



บริษัท เอดีดี เฟอร์เนส จำกัด

ADD FURNACE CO.,LTD.

44 ซอยบรมราชชนนี 70 ถนนบรมราชชนนี แขวงศาลาธรรมสพน์ เขตทวีวัฒนา กรุงเทพฯ 10170

โทร: 02-888-3472 โทร: ออกแบบ:08-08-170-170 แฟกซ์: 02-888-3258

https://www.add-furnace.com E-mail: sales@add-furnace.com

# 2-Point Detection Explosion-Proof Switches Compliant with IEC Standards

## VCX-7000 Series

A compact vertical gas/steam explosion-proof limit switch for outdoor use, with 2-point detection and a pressure-resistant and increased-safety structure, conforming to IEC standards, and usable in a hydrogen gas atmosphere.



- ◆ Certifications: KEMA (Europe), Technology Institution of Industrial Safety (Japan), NEPSI (China), KOSHA (Korea)
- ◆ Usable in a hydrogen gas atmosphere
- ◆ Light-weight and robust die-cast case cover made of aluminum alloy
- ◆ Die-cast surface with rust prevention treatment and baked finish offers excellent resistance to corrosion and weather.
- ◆ Anti-corrosion models made of die-cast anti-corrosive aluminum are also available.\*
- ◆ With the center neutral type, a single limit switch can detect two limit points (valve upper and lower limits), since two different internal switches operate depending on the direction of actuator rotation.

\*Contact our branch or sales office for details.

External standards	Explosion-proof structure
TIIS (Japan)	Ex d e II C T6
NEPSI (China)	Ex d e II C T6
KOSHA (South Korea)	Ex d e II C T6 IP67
CNS (Taiwan)	Ex d e II C T6

External standards	Explosion-proof structure
ATEX (Europe)	II 2G Ex d e II C T6
IECEX	Ex d e II C T6
NK (shipping)	Ex d e II C T6

