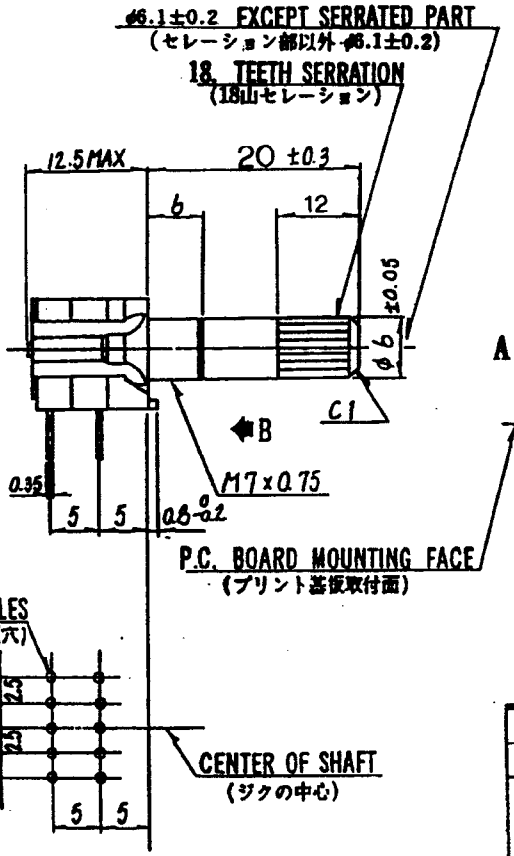
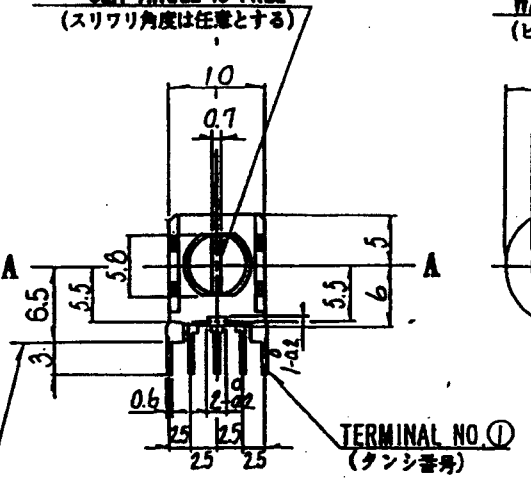
						M. Kise	S. Takahashi	Jun. 8 '93 T. Saito	DRAWING NO. (3/3)



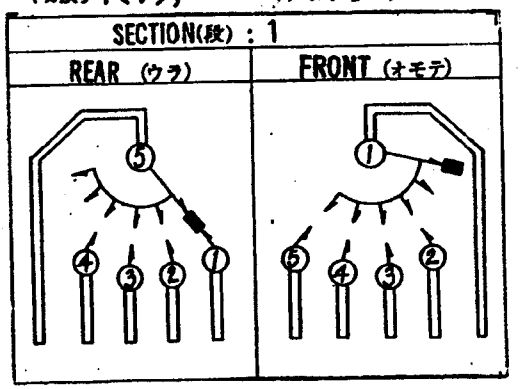


TERMINAL GAUGE (タンシピッチゲージ寸法)
ALL TOLERANCES (全ての許容差):±0.05

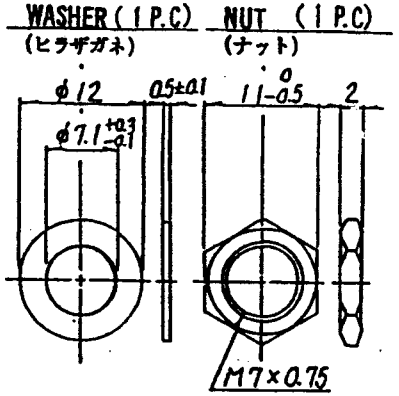


CIRCUIT DIAGRAM (SEE DIRECTION "B")
回路図(B方向より見る)

CHANGEOVER TIMING: NON SHORTING
(切換タイミング) (ノンショーティング)



MOUNTING HARDWARE
(添付部品)



8. CIRCUIT STEPS ARE 3~6 POSITIONS AT FRONT, AND 1~4 POSITIONS AT REAR.
(回路切換はオモテを3~6接点目, ウラを1~4接点目とする)

7. DIRECTION OF MARKINGS OF " ALPS JP PAT.P " IS NEGLECTED.
(ALPS JP PAT.P の方向性は問わない。)

6. SERRATION'S VALLEY: ON THE LINE AA
(セレーション谷位置:AA上)

5. NUMBER OF POSITIONS (ポジション数): 6

4. STEP ANGLE (切換角度): 30°±3°

3. ROTATION TORQUE (回転トルク): 40±20mN·m {400±204gf·cm}

2. SWITCH SHOWN IN FULL C.C.W. POSITION
(スイッチはジクを反時計方向に回し切った位置を示す。)

NOTES (注記) 1. PRODUCT SPECIFICATIONS NO: SRBM-S-501
(適用製品仕様書No.)

TOLERANCES UNLESS OTHERWISE SPEC.	
BASIC DIMENSIONS	TOLERANCES
UP TO 10	±0.3
ABOVE 10 TO 100	±0.5
ABOVE 100	±0.8
ANGULAR DIMENSIONS	±3°

ZONE	SYMB.	DATE	APPD.	CHKD.	DSGD.
			H.Y.	H.Y.	M.K.

ALPS ELECTRIC CO., LTD.

UNIT	SCALE	MODEL NO. (製品番号)
mm	×	SRBM16

APPD.	CHKD.	DSGD.	TITLE
Nov.-5,'94 T. Maruyama	Nov.-5,'94 M. Kise	Nov.5,'94 T. Saitou	PRODUCT DRAWING (製品図)

DOCUMENT NO. SRBM16N-K20