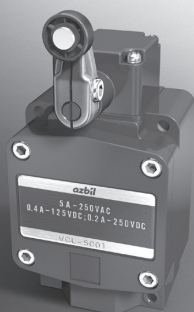


# Waterproof Vertical Type Limit Switches

Model VCL-□□ | 2 sets of SPDT built-in switches enable use as a 2-point detection switch or multi-circuit control switch.



- On the 2-point detection (center-neutral) switch, two different internal switches operate according to the direction (CW or CCW) of actuator rotation
- A single switch can detect two points (valve upper/lower limit, fully open/closed, etc.)
- On the multi-circuit control type, the two switches operate simultaneously according to actuator rotation
- High sensitivity (P.T.=10°, M.D.=3°)

## ORDER GUIDE

Model selection guide: I II III IV Example: VCL-5001-K

| I                     | II               | III            | IV                    | Description                                           | O.F. (N)  | P.T. (°) | M.D. (°) |
|-----------------------|------------------|----------------|-----------------------|-------------------------------------------------------|-----------|----------|----------|
| Basic catalog listing | Operation method | Actuator shape | Custom specifications |                                                       |           |          |          |
| VCL-                  |                  |                |                       | Large water-proof vertical type limit switches        |           |          |          |
|                       | 50               |                |                       | 2-point detection (center-neutral) type               |           |          |          |
|                       | 51               |                |                       | Multi-circuit simultaneous control type               | Max. 15.7 | Max. 10  | Max. 3   |
|                       |                  | 01             |                       | Roller lever (lever length = 30mm)                    |           |          |          |
|                       |                  | 03             |                       | Adjustable roller lever                               |           |          |          |
|                       |                  |                | Blank                 | Standard load type, silver contact                    |           |          |          |
|                       |                  |                | -K                    | Low current load type, gold alloy cross point contact |           |          |          |
|                       |                  |                | -H                    | Heat-resistant type (100°C)                           |           |          |          |
|                       |                  |                | -L                    | Cold-resistant type (-40°C)                           |           |          |          |

### • Contact operation

|          | Center-neutral                         |               |              | Simultaneous  |               |              |
|----------|----------------------------------------|---------------|--------------|---------------|---------------|--------------|
|          | Contact configuration and terminal No. |               |              |               |               |              |
|          | CCW operation                          | Free position | CW operation | CCW operation | Free position | CW operation |
| Switch 1 |                                        |               |              |               |               |              |
| Switch 2 |                                        |               |              |               |               |              |

- Head mounting direction:
- Only two directions (front and rear) can be set on a center-neutral type. When the direction is set to the rear, operation of switches 1 and 2 is reversed.
  - The head can be set in all four directions on a simultaneous operation type.

