

Instruction and Operating Manual

Valve Position Monitor LSB-1000 Series



< Ver. 1.0 >

Power-Genex Ltd.



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1. Safety Instructions / Precautions

1-1. Safety instructions

These safety instructions are intended to prevent hazardous situations and/or equipment damage. These instructions indicate the level of potential hazard with the labels of “**Caution**,” “**Warning**” or “**Danger**.” They are all important notes for safety regulations.



Caution

Caution indicates a hazard with a low level of risk which, if not avoided, could result in minor or moderate injury.



Warning

Warning indicates a hazard with a medium level of risk which, if not avoided, could result in death or serious injury.



Danger

Danger indicates a hazard with a high level of risk which, if not avoided, will result in death or serious injury.



Warning

1. The compatibility of the product is the responsibility of the person who designs the equipment or decides its specifications.

Since the product specified here is used under various operating conditions, its compatibility with specific equipment must be decided by the person who designs the equipment or decides its specifications based on necessary analysis and test results. The expected performance and safety assurance of the equipment will be the responsibility of the person who has determined its compatibility with the product. This person should also continuously review all specifications of the product referring to its latest catalogue information, with a view to giving due consideration to any possibility of equipment failure when configuring the equipment.

2. Only personnel with appropriate training should operate machinery and equipment. The product specified here may become unsafe if handled incorrectly.

The assembly, operation and maintenance of machines or equipment including our products must be performed by an operator who is appropriately trained and experienced.

3. Do not service or attempt to remove product and machinery/equipment until safety is confirmed.

1. The inspection and maintenance of machinery/equipment should only be performed after measures to prevent falling or runaway of the driven objects have been confirmed.
2. When the product is to be removed, confirm that the safety measures as mentioned above are implemented and the power from any appropriate source is cut, and read and understand the specific product precautions of all relevant products carefully.
3. Before machinery/equipment is restarted, take measures to prevent unexpected operation and malfunction.

4. Contact POWER-GENEX beforehand and take special consideration of safety measures if the product is to be used in any of the following conditions.

1. Conditions and environments outside of the given specifications, or use outdoors or in a place exposed to direct sunlight.
2. Installation on equipment in conjunction with atomic energy, railways, air navigation, space, shipping, vehicles, military, medical treatment, combustion and recreation, or equipment in contact with food and beverages, emergency stop circuits, clutch and brake circuits in press applications, safety equipment or other applications unsuitable for the standard specifications described in the product catalogue.
3. An application which could have negative effects on people, property, or animals requiring special safety analysis.
4. Use in an interlock circuit, which requires the provision of double interlock for possible failure by using a mechanical protective function, and periodical checks to confirm proper operation.

1-2. Safety instructions



Caution

1. The product is provided for use in manufacturing industries.

The product herein described is basically provided for peaceful use in manufacturing industries. If considering using the product in other industries consult POWER-GENEX beforehand and exchange specifications or a contract if necessary. If anything is unclear, contact your nearest sales branch.

Limited warranty and Disclaimer/Compliance Requirements

The product used is subject to the following "Limited warranty and Disclaimer" and "Compliance Requirements". Read and accept them before using the product.

Limited warranty and Disclaimer

1. The warranty period of the product is 1 year in service or 1.5 years after the product is delivered. Note 2)

Also, the product may have specified durability, running distance or replacement parts. Please consult your nearest sales branch.

2. For any failure or damage reported within the warranty period which is clearly our responsibility, a replacement product or necessary parts will be provided. This limited warranty applies only to our product independently, and not to any other damage incurred due to the failure of the product.

3. Prior to using POWER-GENEX products, please read and understand the warranty terms and disclaimers noted in the specified catalogue for the particular products.

Note 2) Vacuum pads are excluded from this 1 year warranty.

A vacuum pad is a consumable part, so it is warranted for a year after it is delivered.

Also, even within the warranty period, the wear of a product due to the use of the vacuum pad or failure due to the Deterioration of rubber materials are not covered by the limited warranty.

Compliance Requirements

1. The use of POWER-GENEX products with production equipment for the manufacture of weapons of mass destruction (WMD) or any other weapon is strictly prohibited.

2. The exports of POWER-GENEX products or technology from one country to another are governed by the relevant security laws and regulations of the countries involved in the transaction. Prior to the shipment of a POWER-GENEX product to another country, assure that all local rules governing that export are known and followed.

