PETERCEM

Application

Microswitch for aerospace or industrial use where an hermetically sealed Microswitch is not required.

- Operating temperature: -55 °C ... +85 °C for **H5459** and **H5463** types
  -55 °C ... +150 °C for **H5461** and **H5467** types
- 2 available contact configurations: up to 200 mA for low level applications or 4 A.
- Mechanical service life: 1 000 000 cycles.

Description

Snap action switch - unsealed.

- Plastic casing.
- Gold plated silver contacts or gold contacts.
- Mounting holes for M2 screws.
- Dimensions compliant with DIN 41635 standard – size "B".
- Pin actuator or auxiliary actuator.
- Terminals : 4 options available
  – solder terminals..... code : **"S"**
  – "Radio" terminals..... code : **"R"**
  – fork terminals..... code : **"F"**
  – PCB terminals ..... code : **"J"**

Approvals and Compliance to Standards

French Air Ministry Approval based on standard : **AIR 8459** according to below.

AIR reference: 300-1A ..... for microswitches H5463S, 350-1 ..... for microswitches H5467F,
300-2 ..... for microswitches H5469F, 350-2..... for microswitches H5461F.

AIR equipment sheets No 6.552.200, 6.552.201, 6.552.202, 6.552.203, 6.552.210.

Environmental characteristics

(For other test results, please contact us **)**

Salt spray resistance	48 heures
Humidity	93 % relative humidity, +40 °C duration 168 hours (7 days)
Sinusoidal vibrations	5 _ 500 Hz, 10 g in each of 3 orthogonal axis

Mechanical characteristics

Characteristics according to the actuating point (arrow) indicated on dimension drawings.

Microswitches		**Without accessory**	**With flexible levers** (accessories)		
Type		**H5459.../ H5461...** **H5463.../ H5467...**	**H54... + L11H** **H54... + L11GH**	**H54... + L13H** **H54... + L13GH**	**H54... + L14H** **H54... + L14GH**
Max. operating force	**N**	2.50	3.50	6.40	1.80
Min. release force	**N**	–	1.00	2.50	0.60
Pretravel	**mm**	0.15 ... 0.55	–	–	–
Differential movement	**mm**	0.04 ... 0.10	–	–	–
Min. overtravel (1)	**mm**	0.15	–	–	–

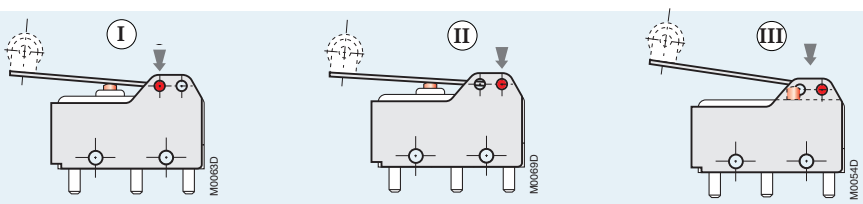
(1) Do not exceed this value in use.

Microswitches		**Articulated lever auxiliary actuator**		
Types		**H54... + L20H lever** **H54... + L20GH lever**		
Actuating lever pivot point		**I**	**II**	**III**
Max. operating force	**N**	0.70	1.70	0.40
Min. release force	**N**	–	–	–
Pretravel	**mm**	0.40 ... 2.0	0.30 ... 1.3	0.80 ... 4.0
Differential movement	**mm**	0.10 ... 0.40	0.10 ...0.30	0.30 ... 0.80
Min. overtravel (1)	**mm**	0.60	0.40	1.20

(1) Do not exceed this value in use.

Lever mounting position

According to required performance, 3 mounting positions of the actuator lever are offered.



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Electrical characteristics

Ratings (electrical load on one throw only)			5 mV ... 30 V d.c.	30 V d.c.	220 V a.c. - 50 Hz
Version 0.2A	– resistive load	**A**	0.2	–	0.2
	– inductive load	**A**	0.1 A (L/R ≤ 5 ms)	–	0.1 (Cos φ ≥ 0.5)
Version 4 A	– resistive load	**A**	–	4	4
	– inductive load	**A**	–	2 (L/R ≤ 5 ms)	2 (Cos φ ≥ 0.5)
Electrical service life		**cycles**	100 000	100 000	100 000
Changeover time		**ms**	≤ 10	≤ 10	≤ 10
Contact resistance		**mΩ**	≤ 50 mΩ under 6 V d.c. – 100 mA according to MIL-PRF-8805 (As new, wires or cable not included)		
Dielectric strength (50 Hz - 1 mn)					
– between terminals		**V a.c.**	500		
– between all terminals and earth (ground)		**V a.c.**	1500		
Insulation resistance		**MΩ**	≥ 100 MΩ under 500 V d.c. (at 23 °C with < 80 % relative humidity)		