### MODEL NUMBERS

Head type	Actuator	Cable lead-in	Contact material	External standards						
				TIIS	NEPSI	KOSHA	CNS	ATEX	IECEX	NK
Center-neutral type	Standard roller lever	G3/4	Silver alloy	VCX-7001-J	VCX-7001-P	VCX-7001-S	VCX-7001-ET	VCX-7001	VCX-7001-E	VCX-7001-N1
			Gold-alloy	VCX-7001-JK	VCX-7001-PK	VCX-7001-SK	VCX-7001-ETK	VCX-7001-K	VCX-7001-EK	VCX-7001-N1K
		Increased-safety packing	Silver alloy	VCX-7001-R						
			Gold-alloy	VCX-7001-RK						
		Cable Gland	Silver alloy	VCX-7001-A1						
			Gold-alloy	VCX-7001-A1K						
		M25	Silver alloy		VCX-7001-Q	VCX-7001-V	VCX-7001-FT	VCX-7001-C	VCX-7001-F	VCX-7001-N2
			Gold-alloy		VCX-7001-QK	VCX-7001-VK	VCX-7001-FTK	VCX-7001-CK	VCX-7001-FK	VCX-7001-N2K
	No lever	G3/4	Silver alloy	VCX-7002-J	VCX-7002-P	VCX-7002-S	VCX-7002-ET	VCX-7002	VCX-7002-E	VCX-7002-N1
			Gold-alloy	VCX-7002-JK	VCX-7002-PK	VCX-7002-SK	VCX-7002-ETK	VCX-7002-K	VCX-7002-EK	VCX-7002-N1K
		Increased-safety packing	Silver alloy	VCX-7002-R						
			Gold-alloy	VCX-7002-RK						
		Cable Gland	Silver alloy	VCX-7002-A1						
			Gold-alloy	VCX-7002-A1K						
		M25	Silver alloy		VCX-7002-Q	VCX-7002-V	VCX-7002-FT	VCX-7002-C	VCX-7002-F	VCX-7002-N2
			Gold-alloy		VCX-7002-QK	VCX-7002-VK	VCX-7002-FTK	VCX-7002-CK	VCX-7002-FK	VCX-7002-N2K
	Adjustable roller lever	G3/4	Silver alloy	VCX-7003-J	VCX-7003-P	VCX-7003-S	VCX-7003-ET	VCX-7003	VCX-7003-E	VCX-7003-N1
			Gold-alloy	VCX-7003-JK	VCX-7003-PK	VCX-7003-SK	VCX-7003-ETK	VCX-7003-K	VCX-7003-EK	VCX-7003-N1K
		Increased-safety packing	Silver alloy	VCX-7003-R						
			Gold-alloy	VCX-7003-RK						
		Cable Gland	Silver alloy	VCX-7003-A1						
			Gold-alloy	VCX-7003-A1K						
		M25	Silver alloy		VCX-7003-Q	VCX-7003-V	VCX-7003-FT	VCX-7003-C	VCX-7003-F	VCX-7003-N2
			Gold-alloy		VCX-7003-QK	VCX-7003-VK	VCX-7003-FTK	VCX-7003-CK	VCX-7003-FK	VCX-7003-N2K
Simultaneous operation type	Standard roller lever	G3/4	Silver alloy	VCX-7101-J	VCX-7101-P	VCX-7101-S	VCX-7101-ET	VCX-7101	VCX-7101-E	VCX-7101-N1
			Gold-alloy	VCX-7101-JK	VCX-7101-PK	VCX-7101-SK	VCX-7101-ETK	VCX-7101-K	VCX-7101-EK	VCX-7101-N1K
		Increased-safety packing	Silver alloy	VCX-7101-R						
			Gold-alloy	VCX-7101-RK						
		Cable Gland	Silver alloy	VCX-7101-A1						
			Gold-alloy	VCX-7101-A1K						
		M25	Silver alloy		VCX-7101-Q	VCX-7101-V	VCX-7101-FT	VCX-7101-C	VCX-7101-F	VCX-7101-N2
			Gold-alloy		VCX-7101-QK	VCX-7101-VK	VCX-7101-FTK	VCX-7101-CK	VCX-7101-FK	VCX-7101-N2K

\*For G3/4 cable lead-in with TIIS certification (-J), use it in combination with a nipple and ceiling fitting. Anti-corrosion models are available except for cable gland type A1. For details, contact the local Azbil branch office or sales office.

Coding of catalog listing: VCX-7□□-□□M Example: VCX-7001-RKM

↓  
Anti-corrosion type



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Head type	Actuator	Cable lead-in	Contact material	External standards						
				TIIS	NEPSI	KOSHA	CNS	ATEX	IECEX	NK
Simultaneous operation type	No lever	G3/4	Silver alloy	VCX-7102-J	VCX-7102-P	VCX-7102-S	VCX-7102-ET	VCX-7102	VCX-7102-E	VCX-7102-N1
			Gold-alloy	VCX-7102-JK	VCX-7102-PK	VCX-7102-SK	VCX-7102-ETK	VCX-7102-K	VCX-7102-EK	VCX-7102-N1K
		Increased-safety packing	Silver alloy	VCX-7102-R						
			Gold-alloy	VCX-7102-RK						
		Cable Gland	Silver alloy	VCX-7102-A1						
			Gold-alloy	VCX-7102-A1K						
	M25	Silver alloy		VCX-7102-Q	VCX-7102-V	VCX-7102-FT	VCX-7102-C	VCX-7102-F	VCX-7102-N2	
		Gold-alloy		VCX-7102-QK	VCX-7102-VK	VCX-7102-FTK	VCX-7102-CK	VCX-7102-FK	VCX-7102-N2K	
	Adjustable roller lever	G3/4	Silver alloy	VCX-7103-J	VCX-7103-P	VCX-7103-S	VCX-7103-ET	VCX-7103	VCX-7103-E	VCX-7103-N1
			Gold-alloy	VCX-7103-JK	VCX-7103-PK	VCX-7103-SK	VCX-7103-ETK	VCX-7103-K	VCX-7103-EK	VCX-7103-N1K
		Increased-safety packing	Silver alloy	VCX-7103-R						
			Gold-alloy	VCX-7103-RK						
		Cable Gland	Silver alloy	VCX-7103-A1						
			Gold-alloy	VCX-7103-A1K						
	M25	Silver alloy		VCX-7103-Q	VCX-7103-V	VCX-7103-FT	VCX-7103-C	VCX-7103-F	VCX-7103-N2	
		Gold-alloy		VCX-7103-QK	VCX-7103-VK	VCX-7103-FTK	VCX-7103-CK	VCX-7103-FK	VCX-7103-N2K	

