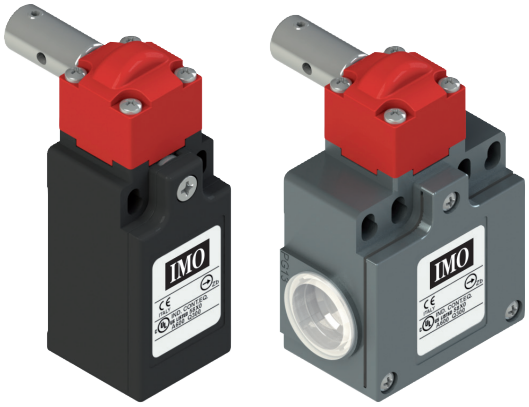
IMO

LR-LM-LX-LZ-LK Safety Switches
for hinges



- Metal or technopolymer housing, from one to two conduit entries
- Protection degree IP67 according to EN 60529
- 12 contact blocks available
- Versions with M12 connector
- Versions with gold-plated silver contacts
- Versions with stainless steel external metalic parts

Approvals

CE cULus

Housing

LR, LX and LK series housing made of glass fiber reinforced technopolymer, self-extinguishing, shock-proof and with double insulation: ⧈
LM and LZ series: metal housing, baked powder coating.

LR, LM series - one threaded conduit entry:	M20x1.5 (standard)
LK series: one threaded conduit entry:	M16x1.5 (standard)
LX series - two knock-out threaded conduit entries:	M20x1.5 (standard)
LZ series - two threaded conduit entries:	M20x1.5 (standard)
Protection degree:	IP67 acc. to EN 60529 with cable gland having equal or higher protection degree

General data

For safety applications up to:	SIL 3 acc. to EN 62061 PL e acc. to EN ISO 13849-1
Mechanical interlock, not coded:	type 1 acc. to EN ISO 14119
Safety parameters:	
B_{10d}:	5,000,00 for NC contacts
Service life:	20 years
Ambient temperature:	-25°C … +80°C
Max. actuation frequency:	3600 operating cycles[1]/hour
Mechanical endurance:	1 million operating cycles[1]
Max. actuation speed:	180°/s
Min. actuation speed:	2°/s

(1) One operation cycle means two movements, one to close and one to open contacts, as defined in EN 60947-5-1.

In conformity with standards:
IEC 60947-5-1, EN 60947-5-1, EN 60947-1, IEC 60204-1, EN 60204-1, EN ISO 14119, EN ISO 12100, IEC 60529, EN 60529, UL 508, CSA 22.2 No.14.
Approvals:
IEC 60947-5-1, UL 508, CSA 22.2 No.14 , GB14048.5-2001.

Cable cross section (flexible copper strands)

Contact blocks C20, C21, C22, C33, C34:	min.	1 x 0.34 mm²	(1 x AWG 22)
	max.	2 x 1.5 mm²	(2 x AWG 16)
Contact blocks C5, C6, C7, C9, C14, C18, C66:	min.	1 x 0.5 mm²	(1 x AWG 20)
	max.	2 x 2.5 mm²	(2 x AWG 14)

In conformity with the requirements of:
Low Voltage Directive 2006/95/EC, Machinery Directive 2006/42/EC and
EMC Directive 2004/108/EC.
Positive contact opening in conformity with standards:
IEC 60947-5-1, EN 60947-5-1.