1-3. Precautions

Operation



Warning

1. Do not operate the Switch Box outside the specified range as this may cause problems. (Refer to the specifications.)
2. Design the system to include a safety circuit to avoid the risk of danger should the Switch Box suffer failure.
3. Be sure that exterior lead-in wiring to the terminal box is based on the guidelines for explosion-protection of manufactory electric equipment when being used as a flame proof, explosion proof construction.
4. Do not remove terminal cover in a hazardous location while the power is on.
5. Covers for the terminal and body should be in place while operating.
6. Do not wire in a hazardous location while the power is on.



Caution

1. Do not touch the actuator or valve's oscillating section when supply pressure has been added, as this is dangerous.
2. Make sure fingers do not get caught when mounting and aligning the cam.
Cut off the pressure supply and always release the compressed air inside the Switch Box and actuator before performing this work.
3. Always flush the pipe's inside before piping to ensure foreign objects such as machining chips do not enter the Switch Box.
4. The actuator opening may become unstable when using the booster relay.
5. Always use a ground connection to prevent noise from the input current and to prevent damage because of static electricity.
6. Use the pressure reading on the supplied pressure gauge as an indication.
7. The supplied pressure gauge's needle will malfunction if the pressure supply to the internal mechanism or Switch Box freezes. Ensure that the pressure gauge's internal parts do not freeze if using the pressure gauge in an operating environment with an ambient temperature of less than 0°C.

For users



Caution

1. Assemble, operate and maintain the Switch Boxes after reading the operation manual thoroughly and understanding the content.

1-4. Precautions

Handling



Caution

1. Avoid excessive vibration or impact to the Switch Box body and any excessive force to the armature, as these actions may cause damage to the product. Handle carefully while transporting and operating.
2. If being used in a place where vibration occurs, using a binding band is recommended to prevent broken wires because of the vibration.
3. When exposed to possible moisture invasion, please take the necessary measures. For example, if the Switch Box is left onsite for long periods, a plug should be put in the piping port and a body cover unit fitted to avoid water penetration.
Take measures to avoid dew condensation inside the positioner if exposed to high temperature and humidity. Take enough measures against condensation especially when packing for export.
4. Keep magnetic field off the positioner, as this affects its characteristics.

Operating Environment



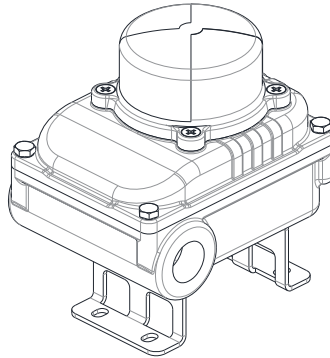
Caution

1. Do not operate in locations with an atmosphere of corrosive gases, chemicals, sea water, or where these substances will adhere to the regulator.
2. Do not operate out of the indicated operation temperature range as this may cause damage to electronic parts and seal materials to deteriorate.
3. Do not operate in locations where excessive vibration or impact occurs.

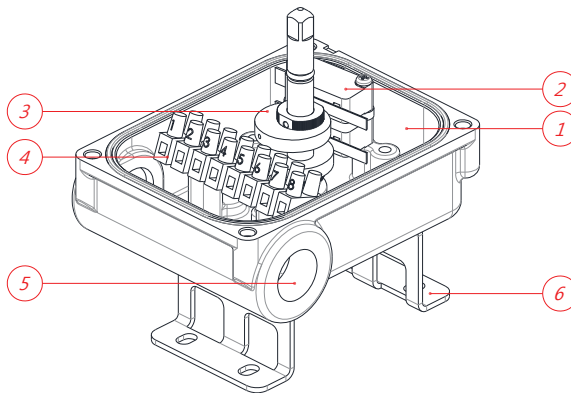
2. Overview of Structure

This product is composed with following parts

- SPDT Mechanical / P&F Proximity Sensor NJ2-V3-N / Autonics Proximity SensorPSN17-D / Honeywell SPDT limit Switches
- NAMUR Mounting Shaft and Brackets



Below are descriptions and the internal view of the product with open cover.