Ordering details

Rated breaking capacity (220 V - 50 Hz) A	Terminals	P/N	Weight (1 piece) kg
Microswitch with pin actuator - Operating temperature +85 °C			
0.2 Low currents	Solder terminals	**H5459S**	0.003
	Fork terminals	**H5459F**	0.003
	"Radio" terminals	**H5459R**	0.003
	PCB terminals	**H5459J**	0.003
4 Higher currents	Solder terminals	**H5463S**	0.003
	Fork terminals	**H5463F**	0.003
	"Radio" terminals	**H5463R**	0.003
	PCB terminals	**H5463J**	0.003
Microswitch with pin actuator - Operating temperature +150 °C			
0.2 Low currents	Solder terminals	**H5461S**	0.003
	Fork terminals	**H5461F**	0.003
	"Radio" terminals	**H5461R**	0.003
4 Higher currents	Solder terminals	**H5467S**	0.003
	Fork terminals	**H5467F**	0.003
	"Radio" terminals	**H5467R**	0.003

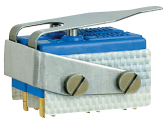

H5459J + L20GH

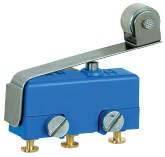

H5463R


H5467S

Ordering details - Accessories

	Lever length mm	P/N	Weight (1 piece) kg
Flexible lever			
Simple lever	24	**L11H**	0.001
Tandem lever	25.5	**L13H**	0.002
Simple lever	34	**L14H**	0.001
Flexible roller levers			
Simple lever	23	**L11GH**	0.002
Tandem lever	24.5	**L13GH**	0.003
Simple lever	33	**L14GH**	0.002
Articulated lever auxiliary actuatore			
Simple lever		**L20H**	0.002
Roller lever actuator		**L20GH**	0.003


2 Microswitches H5467F type
+ lever L13H type
+ insulating plates IBCH type


H5467R + L14GH

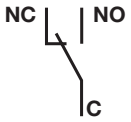

H5461R + L20H

Insulating plates - The use of an insulating plate is recommended if the microswitch is to be fitted against a metallic face.

19 x 10 x 0.4	**IACH**	NS
19 x 10 x 0.5	**IBCH**	NS
20 x 18 x 0.4	**IALH**	NS

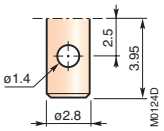
Note : Accessories in packs of 10.

Circuit diagram

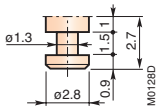


Connection

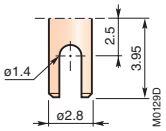
- Solder terminals **"S"**



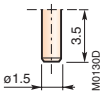
- "Radio" terminal **"R"**



- Fork terminals **"F"**



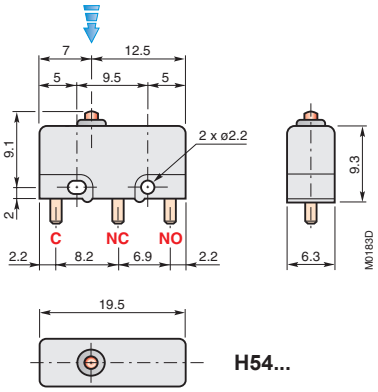
- PCB terminals **"J"**



Dimensions

PCB terminal devices are shown on below drawings. M2 screws recommended tightening torque: 0.25 to 0.30 Nm

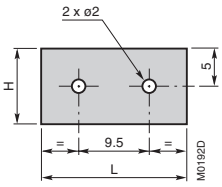
Microswitches without accessory



H54...