Electrical data

Utilization category

without connector	Thermal current (Ith):	10 A	
	Rated insulation voltage (Ui):	500 Vac 600 Vdc 400 Vac 500 Vdc (contact blocks 20, 21, 22, 33, 34)	
	Rated impulse withstand voltage (U_{imp}):	6 kV 4 kV (contact blocks 20, 21, 22, 33, 34)	
	Conditional short circuit current:	1000 A acc. to EN 60947-5-1	
	Protection against short circuits:	type aM fuse 10 A 500 V	
	Pollution degree:	3	

Alternating current: AC15 (50÷60 Hz)

Ue (V)	250	400	500
Ie (A)	6	4	1

Direct current: DC13

Ue (V)	24	125	250
Ie (A)	6	1.1	0.4

with M12 connector 4 and 5 poles	Thermal current (Ith):	4 A	
	Rated insulation voltage (Ui):	250 Vac 300 Vdc	
	Protection against short circuits:	type gG fuse 4 A 500 V	
	Pollution degree:	3	

Alternating current: AC15 (50÷60 Hz)

Ue (V)	24	120	250
Ie (A)	4	4	4

Direct current: DC13

Ue (V)	24	125	250
Ie (A)	4	1.1	0.4

with M12 connector 8 poles	Thermal current (Ith):	2 A
	Rated insulation voltage (Ui):	30 Vac 36 Vdc
	Protection against short circuits:	type gG fuse 2 A 500 V
	Pollution degree:	3

Alternating current: AC15 (50÷60 Hz)

Ue (V)	24
Ie (A)	2

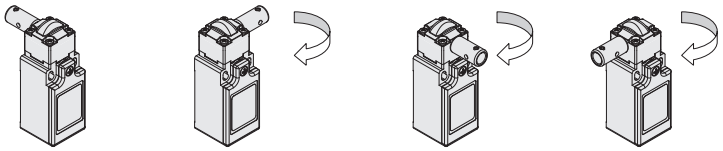
Direct current: DC13

Ue (V)	24
Ie (A)	2

Description

These safety switches are ideal to control gates or doors protecting hazardous parts of machines without inertia. Being sensitive with positively open contacts, contacts open after few degrees of rotation, sending an immediate stop signal. The head is adjustable in 90° steps allowing installation in four different positions. Available with technopolymer or metal housings, with protection degree IP67. Its special shape allows it to be used in those areas where dust and dirt is a problem and could block working of normal safety switches with separate actuator.

Orientable heads



By removing the four fastening screws, it is possible to rotate the head in 90° steps.

Protection degree IP67

IP67

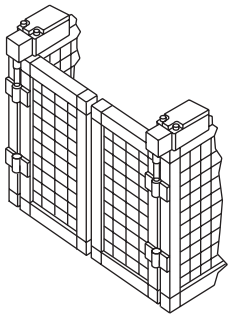
These devices are designed to be used in the toughest environmental conditions and they pass the IP67 immersion test acc. to IEC 60529.
They can therefore be used in all environments where the maximum protection of the housing is required.

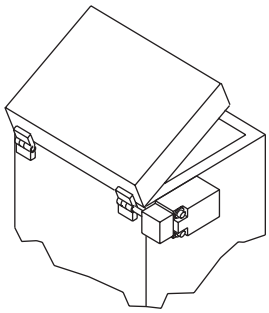
Extended temperature range

-40°C

Options are also available with an ambient operating temperature range of -40ºC to +80ºC.
For use in applications such as cold stores, sterilisers and others with low temperature environments. Special materials are used to realise these versions, and to maintain their features under these conditions, widening the installation possibilities.

Application examples





Adjustable operating point

When installing the device, you can adjust the contact operating point over the entire 360° range. By attaching the grub screw, one can check the correct activation angle adjustment, and quickly and easily adjust it if required. Once adjustment is complete, one can render the device tamper-proof against commonly used tools using the supplied lock pin.

