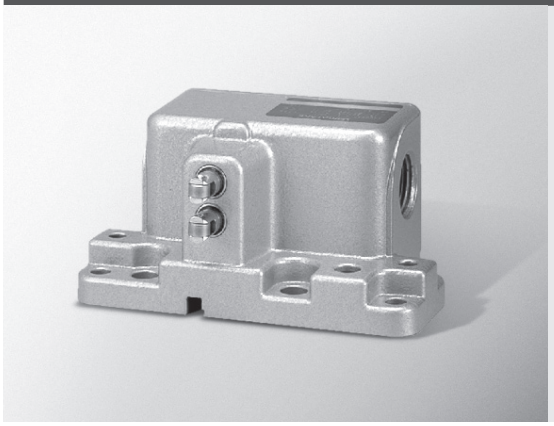
EN/IEC-Compliant Multiple-Plunger Limit Switches

LDVS Series | **Multiple-plunger limit switches compatible with EC directives for general industrial machinery and EN/IEC standards vital for acquiring CE marking.**



- **Complies with EN 60947-5-1.**
- **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 Name/shape	Number of plungers	Specifications G½ conduit Two on mounting surface and side surface Catalog listing
Bevel plunger 	2	**LDVS-5204S**
	3	**LDVS-5304S**
	4	**LDVS-5404S**
Roller plunger 	2	**LDVS-5214S**
	3	**LDVS-5314S**
	4	**LDVS-5414S**

EXTERNAL STANDARDS

Approval body	Approval standard	File No.
TÜV	EN 60947-5-1	J 9850943

PERFORMANCE

External standards	**Conformed standards**		NECA C 4508/IEC 60947-5-1
	Approved atandards		EN60947-5-1
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
	Protective structure		IP67 (IEC60529, JIS C 0920)
	Operating environment pollution level		3 (EN 60947-5-1)
	Protection class		Class Ⅰ (IEC 60536)
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. 100MΩ (by 500Vdc megger)
	Initial contact resistance:	**Normal load**	Max. 50mΩ (6 to 8Vdc, energizing current 1A,voltage drop method)
		Low current load	Max. 100mΩ (6 to 8Vdc, energizing current 0.1A,voltage drop method)
	Recommended mim. 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 10A (BASSMANN ABC10 (10A) or equivalent)
	Conditional rated short-circuit current		100A (at resistive load)
	Switching overvoltage		Category Ⅲ (IEC 60204-1)
Mechanical performance	**Actuator strength**		75N for 1 minute in operating direction
	Terminal strength		Withstand tightening toeque of 0.6N-m for 1 minute
	Impact resistance		Normal load: 600m/s^2, Low current load: 400m/s^2 Contact release of 1ms max. at free position and operating limit positions (NECA C 4508)
	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 (NECA C 4508)
	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-5A 30Vdc-0.4A 125Vdc-0.2A, 250Vdc-0.1A	Min. 100,000 operations
Gold alloy cross point for low current load	AC 125V-0.1A DC 30V-0.1A	Category DC-12: DC 30V-0.1A Category AC-12: AC 125V-0.1A	AC 125V-0.1A DC 30V-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

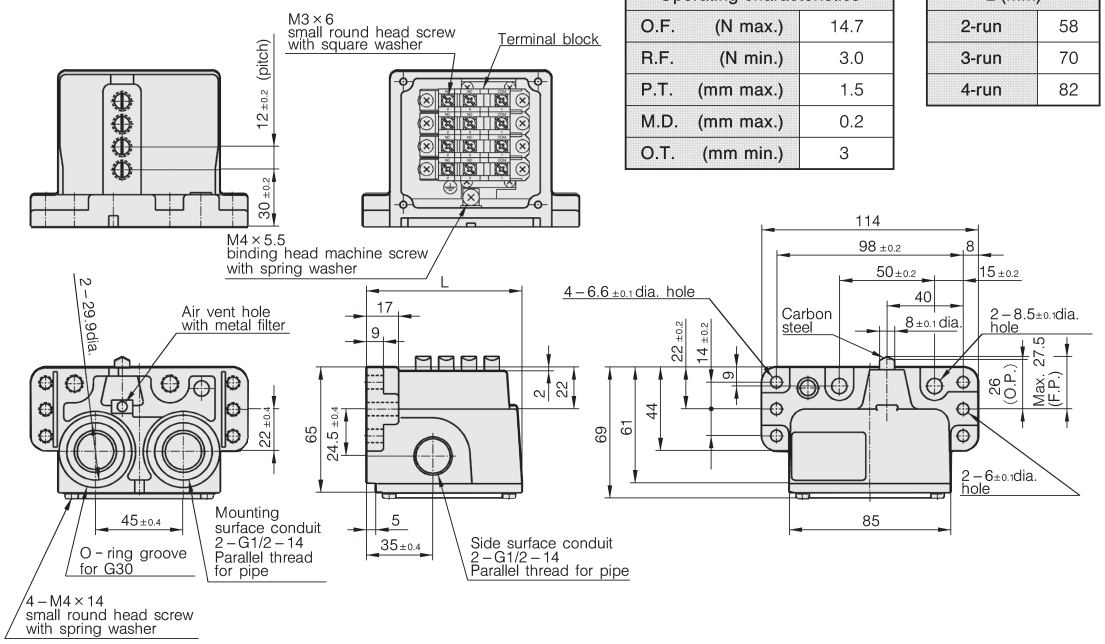
(unit: mm)

