

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 

6 00						作成DR. YANASE 9, 28, '01		尺度 SCALE ~	記入のない公差 TOL. UNLESS NOTED ~	
5 02						検図CHK. KITAHARA 10, 9, '01	形番 MODEL	SL1-A*		
4 00	03	JE003-1429	12,15,'03	TATSUHARA	SAITO	認可APPD H.NOGUCHI 10, 9, '01	名称 NAME	MINIATURE LIMIT SWITCH		
3 03	02	JE002-1394	11,12,'02	TATSUHARA	TOMITA	日付DATE 10, 10, '01	図番 NO.	AD53716E	改番REV. 03	1/6
2 03	01	JE001-1448	11, 30, '01	YANASE	KITAHARA					
頁 PAGE	改番 REV.	改番 REV.	来歴 RECORD	日付 DATE	担当 BY	検閱 APPD.				

SR. No.

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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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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. 2/6

頁改番  
PAGE REV.改番  
REV.来歴  
RECORD: 日付  
DATE担当  
BY検閲  
APPD.日付DATE  
10, 10, '01図番  
NO.

AD53716E

改番REV.  
03

2/6

SR. No.

# Yamatake Corporation

## 製品仕様書 SPECIFICATIONS

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 (Ith)

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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認可APPD. H.NOGUCHI 10, 9, '01	名称 NAME	<b>MINIATURE LIMIT SWITCH</b>	
日付DATE 10, 10, '01	図番 NO.	<b>AD53716E</b>	改番REV. <b>03 / 6</b>

頁 PAGE	改番 REV.	改番 REV.	来歴 RECORD	: 日付 DATE	担当 BY	検閲 APPD.
		03	ADDITION	12,15,'03	TATSUHARA	SAITO

SR. No.

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/s<sup>2</sup>  
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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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. 00 / 4 / 6

SR. No.

# Yamatake Corporation

## 製品仕様書 SPECIFICATIONS

### 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.



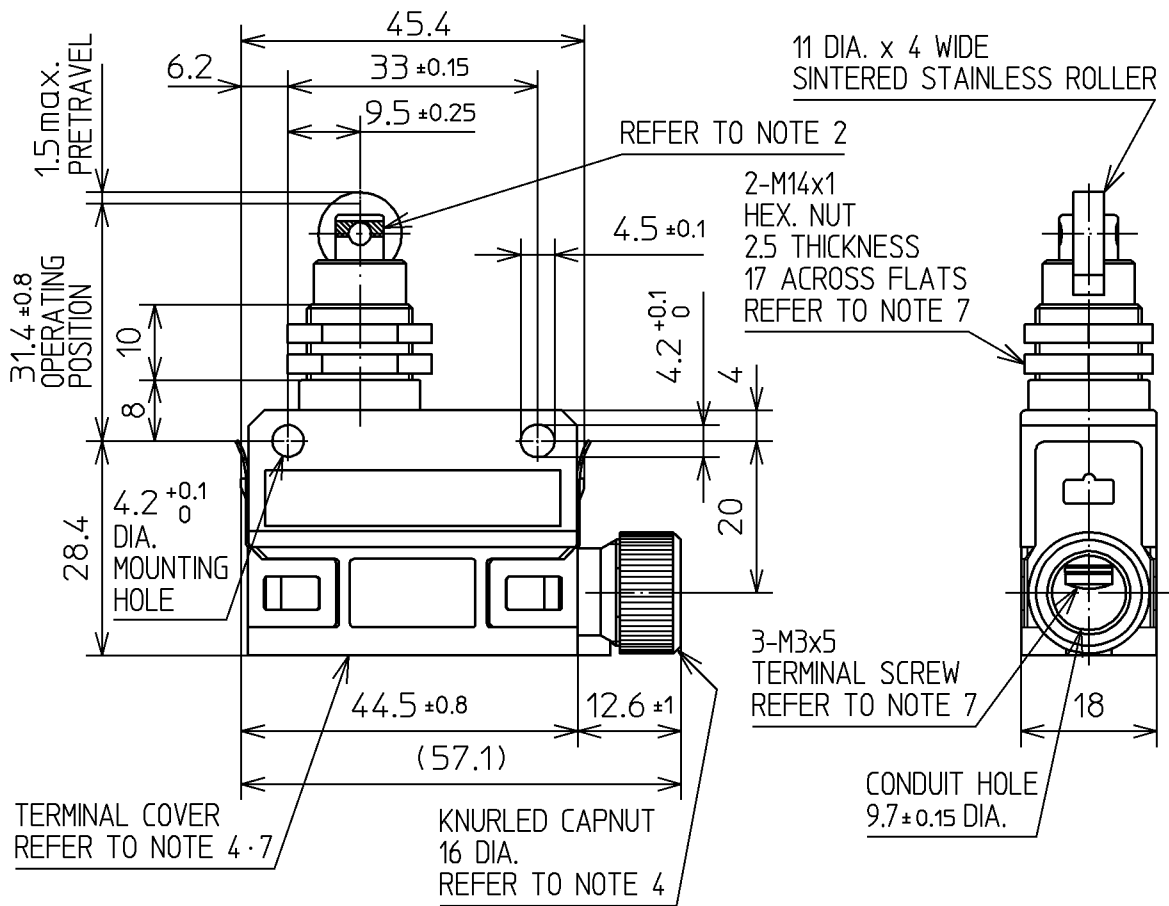
SMALL OVERTRAVEL MAY CAUSE CHATTERING OF CONTACT OR CONTACT FAILURE BY VIBRATION OR SHOCK.

