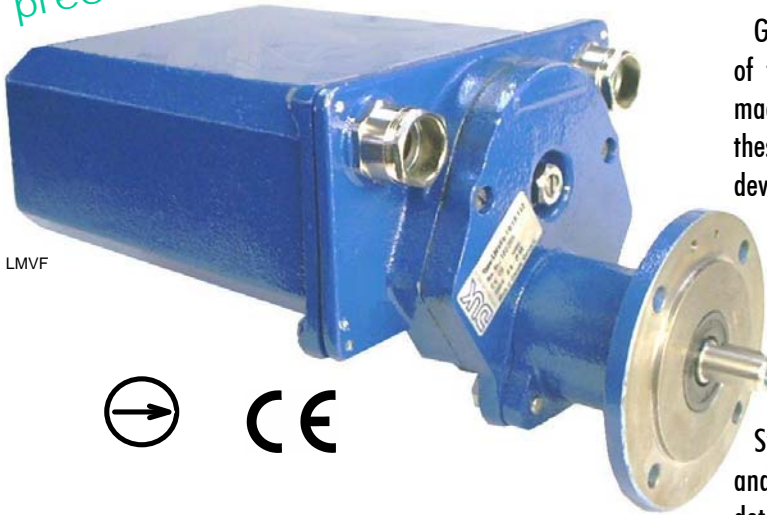


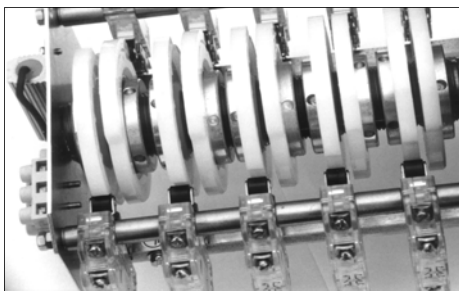
# Geared Limit Switch

## LMV

When safety and  
precision matters



- **Unrivalled high repeatability of the switch points**
- **Easiest adjustment of the switch points**
- **Double ball-bearing shaft**
- **Snap action**
- **Up to 16 Ampère**
- **Direct opening**
- **Up to 12 micro switches**



Each cam disc is countered  
by its own lock nut



Fine adjustment  
by matching screws

Geared limit switches commute depending on the number of turns of an incoming shaft. They are used to stop a machine/plant at 2 limit positions and to give signal between these stops. The complete path/way of a machine or plant is developed on less than 1 cam disc turn by the integrated gear.

Geared limit switches type LMV are designed for a very fine adjustability of the switch points as well as their very high repeatability. The double ball-bearing of the input shaft allows radial forces on the shaft butt/coupling and facilitates a very high lifetime.

Switches type LMV will be equipped with up to 12 cam-discs and same number of micro-switches. The flanks of the cams determine the switchpoints: The increasing flank causes a switching with direct opening (positive drive) of the NC-contacts (except micro switch „15“), the decreasing flank causes the switching back. All switch points are adjustable very easy and individual, independent from the other contacts. For adjustment only a single cam disc can be loosened individual (without loosening the others), turned to the required switch point and tightened. Afterwards the fine-adjustment screw allows the exact corrections. The competitive large diameter of the cam discs of 70mm effects the exact and easy adjustment of the switch points and their unrivalled high repeatability.

The high area of the cam disc is 120° long, the low area 240°. The 120° long cam can be shortened on-site on 90°, 60° or 30°.

Different gear ratios are available for best adaption to the number of turns of the plant. Best selection of the gear ratio is given when the complete working range (between the limit positions plus slow-down paths) will be developed most long on 1 turn of the cam disc. There is no mechanical stop behind 360° of rotation.

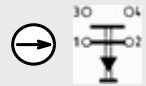
2 different versions are available for different fixing: By pedestal it is the version LMVL, by flange it is LMVF. The shaft butt is 14mm diametered and equipped with a featherkey. The all-metal housing and all-metal gear-wheels are the guarantors for reliable service.

The individual production allows also the equipment with customer requested devices.

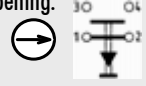
# Geared Limit Switch LMV

## Selection of the micro switches

**Type 10:** 1 NO und 1 NC, selfcleaning, silver, snap action, direct opening. AC-15 230VAC / 10A, DC-13 110VDC / 0,5A  
 Lifetime mechanical 10 Millionen cycles  
 Lifetime elektrical 1 Million cycles at: 230 VAC  $\cos \phi = 1 : 0,5A$ ,  $\cos \phi = 0,7 : 0,3A$   
 380 VAC  $\cos \phi = 1 : 0,5A$ ,  $\cos \phi = 0,7 : 0,3A$  24 VDC  $0ms = 4A$   
 Repeatability  $0,055^\circ$ , Hysteresis (differential way)  $2,6^\circ$  on the cam disc



