

SR. No.

Yamatake Corporation

製品仕様書
SPECIFICATIONS





CATALOG LISTING

SL1 - A*

ROLLER PLUNGER ←


CODE	CONTACT MATERIAL
~	SILVER
K	GOLD PLATED

CATALOG LISTING AND ELECTRICAL RATINGS COVERED BY THIS DRAWING ARE AS IN THE BELOW TABLE.

CATALOG LISTING	ELECTRICAL RATINGS	
SL1 - A	EN (JIS/IEC)	AC-15 3A-250V AC-12 5A-250V DC-12 2A-48V  A015902
	UL/CSA	5A-250V ac General Use load 5A-30V dc 
SL1 - AK	EN (JIS/IEC)	AC-12 0.1A-125V DC-12 0.1A-48V  A015902
	UL/CSA	0.1A-125V ac General Use load 0.1A-30V dc 

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03	JE003-1429	12,15,'03	TATSUHARA	SAITO
02	JE002-1394	11,12,'02	TATSUHARA	TOMITA
01	JE001-1448	11, 30, '01	YANASE	KITAHARA
来歴	RECORD	: 日付	担当	検閲
RECORD		DATE	BY	APPD.

作成DR. YANASE 9, 28, '01		尺度 SCALE ~	記入のない公差 TOL. UNLESS NOTED ~
検図CHK. KITAHARA 10, 9, '01	形番 MODEL	SL1-A*	
認可APPD. H.NOGUCHI 10, 9, '01	名称 NAME	MINIATURE LIMIT SWITCH	
日付DATE 10, 10, '01	図番 NO.	AD53716E	改番REV. 03 / 1 / 6

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1. STANDARDS

・Conform to: IEC 60947-5-1
JIS C 8201-5-1

△△ Approved by: UL 508

(UL, File E96090)

CSA C22.2 No.14 (C-UL)

(UL, File E96090)

EN 60947-5-1

(TUV No. : R 2-50006349)

△△ GB14048.5 : 2001

(CQC No. : 2003010305083850)

2. STRUCTURE

- ・Contact Form: C (SPDT)
- ・Shape of Contact: Rivet
- ・Type of Terminal: Screw (M3 binding head screw with lock washer)
- ・Degree of Protection: IP67 (IEC 60529)
- ・Protection Class: Class II
- ・Pollution degree: Degree 3

3. ELECTRICAL CHARACTERISTICS

・Rated operational voltage (Ue), Utilization category and Rated operational current (Ie)

Item	Silver contacts			Gold plated contacts	
	Rated operational voltage (Ue)	AC250V	AC250V	DC48V	AC125V
Utilization category	AC-15	AC-12	DC-12	AC-12	DC-12
Rated operational current(Ie)	3A	5A	2A	0.1A	

- ・Rated frequency: 45 to 65Hz and d.c.
- ・Insulation Resistance
 - Between terminals of different polarities: 100 MΩ min. △
 - Between each terminal and the enclosure: 100 MΩ min. △
- ・Rated insulation voltage (Ui): 250V
 - Notes 1. Dielectric test voltage between each terminal and the enclosure: 2000VAC (50 to 60Hz, for 5 seconds, leak current 1mA)
- ・Dielectric test voltage between the open contacts: 1000VAC (50 to 60Hz, for 1 minute, leak current 1mA)
- ・Rated impulse withstand voltage (Uimp):
 - △△ Between terminals of different polarities: 2500V
 - △△ Between each terminal and the enclosure: 2500V
- ・Switching over voltage: Category II
- ・Contact Resistance
 - Silver Contacts: 50 mΩ max. (initial) Measured by the voltage drop method at 6 to 8 VDC 1A.
 - Gold Plated Contacts: 100 mΩ max. (initial) Measured by the voltage drop method at 6 to 8 VDC 0.1A.

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Operational Currents: (in amperes)

Silver Contacts

Current	Voltage	Load			
		Resistive	Inductive	Motor	
				NC	NO
AC	125 VAC	5	3	1	2
	250 VAC	5	3	0.5	1
DC	8 VDC	5	3		
	14 VDC	5	3		
	30 VDC	5	3		
	115 VDC	0.5	0.1		
	230 VDC	0.25	0.05		

Gold Plated Contacts


Current	Voltage	Load			
		Resistive	Inductive	Motor	
				NC	NO
AC	125 VAC	0.1	~	~	~
DC	8 VDC	0.1	~		
	14 VDC	0.1	~		
	30 VDC	0.1	~		

Notes 2. Inductive load: Power factor 0.4 (AC).