\*For G3/4 cable lead-in with TIIS certification (-J), use it in combination with a nipple and ceiling fitting. Anti-corrosion models are available except for cable gland type A1. For details, contact the local Azbil branch office or sales office.

Coding of catalog listing: VCX-7□□-□□□□M Example: VCX-7001-RKM

Anti-corrosion type

● Nipple (increased-safety electrical pipe type, used in combination with VCX-7□□-J(K))

Shape	Catalog listing	Dimensions						Material		
		A	B	C	Nickel, width across flats	Tightening nut, width across flats	Screw nominal size	O-ring	Nipple	Tightening nut
	2PA-JEXN22	80	15.5	15.5	34	34	G 3/4	Silicone rubber	Brass	Brass

\*For product delivery dates, contact one of our sales representatives.

\*For wiring and combinations with explosion-proof equipment, refer to product specifications or instruction manuals.

● Pressure-Resistant Packing Connector (used in combination with VCX7□□-R(K))

Shape	Catalog listing	Protective pipe size	Applicable cable diameter	Catalog listing	Protective pipe size	Applicable cable diameter
	2PA-JEX108PM	G 1/2	7.5 to 8.5 mm dia.	2PA-JEX208PM	G 3/4	7.5 to 8.5 mm dia.
	2PA-JEX109PM		8.5 to 9.5 mm dia.	2PA-JEX209PM		8.5 to 9.5 mm dia.
	2PA-JEX110PM		9.5 to 10.5 mm dia.	2PA-JEX210PM		9.5 to 10.5 mm dia.
	2PA-JEX111PM		10.5 to 11.5 mm dia.	2PA-JEX211PM		10.5 to 11.5 mm dia.
	2PA-JEX112PM		11.5 to 12.5 mm dia.	2PA-JEX212PM		11.5 to 12.5 mm dia.
	2PA-JEX113PM		12.5 to 13.5 mm dia.	2PA-JEX213PM		12.5 to 13.5 mm dia.

\*For product delivery dates, contact one of our sales representatives.

● Auxiliary Actuators

Type	Shape	Lever length	Model no.	Roller material	Lever material	Method of attaching lever
roller lever		38.1 mm	6PA-J63	Black nylon	Corrosion-resistant aluminum	Hexagon socket head bolt
		38.1 mm	6PA-J78	Brass	Corrosion-resistant aluminum	Hexagon head bolt
		38.1 mm	LS-6PA44-002	Black nylon	Stainless	Hexagon socket head bolt
		38.1 mm	LS-6PA44-004	Brass	Stainless	Hexagon socket head bolt
		30 mm	6PA-J105	Black nylon	Corrosion-resistant aluminum	Hexagon socket head bolt
		30 mm	LS-6PA107	Brass	Corrosion-resistant aluminum	Hexagon socket head bolt
		30 mm	LS-6PA44-102	Black nylon	Stainless	Hexagon socket head bolt
		30 mm	LS-6PA44-104	Brass	Stainless	Hexagon socket head bolt
Adjustable roller lever		26.0 to 89.0 mm	6PA-J79	Black nylon	Stainless/Corrosion-resistant aluminum	Hexagon socket head bolt
		26.0 to 89.0 mm	6PA-J119	Brass	Stainless/Corrosion-resistant aluminum	Hexagon socket head bolt

\*For product delivery dates, contact one of our sales representatives.