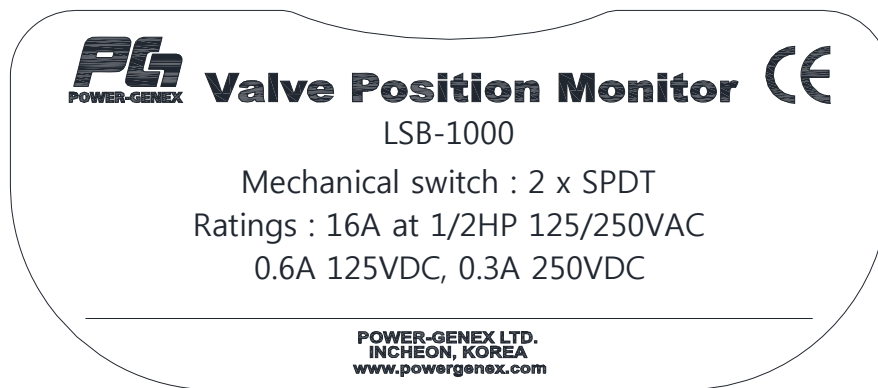
No.	Description
1	LSB1000 Body
2	Switch / Sensor
3	Switch Cam
4	Socket Terminal
5	Wire Connector
6	Bracket

3. Product Specifications

Product	LSB-1000
Protection Rate	Waterproof Dustproof IP67 (Option IP68)
Switch / Sensor	Mechanical Switch (2) SPDT, (4) SPDT P&F Proximity Sensor (2)NJ2-V3-N Autonics Proximity Sensor (2)PSN17-5D Honeywell Mechanical Switch (2)SPDT Hermetically-sealed magnetic Sensor (2)MS-20
Operating Temperature	-40 ~ +100°C (-40 ~ +212°F)
Electrical Connections	PF1/2, NPT 1/2, M20x1.5, PG13.5
Body Materials	Aluminum Die-cast
Weight	0.8kg

- Non-Explosion-proof type (IP67 / IP68) Switch Box.
- Made with solid Aluminum Die-Casting Material

4. Nameplate



- Model: LSB-1000
- Switch: Shows Switch / Sensor type.
- Ratings: Shows rated voltage / Current.

5. Part Numbering System (order code)

		LSB	—	1	x	x	x	—	x	x	x	x	x	x	
				0											
Switch / Sensor	Mechanical Switch	2 x SPDT			0										
		4 x SPDT			2										
	Proximity Sensor	2 x NJ2-V3-N / P&F			4										
		2 x PSN17-5D (PNP or NPN) Autonics			8										
	Honeywell Switch	2 x SPDT (Silver)			J										
2 x SPDT (Gold)				L											
Hermetically Sealed magnetic Sensor	2 x MS-20			C											
Position transmitter	Not Included				0										
Protection Rate	Waterproof	Dustproof IP67						7							
	Waterproof	Dustproof IP68						8							
Beacon Indicator	Not Included								N						
	Beacon Indicator 90° (open / close)								A						
	L or T Port Indicator								D						
Electrical Connections	PF 1/2									C					
	NPT 1/2									D					
	M20x1.5									E					
	PG 13.5									H					
No. of Electrical Connections	2 pcs											2			
Feedback Shaft	Rotary Type	NAMUR Shaft											N		
		Fork Lever											F		
		Stroke 10 ~ 40mm											A		
	Linear Type	Stroke 10 ~ 80mm												B	
		Stroke 80 ~ 150mm												C	
	Stroke 80 ~ 200mm												D		
Mounting Bracket	Non													N	
	30 x 80 x 20(H) - VDI / VDE3845 (IEC60534-6-2)													1	
	30 x 80 x 30(H) - VDI / VDE3845 (IEC60534-6-2)													2	
	30 x 130 x 30(H) - VDI / VDE3845 (IEC60534-6-2)													3	
	30 x 130 x 50(H) - VDI / VDE3845 (IEC60534-6-2)													4	
	Multi-Size Bracket													M	

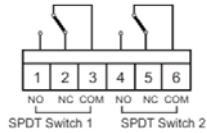
6. Specifications of Switches and Sensors