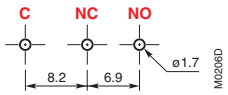
Insulating plates

The use of an insulating plate is recommended if the Microswitch is to be fitted against a metallic face;

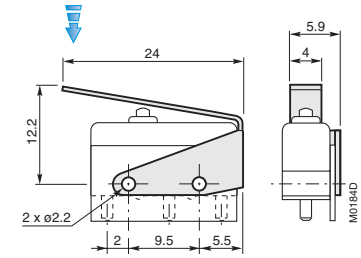


Types	L	H	Th.
	mm	mm	mm
IACH	19	10	0.4
IBCH	19	10	0.5
IALH	20	18	0.4

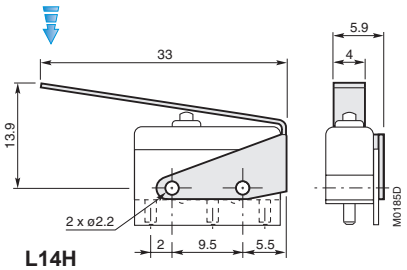
Printed Circuit Board drilling plan for "J" terminals



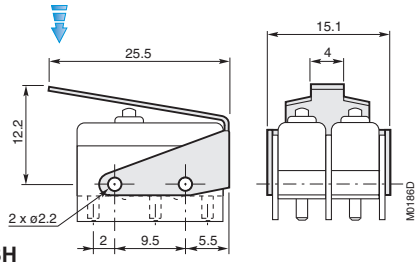
Flexible levers



L11H

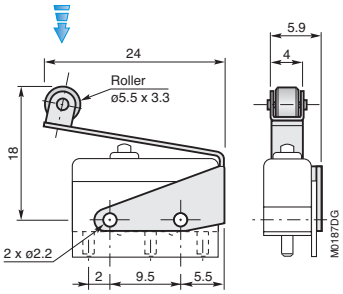


L14H

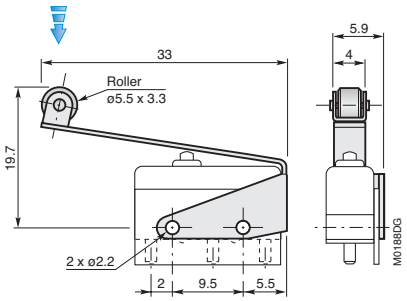


L13H

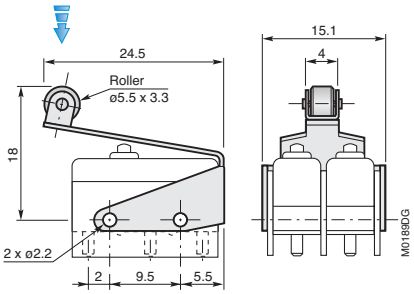
Flexible roller lever



L11GH

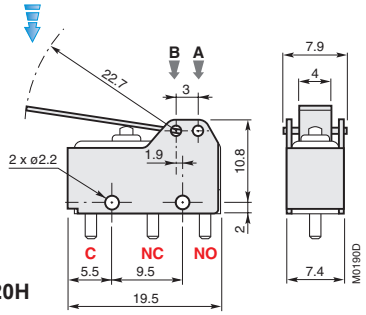


L14GH



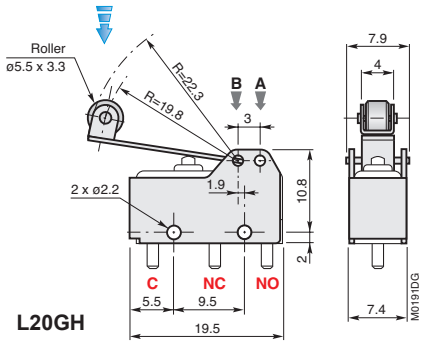
L13GH

Articulated lever auxiliary actuator



L20H

Articulated roller lever auxiliary actuator



L20GH

Application

Microswitch for industrial applications.

- Operating temperature: -40 °C ... +85 °C
- Rated breaking capacity: From few mA up to 5 A.
- 2 available mechanisms allowing 2 operating forces:
  – standard operating force: 1.5 N,
  – low operating force: 0.6 N.
- Mechanical service life : 10 000 000 cycles.

Description

Snap action switch - unsealed.

- Polyamide 6 casing.
- Gold plated silver contacts.
- Mounting holes for M2 screws.
- **HP** type Microswitches dimensions compliant with DIN 41635 standard – size "B".
- Pin actuator or auxiliary actuator (accessory) for **HP** types ; integral actuator (factory assembled) for **HL** types.
- Terminals: 3 options available
  – solder terminals..... code : **"S"**
  – quick connect terminals, 2.8 mm..... code : **"E"**
  – PCB terminals ..... code : **"J"**

Environmental characteristics

(For other test results, please contact us)

Salt spray resistance	24 hours
Humidity	93 % relative humidity, +40 °C duration 240 hours (10 days)
Sinusoidal vibrations	5 _ 500 Hz, 10 g in each of 3 orthogonal axis

Mechanical characteristics of HP microswitches

Characteristics according to the actuating point (arrow) indicated on dimension drawings.