● Shaft cover

Catalog listing	Material
PA-J269	Silicone (black)

\*Sold in sets of 10.



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## PERFORMANCE

Standards compliance		NECA C 4508	
External standards	Certifications	TIIS	Explosion-proof electrical apparatus (technical standard) (compatible with international standards)
		NK	Format number: 08T614
		KEMA	EN60079-0: 2006 (explosion-proof electrical apparatus, general rules)
			EN60079-1: 2007 (flameproof: "d")
			EN60079-7: 2007 (increased safety explosion-proof: "e")
		IECEX	IEC60079-0:2007 (explosion-proof electric apparatus, general rules) IEC60079-1:2007 (flameproof: "d") IEC60079-7:2006 (increased safety explosion-proof: "e")
		NEPSI	GB3836. 1-2000, GB3836. 2-2000, GB3836. 3-2000
KOSHA	KSCIEC60079-0, KSCIEC60079-1, KSCIEC60079-7		
CNS	CNS 3376-0(2008) ; CNS 3376-1(2008) ; CNS 3376-7(2008)		
Structure	Contact form	Single-pole double-throw (SPDT)x2	
	Terminal type	M3.5 pan head screw with square washer	
	Contact material	Silver: rivet. Gold alloy: cross-point	
	Explosion-proof structure	Internal switch: d (explosion-proof), housing: e (increased-safety explosion-proof)	
	Protective structure	IP67 (IEC 60529, JIS C 0920)	
Electrical performance	Electrical rating	Silver: 5A at 250 Vac, 0.4A at 125 Vdc, 0.2A at 250 Vdc Gold-alloy: 0.1A at 125 Vac, 0.1A at 30 Vdc	
	Dielectric strength	Between continuous terminals: 600 Vac, 50/60 Hz for 1 minute Between non-continuous terminals: 2,000 Vac, 50/60 Hz for 1 minute Between each terminal and non-live metal part: 2000 Vac, 50/60 Hz for 1 minute Between each terminal and ground: 2000 Vac, 50/60 Hz for 1 minute	
	Insulation resistance	Min. 100 MK (by 500 Vdc megger)	
	Initial contact resistance	Silver: max. 50 MK (6-8 Vdc, thermal current 1 A, measured by voltage drop method) Gold-alloy: max. 100 MK (6-8 Vdc, thermal current 0.1 A, measured by voltage drop method)	
	Recommended min. contact operating voltage/current	Silver: 10 mA at 24 V, 20 mA at 12 V Gold-alloy: 10 mA at 5 V	
Mechanical performance	Actuator strength	Withstands loads 5 times O.F. (operating direction for 1 minute)	
	Terminal strength	Withstands tightening torque of 0.6 N-m for 1 minute	
	Impact resistance	200 m/s <sup>2</sup> , contacts open for 1 ms max. in free position	
	Vibration resistance	1.5 mm peak-to-peak amplitude, frequency 10 to 55 Hz, 2 h continuously, contacts open for 1 ms max. in free position and total travel position	
	Allowable operating speed	0.3 mm/s to 0.5 m/s At min. speed, unstable state of contacts lasts for 0.1 s max. At max. speed actuator is not damaged.	
	Operating frequency	Max. 120 operations/minute	
Life	Mechanical	Min. 2 million operations (with overtravel at 70 to 100% of rated value)	
	Electrical	Silver: min. 30,000 operations, 5 A at 250 Vac, 0.4 A at 125 Vdc, 0.2 A at 250 Vdc (Min. 100,000 operations, 3 A at 250 Vac, 0.4 A at 30 Vdc, 0.2 A at 125 Vdc, 0.1 A at 250 Vdc) Gold-alloy: min. 2 million operations, 0.1 A at 125 Vac, 0.1 A at 30 Vdc	
Environment	Operating temperature	-10 to +60°C (no freezing allowed)	
	Operating humidity	45-85%RH	
	Storage temperature	-10 to +60°C	
	Storage humidity	Max. 98% RH (with conduit section plug inserted)	
	Group and temperature class	II C T6	
	Hazardous area classification	Zone 1 and Zone 2 hazardous areas	
Recommended tightening torque	Body	5-6 N-m (M5 hexagon socket head bolt)	
	Cover	5-6 N-m (M5 hexagon socket head bolt with spring washer)	
	Head	1.3-1.7 N-m (M4 pan head screw head with spring washer)	
	Terminals	0.8-1.2 N-m (M3.5 pan head screw with square washer)	
	Lever	4-5.2 N-m (M5 hexagon socket head bolt)	
	Internal ground	0.4-0.6 N-m (M3 binding head machine screw with toothed washer)	
	External ground	1.3-1.7 N-m (M4 binding head machine screw with spring washer)	
Applicable cable size	Terminals	Stranded cable	Nominal cross-sectional area 0.5 mm <sup>2</sup> to 1.5 mm <sup>2</sup> (AWG20 to AWG16)
		Single cable	Nominal cross-sectional area 0.5 mm <sup>2</sup> to 1.5 mm <sup>2</sup> (AWG20 to AWG16)
	Internal ground	Uses M3 crimp-type terminal with insulating coating	
	External ground	Uses M4 crimp-type terminal Cables with a nominal cross-sectional area of up to 4 mm <sup>2</sup> can be connected	
Main materials	Housing parts	Aluminum alloy + dark beige baked acrylic resin finish	
	External screws	Stainless steel	
	Seal	Silicone rubber	