● Bevel plunger (2-, 3- or 4-run)

LDVS-5□0□

Operating characteristics		
O.F.	(N max.)	14.7
R.F.	(N min.)	3.0
P.T.	(mm max.)	1.5
M.D.	(mm max.)	0.2
O.T.	(mm min.)	3

L (mm)	
2-run	58
3-run	70
4-run	82

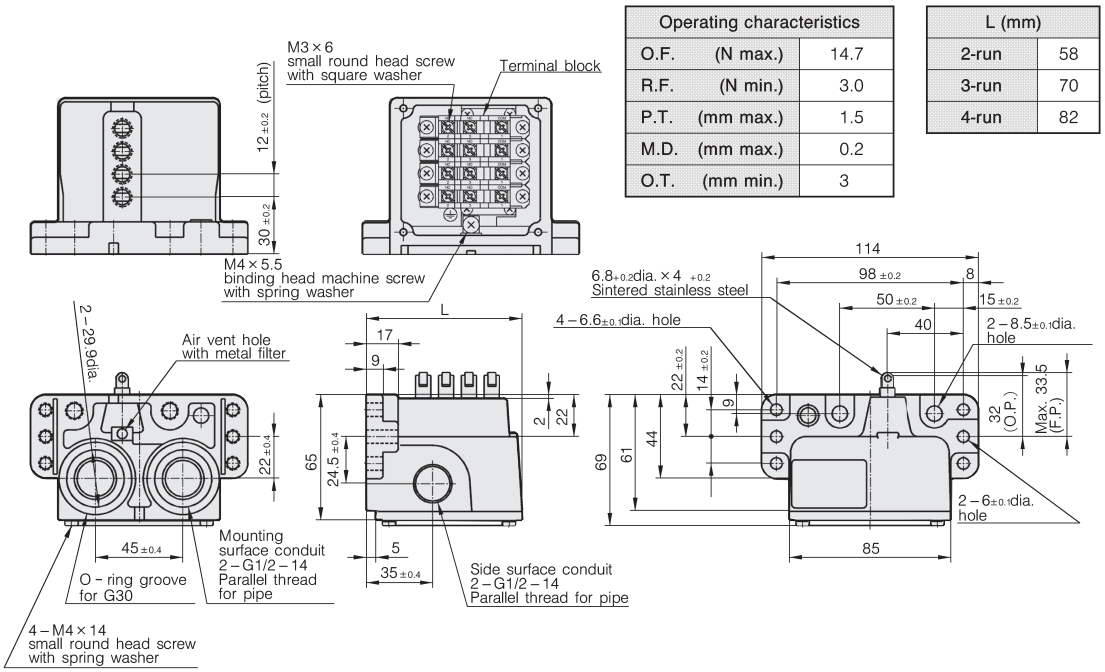


● Roller plunger (2-, 3- or 4-run)

LDVS-5□1□

Operating characteristics		
O.F.	(N max.)	14.7
R.F.	(N min.)	3.0
P.T.	(mm max.)	1.5
M.D.	(mm max.)	0.2
O.T.	(mm min.)	3

L (mm)	
2-run	58
3-run	70
4-run	82



PRECAUTIONS UPON USE

1. 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.

2. 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.

3. 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 1/3 to 2/3 of the specified characteristic values. Small overtravel might cause the contacts to rattle due to vibration and impact, resulting in defective contact.

4. Environment

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

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.