

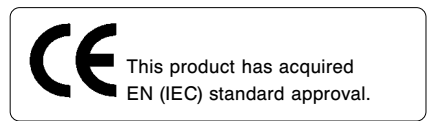
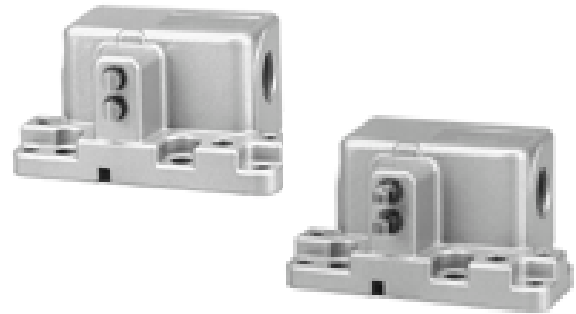
# LDVS-5000 Series

## EN/IEC-conformed Multiple-plunger Limit Switches



### FEATURES

Multiple-plunger Limit Switches Compatible with EC Machine Directives for General Industrial Machinery and EN/IEC Standards Vital for Acquiring CE Marking.

- Complies with EN 60947-5-1 chap.1.  
Approval of compliancy with the standards of the "TÜV Rheinland" an EC official approving body has been acquired.
- Highly reliable basic switch SSM series is used as internal switches to improve wirability.
- In addition to COM, N.C. and N.O. indications, terminal Nos. 1, 2 and 3 are also indicated as switch terminal indications.
- A continuous number (switch No.) corresponding the number of continuous plungers is also indicated on internal switches.
- Wiring has been facilitated on the terminal block.



### ORDER GUIDE

Actuator	Number of plungers	Specifications
		Catalog listing
Bevel plunger 	2	<b>LDVS-5204S</b>
	3	<b>LDVS-5304S</b>
	4	<b>LDVS-5404S</b>
Roller plunger 	2	<b>LDVS-5214S</b>
	3	<b>LDVS-5314S</b>
	4	<b>LDVS-5414S</b>

### EXTERNAL STANDARDS

	Approval body	Approval standard	File No.
International approval standards	TÜV	EN 60947-5-1	J 9850943
Domestic compliant standards	—	JIS C 4508 JIS C 8201-5-1	—

## PERFORMANCE

External standards	Conformed standards	JIS C 4508		
	Approved standards	EN 60947-5-1		
Structure	Contact type	Single-Pole Double-Throw (SPDT)		
	Terminal shape	Screw (M3 small round head screw with square washer)		
	Contact shape	Normal load type: Silver rivet, Low current load type: Gold alloy cross point		
	Protective structure	IP67 (IEC 529)		
	Operating environment pollution level	3 (EN 60947-5-1)		
Electrical performance (1) General characteristics	Electrical rating	See Table 1.		
	Dielectric strength	Between non-continuous terminals: 600Vac, 50/60Hz for 1 minute		
		Between each terminal and non-conducting metal part: 1,500Vac, 50/60Hz for 1 minute		
		Between each terminal and ground: 1,500Vac, 50/60Hz for 1 minute		
	Insulation resistance	Min. 100M $\Omega$ (by 500Vdc megger)		
	Initial contact resistance	Normal load	Max. 50m $\Omega$ (6 to 8Vdc, energizing current 1A, voltage drop method)	
Low current load		Max. 100m $\Omega$ (6 to 8Vdc, energizing current 0.1A, voltage drop method)		
Recommended min. contact operating voltage/current	Normal load	24V-10mA, 12V-20mA		
	Low current load	5V-10mA		
Electrical performance (2) EN 60947-5-1 related characteristics	Operating rated voltage	240Vac, 30Vdc		
	Rated frequency	45 to 65Hz and "d.c."		
	Rated insulating voltage (Ui)	250Vac		
	Rated impulse dielectric strength (Uimp)	2,500V		
	Rated energizing current (Ith)	Normal load	5A	
		Low current load	0.1A	
	Short-circuit protection mechanism	Instant blowing fuse 8A (BASSMANN ABC8 (8A) or equivalent)		
	Conditional rated short-circuit current	50A (at resistive load)		
Switching overvoltage	Category 3 (IEC 204-1)			
Mechanical performance	Actuator strength	75N for 1 minute in operating direction		
	Terminal strength	Withstand tightening torque of 0.6N-m for 1 minute		
	Impact resistance	Normal load: 600m/s <sup>2</sup> , low current load: 400m/s <sup>2</sup> Contact release of 1ms max. at free position and operating limit positions		
	Vibration resistance	1.5mm peak-to-peak amplitude, frequency 10 to 55Hz for 2 continuous hours Contact release of 1ms max. at free position and operating limit positions		
	Allowable operating speed	0.07mm/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		
Life	Mechanical life	Min. 5 million operations. Function after operation is 70 to 100% of standard value.		
	Electrical life	See Table 1.		
Environmental conditions	Operating ambient temperature	- 10 to +70°C (freezing not allowed)		
	Operating ambient humidity	Max. 98%RH		
Recommended tightening torque	Body	6 to 8N-m (M6 hexagon socket head bolt)		
	Terminal screw	0.4 to 0.6N-m (M3 small round head screw)		
	Cover	1.3 to 1.7N-m (M4 small round head screw)		