HP type Microswitch with pin actuator - Without accessory

		HP...12	HP...32
Max. operating force	**N**	1.50	0.60
Min. release force	**N**	0.35	0.12
Operating point (1)	**mm**	8.4 ± 0.3	8.4 ± 0.3
Max. differential movement	**mm**	0.15	0.15
Min. overtravel (2)	**mm**	0.15	0.15

HP type Microswitch with flexible lever auxiliary actuator

Standard mechanism		**HPS12 HPE12 HPJ12 + lever L110**		**HPS12 HPE12 HPJ12 + lever L140**		**HPS12 HLE12 HPJ12 + lever L13H**	
Actuating lever pivot point		**I**	**II**	**I**	**II**	**I**	**II**
Max. operating force	**N**	2.45	2.10	1.75	1.50	3.50	2.50
Min. release force	**N**	0.45	0.40	0.30	0.25	1.20	1.0
Max. pretravel	**mm**	6.50	6.50	13.0	13.0	5.50	5.50
Max. differential movement	**mm**	0.60	1.20	1.20	2.40	0.60	1.20
Min. overtravel (2)	**mm**	0.40	0.50	0.60	0.70	0.40	0.50

HP type Microswitch with flexible roller lever auxiliary actuator or with flexible simulated roller lever auxiliary actuator

Standard mechanism		**HPS12 HPE12 HPJ12 + lever LG110 or + lever LC110**		**HPS12 HPE12 HPJ12 + lever LG140 or + lever LC140**		**HPS12 HPE12 HPJ12 + lever L13GH**	
Actuating lever pivot point		**I**	**II**	**I**	**II**	**I**	**II**
Max. operating force	**N**	2.90	2.50	1.95	1.70	4.00	3.00
Min. release force	**N**	0.55	0.45	0.40	0.30	1.30	1.10
Max. pretravel	**mm**	5.50	5.50	11.0	11.0	5.50	5.50
Max. differential movement	**mm**	0.50	1.00	1.00	1.00	0.50	1.00
Min. overtravel (2)	**mm**	0.30	0.40	0.50	0.60	0.30	0.40

Mechanical characteristics of HP microswitches (continued)

HP type Microswitch with flexible lever auxiliary actuator

Low operating force mechanism		HPS32 HPE32 HPJ32 + lever L110		HPS32 HPE32 HPJ32 + lever L140		HPS32 HPE32 HPJ32 + lever L13H	
Actuating lever pivot point		**I**	**II**	**I**	**II**	**I**	**II**
Max. operating force	**N**	1.95	1.80	1.40	1.30	2.80	2.30
Min. release force	**N**	0.35	0.30	0.20	0.20	1.10	0.90
Max. pretravel	**mm**	6.50	6.50	13.0	3.0	5.50	5.50
Max. differential movement	**mm**	0.50	1.00	0.90	1.80	0.50	1.20
Min. overtravel (2)	**mm**	0.40	0.50	0.60	0.70	0.40	0.40

HP type Microswitch with flexible roller lever auxiliary actuator or with flexible simulated roller lever auxiliary actuator

Low operating force mechanism		HPS32 HPE32 HPJ32 + lever LG110 or + lever LC110		HPS32 HPE32 HPJ32 + lever LG140 or + lever LC140		HPS32 HPE32 HPJ32 + lever L13GH	
Actuating lever pivot point		**I**	**II**	**I**	**II**	**I**	**II**
Max. operating force	**N**	2.30	2.15	1.55	1.45	3.30	2.70
Min. release force	**N**	0.40	0.35	0.30	0.25	1.20	1.00
Max. pretravel	**mm**	5.50	5.50	11.0	11.0	5.50	5.50
Max. differential movement	**mm**	0.40	0.80	0.70	1.00	0.40	1.00
Min. overtravel (2)	**mm**	0.30	0.40	0.50	0.60	0.30	0.40

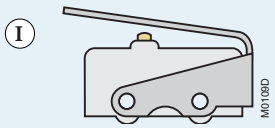
(1) Dimension regarding mounting holes axis.

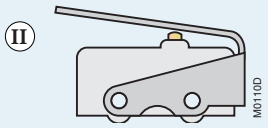
(2) Do not exceed this value in use.