3. Motor load: With inrush current 6 times as high as the rated current.

Minimum operational current and voltage

Silver Contacts: **5mA-24VDC, 10mA-12VDC**Gold Plated Contacts: **5mA-5VDC**Conventional free air thermal current (I_{th})Silver Contacts: **5A**Gold Plated Contacts: **1A**Notes 4. Temperature-rise limit: **65 °C max.**Short-circuit protective device: TÜV; **M10A** (IEC 60127, fuse)△ CQC, Silver Contacts: **10A** (cartridge fuse)Gold Plated Contacts: **3A** (cartridge fuse)Conditional short-circuit current: **1000A** (Power factor 0.5 to 0.7)

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4. MECHANICAL CHARACTERISTICS

- Actuator Strength: Withstand 5 times O.F. in the operating direction for 1 minute.
- Terminal Strength: Withstand 0.6N·m tightening torque applied for 1 minute.
- Shock: 300 m/s²
Misoperation of the contact shall be 1 ms max. in the free position and the total travel position.
- Vibration: Peak-to-peak amplitude 1.5 mm Vibration frequency 10 to 55 Hz for continuous 2 hours.
Misoperation of the contact shall be 1 ms max. in the free position and the total travel position.
- Allowable Operating Speed: 0.02 mm/s to 0.5 m/s
The lowest speed: Unstable condition of the contact shall be 0.1s max.
The highest speed: The actuator shall not damage.
- Mechanical Operating Frequency: 120 cycles/minute max.

5. LIFE

- Mechanical Life: 20000k cycles min. at overtravel of 70 to 100% of the specified value with 30° cam angle.
- Electrical Life:

Contact material	Condition	Operation cycle
Silver	5A-250VAC 2A-48VDC 5A-30VDC	300k cycles min.
	1A-125VAC	2000k cycles min.
Gold plated	0.1A-125VAC 0.1A-48VDC	5000k cycles min.

At operating frequency of 20 cycles a minute and at resistive load

6. ENVIRONMENTAL CHARACTERISTICS


- Operating Temperature: -10 to +70 °C (at no freezing)
- Operating Humidity : 98 %RH max.

7. REFERENCE TEST CONDITIONS

- Temperature: +20 °C
- Humidity : 65 %RH

8. MOUNTING

- Recommended Tightening Torque
 - For mounting the switch to panel: 1.3 to 1.7N·m (M4)
 - For mounting the terminal to switch: 0.4 to 0.6N·m (M3)
 - For mounting the nut to switch: 4 to 6N·m (M14)

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PRECAUTIONS

(1) MOUNTING

- ・TIGHTEN EACH PORTION OF LIMIT SWITCH AT REASONABLE TORQUE SPECIFIED IN THIS SPECIFICATION. OVER-TIGHTENING MAY DAMAGE THE SCREW OR OTHER PARTS.
- ・DOG MUST BE FREE FROM THE FORCE TO PUSH THE SWITCH ACTUATOR UNDER FREE POSITION.
- ・DO NOT USE SILICONE ADHESIVES OR SILICONE-CONTAINED GREASE. IT MAY CAUSE ELECTRICAL CONTACT CONDUCTION FAILURE.

(2) WIRING

- ・DO NOT PERFORM WIRING WHILE POWER IS CONNECTED. IT MAY CAUSE OPERATOR'S ELECTRICAL SHOCK OR SUDDEN MACHINE START.
- ・SNAP TERMINAL-COVER TIGHT. LOOSE SNAP MAY CAUSE INSULATION FAILURE DUE TO DECREASE IN SEALING PERFORMANCE. AS A RESULT, THE SWITCH WOULD NOT SATISFY ITS OPERATION PERFORMANCE.

(3) ADJUSTMENT

- ・DO NOT APPLY EXCESSIVE FORCE (MORE THAN 5 TIMES OF OPERATING FORCE) TO THE ACTUATOR. IT MAY BREAK THE SWITCH.