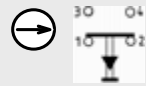
**Type 13:** 1 NO und 1 NC, selfcleaning, gold plated for best contact safety at lowest tensions and lowest currents, snap action, direct opening.  
 AC-12 230VAC / 0,25A, DC-12 110VDC / 0,25A Lifetime mechanical 10 Millionen cycles  
 Repeatability  $0,055^\circ$ , Hysteresis (differential way)  $2,6^\circ$  on the cam disc



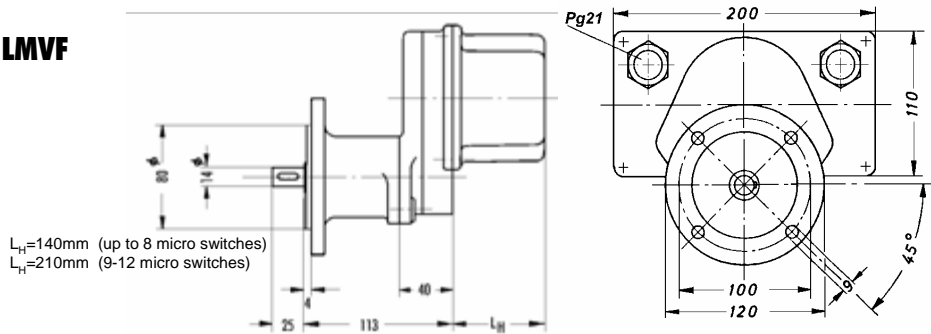
**Typ 15:** Changeover contact with lowest hysteresis, very high repeatability of the switch points, snap action, without direct opening.  
 Lifetime electrical 25000 cycles at 230VAC 15A or at 125 VDC 0,5A  
 Repeatability  $0,026^\circ$ , Hysteresis  $0,33^\circ$  on the cam disc



**Typ 16:** Changeover contact, snap action, direct opening  
 Lifetime mechanical: 10 millionen cycles  
 Lifetime electrical: 1 million cycles at: 230 VAC  $\cos \phi = 1 : 16A$ ,  $\cos \phi = 0,8 : 16A$   
 380VAC  $\cos \phi = 1: 12A$ ,  $\cos \phi = 0,8: 6A$   
 110 VDC  $0ms = 7A$ ,  $5ms = 2A$   
 24 VDC  $0ms = 16A$ ,  $5ms = 9A$   
 Repeatability  $0,139^\circ$ , Hysteresis  $2,5^\circ$  on the cam disc

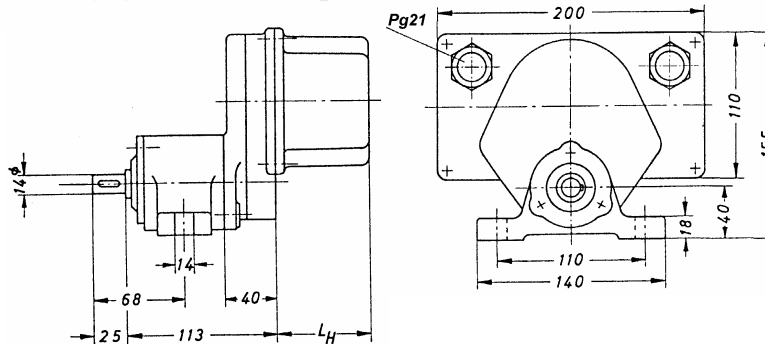


## LMVF

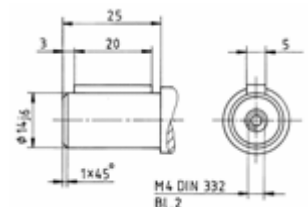


$L_H = 140mm$  (up to 8 micro switches)  
 $L_H = 210mm$  (9-12 micro switches)

## LMVL



## Shaft Butt



## Technical Data

Conforms to	EN 60947, EN 60529
Isolation	according to VDE 0110
Repeatability of the switch points	please see „selection of the micro switches“
Hysteresis	please see „selection of the micro switches“
Enclosure	made of cast iron and aluminium
Coating	RAL 5001 blue
Cable inlets	2 x M25-threads
Weight	up to 8 micro switches 8,0 kg, more than 8 micro switches 12,0 kg
Protection	IP65 according to EN 60529
Mounting position	free
Ambient temperature	$-30^\circ C$ up to $80^\circ C$

## Selection of gear ratios

310:1, 155:1, 132:1, 108:1, 84:1, 62:1, 50:1, 40:1, 20:1, 10:1, 8:1, 4:1, 2:1, (1:1 please see separate datasheet „LM“)

## Ordering key

**LMVL-16/6-20** Geared limit switch, pedestal mounting, 6 micro switches type „16“, gear ratio 20:1  
**LMVF-10/4+16/2-108** Geared limit switch, flange mounting, 4 micro switches „10“ plus 2 pieces „16“, gear ratio 108:1

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