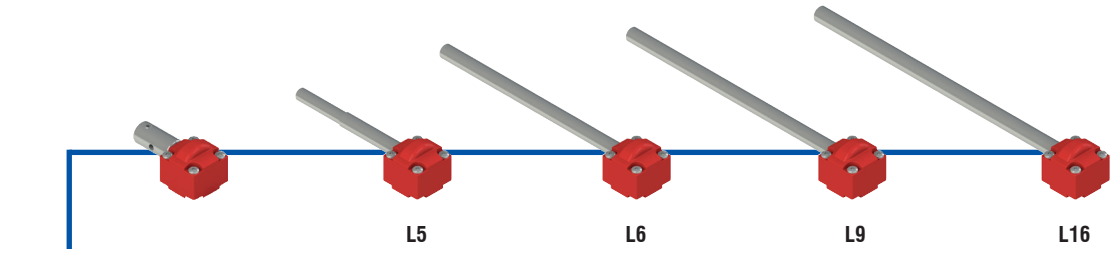
Characteristics approved by UL

Utilization categories Q300 (69 VA, 125 … 250 Vdc)
A600 (720 VA, 120 … 600 Vac)
Data of housing type 1, 4X "indoor use only", 12, 13
For all contact blocks use 60 or 75 °C copper (Cu) conductor, rigid or flexible, wire size AWG 12-14. Terminal tightening torque of 7.1 lb in (0.8 Nm).

In conformity with standard: UL 508, CSA 22.2 No.14

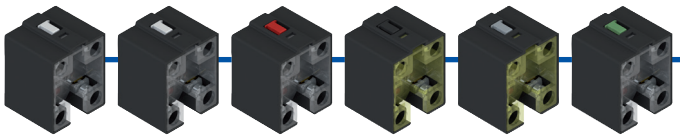
Please contact our technical service for the list of approved products.

Selection diagram



ACTUATORS

CONTACT BLOCKS



C5 1NO+1NC, snap action

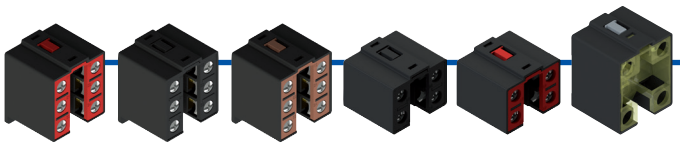
C6 1NO+1NC, slow action

C7 1NO+1NC, slow action, overlapped

C9 2NC slow action

C14 2NC slow action, shifted

C18 1NO+1NC, slow action, closer



C20 1NO+2NC, slow action

C21 3NC slow action

C22 2NO+1NC, slow action

C33 1NO+1NC, slow action

C34 2NC slow action

C66 1NC slow action

CONDUIT ENTRIES

Threaded conduit entries (standard)

With cable gland

With M12 plastic connector

With M12 metal connector

product option

accessory sold separately

Code structure

Note: The feasibility of a code number does not mean the effective availability of a product

LR	C18	CH	-	SS	G	L16	20	X70	H6

Housing

technopolymer, one conduit entry	LR
metal, one conduit entry	LM
technopolymer, two conduit entries	LX
metal, two conduit entries	LZ

Contact Blocks

1NO+1NC, snap action	C5
1NO+1NC, slow action	C6
1NO+1NC, slow action, overlapped	C7
2NC, slow action	C9
2NC, slow action	C14
1NO+1NC, slow action, closer	C18
1NO+2NC, slow action	C20
3NC, slow action	C21
2NO+1NC, slow action	C22
1NO+1NC, slow action	C33
2NC, slow action	C34
1NC, slow action	C66

External Metalic Parts

zinc-plated steel (standard)	
stainless steel	SS

Contact Type

silver contacts (standard)	
silver contacts with 1 μm gold coating	G

Actuators

	actuator with hole (standard)
L5	Ø 8x69mm tapered Ø 6.9
L6	Ø 8x120mm
L9	Ø 8x140mm
L16	Ø 8.7x165mm, stainless steel

Threaded Conduit Entry

20	M20x1.5 (standard)
16	M16x1.5 (LR-LX housing only)
	PG 13.5
11	PG11 (LR-LX housing only)

Pre-installed Cable Glands or Connectors

	without cable gland or connector (standard)
X23	cable gland for cables Ø 6…Ø 12 mm
...	.....
X70	M12 plastic connector, 4 poles
...	.....

Additional combinations possible. Contact Technical Support for information.

Ambient Temp.

