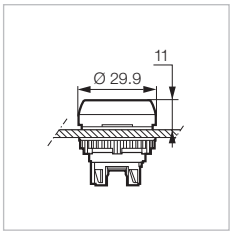
Operator Heads: ø 22mm

► MAINTAINED - NON-ILLUMINATED

Technical Info (p. 103)

FLUSH

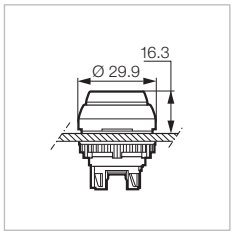
L21CA01



	Chrome Bezel Part Number	Black Bezel Part Number
● Red	**L21CA01**	**L22CA01**
● Green	**L21CA02**	**L22CA02**
● Black	**L21CA03**	**L22CA03**
● Yellow	**L21CA04**	**L22CA04**
○ White	**L21CA05**	**L22CA05**
● Blue	**L21CA06**	**L22CA06**

PROJECTING

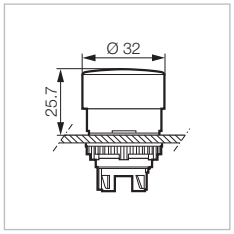
L21CB02



● Red	**L21CB01**	**L22CB01**
● Green	**L21CB02**	**L22CB02**
● Black	**L21CB03**	**L22CB03**
● Yellow	**L21CB04**	**L22CB04**
○ White	**L21CB05**	**L22CB05**
● Blue	**L21CB06**	**L22CB06**

Ø 32 MUSHROOM — Push-turn to reset

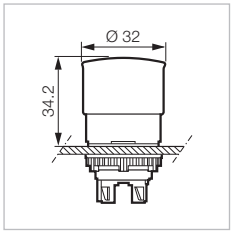
L22EC01



● Red	**L22EC01**
● Green	**L22EC02**
● Black	**L22EC03**
● Yellow	**L22EC04**

Ø 32 MUSHROOM — Push-pull to reset

L22DC01



● Red	**L22DC01**

Technical Specifications

GENERAL

Characteristics	Data	Standards
Storage temperature	- 40 °C to + 70 °C	
Operating temperature	- 25 °C to + 70 °C	
Climatic resistance	Constant humid heat Cyclic damp heat Resistance to sea air	IEC 60068-2-3 IEC 60068-2-30 IEC 60068-2-52
Degree of protection	IP 66 for standard heads IP 67 for shrouded heads IP 66 for equipped control stations IP 20 at the rear of the panel for contact blocks and one piece pilot lights Type 1, 2, 3, 3R, 3S, 4, 4X, 12, and 13 for heads and control stations	IEC 60529 NEMA standard
Protection against mechanical impacts	IK 05 illuminated and non-illuminated heads IK 07 empty control station	IEC 62262
Electrical insulation	Class II - heads and control station	IEC 60947-5-1
Terminal marking		IEC 60947-1
Tightening torques	Locking ring: recommended 3 N.m terminals: max. 1.2 N.m	
Approvals	UL United states and Canada BV Bureau Véritas Certification OC/CB	UL 508, CSA 22.2 Marine rules IEC 60947-5-1 IEC 60947-5-5 IEC 60947-5-4
Vibrations	withstand vibration Fc test: 2 to 25 Hz, 1.6 mm; 25-100 Hz, 4 g	IEC 60068-2-6

Technical Specifications

HEADS

Characteristics	Data	Standards
Mechanical endurance	Spring return: 5,000,000 Push-push: 500,000 Selector switches: 300,000 Mushroom head maintained function EN 418: 10,000 Mushroom head maintained function: 150,000	
Activation force in N	Spring return + NO: 6.5 Spring return + NC: 4.5 Additional NO contact: 4.5 Additional NC contact: 3.0 Push-pull mushroom head + NO + NC: 27 Push-turn mushroom head + NO + NC: 22 Push-pull mushroom head EN 418 + NO + NC: 37 Push-turn mushroom head EN 418 + NO + NC: 60	
Activation force in Nm	Selector switch + NO: 0.04 Additional NO contact: 0.03	

EMERGENCY STOP ACTUATORS - EN 418/ISO 13850:

According to IEC/EN60947-5-5, the emergency stop function can be provided by an EN418/ISO13850 mushroom head combined with a "positive opening" NC contact block.

The mechanism of our EN418/ISO13850 mushroom heads is so designed that a "push" action of sufficient force to open the contact systematically triggers an irreversible locking of this opening. This generates an "emergency stop" signal which can be cancelled only by deliberate manual resetting of the mushroom head (pull and turn or unlocking by key).

This function allows to generate an "emergency stop" signal for any equipment subject to directive 98/37CE (machinery safety) completed by the IEC 60204-1 standard.

The EN418/ISO13850 mushroom heads also comply with the safety requirements detailed in standards EN418 and ISO13850.