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● Table 1. Electrical rating

Catalog listing	VCX-7□0□-J	VCX-7□0□
Contact material	VCX-7□0□-R	VCX-7□0□-C
<b>Silver</b>	5A-250 Vac 0.4A-125 Vdc 0.2A-250 Vdc	AC-12: 5A-250V DC-12: 0.4A-125V DC-12: 0.2A-250V
<b>Gold plated</b> (VCX-7□□□-K ↑ Gold plated)	0.1A-125 Vac 0.1A-30 Vdc	AC-12: 0.1A-125V DC-12: 0.1A-30V

### Circuit diagram

Code	Operation type	Circuit diagram		
		Counterclockwise direction operation	Free position	Clockwise direction operation
0	Center-neutral			
1	Simultaneous operation			

### Conduit section details

Conduit section details	
<b>VCX-7 *** -□ **</b> (Increased-safety conduit type)	<b>VCX-7 *** -R□ **</b> (Increased-safety packing type)
<p>G3/4 parallel screw for piping Effective thread 5 threads min.</p>	

Conduit section details	
VCX-7 ***-□**	
<p>Metric fine pitch thread M25 x 1.5 Effective thread depth: min. 5 threads</p>	□ : Q,V,C,F



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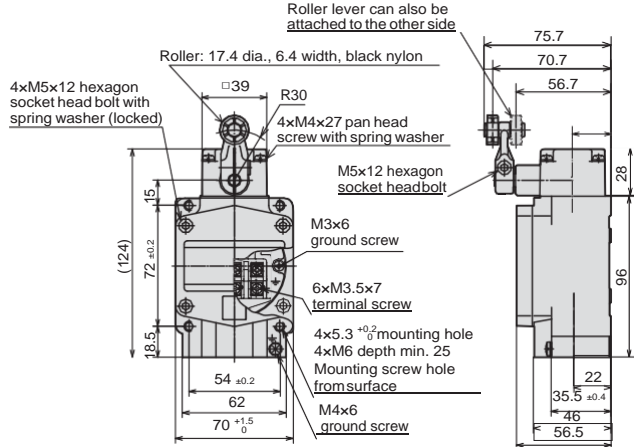
**EXTERNAL DIMENSIONS**