6.1 Mechanical Switch

6.1.1 SPDT, SZM-V16-2FA-61



< SPDT Mechanical Switch >



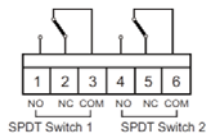
<Connection Diagram >

Model		Non-Inductive Override		Inductive override	
		Resistance	Lamp	Inductivity	Motor
Allowed voltage	250VAC	16A	2A	10A	3A
	8VDC	16A	4A	10A	6A
	30VDC	10A	4A	10A	4A
	125VDC	0.6A	0.1A	0.6A	0.1A
	250VDC	0.3A	0.05A	0.3A	0.05A
Operating Temperature		-30 ~ +105 °C			

6.1.2 Honeywell SPDT, V7-1C17E9-022



< SPDT Mechanical Switch >



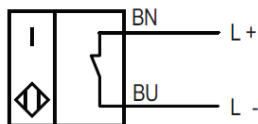
<Connection Diagram >

Model		Non-Inductive Override / Inductive override
Allowed Voltage	125VAC	15.1A 1/2HP
	250VAC	15.1A 1/2HP
	277VAC	15.1A 1/2HP
	125VDC	0.5A
	250VDC	0.25A
Operating Temperature		-40 ~ +82 °C

6.2 P&F Proximity Sensor NJ2-V3-N



<Proximity Sensor >

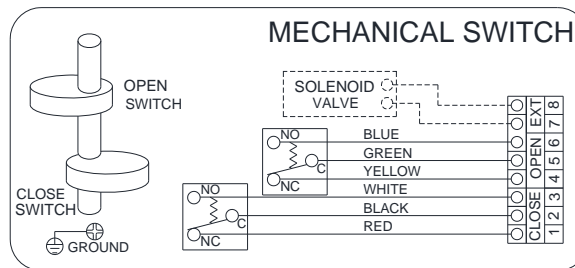


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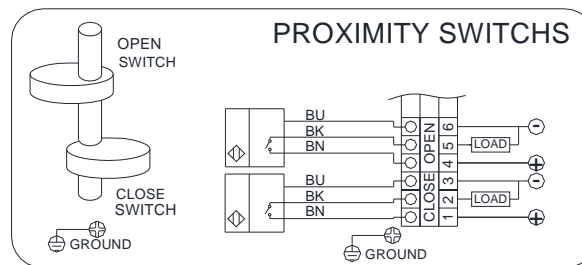
Standard Features	
Switching Functioning Factor	NAMUR NC
Detection Range	2mm
Installation	Built-in
Output polarity	NAMUR
Certified Detection range	0 ~ 1.62 mm
Nominal Ratings	
Nominal voltage	8.2 VDC
Switching Frequency	0 ~ 1000 Hz
Hysteresis	0.01 ~ 0.1 mm
Power consumption	
Measuring plate not detected	> 3mA
Measuring plate detected	< 1mA
Mechanical property	
Connection Type	PCV Cable, 130 mm
Core Cross Section	0.14 mm
Housing Material	PBT
Sensor Surface	PBT
Protection Rate	IP67
Operating Temperature	-25 ~ +100 °C

7. Wirings

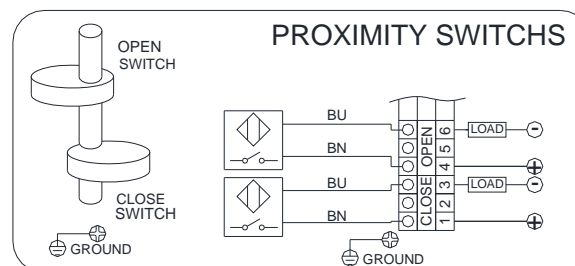
- ① Supply voltage and current as mentioned in this manual. Otherwise, it may cause critical damages to the product or malfunctions.
- ② When using the product, earth the internal and external electrical box.
- ③ Check +, - Polarity correctly before connection.