The force at full overtravel should not be greater than twice the maximum operating force.

Lever mounting position

According to required performance, 2 mounting positions of the actuator lever are offered.





Mechanical characteristics of HL microswitches

Characteristics according to the actuating point (arrow) indicated on dimension drawings.

Microswitch with straight lever actuator

Standard mechanism		HL...12-L22		HL...12-L24		HL...12-L27	
Actuating lever pivot point		**C**	**B**	**C**	**B**	**C**	**B**
Max. operating force	**N**	0.23	0.37	0.21	0.34	0.19	0.31
Min. release force	**N**	0.03	0.06	0.03	0.06	0.02	0.05
Operating point (1)	**mm**	11.9 $^{\pm 4.0}$	10.6 $^{\pm 2.2}$	12.2 $^{\pm 4.4}$	10.7 $^{\pm 2.4}$	12.6 $^{\pm 5.0}$	10.9 $^{\pm 2.7}$
Max. differential movement	**mm**	1.60	0.85	1.75	0.90	1.95	1.00
Min. overtravel (2)	**mm**	0.90	0.55	1.0	0.60	1.15	0.70

Microswitch with roller lever actuator

Standard mechanism		HL...12-LG22		HL...12-LG24		HL...12-LG27	
Actuating lever pivot point		**C**	**B**	**C**	**B**	**C**	**B**
Max. operating force	**N**	0.26	0.44	0.25	0.40	0.22	0.35
Min. release force	**N**	0.03	0.07	0.03	0.06	0.02	0.05
Operating point (1)	**mm**	17.7 $^{\pm 3.5}$	16.6 $^{\pm 2.1}$	18.0 $^{\pm 3.9}$	16.7 $^{\pm 2.3}$	18.4 $^{\pm 4.4}$	16.9 $^{\pm 2.6}$
Max. differential movement	**mm**	1.40	0.75	1.55	0.80	1.75	0.90
Min. overtravel (2)	**mm**	0.80	0.45	0.85	0.50	1.00	0.60

Microswitch with simulated roller lever actuator

Standard mechanism		HL...12-LC22		HL...12-LC24		HL...12-LC27	
Actuating lever pivot point		**C**	**B**	**C**	**B**	**C**	**B**
Max. operating force	**N**	0.31	0.49	0.28	0.44	0.24	0.38
Min. release force	**N**	0.04	0.08	0.03	0.07	0.03	0.06
Operating point (1)	**mm**	14.3 $^{\pm 3.3}$	13.3 $^{\pm 1.9}$	14.6 $^{\pm 3.7}$	13.4 $^{\pm 2.1}$	15.0 $^{\pm 4.2}$	13.6 $^{\pm 2.4}$
Max. differential movement	**mm**	1.25	0.65	1.40	0.75	1.60	0.85
Min. overtravel (2)	**mm**	0.70	0.40	0.80	0.45	0.90	0.55

Mechanical characteristics of HL microswitches (continued)

Microswitch with straight lever actuator

Low operating force mechanism		HL...32-L22		HL...32-L24		HL...32-L27	
Actuating lever pivot point		C	B	C	B	C	B
Max. operating force	N	0.10	0.15	0.09	0.14	0.08	0.13
Min. release force	N	0.01	0.02	0.01	0.02	0.01	0.01
Operating point (1)	mm	11.9 ± 4.0	10.6 ± 2.2	12.2 ± 4.4	10.7 ± 2.4	12.6 ± 5.0	10.9 ± 2.7
Max. differential movement	mm	1.60	0.85	1.75	0.90	1.95	1.00
Min. overtravel (2)	mm	0.90	0.55	1.00	0.60	1.15	0.70

Microswitch with roller lever actuator

Low operating force mechanism		HL...32-LG22		HL...32-LG24		HL...32-LG27	
Actuating lever pivot point		C	B	C	B	C	B
Max. operating force	N	0.11	0.18	0.10	0.16	0.09	0.14
Min. release force	N	0.01	0.02	0.01	0.02	0.01	0.02
Operating point (1)	mm	17.7 ± 3.5	16.6 ± 2.1	18.0 ± 3.9	16.7 ± 2.3	18.4 ± 4.4	16.9 ± 2.6
Max. differential movement	mm	1.40	0.75	1.55	0.80	1.75	0.90
Min. overtravel (2)	mm	0.80	0.45	0.85	0.50	1.00	0.60