**Standard roller lever type VCX-700□-□□**

(unit : mm)



Catalog listing	VCX-700□-□□
O.F. (Max. N)	15.7
R.F. (Min. N)	2.2
R.T. (Max. °)	10
M.D. (Max. °)	3
O.T. (Min. °)	35
2-switch simultaneous operation	—



Notes:

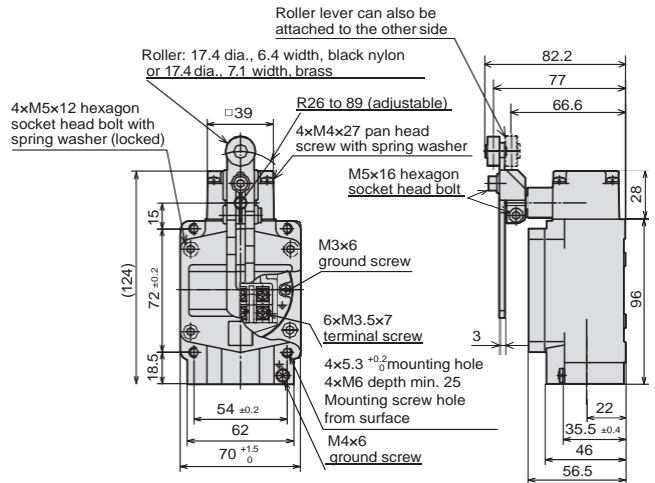
- ※The diagrams above show the shape for brass rollers. For nylon roller shape, see the VCX-703□-□□ diagrams below.
- ※Dimensional tolerance is ±0.8 unless otherwise specified.

**Adjustable roller lever type VCX-710□3-□□**



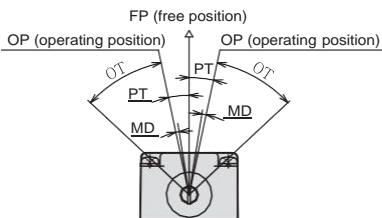
Catalog listing	VCX-710□3-□□
O.F. (Max. N)	15.7*
R.F. (Min. N)	2.2*
R.T. (Max. °)	12
M.D. (Max. °)	3
O.T. (Min. °)	35
2-switch simultaneous operation	3

\* When lever length is 38.1 mm

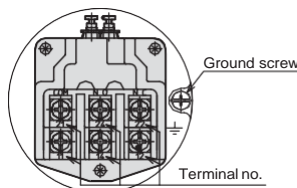


Notes:

- ※The diagrams above show the shape for nylon rollers. For brass roller shape, see the VCX-701□-□□ diagrams below.
- ※Dimensional tolerance is ±0.8 unless otherwise specified.



Detailed terminal diagram



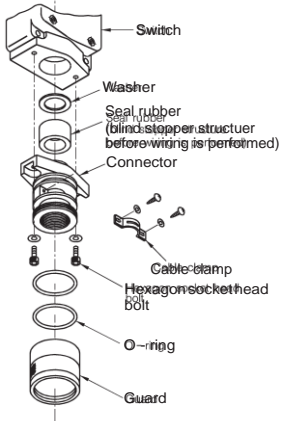
Terminal connections

Switch 1		Switch 2	
Terminal no.	Type	Terminal no.	Type
11	COM	21	COM
12	N.C.	22	N.C.
14	N.O.	24	N.O.



**EXPLODED VIEW OF PRESSURE-RESISTANT PACKING CONNECTOR**

Exploded view



Note: regarding conduits in dimensional drawing

Switches with threaded electrical conduit connections have G3/4 threads, and a protective cap is provided to seal the opening until wiring work is done.

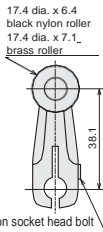
On the pressure-resistant packing pull-in type, the conduit connections are not threaded because this type is used with a separately sold special connector.