## PERFORMANCE

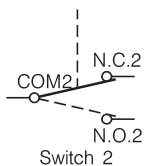
| Item                          |                                                    | Details                                                                                                                                                                                                                   |                                     |
|-------------------------------|----------------------------------------------------|---------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|-------------------------------------|
| External standards            | Conformed standards                                | NECA C 4508                                                                                                                                                                                                               |                                     |
| Structure                     | Contact type                                       | Single-Pole Double-Throw (SPDT) ×2                                                                                                                                                                                        |                                     |
|                               | Contact shape                                      | Standard load type: Pure silver rivet, Low current load type: Gold alloy cross point                                                                                                                                      |                                     |
|                               | Terminal shape                                     | Screw (M4 binding head machine screw with toothed washer)                                                                                                                                                                 |                                     |
|                               | Protective structure                               | IP67 (IEC60529, JIS C 0920)                                                                                                                                                                                               |                                     |
| Electrical performance        | Electrical rating                                  | Standard load type                                                                                                                                                                                                        | 250Vac-5A, 125Vdc-0.4A, 250Vdc-0.2A |
|                               |                                                    | Low current load type                                                                                                                                                                                                     | 125Vac-0.1A, 30Vdc-0.1A             |
|                               | Dielectric strength                                | Between non-continuous terminals: 600V, 50/60Hz for 1 minute<br>Between each terminal and non-conducting metal part: 2,000V, 50/60Hz for 1 minute<br>Between each terminal and ground: 2,000V, 50/60Hz for 1 minute       |                                     |
|                               | Insulation resistance                              | Max. 100MΩ (by 500Vdc megger)                                                                                                                                                                                             |                                     |
|                               | Initial contact resistance                         | Silver contact: Max.50 mΩ<br>(6 to 8 Vdc, energizing current 1A, measured by voltage drop method)<br>Gold alloy cross point contact: Max.100 mΩ<br>(6 to 8 Vdc, energizing current 0.1A, measured by voltage drop method) |                                     |
|                               | Recommended min. contact operating voltage/current | 24Vac/dc-10mA, 12Vac/dc-20mA                                                                                                                                                                                              |                                     |
|                               | Temperature rise                                   | Max. 30°C Terminal temperature measured by thermoelectric thermometer after energizing by rated current                                                                                                                   |                                     |
| Mechanical performance        | Actuator strength                                  | Withstand load 5 times O.F. (operating direction for 1 minute)                                                                                                                                                            |                                     |
|                               | Terminal strength                                  | Withstand tightening torque strength of 0.6N-m for 1 minute                                                                                                                                                               |                                     |
|                               | Impact resistance*                                 | 200m/s <sup>2</sup> , Contact release of 1ms max. at free position and operating limit positions                                                                                                                          |                                     |
|                               | Vibration resistance*                              | Frequency 10 to 55Hz, 1.5mm peak-to-peak amplitude for 2 continuous hours<br>Contact release of 1ms max. at free position and operating limit positions or operating limit position                                       |                                     |
|                               | Allowable operating speed                          | 0.3mm/s to 0.5m/s Min. speed: Unstable state of contacts 0.1s max.<br>Max. speed: Actuator damage not allowed                                                                                                             |                                     |
|                               | Mechanical operating frequency                     | Max. 120 operations/minute                                                                                                                                                                                                |                                     |
| Life                          | Mechanical life                                    | Min. 2 million operations                                                                                                                                                                                                 |                                     |
|                               | Electrical life                                    | Min. 100,000 operations (250Vac-3A resistive load)                                                                                                                                                                        |                                     |
| Environmental conditions      | Operating temperature range                        | -10 to +70°C                                                                                                                                                                                                              |                                     |
|                               | Operating humidity range                           | 98%RH max.                                                                                                                                                                                                                |                                     |
| Recommended tightening torque | Body                                               | 5 to 6N-m (M5 hexagon socket head bolt)                                                                                                                                                                                   |                                     |
|                               | Terminal                                           | 0.4 to 0.6N-m (M4 binding head machine screw with toothed washer)                                                                                                                                                         |                                     |
|                               | Operation head                                     | 1.3 to 1.7N-m (M3.5 screw)                                                                                                                                                                                                |                                     |
|                               | Actuator                                           | 4 to 5.2N-m (M5 screw)                                                                                                                                                                                                    |                                     |
|                               | Cover                                              | 5 to 6 N-m (M5 hexagon socket head cap screw with spring washer)                                                                                                                                                          |                                     |

Note: Items marked by \* are values for catalog listing **VCL-5001**. Unmarked items are values common to all models in the **VCL-5000** Series.

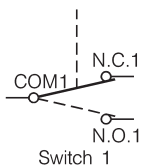
### • Contact type

#### • Center-neutral type

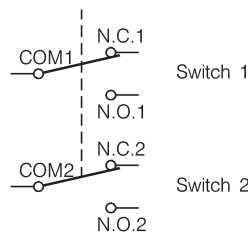
CCW operation



CCW operation



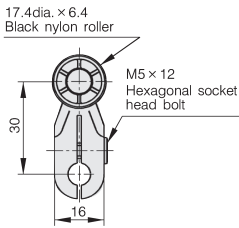
#### • 2-circuit simultaneous operation type



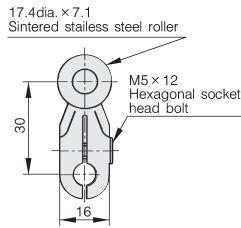


● Auxiliary actuators

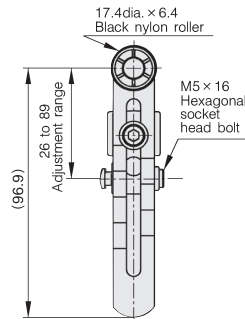
(unit: mm)