	-25°C … +80°C (standard)
H6	-40°C … +80°C

LK	C33	CH	-	SS	G	L16	16	X24	H6

Housing

technopolymer, one conduit entry	LK

Contact Blocks

1NO+1NC, slow action	C33
2NC, slow action	C34

External Metalic Parts

zinc-plated steel (standard)	
stainless steel	SS

Contact Type

silver contacts (standard)	
silver contacts with 1 μm gold coating	G

Actuators

	actuator with hole (standard)
L5	Ø 8x69mm tapered Ø 6.9
L6	Ø 8x120mm
L9	Ø 8x140mm
L16	Ø 8.7x165mm, stainless steel

Threaded Conduit Entry

16	M16x1.5 (standard)
	PG 11

Pre-installed Cable Glands

	without cable gland (standard)
X24	cable gland for cables Ø 5…Ø 10 mm
X28	cable gland for cables Ø 3…Ø 7 mm

Ambient Temp.

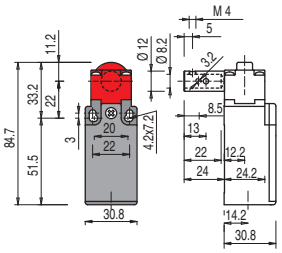
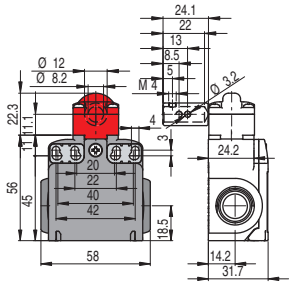
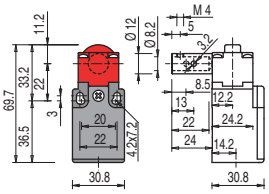
	-25°C … +80°C (standard)
H6	-40°C … +80°C

Dimensional drawings

All measures in the drawings are in mm

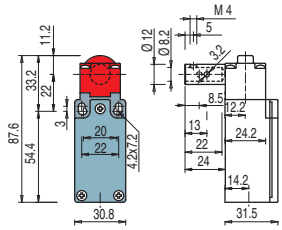
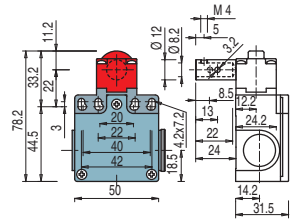
Contact type:

R = snap action
L = slow action
LO = slow action overlapped
LS = slow action shifted

Contact blocks		Technopolymer housing	Technopolymer housing	Technopolymer housing
				
C5	R	LRC5CH-20 1NO+1NC	LXC5CH-20 1NO+1NC	
C6	L	LRC6CH-20 1NO+1NC	LXC6CH-20 1NO+1NC	
C7	LO	LRC7CH-20 1NO+1NC	LXC7CH-20 1NO+1NC	
C9	L	LRC9CH-20 2NC	LXC9CH-20 2NC	
C14	LS	LRC14CH-20 2NC	LXC14CH-20 2NC	
C18	L	LRC18CH-20 1NO+1NC	LXC18CH-20 1NO+1NC	
C20	L	LRC20CH-20 1NO+2NC	LXC20CH-20 1NO+2NC	
C21	L	LRC21CH-20 3NC	LXC21CH-20 3NC	
C22	L	LRC22CH-20 2NO+1NC	LXC22CH-20 2NO+1NC	
C33	L	LRC33CH-20 1NO+1NC	LXC33CH-20 1NO+1NC	LKC33CH-16 1NO+1NC
C34	L	LRC34CH-20 2NC	LXC34CH-20 2NC	LKC34CH-16 2NC
C66	L	LRC66CH-20 1NC	LXC66CH-20 1NC	
Min. force		0.15 Nm (0.4 Nm)	0.15 Nm (0.4 Nm)	0.15 Nm (0.4 Nm)
Travel diagrams		group 9	group 9	group 9

