

1LX5700 Series

IEC-conformed and PTB-approved Explosion-proof Switches

FEATURES

This Compact Vertical Limit Switches Can be Used in Hydrogen Gas Environments. Gas Explosion-proof and Pressure-tight, the **1LX5700** Series Can be Used in Outside Applications.

- *Conforms to the following standards:*
EN 50 014: 1977 + A1A5. (Electrical apparatus for potentially explosive atmospheres General requirements.)
EN 50 018: 1977 + A1A3. (Electrical apparatus for potentially explosive atmospheres Flameproof enclosure "d".)
EN 50 019: 1977 + A1A5. (Electrical apparatus for potentially explosive atmospheres Increased safety "e".)
- *PTB environmental approval category*
Satisfies EEx de IIC T6. (approval No. EX-95.D.3141)
- *Internal switches conform to potentially explosive atmospheres Flameproof structure. Clip-on terminals screws are used on the terminal plate to facilitate wiring.*
- *Usable in hydrogen gas atmospheres.*
- *A conduit wiring system is used for leading out cables, making a junction box unnecessary when wiring.*
- *Comfoms to the ATEX directive.*



ORDER GUIDE

- Catalog listing

Catalog listing	Lever shape	Conduit size	IEC-conformed and PTB-approved explosion-proof switch
1LX5701	Standard roller lever	Straight screw for conduit G½	○
1LX5701-C		Metric fine pitch thread M20 × 1.5	
1LX5701-D		DIN standard screw Pg13.5	
1LX5703	Adjustable roller lever	Straight screw for conduit G½	○
1LX5703-C		Metric fine pitch thread M20 × 1.5	
1LX5703-D		DIN standard screw Pg13.5	

- Auxiliary Actuator

Type	Shape	Catalog listing	Roller material	Lever tightening method
Roller lever		6PA-J63	Black nylon roller	Hexagon socket head bolt
		6PA-J105		
Adjustable roller lever		6PA-J79	Black nylon roller	
		6PA-J119	Brass roller	

Note: When combining actuators, use combinations made of non-ignitable materials.

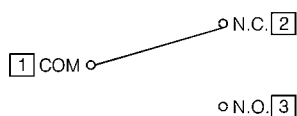
PERFORMANCE

External standards	Conformed standards	JIS C 4508	
	Approval standards	EN 50 014: 1977 + A1 A5 (explosion-proof electrical equipment regulations) EN 50 018: 1977 + A1 A3 (pressure-tight, explosion proofing "d") EN 50 019: 1977 + A1 A5 (increased safety explosion-proofing "e")	
Structure	Circuitry	Single-pole, double-throw (SPDT)	
	Terminal shape	Clip-on terminal plate (M2.6 slotted-head screw)	
	Contact shape	Silver-rivet type	
	Protective structure	Immersion-proof type (JIS), IP67 (IEC 529), Flameproof structure type	
Electrical Performance	Electrical rating	See Table 1 below.	
	Dielectric strength	Across non-continuous terminals 600Vac, 50/60Hz, for 1 minute Across terminals and electrically non-live metals 2,000Vac, 50/60Hz, for 1 minute Across terminals and earth 2,000Vac, 50/60Hz, for 1 minute	
	Insulating resistance	Max. 100M Ω (by 500Vdc megger)	
	Initial contact resistance	Max. 125m Ω (measured by fall-of-potential method 6 to 8Vdc, energizing current 1A)	
	Recommended min. contact voltage/current	24Vdc, 20mA	
Mechanical performance	Actuator strength	5 times O.F. (operating force) (1 minute in operating direction)	
	Terminal strength	Withstand tightening torque of 0.5N-m for 1 minute	
	Shock resistance	200m/s ² (approx. 20G) Contact separation at free position and total travel position 1ms max.	
	Vibration resistance	Amplitude 1.5mm, frequency 10 to 55 Hz, 2 hours continuous Contact separation at free position and total travel position 1ms max.	
	Allowable operating speed	1.0mm/s to 0.5m/s Min. speed: Unstable state of contacts 0.1s max. Max. speed: Actuator damage not allowed	
	Mechanical operating frequency	Max. 120 operations/minute, 3,000 operations/hour max.	
Life	Mechanical life	Min. 2 million operations. Over-travel operation must be 70 to 100% of rated value.	
	Electrical life	Min. 50,000 operations. 240Vac, 2A/ 125Vdc, 0.2A, resistive load	
Environmental Conditions	Standard ambient temp. range	-20 to +60°C. (no freezing nor condensation allowed)	
	Environmental category	PTB-approved explosion-proof switch. Satisfies EEx de IIC T6.	
Recommended Tightening Torques	Body	5 to 6N-m (M5 hexagon socket head cap screw)	
	Cover	2.5 to 3.0N-m (M5 screw)	
	Head	1.3 to 1.7N-m (M4 screw)	
	Terminals	0.3 to 0.4N-m (M2.6 screw)	
	Lever	4 to 5.2N-m (M5 screw)	
	Internal earth	1.3 to 1.7N-m (M4 screw)	
	External earth	2.5 to 3.0N-m (M5 screw)	
Applicable Lead Diameters	Terminals	Strand leads	0.5 to 1.5mm ²
		Single leads	0.5 to 2.5mm ²
	Internal earth	Strand leads	Max. 1.5mm ²
		Single leads	Max. 2.5mm ²
	External earth	Strand leads	Max. 2.5mm ²
		Single leads	Max. 4mm ²