Microswitch with simulated roller lever actuator

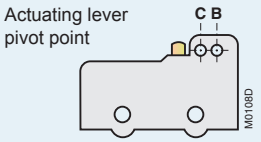
Low operating force mechanism		HL...32-LC22		HL...32-LC24		HL...32-LC27	
Actuating lever pivot point		C	B	C	B	C	B
Max. operating force	N	0.12	0.20	0.11	0.18	0.10	0.15
Min. release force	N	0.01	0.02	0.01	0.02	0.01	0.02
Operating point (1)	mm	14.3 ± 3.3	13.3 ± 1.9	14.6 ± 3.7	13.4 ± 2.1	15.0 ± 4.2	13.6 ± 2.4
Max. differential movement	mm	1.25	0.65	1.40	0.75	1.60	0.85
Min. overtravel (2)	mm	0.70	0.40	0.80	0.45	0.90	0.55

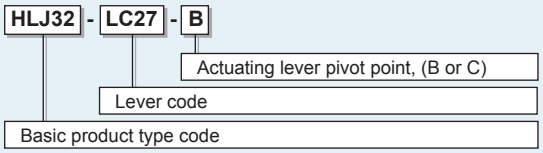
(1) Dimension regarding mounting holes axis. (2) Do not exceed this value in use.

The force at full overtravel should not be greater than twice the maximum operating force.

Attention :

Due to factory mounting, **HL** type product codes must be followed by an actuating lever type and it's pivot point.



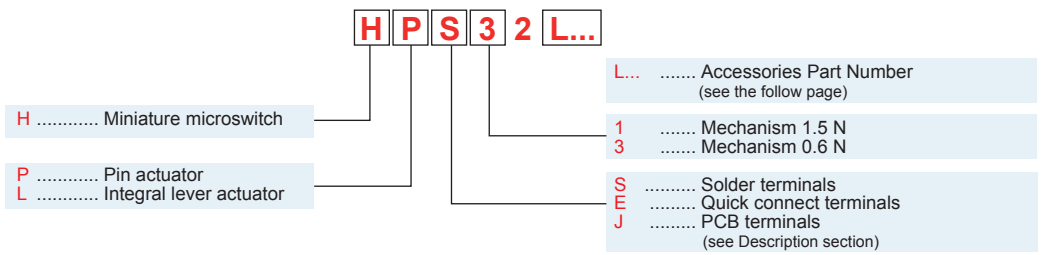


Electrical characteristics

Ratings (electrical load on one throw only)			30 V d.c. (see Note)	125 V a.c. - 50 Hz	220 V a.c. - 50 Hz
Mechanism	– resistive load	A	50 mA ... 2 A	5 A	2 A
1.5 N	– inductive load	A	25 mA ... 1 A (L/R ≤ 5 ms)	2.5 A (cos φ ≥ 0.5)	1 A (cos φ ≥ 0.5)
Mechanism	– resistive load	A	50 mA ... 1.5 A	3 A	1.5 A
0.6 N	– inductive load	A	25 mA ... 0.75 A (L/R ≤ 5 ms)	1.5 A (cos φ ≥ 0.5)	1 A (cos φ ≥ 0.5)
Electrical service life		cycles	100 000		
Dielectric strength (50 Hz - 1 mn)					
– between terminals		V a.c.	500		
– between all terminals and earth (ground)		V a.c.	1500		
Insulation resistance		MΩ	≥ 100 MΩ under 500 V d.c. (at 23 °C with < 80 % relative humidity		

Note: Ratings = 50 mA resistive load and 25 mA inductive load (30V d.c.) for PCB terminal Microswitches ("J" termination)

Coding (example)



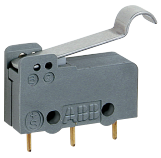
Ordering details

Operating force N	Terminals	P/N	Weight (1 piece) Kg
Microswitch with pin actuator			
1.5 Standard	Solder terminals	**HPS12**	0.002
	Quick connect terminals	**HPE12**	0.002
	PCB terminals	**HPJ12**	0.002
0.6 low force	Solder terminals	**HPS32**	0.002
	Quick connect terminals	**HPE32**	0.002
	PCB terminals.	**HPJ32**	0.002
Microswitch with integral lever actuator			
1.5 Standard	Solder terminals	**HLS12-L...**	0.002
	Quick connect terminals	**HLE12-L...**	0.002
	PCB terminals.	**HLJ12-L...**	0.002
0.6 low force	Solder terminals	**HLS32-L...**	0.002
	Quick connect terminals	**HLE32-L...**	0.002
	PCB terminals	**HLJ32-L...**	0.002