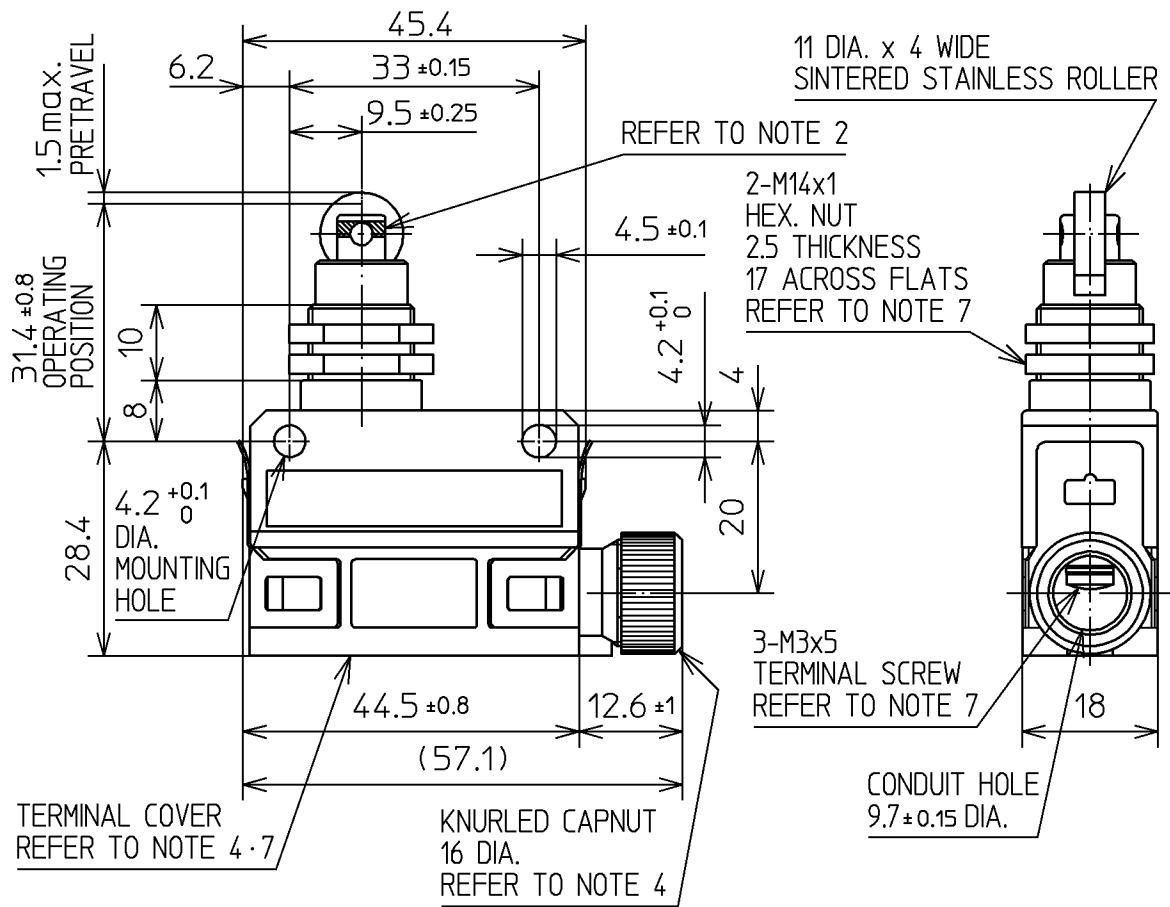
SMALL OVERTRAVEL MAY CAUSE CHATTERING OF CONTACT OR CONTACT FAILURE BY VIBRATION OR SHOCK.

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- NOTES
- SWITCH ENCLOSURE IS OF ZINC ALLOY COATED WITH BLACK FLUOROPLASTICS. TERMINAL COVER IS PLASTIC.
 - SET FULL OVERTRAVEL POSITION SO THAT TOP OF BUSHING BE WITHIN RANGE OF ROLLER PLUNGER GROOVES SHOWN WITH CROSS HATCHING.
 - SEAL IS ALREADY ASSEMBLED FOR A CABLE OF 5.8 TO 7.8 DIA.
 - MOUNT COMPLETELY THE TERMINAL COVER AFTER WIRING, TO KEEP THE SEALING OF TERMINAL HOUSING. TIGHTEN FULLY THE KNURLED CAPNUT BY HAND WITHOUT USING A TOOL.
 - USE A LEAD WIRE WHOSE CROSS SECTION IS FROM 0.75 TO 1.25mm² TO THE DIAMETER.
 - CONNECT LEAD-WIRES WITH INSULATED R-SHAPE OR Y-SHAPE CRIMP TYPE TERMINAL.
 - TERMINAL COVER, TERMINAL SCREWS AND HEX NUTS ARE FURNISHED UNASSEMBLED.