Table 1. Electrical rating and electrical life

Contact material	Electrical rating		Electrical life	
	Normal rating	EN (IEC) standard compliancy rating	Conditions	Number of operations
Silver for normal load	250Vac-5A	Category AC-15: 240Vac-1.5A	250Vac-5A 125Vdc-0.4A, 250Vdc-0.2A	Min. 50,000 operations
		Category DC-12: 30Vdc-0.5A	250Vac-3A 30Vdc-0.4A 125Vdc-0.2A, 250Vdc-0.1A	Min. 100,000 operations
Gold alloy cross point for low current load	125Vac-0.1A 30Vdc-0.1A	Category DC-12: 30Vdc-0.1A	125Vac-0.1A 30Vdc-0.1A	Min. 2,000,000 operations

**Note 1:** Life is the value measured at a startup dog angle of 30°.

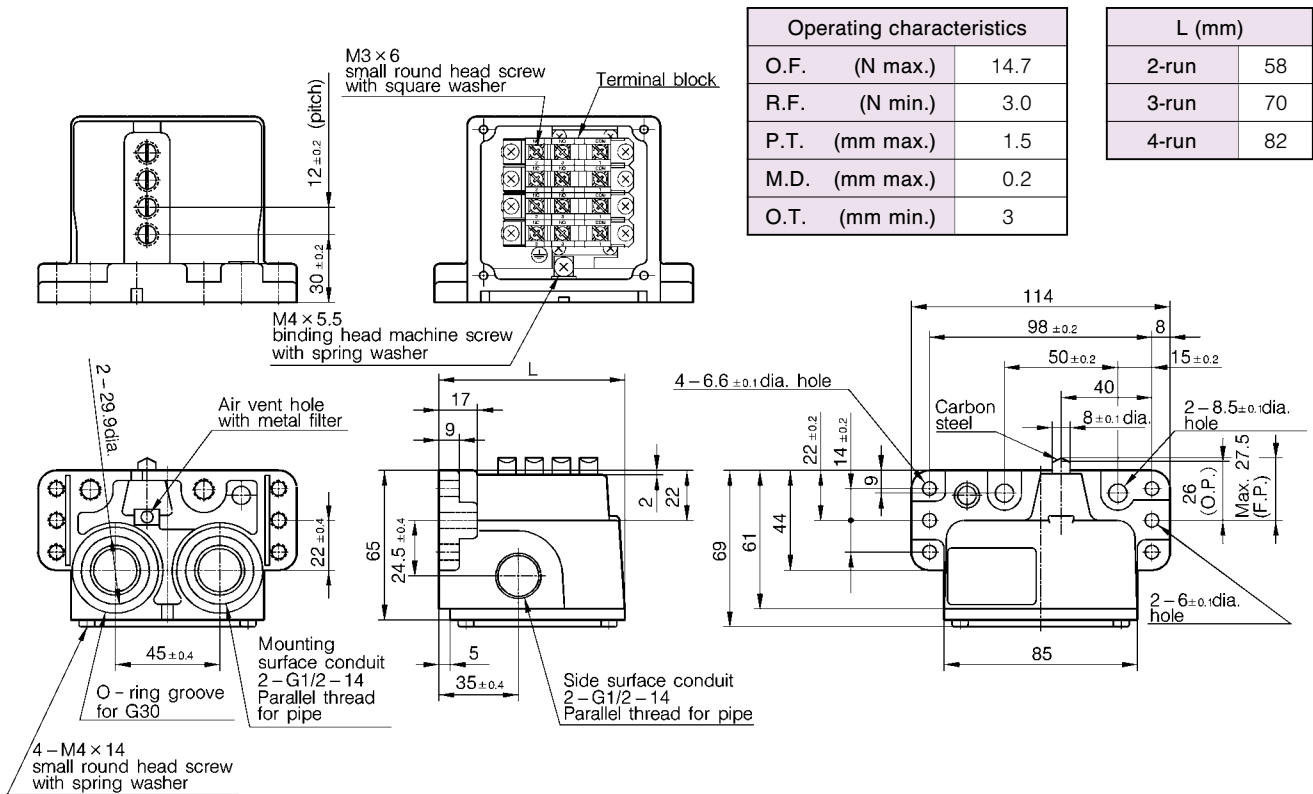
**Note 2:** Electrical life is the value measured at an operating frequency of 20 operations/minute.