HPE12

HPS Microswitch + LC110 lever + insulating plate IBCH

HLS12-L27-C



HLJ32-LC24-B

Ordering details - Accessories

	Lever length L = 22.5 mm	L = 24.5 mm	L = 27.5 mm	P/N	Weight (1 piece) kg
Simple lever	**L22**	**L24**	**L27**	Due to numerous possibilities, available products code are not listed in this table	0.001
Roller lever actuator	**LG22**	**LG24**	**LG27**		0.002
Simulated roller lever	**LC22**	**LC24**	**LC27**		0.001

Accessories for HP type Microswitch

	Lever length mm	P/N	Weight (1 piece) kg
Flexible levers			
Simple lever	25	**L110**	0.001
Tandem lever	24	**L13H**	0.002
Simple lever	35	**L140**	0.001
Flexible roller levers			
Simple lever	24	**LG110**	0.002
Tandem lever	23	**L13GH**	0.003
Simple lever	34	**LG140**	0.002
Flexible simulated roller lever auxiliary actuator"			
Simple lever	23	**LC110**	0.001
Simple lever	33	**LC140**	0.001

L110, L140

L13H

LG110, LG140

L13GH

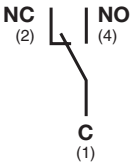
LC110, LC140

Insulating plates - The use of an insulating plate is recommended if the microswitch is to be fitted against a metallic face.

19 x 10 x 0.4	**IACH**	NS
19 x 10 x 0.5	**IBCH**	NS
20 x 18 x 0.4	**IALH**	NS

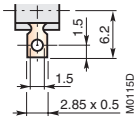
Note : Accessories in packs of 10. Screws are not included with the accessories.

Circuit diagram

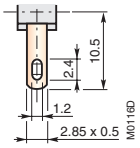


Connection

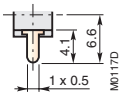
- **Solder terminals "S"**



- **Quick connect 2.8 mm "E"**



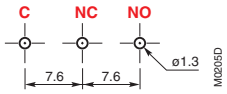
- **PCB terminal "J"**



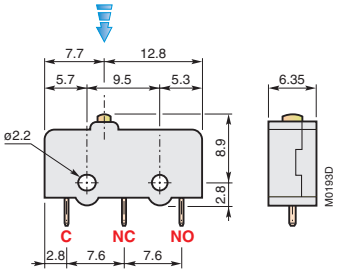
Dimensions

"J" PCB terminal devices are shown on below drawings.
M2 screws recommended tightening torque: 0.25 to 0.30 Nm

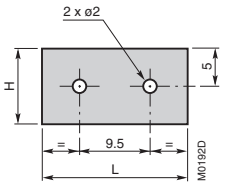
Printed Circuit Board drilling plan for HPJ... et HLJ... terminals



HP type Microswitch

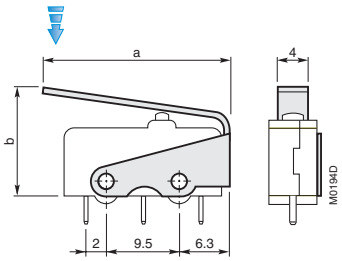


Insulating plates



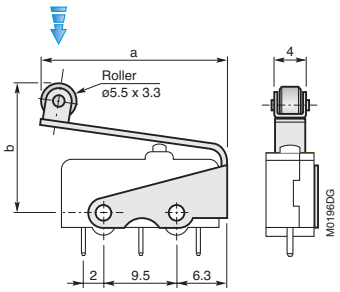
Types	L	H	th.
	mm	mm	mm
IACH	19	10	0.4
IBCH	19	10	0.5
IACL	20	18	0.4

Flexible levers



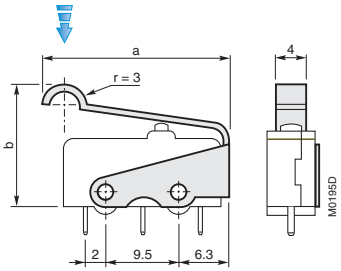
Types	Dimension: mm	
	a	b
L110	25	13.5
L140	35	16.2