CHARACTERISTICS

OPERATING FORCE	11.8N max.
RELEASE FORCE	4.9N min.
MOVEMENT DIFFERENTIAL	0.1 max.
OVERTRAVEL	3 min.

CIRCUIT DIAGRAM



作成DR. YANASE 9, 28, '01 尺度 SCALE 1:1 記入のない公差 TOL. UNLESS NOTED ± 0.4

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SPECIFICATIONS**Terms and Conditions**

We would like to express our appreciation for your purchase and use of Yamatake products.

You are required to acknowledge and agree upon the following terms and conditions for your purchase of Yamatake products (field instruments, control valves, and control products), unless otherwise stated in any separate document, including, without limitation, estimation sheets, written agreements, catalogs, specifications and instruction manuals.

1 Warranty period and warranty scope**1.1 Warranty period**

Yamatake products shall be warranted for one (1) year from the date of your purchase of the said products or the delivery of the said products to a place designated by you.

1.2 Warranty scope

In the event that Yamatake product has any failure attributable to Yamatake during the aforementioned warranty period, Yamatake shall, without charge, deliver a replacement for the said product to the place where you purchased, or repair the said product and deliver it to the aforementioned place.

Notwithstanding the foregoing, any failure falling under one of the following shall not be covered under this warranty:

- (1) Failure caused by your improper use of Yamatake product
(noncompliance with conditions, environment of use, precautions, etc. set forth in catalogs, specifications, instruction manuals, etc.);
- (2) Failure caused for other reasons than Yamatake product;
- (3) Failure caused by any modification or repair made by any person other than Yamatake or Yamatake's subcontractors;
- (4) Failure caused by your use of Yamatake product in a manner not conforming to the intended usage of that product;
- (5) Failure that the state-of-the-art at the time of Yamatake's shipment did not allow Yamatake to predict; or
- (6) Failure that arose from any reason not attributable to Yamatake, including, without limitation, acts of God, disasters, and actions taken by a third party.

Please note that the term "warranty" as used herein refers to equipment-only-warranty, and Yamatake shall not be liable for any damages, including direct, indirect, special, incidental or consequential damages in connection with or arising out of Yamatake products.

2 Ascertainment of suitability

You are required to ascertain the suitability of Yamatake product in case of your use of the same with your machinery, equipment, etc. (hereinafter referred to as "Equipment") on your own responsibility, taking the following matters into consideration:

- (1) Regulations and standards or laws that your Equipment is to comply with.
- (2) Examples of application described in any documents provided by Yamatake are for your reference purpose only, and you are required to check the functions and safety of your Equipment prior to your use.
- (3) Measures to be taken to secure the required level of the reliability and safety of your Equipment in your use

Although Yamatake is constantly making efforts to improve the quality and reliability of Yamatake products, there exists a possibility that parts and machinery may break down.

You are required to provide your Equipment with fool-proof design, fail-safe design, anti-flame propagation design, safety design, or the like so that the said Equipment may satisfy the level of the reliability and safety required in your use, whereby preventing any occurrence of physical injuries, fires, significant damage, and so forth.

3 Precautions and restrictions on application

Yamatake products other than those explicitly specified as applicable (e.g. Yamatake Limit Switch For Nuclear Energy) shall not be used in a nuclear energy controlled area (radiation controlled area).

Any Yamatake products shall not be used for/with medical equipment.

In addition,

you are required to conduct a consultation with our sales representative and understand detail specifications, cautions for operation, and so forth by reference to catalogs, specifications, instruction manual, etc. in case that you intend to use Yamatake product for any purposes specified in (1) through (6) below.