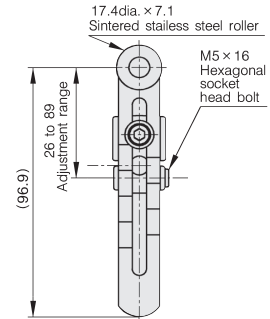
6PA-J105



LS-6PA51



6PA-J79



LS-6PA58

**NOTES FOR USE OF VCL SERIES**

**1. Precautions for use**

- This switch is not explosion-proof. If an explosion-proof switch is required, use the VCX-5\*\*\* series.
- Use this switch within the range described in the product specification.

**2. Wiring**

- 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 allow water or dust to enter the switch, possibly causing a malfunction.
- Wire electric wires using crimp-type terminals with insulation so that they do not come into contact with the cover or housing.
- Securely tighten the cover and conduit. Insufficient tightening impairs sealing performance, leading to insulation failure and eventually preventing the switch from performing satisfactorily.
- Use a connector for the conduit section that has sealing performance equivalent to IP67 or higher.

**3. Installing the switch**

- Protective plugs should be left in until you begin connecting the wiring and conduit.
- Tighten each part of the limit switch to the appropriate tightening torque as described in the product specification. Overtightening will damage the threads or other parts. Insufficient tightening degrades the seal and other characteristics.

- Do not let the activating object come into contact with the lever arm. If it does, the actuator may become bent and the switch may not be able to return properly.
- Do not use leads with silicone rubber insulation, or silicone filler, or grease or oil containing silicone. They can cause contacts to fail to conduct electricity.

**4. Precautions for adjustment**

- Do not apply excessive force (5 times the O.F. or more) to the actuator beyond the travel limit position. Doing so may damage the switch.
- Set overtravel between 1/3 and 2/3 of the rated value. With a small overtravel, vibration or shock may cause the contacts to rattle or to make poor contact.

**5. Environment**

- Do not use the switch in an environment where strong acid or alkali is directly splashed onto it.

**6. Other cautions**

- Do not apply a lubricant to the sliding part of the actuator or any other component. Application of an inappropriate lubricant may degrade sliding performance or impair the protective structure.
- Remove any foreign substances adhering to the sliding part. Dust or any other foreign substance attached to the sliding part may cause a malfunction.
- Check the actual load.  
To increase reliability, confirm that the switch has no problems in actual use before using the switch.

Before use, thoroughly read the "Precautions for use" and "Precautions for handling" in the Technical Guide on pages D-111 to D-122 as well as the instruction manual and product specification for this switch.

PHOTOELECTRIC SENSORS & SWITCHES

MEASUREMENT SENSORS

PROXIMITY SWITCHES

LIMIT SWITCHES

SAFETY KEY SWITCHES

LIMIT SWITCHES WITH POSITIVE OPENING MECHANISM

GENERAL PURPOSE LIMIT SWITCHES

TECHNICAL GUIDE FOR LIMIT SWITCHES

EXPLOSION-PROOF SWITCHES

TECHNICAL GUIDE FOR EXPLOSION-PROOF SWITCHES

STANDARD  LS

SPATTER-GUARDED  LS

1LS-J7

1LS-J8

1LS-J401

VCL-

SL1-

SL1-  C

Connector with cable



See page F-001

Please read "Terms and Conditions" from the following URL before ordering and use.

<https://www.azbil.com/products/factory/order.html>

*[Notice] Specifications are subject to change without notice.  
No part of this publication may be reproduced or duplicated  
without the prior written permission of Azbil Corporation.*

Other product names, model numbers and company names may be trademarks of the respective company.

## Azbil Corporation

Advanced Automation Company

*Yamatake Corporation changed its name to Azbil Corporation on April 1, 2012.*

1-12-2 Kawana, Fujisawa  
Kanagawa 251-8522 Japan

URL: <https://www.azbil.com>

1st Edition : Jan. 2018