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MODEL No.	DETECTOR SWITCH(1120 TYPE)	PAGE	1/5

1. GENERAL

- 1.1 Application : This specification is applied to low current circuit (Secondary circuit) push 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 (860~1060 mbar) in atmospheric pressure.
Should any doubt arise in judgement, tests shall be conducted at 20±2 , 65±5% RH and 860~1060 mbar.

2. APPEARANCE CONSTRUCTION AND DIMENSION

- 2.1 Appearance : Switch shall have good finishing and shall have no rust, crack of plating failures.
- 2.2 Construction and dimension : Per individual product drawing.
- 2.3 Markings : Per individual product drawing.

3. RATED VOLTAGE AND CURRENT

12V DC 100mA (Resistive load)

4. ELECTRICAL PERFORMANCE

	PROPERTY	TEST CONDITION	PERFORMANCE
4.1	Contact resistance	Shall be measured at 1KHz ±200Hz(20mV MAX,50mA MAX) or 1A 5V DC by voltage drop method.	80m max
4.2	Insulation resistance	Test voltage : 100V DC, measured after 1 minute ±5seconds. Applied position : Between all terminals Between terminals and ground (frame)	100 MΩ min
4.3	Voltage proof	Test voltage : 100V AC (50-60Hz, cut-off current 2 mA) Applied position : Between all terminals, between terminals and grounds(frame)	No dielectric breakdown shall occur.
4.4	Changeover timing		As per individual product drawing.

5. MECHANICAL PERFORMANCE

	PROPERTY	TEST CONDITION	PERFORMANCE
5.1	Operating force	A static load shall be applied to the tip of actuator in operating direction.	As per individual product drawing.

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5. MECHANICAL PERFORMANCE			
	PROPERTY	TEST CONDITION	PERFORMANCE
5.2	Terminal strength	A static load of 3N(306gf) shall be applied to the tip of terminal in a desired direction for 1 minute. The number of test 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.
5.3	Control strength	1) A static load of 1 Kgf shall be applied in the operating direction of actuator for 15 seconds. 2) A static load of 0.3kgf shall be applied to the pull direction of actuator for 15 seconds. (For construction with lock, the test shall be conducted at the condition of lock released) 3) A static load of 0.2Kgf shall be applied to the vertical direction of operation at the tip of actuator for 15 seconds.	Shall be free from pronounced wobble, bending and mechanical abnormalities.
5.4	Wobble of actuator	Run-out (P-P) shall be measured by applying a static load of 102gf in the vertical direction of operation at the tip of actuator.	P-P : 1.0 mm max
5.5	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, 1minute. 4)Method of changing the sweep vibration frequency : Logarithmic or linear. 5)Direction of vibration : Three vertical directions including actuator. 6)Time : 2hours each (6 hour in total)	* Contact resistance (Item4.1) : 150m max * Insulation resistance (Item 4.2) : 100MΩ min * Voltage proof(Item 4.3) : apply 100V AC for 1minute. * No dielectric breakdown shall occur. * Operating force (Item5.1) : within +30% of specified value. * No abnormalities shall be recognized in appearance and construction
5.6	Mechanical shock	Switch shall be measured after following test. 1)Mounting method : normal mounting method 2)Acceleration : 490m/s ² (50G) 3)Duration : 11ms 4)Test direction : 6 directions 5)Number of shock : 3 times per direction (18 times in total)	* Contact resistance (Item4.1) : 150m max * Operating force (Item5.1) : within +30% of specified value. * Shall be free from mechanical abnormalities. (Dislocation of lock of actuator shall not be regarded as abnormalities)