Remove the protective cap and install the special connector.

**Auxiliary actuator for VCX explosion-proof switches**

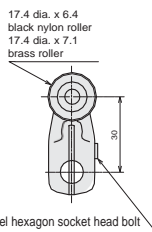
(unit: mm)

- 6PA-J63 (black nylon roller)
- 6PA-J78 (brass roller)
- LS-6PA44-002 (black nylon roller)
- LS-6PA44-004 (brass roller)



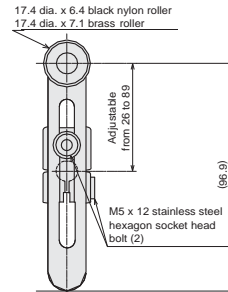
M5 x 12 stainless steel hexagon socket head bolt

- 6PA-J105 (black nylon roller)
- LS-6PA107 (brass roller)
- LS-6PA44-102 (black nylon roller)
- LS-6PA44-104 (brass roller)



M5 x 12 stainless steel hexagon socket head bolt

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



Note: about conduit sections in dimension drawings

On conduit type switches, the conduit section has a G1/2 screw thread, and a blind stopper is inserted to seal the conduit before wiring. On switches with pressure-resistant packing lead-in, there is no screw thread because a special connector (sold separately) is used. Remove the stopper before attaching the connector.



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#### NOTES FOR USE OF VCX-7000 SERIES

- Do not wire while the power is connected. Depending on the voltage used, there is a risk of electrical shock.
- Do not leave the switch unattended or use it with the cover or conduit section open. Doing so may lead to an explosion.
- This switch conforms to IEC-compliant explosion-proof standards. Use it in an area that is appropriate for its explosion-proof structure, in accordance with the standards for the facility or equipment.
- By removing the four head mounting screws, the switch head position can be rotated 180°. Retighten the head screws to a torque of 1.3-1.7 N•m.
- To wire the switch, remove the cover by removing the four M5 screws with a 4 mm hex key (Allen wrench), and then connect the wires to the required terminals. Make sure that the switch plunger does not come into contact with a wire. Note that if the cover is unevenly tightened, if the tightening force is insufficient, or if the conduit section after wiring is improperly attached, explosion-proof performance may be impaired.
- To utilize the TIS certification, electric wires and cables must have an allowable temperature of 70 °C or higher.
- Do not disassemble the switch, except for removing the cover during wiring and removing the operation head to change its direction.
- If the switch has been damaged by a tool or dropped during construction work, do not it. Also, if there is a large dent or crack in the cover or housing, replace the switch immediately. The explosion-proof performance may be impaired.
- The lever is the only replaceable part. Otherwise the whole switch must be replaced.
- The housing, cover and head, are made of aluminum alloy finished with gray paint.
- External screws are stainless steel.
- Do not remove the protective plug until you begin the wiring work.
- Be sure to ground the switch by the ground screw.
- Hazardous areas where the switch can be used: Category I, Category II  
(Category I: areas that could be hazardous under normal conditions)  
(Category II: areas that could be hazardous under abnormal conditions)
- Do not use the switch in an environment where it may come into direct contact with strong acid or alkali.
- For increased-safety electrical conduit models, it is necessary to do explosion-proofing work by using sealing compound to make a sealed fitting for the electrical conduit close to the conduit section. Note that increased-safety electrical conduit type switches cannot be used in combination with commercially available packing-type connectors.
- Use electric wires or cables made to withstand temperatures of 70 °C or higher.
- When using an increased-safety packing type, use a **2PA-JEX1\*\*L** series connector (protective tube size G1/2) or **2PA-JEX2\*\*L** series connector (protective tube size G3/4) as stipulated in the certification for the switch. As the connector is not included, select an appropriate connector and order it separately.

Before use, thoroughly read the "Precautions for use" and "Precautions for handling" in the Technical Guide on pages **D-137** as well as the instruction manual and product specification for this switch.