Table 1. Electrical Rating

Usage categories	AC-11: 240Vac, 2A DC-11: 125Vdc, 0.2A
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CONTACT CIRCUITRY



Numbers on terminal plate are indicated.

EXTERNAL APPEARANCE, OPERATING PERFORMANCE, EXTERNAL DIMENSIONS

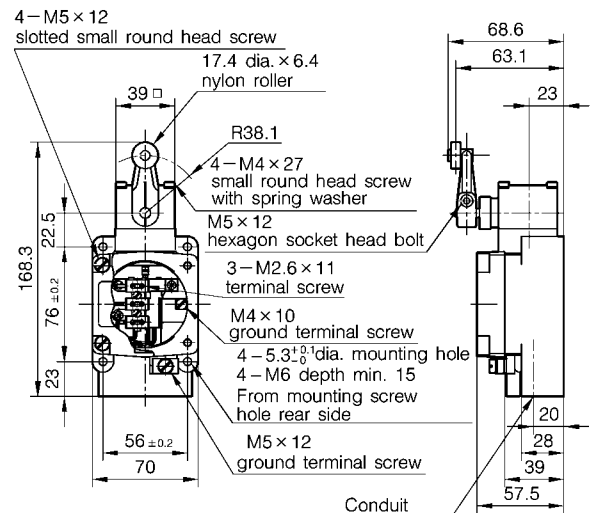
(unit: mm)

Roller Lever type

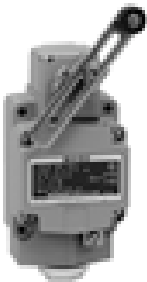


Catalog listing	1LX5701-□	
Approved standard	EN (IEC)	
O.F. (Operating Force)	Max.	12.4N
R.F. (Release Force)	Min.	1.7N
P.T. (Pretravel)	Max.	15°
M.D. (Movement Differential)	Max.	7°
O.T. (Overtravel)	Min.	30°

Note: Conduit size code is applied to □.



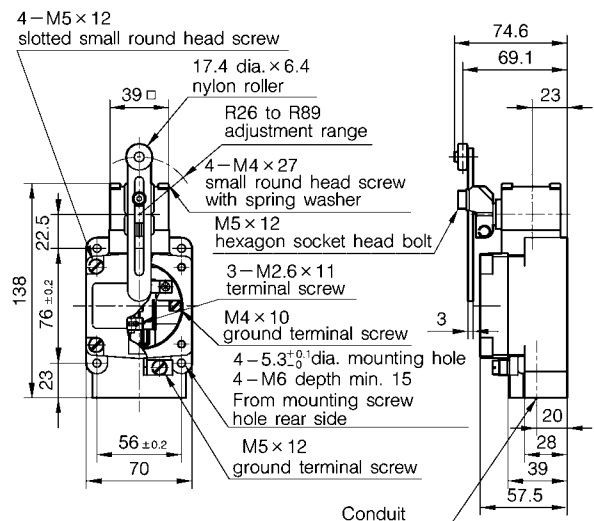
Adjustable Roller Lever type



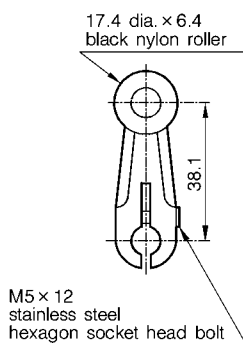
Catalog listing	1LX5703-□	
Approved standard	EN (IEC)	
O.F. (Operating Force)	Max.	12.4N
R.F. (Release Force)	Min.	1.7N
P.T. (Pretravel)	Max.	15°
M.D. (Movement Differential)	Max.	7°
O.T. (Overtravel)	Min.	30°

Note1: Operation characteristics values for lever length of 38.1 mm are indicated.

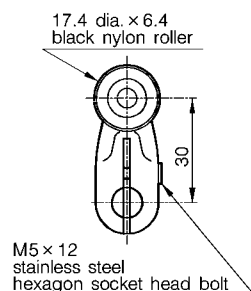
Note2: Conduit size code is applied to □.