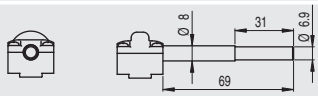
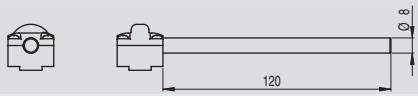
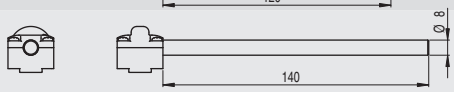
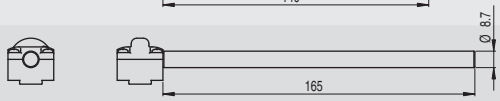
Contact type:

R = snap action
L = slow action
LO = slow action overlapped
LS = slow action shifted

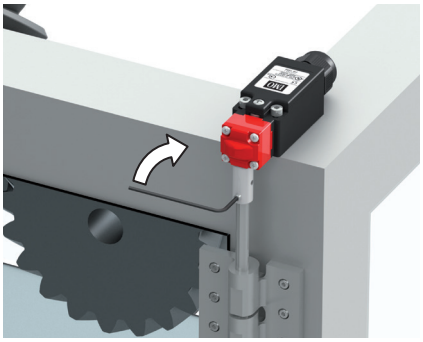
Contact blocks		Metal housing	Metal housing
			
C5	R	LMC5CH-20 1NO+1NC	LZC5CH-20 1NO+1NC
C6	L	LMC6CH-20 1NO+1NC	LZC6CH-20 1NO+1NC
C7	LO	LMC7CH-20 1NO+1NC	LZC7CH-20 1NO+1NC
C9	L	LMC9CH-20 2NC	LZC9CH-20 2NC
C14	LS	LMC14CH-20 2NC	LZC14CH-20 2NC
C18	L	LMC18CH-20 1NO+1NC	LZC18CH-20 1NO+1NC
C20	L	LMC20CH-20 1NO+2NC	LZC20CH-20 1NO+2NC
C21	L	LMC21CH-20 3NC	LZC21CH-20 3NC
C22	L	LMC22CH-20 2NO+1NC	LZC22CH-20 2NO+1NC
C33	L	LMC33CH-20 1NO+1NC	LZC33CH-20 1NO+1NC
C34	L	LMC34CH-20 2NC	LZC34CH-20 2NC
C66	L	LMC66CH-20 1NC	LZC66CH-20 1NC
Min. force		0.15 Nm (0.4 Nm)	0.15 Nm (0.4 Nm)
Travel diagrams		group 9	group 9

Dimensional drawings for actuators

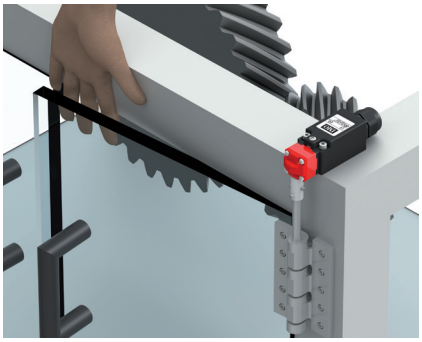
All measures in the drawings are in mm

Option	Drawing
L5	
L6	
L9	
L19	

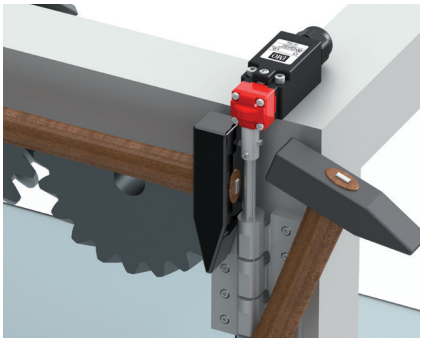
Adjustment of the operating point



Temporary shaft locking
(dowel provided).



Verify the operating point according to
EN ISO 13857, adjust the
operating point again if necessary.



Switch locking (pin provided).