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5. MECHANICAL PERFORMANCE			
	PROPERTY	TEST CONDITION	PERFORMANCE
5.7	Solderability	Switch shall be checked after following test. (1)Solder : H63A(JIS Z 3282) (2)Flux : Rosin flux (JIS K 5902) having a normal 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±0.5s Flux immersing times 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 Immersion depth shall be at wiring portion of lead wire for lead wire terminal.	* More than 75% of immersed part shall be covered with solder. <Cutting section shall not be applied.(frame)>
5.8	Soldering heat resistance	The test shall be conducted under the following conditions. Reflow soldering Switch shall be measured after following test sequence. (1) 3min, at 150±2 (2) 0.5min, at 230±2 (3) Recovery to normal temperature. Manual soldering - Capacity of soldering iron tip : 15M - Diameter of soldering iron : Ø1mm - Temperature of soldering iron : 300±5 soldering time : 5 sec, max. - Above conditions shall be applied to the grass-epoxy type P.C.B of 0.3 0.8mm thick. Soldering iron shall be put at the tip of terminal and prevented abnormal force 4 to the terminals.	* No abnormalities shall be recognized in appearance * The electrical performance requirements specified in 4 shall be satisfied.
6.DURABILITY			
	PROPERTY	TEST CONDITION	PERFORMANCE
6.1	Operating life without load	Switch shall be operated 50,000 cycles at 15~20 cycles/minute without load. (When pushing the actuator at right angle)	* Contact resistance (Item4.1) : 150m max Insulation resistance (Item4.2) : 10M min * Voltage proof (Item 4.3) : apply 100V AC for 1 minute. * No dielectric breakdown shall occur. * Operating force (Item5.1) within +30 of specified value. * No abnormalities shall be recognized in appearance and construction.

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6.DURABILITY			
	PROPERTY	TEST CONDITION	PERFORMANCE
6.2	Operating life with load	Switch shall be operated 50,000 cycles at 15~20 cycles/minute with 12V DC 100mA. (Resistive load) (When pushing the actuator at right angle)	* Contact resistance (Item 4.1) : 150m max * Insulation resistance (Item 4.2) : 10M min * Voltage proof (Item 4.3) : apply 100 V AC for 1minute. * No dielectric breakdown shall occur. * Operating force (Item5.1) : Within +30% of specified value. * No abnormalities shall be recognized in appearance and construction.
7. WEATHER PROOF			
	PROPERTY	TEST CONDITION	PERFORMANCE
7.1	Cold proof	After testing at -20 ± 2 for 96 hours, the switch shall be allowed to stand under normal temperature and humidity condition for 1 hour and then measurement shall be made within 1 hour. Water drops shall be removed.	* Contact resistance (Item 4.1) : 150m max * Insulation resistance (Item 4.2) : 10M min * Voltage proof (Item 4.3) : apply 100 V AC for 1minute. * No dielectric breakdown shall occur. * Operating force (Item5.1) : Within +30% of specified value. * No abnormalities shall be recognized in appearance and construction.
7.2	Dry heat	After testing at 85 ± 2 for 96hours the switch shall be allowed to stand under normal temperature and humidity conditions for 1 hour and then measurement shall be made within 1hour	* Contact resistance (Item 4.1) : 150m max * Insulation resistance (Item 4.2) : 10M min
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 condition for 1 hour, and measurement shall be made within 1hour after that. Water drops shall be removed.	* Voltage proof (Item 4.3) : apply 100V AC for 1minute * No dielectric breakdown shall occur. * Operating force (Item 5.1) : within +30% 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 : $5\pm 1\%$ (solids by weight) (3) Duration : 24 ± 1 hour After the test, salt deposit shall be removed in running water.	* No remarkable corrosion shall be recognized in metal part.