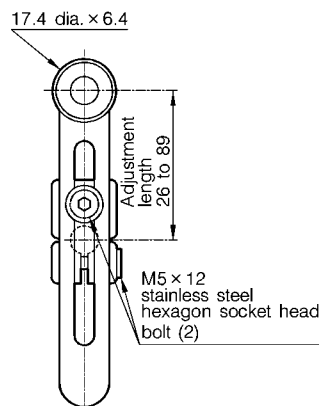
Auxiliary actuator for 1LX5700 explosion-proof switches



6PA-J63



6PA-J105



6PA-J79 (black nylon roller)
6PA-J119 (brass roller)

Conduit size

1LX57**□	
(none)	
C	
D	
Code	Screw
(none)	G½
C	M20×1.5
D	Pg13.5

Min.14
plug

PRECAUTIONS UPON USE

- Before wiring to the switch, turn the equipment power OFF. Some operating voltages may cause an electric shock.
- Do not leave nor use the **1LX5700** Series with the covers and conduit open. Doing so might cause an explosion.
- The **1LX5700** Series conforms to EN explosion-proof standards. Use in applicable areas in corresponding explosion-proof structures according to the standards of the corresponding facilities or equipment.
- To connect to the **1LX5700** Series, remove the four M5 screws with a flat-head screwdriver to remove the cover, and wire to the required terminals. During this operation, take care to prevent the power leads from contacting the switch plunger. Also, take care to tighten the cover applying sufficient pressure on all of the screws uniformly, and join the conduit properly. Failure to do so might result in a drop in explosion-proof performance.
- Do not disassemble the switch except when removing the covers for wiring or when removing the operating head to change the operating direction.
- During work, do not allow tools to touch or drop on the switch. Also, do not use the switch in a damaged state. If the switch cover or housing is dented or cracked, replace the body immediately.
- Only the lever can be replaced. When replacing other parts, replace the entire unit.
- The housing, covers and head are made of aluminum alloy, and finished in gray paint.
- Use stainless steel screws on externally exposed parts.
- When connecting the power lead to the terminal plate, process the ends of the leads using a Weidmuller H sleeve (Model: H0.75, Order No.: 02827.0) or equivalent product.
- Do not disconnect the plug until wiring is carried out.
- Be sure to ground the **1LX5700** Series using the switch earth screw.
- Applicable hazardous areas: Class 1 and 2
Class 1: Location which might become hazardous under normal condition.
Class 2: Location which might become hazardous under abnormal condition.
- “EC explosion-proof environment **EEx de IIC T6**” refers to the following environmental conditions:

E Ex d e II C T6

(1) (2) (3) (4) (5) (6) (7)

- | | |
|---|---|
| (1): EN-conformed explosion-proofing | (5): Explosion-proof electrical equipment group |
| (2): Explosion-proof structure | (6): Gas or moisture category |
| (3): Type of explosion-proof structure (Flameproof enclosure structure) | (7): Temperature class (or maximum surface temperature) |
| (4): Type of explosion-proof structure (increased safety explosion-proof structure) | |

● Example of Explosion-proof Electrical Equipment Group and Corresponding Explosive Gases

New Electrical Facilities Explosion-proof Index (gas explosion proofing 1985)

Temp. Class		T1	T2	T3	T4	T5	T6
Explosive Gas Category		Over 450°C	Over 300°C and under 450°C	Over 200°C and under 300°C	Over 135°C and under 200°C	Over 100°C and under 135°C	Over 85°C and under 100°C
Explosion-proof Electrical Equipment Group	II	IIA	Acetone-ammonia, Ethyl acetate-benzene, Carbon monoxide-methane, Methanol-propane, Toluene	Ethanol-chloro-ethylene, Butyl acetate-ethylbenzene, Dimethylamine-propylene, I-propanol-n-butane, Methyl methacrylate	Octane-hexane, Cyclohexane-butyl chloride, Pentane-I-octanol, Gasoline-kerosene, Petroleum naphtha	Acetaldehyde, Trimethylamine	Ethyl nitrite
		IIB	Acrylonitrile-hydrocyanic acid, Cyclopropane-coke-oven gas	Ethyl acrylate-ethylene, Ethylene oxide-I-3-butadiene	Acrylaldehyde-crotonaldehyde, Dimethyl ether-tetrahydrofuran	Methyl ethyl-di-n-butyl ethyl, Di-n-butyl ethyl-tetrafluoroethylene	-
		IIC	Hydrogen	Acetylene	-	-	Carbon disulfide

CAUTION

The **1LX5700** Series has been designed, developed and manufactured for general-purpose application in machines and equipment. Accordingly, when used in the application outlined below, special care should be taken to implement a fail-safe and /or redundant design concept, as well as a periodic maintenance program to ensure the safety of the overall system, and machines and equipment.

- Safety devices for plant worker protection

Never use the **1LX5700** Series in applications where human safety may be put at risk.



RESTRICIONS 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.

YAMATAKE

Specifications are subject to change without notice.

Yamatake Corporation
Advanced Automation Company

International Business Headquarters

Totate International Building

2-12-19 Shibuya Shibuya-ku

Tokyo 150-8316 Japan

URL:<http://www.yamatake.com>

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