## APPEARANCE, OPERATING CHARACTERISTICS AND EXTERNAL DIMENSIONS

### ● Bevel plunger (2-, 3- or 4-run)

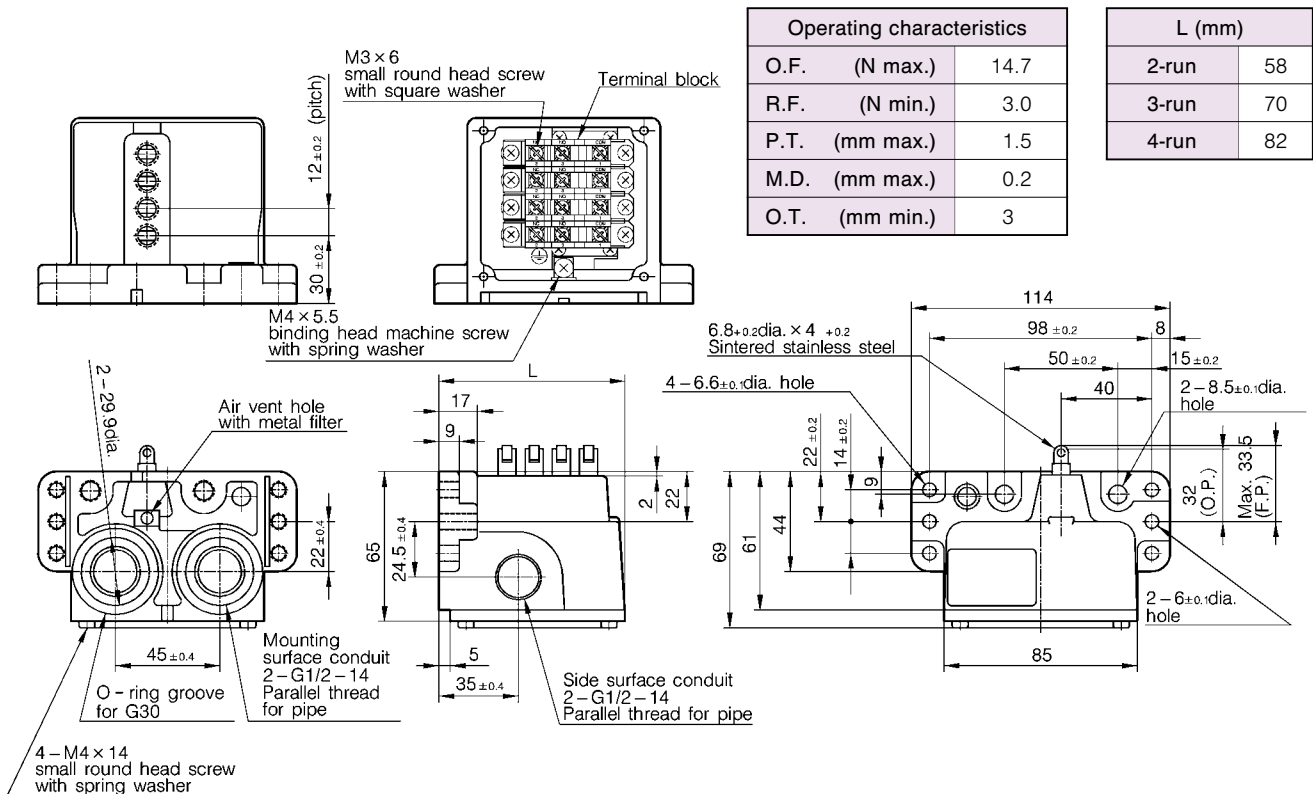
(unit: mm)

LDVS-5□0□



### ● Roller plunger (2-, 3- or 4-run)

LDVS-5□1□



## PRECAUTIONS UPON USE

### ● Mounting

- Tighten each of the parts on limit switches according to the appropriate tightening torques listed in the performance tables.  
Overtightening leads to damage to screws and other parts. Alternately, insufficient tightening results in a drop in switch sealability and performance such as various characteristics.
- Do not leave or use covers and conduit parts opened.  
Water or dirt and dust may enter, which causes malfunction.
- Prevent the plunger from being pushed into beyond the operating limit.
- Do not use silicon rubber electrical lead, silicon adhesive or grease containing silicon. Doing so might result in defective electrical conduction.

### ● Wiring

- Do not perform wiring with the power ON. Doing so might cause electric shock, or the machine may start suddenly, causing unexpected accidents.
- Use crimp-type terminal lugs with covered insulation for electrical leads to prevent contact with covers and housings.  
If a crimp-type terminal lug contacts a cover, the cover may no longer be shut or a ground fault may occur.
- Use seal connectors (PA1 series, etc. sold separately) or flexible piping (PA3 series) that have IP67 or equivalent sealability on conduits.
- Firmly tighten covers and conduits. If covers and conduits are not sufficiently tightened, not only sealability will be impaired and cause defective insulation, but also switch performance may no longer be ensured.

### ● Adjustment

- Do not apply excessive force (5 times of O.F.) to the actuator beyond the operating limit position. Doing so might damage the switch.
- Limit overtravel to 70 to 100% of the specified characteristic values. Small overtravel might cause the contacts to rattle due to vibration and impact, resulting in defective contact.



## 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.*

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