Flexible roller levers

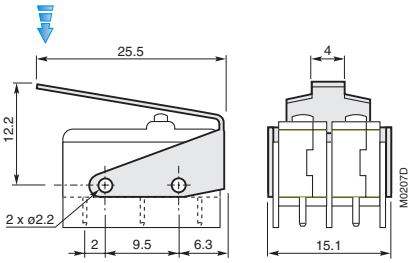


Types	Dimension: mm	
	a	b
LG110	24	19
LG140	34	21.7

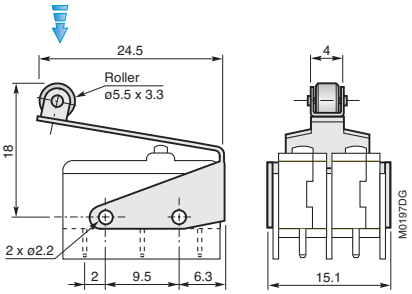
Flexible simulated roller levers



Types	Dimension: mm	
	a	b
LC110	23	14.5
LC140	33	17.2



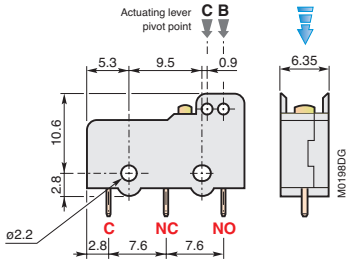
L13H

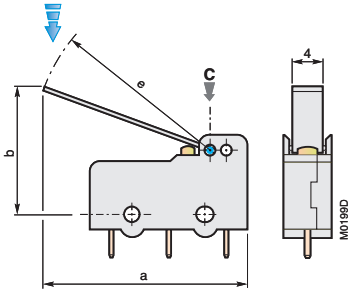


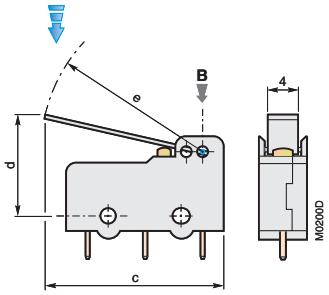
L13GH

Dimensions

HL type Microswitch (Lever not shown)



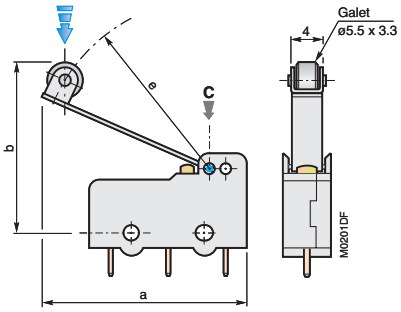


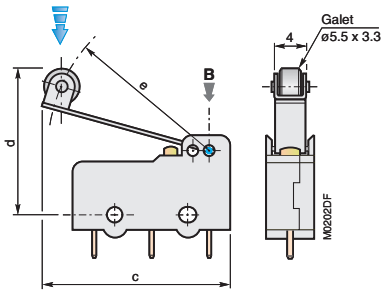


HL...-L...

Simple lever

Types	Dimension: mm				
	a	b	c	d	e
L22	27.2	17.2	25.2	13.5	22.4
L24	29.2	17.9	27.2	13.9	24.4
L27	32.2	19	30.2	14.5	27.4
position	C		B		

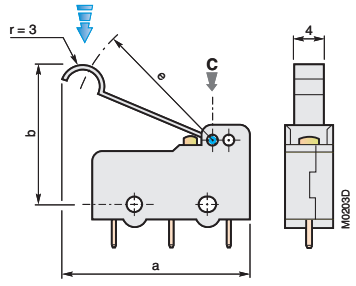


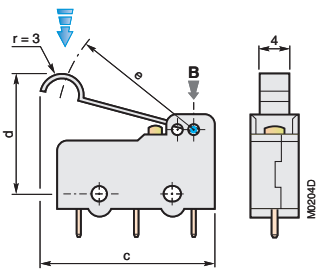


HL...-LG...

Roller lever actuator

Types	Dimension: mm				
	a	b	c	d	e
LG22	26.75	22.5	24.75	19.1	19.2
LG24	28.75	23.2	26.75	19.5	21.2
LG27	31.72	24.3	29.75	20.1	24.2
position	C		B		





HL...-LC...

Simulated roller lever

Types	Dimension: mm				
	a	b	c	d	e
LC22	25	18.6	23	15.7	17.2
LC24	27	19.3	25	16.1	19.2
LC27	30	20.4	28	16.7	22.2
position	C		B		