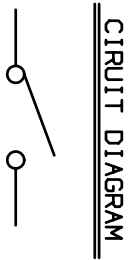
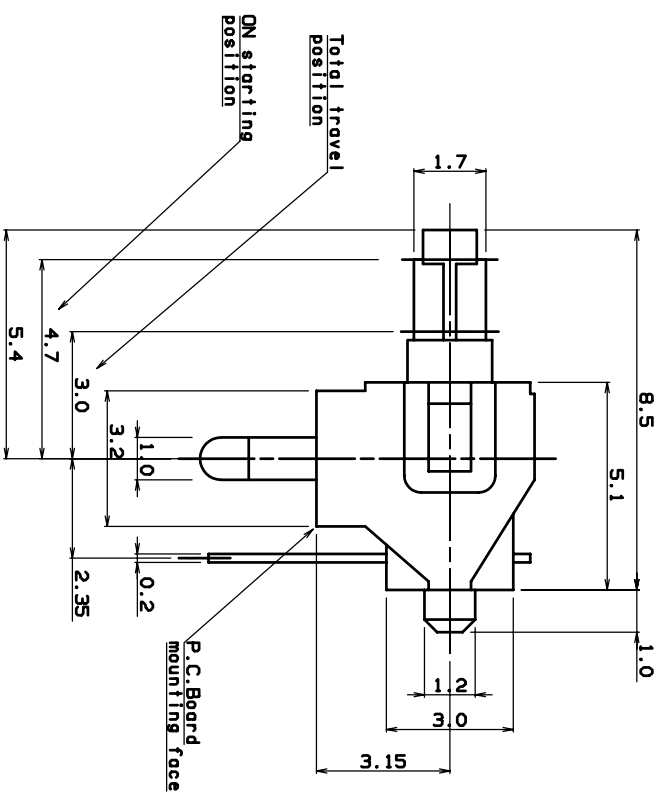
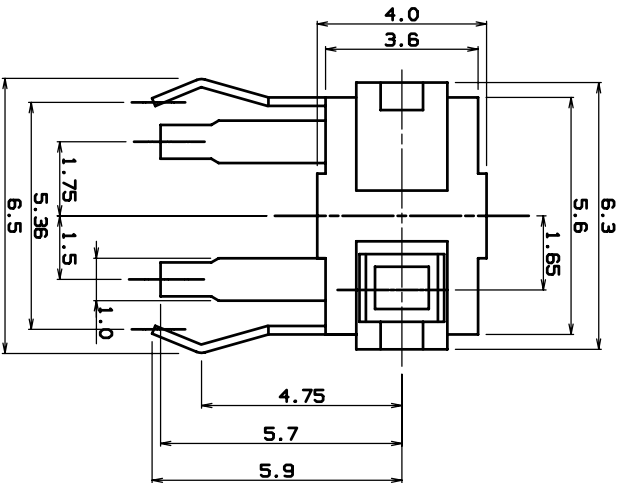
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7. WEATHER PROOF

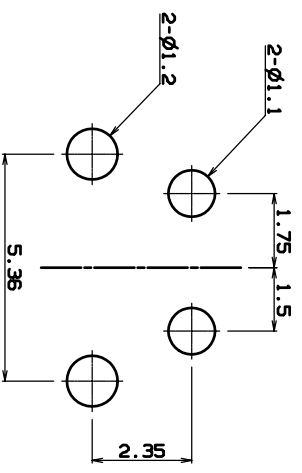
	PROPERTY	TEST CONDITION	PERFORMANCE
7.5	Temperature cycling	After 5 cycles of following conditions, the switch shall be allowed to stand under normal temperature and humidity condition for 1 hour, and measurement shall be made within 1 hour after that. Water drops shall be removed.	* Contact resistance (Item 4.1) : 150m max * Insulation resistance (Item 4.2) : 10M min * Voltage proof (Item 4.3) : apply 100V AC for 1minute * No dielectric breakdown shall occur. * Operating force (Item 5.1) : within +30% of specified value * No abnormalities shall be recognized in appearance and construction.
7.6	Damp heat with load (Silver migration)	DC voltage 1.5 times as much as rated voltage shall be applied continuously between adjacent terminal at 60±2 and 90~95% HR. After 500hours testing, switch shall be allowed to stand under normal temperature and humidity condition 1 hour and measurement shall water drops shall be removed.	* Insulation resistance (50V DC) : 10M min * Voltage proof : apply 100V AC for 1 minute. * No dielectric breakdown shall occur.

8. PRECAUTION IN USE

- 8.1 Note that if load is applied to the terminals during soldering they might suffer deformation and defects in electrical performance.
- 8.2 Use of water-soluble soldering flux shall be avoided because it may cause corrosion of the switch.
- 8.3 Reflow soldering condition shall be confirmed at the actual mass production.
- 8.4 Print pattern designing and layout of switch shall be considered enough because the characteristics of switch may be influenced by the deformation of P.C.B
- 8.5 Knob strength
Operation force exceeding specified value shall be prevented because the knob is small and thin.



P.C.B LAND PATTERN



NOTE

1. RATING : DC30V 0.1A
2. CIRUIR : 1C-1P
3. OPERATING FORCE : 40gf MAX
4. CONTACT RESISTANCE : 1Ω MAX
5. LIFE : 50,000 CYCLE MIN

No.	PART NAME	Q'TY	MATERIAL	SCALE	MODEL	TREAT.	REMARKS
5				1	1120A		
4							
3							
2							
1							

NO.	DATE	NOTE	SIGN	DESIGNED	DWG. NAME	DWG. NO.
					ASS'Y DIAGRAM	