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認可APPD H.NOGUCHI 10, 9, '01	名称 NAME	MINIATURE LIMIT SWITCH			
改番 REV. 02	来歴 RECORD	日付 DATE 11,12,'02	担当 BY TATSUHARA	検閲 APPD. TOMITA	日付 DATE 10, 10, '01
頁 PAGE	改番 REV.	改番 REV.	来歴 RECORD	日付 DATE	日付 DATE
					図番 NO. AD53716E
					改番 REV. 02
					5/6

SR. No.

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# 製品仕様書 SPECIFICATIONS



- NOTES
1. SWITCH ENCLOSURE IS OF ZINC ALLOY COATED WITH BLACK FLUOROPLASTICS. TERMINAL COVER IS PLASTIC.
  2. SET FULL OVERTRAVEL POSITION SO THAT TOP OF BUSHING BE WITHIN RANGE OF ROLLER PLUNGER GROOVES SHOWN WITH CROSS HATCHING.
  3. SEAL IS ALREADY ASSEMBLED FOR A CABLE OF 5.8 TO 7.8 DIA.
  4. 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.
  5. USE A LEAD WIRE WHOSE CROSS SECTION IS FROM 0.75 TO 1.25mm<sup>2</sup> TO THE DIAMETER.
  6. CONECT LEAD-WIRES WITH INSULATED R-SHAPE OR Y-SHAPE CRIMP TYPE TERMINAL.
  7. 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

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. 00/6

頁改番 改番 来歴 : 日付 担当 検閲  
PAGE REV. REV. RECORD : DATE BY APPD.

SP.NO.

**Yamatake Corporation**

製品仕様書  
**SPECIFICATIONS**

“RESTRICTIONS ON USE”

This product has been designed, developed and manufactured for general-purpose application in machinery and equipment.

Accordingly, when used in applications outlined below, special care should be taken to implement a fail-safe and/or redundant design concept as well as a periodic maintenance program.

- Safety devices for plant worker protection
- Start/stop control devices for transportation and material handling machines
- Aeronautical/aerospace machines
- Control devices for nuclear reactors

Never use this product in applications where human safety may be put at risk.

1	00	00	First issue	12-2-02	Harada	Miura
頁	改番	改番	来歴	日付	担当	検閲
	REV.	REV.	RECORD	DATE	BY	APPD.