Moreover, you are required to provide your Equipment with fool-proof design, fail-safe design, anti-flame propagation design and other designs of protection/safety circuit on your own responsibility to ensure the reliability and safety, whereby preventing problems caused by failure or nonconformity.

- (1) For use under such conditions or in such environments as not stated in technical documents, including catalogs, specification, and instruction manuals
- (2) For use of specific purposes, such as:
 - * Nuclear energy/radiation related facilities
[For use outside nuclear energy controlled areas]
[For use of Yamatake Limit Switch For Nuclear Energy]
 - * Machinery or equipment for space/sea bottom
 - * Transportation equipment
[Railway, aircraft, vessels, vehicle equipment, etc.]
 - * Antidisaster/crime-prevention equipment
 - * Burning appliances
 - * Electrothermal equipment
 - * Amusement facilities

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		<p>(3) Supply systems such as electricity/gas/water supply systems, large-scale communication systems, and traffic/air traffic control systems requiring high reliability</p> <p>(4) Facilities that are to comply with regulations of governmental/public agencies or specific industries</p> <p>(5) Machinery or equipment that may affect human lives, human bodies or properties</p> <p>(6) Other machinery or equipment equivalent to those set forth in items (1) to (5) above which require high reliability and safety</p> <p>4 Precautions against long-term use</p> <p>Use of Yamatake products, including switches, which contain electronic components, over a prolonged period may degrade insulation or increase contact-resistance and may result in heat generation or any other similar problem causing such product or switch to develop safety hazards such as smoking, ignition, and electrification.</p> <p>Although acceleration of the above situation varies depending on the conditions or environment of use of the products, you are required not to use any Yamatake products for a period exceeding ten (10) years unless otherwise stated in specifications or instruction manuals.</p> <p>5 Recommendation for renewal</p> <p>Mechanical components, such as relays and switches, used for Yamatake products will reach the end of their life due to wear by repetitious open/close operations.</p> <p>In addition, electronic components such as electrolytic capacitors will reach the end of their life due to aged deterioration based on the conditions or environment in which such electronic components are used.</p> <p>Although acceleration of the above situation varies depending on the conditions or environment of use, the number of open/close operations of relays, etc. as prescribed in specifications or instruction manuals, or depending on the design margin of your machine or equipment, you are required to renew any Yamatake products every 5 to 10 years unless otherwise specified in specifications or instruction manuals.</p> <p>Field instruments (sensors such as pressure/flow/level sensors, regulating valves, etc.) will reach the end of their life due to aged deterioration of parts.</p> <p>For those parts that will reach the end of their life due to aged deterioration, recommended replacement cycles are prescribed. You are required to replace parts based on such recommended replacement cycles.</p> <p>6 Other precautions</p> <p>Prior to your use of Yamatake products, you are required to understand and comply with specifications (e.g., conditions and environment of use), precautions, warnings/cautions/notices as set forth in the technical documents prepared for individual Yamatake products, such as catalogs, specifications, and instruction manuals to ensure the quality, reliability, and safety of those products.</p> <p>7 Changes to specifications</p> <p>Please note that the descriptions contained in any documents provided by Yamatake are subject to change without notice for improvement or for any other reason.</p> <p>For inquires or information on specifications as you may need to check, please contact our branch offices or sales offices, or your local sales agents.</p> <p>8 Discontinuance of the supply of products/parts</p> <p>Please note that the production of any Yamatake product may be discontinued without notice.</p> <p>For repairable products, we will, in principle, undertake repairs for five (5) years after the discontinuance of those products. In some cases, however, we cannot undertake such repairs for reasons, such as the absence of repair parts.</p> <p>For field instruments, we may not be able to undertake parts replacement for similar reasons.</p> <p>9 Scope of services</p> <p>Prices of Yamatake products do not include any charges for services such as engineer dispatch service. Accordingly, a separate fee will be charged in any of the following cases:</p> <p>(1) Installation, adjustment, guidance, and attendance at a test run</p> <p>(2) Maintenance, inspection, adjustment, and repair</p> <p>(3) Technical guidance and technical education</p> <p>(4) Special test or special inspection of a product under the conditions specified by you</p> <p>Please note that we cannot provide any services as set forth above in a nuclear energy controlled area (radiation controlled area) or at a place where the level of exposure to radiation is equivalent to that in a nuclear energy controlled area.</p>				
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