<SPDT Mechanical Switch>

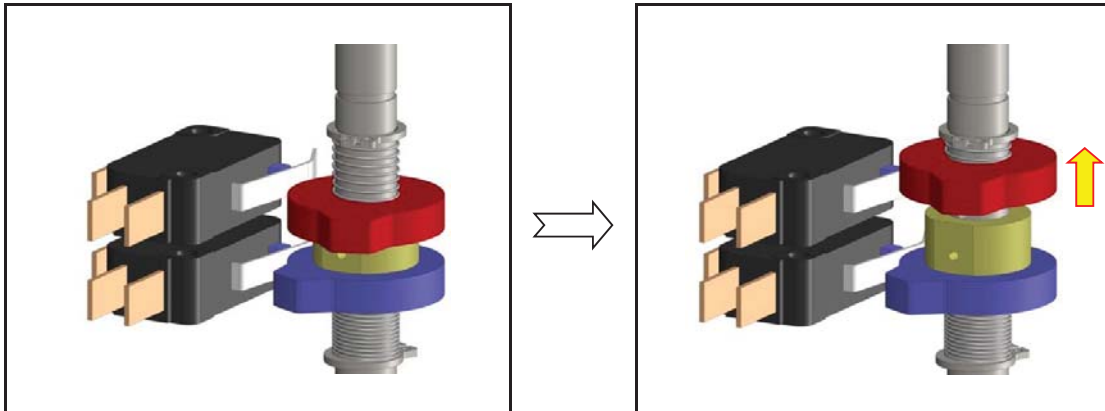


<Autronics 3 Wire Proximity Sensor>



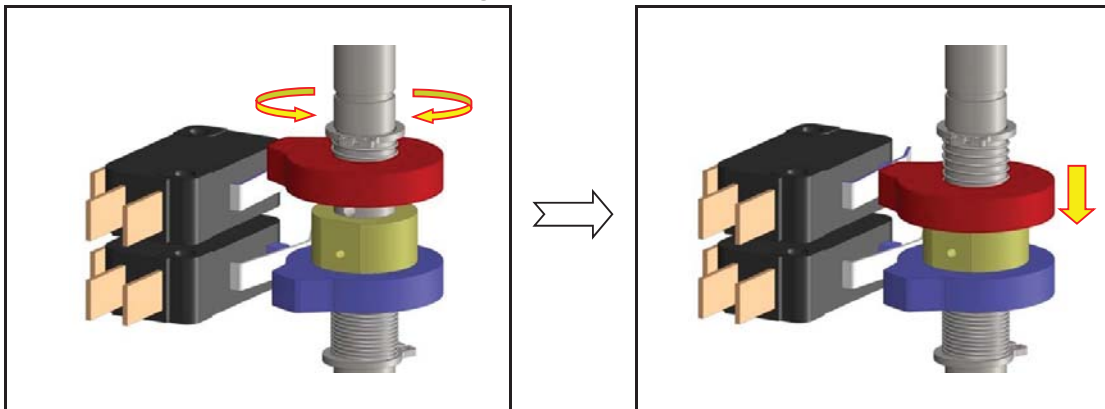
<P&F 2 Wire Proximity Sensor>

8. Adjusting Switch Cams



a) Users can make change the default position of the Cam.

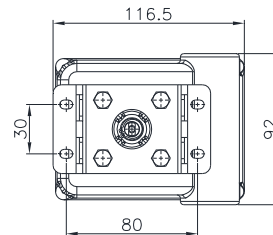
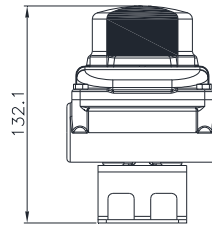
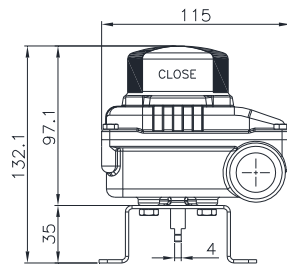
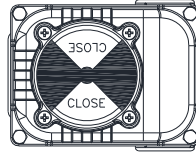
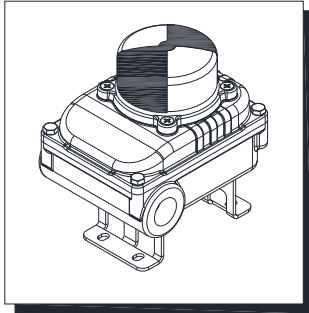
b) Pull the Cam up as shown on the diagram to turn.



c) Turn the Red Cam to a position where user wishes to operate limit switches and push the Cam down to adjust.

d) Blue Cam can be turned by pulling downward and place it on a positioner where user wishes to operate limit switches.

9. Dimensions



Bracket Size

	A	B	C	D
80x30x20	35	80	96	64
80x30x30	45	80	96	64
130x30x30	45	130	150	100