Technical Specifications

CONTACT BLOCKS

Screw and plug-in connection characteristics	Data	Standards
Rated insulation voltage	690 V AC 600 V AC	IEC/EN 60947-1 UL 508
NC contacts	Positive opening	IEC/EN 60947-5-1
Rated impulse voltage Uimp Pollution degree	6kV 3	
Conventional thermal current in free air conditions	AC15: 10 A DC13: 2.5 A	IEC 60947-5-1
Electrical ratings	**Alternating current** AC15 - A 600 Ue = 120 V, Ie = 6 A Ue = 240 V, Ie = 3 A Ue = 380 V, Ie = 1.9 A Ue = 480 V, Ie = 1.5 A Ue = 500 V, Ie = 1.4 A Ue = 600 V, Ie = 1.2 A **Minimum operating current** - standard blocks Ue = 24 V DC and Ie = 5 mA Failure rate < 10^{-8} **UL508** Alternating Current 50/60Hz - **A600** Continuous Current - 10 amps Rated Voltage - 600Vac Voltage / Max. Amps Make / Max. Amps Break 72 / 60 / 10 120 / 60 / 6.0 240 / 30 / 3.0 480 / 15 / 1.5 600 / 12 / 1.2 **Direct current** DC13 - Q 600 Ue = 125 V, Ie = 0.55 A Ue = 250 V, Ie = 0.27 A Ue = 400 V, Ie = 0.15 A Ue = 500 V, Ie = 0.13 A Ue = 600 V, Ie = 0.1 A - gold plated contacts Ue = 5 V DC and Ie = 1 mA Failure rate < 10^{-8} Direct Current - **Q600** Continuous Current - 2.5 amps Rated Voltage - 600Vdc Voltage / Max. Amps Make / Max. Amps Break 24 / 2.5 / 2.5 125 / 0.55 / 0.55 250 / 0.27 / 0.27 301-600 / 0.10 / 0.10	IEC 60947-5-1
Electrical operating life	**1 million cycles for:** - AC15 - B 300 Ue = 120 V, Ie = 3 A Ue = 240 V, Ie = 1.5 A - DC13 - R 300 Ue = 125 V, Ie = 0.22 A Ue = 250 V, Ie = 0.1 A	
Applicable wire sizes	Rigid or flexible wire without ferrule: 0.5 mm^2 to 2 x 2.5 mm^2 Rigid or flexible wire with ferrule: 0.5 mm^2 to 2 x 1.5 mm^2	

Technical Specifications

CONTACT BLOCKS

Faston connection	Data	Standards
Rated insulation voltage	320 V AC 300 V AC	IEC/EN60947-1 UL 508
NC contacts	Positive opening	IEC/EN 60947-5-1
Rated impulse withstanding voltage Uimp Pollution degree	6 kV 3	
Conventional thermal current in free air conditions	AC 15: 10 A DC 13: 2.5 A	IEC 60947-5-1
Electrical ratings	**Alternating current** AC15 - A 300 Ue = 120 V, Ie = 6 A Ue = 240 V, Ie = 3 A **Direct current** DC13 - Q 300 Ue = 125 V, Ie = 0.55 A Ue = 250 V, Ie = 0.27 A **Minimum current of use** Ue = 24 V DC and Ie = 5 mA Failure rate < 10^{-8} **UL508** Alternating Current 50/60Hz - **A300** Continuous Current - 10 amps Rated Voltage - 300Vac Direct Current - **Q300** Continuous Current - 2.5 amps Rated Voltage - 300Vdc	IEC 60947-5-1

Voltage	Max. Amps Make	Max. Amps Break
72	60	10
120	60	6.0
240	30	3.0

Voltage	Max. Amps Make	Max. Amps Break
24	2.5	2.5
125	0.55	0.55
250	0.27	0.27

Electrical operating life	**1 million cycles for:** - AC15 - B 300 Ue = 120 V, Ie = 3 A Ue = 240 V, Ie = 1.5 A - DC13 - R 300 Ue = 125 V, Ie = 0.22 A Ue = 250 V, Ie = 0.1 A	
Faston size	6.35 mm (0.25") or 2 x 2.8 mm (0.110")	

Technical Specifications

CONTACT BLOCKS

Pin-style connection (for PCB)	Data	Standards
Rated insulation voltage	250 V AC 250 V AC	IEC/EN60947-1 UL 508
NC contacts	Positive opening	IEC/EN 60947-5-1
Rated impulse withstanding voltage Uimp Pollution degree	4 kV 3	
Conventional thermal current in free air conditions	AC 15: 5 A DC 13: 1 A	IEC 60947-5-1
Electrical ratings	**Alternating current** AC 15 - B 300 Ue = 120 V, Ie = 3 A Ue = 240 V, Ie = 1.5 A **Minimum current of use** - standard blocks Ue = 24 V DC and Ie = 5 mA Failure rate < 10^{-8}	**Direct current** DC13 - R 300 Ue = 125 V, Ie = 0.22 A Ue = 250 V, Ie = 0.1 A - golden contacts Ue = 5 V DC and Ie = 1 mA Failure rate < 10^{-8}	IEC 60947-5-1 IEC 60947-5-4
Electrical operating life	**1 million cycles for:** - AC15 - B 300 Ue = 120 V, Ie = 3 A Ue = 240 V, Ie = 1.5 A	- DC13 - R 300 Ue = 125 V, Ie = 0.22 A Ue = 250 V, Ie = 0.1 A	
Pin diameter	ø 1 mm		

UL508

Alternating Current 50/60Hz - **B300**
Continuous Current - 5 amps
Rated Voltage - 300Vac

Voltage	Max. Amps Make	Max. Amps Break
72	30	5.0
120	30	3.0
240	15	1.5

Direct Current - **R300**
Continuous Current - 1 amp
Rated Voltage - 300Vdc

Voltage	Max. Amps Make	Max. Amps Break
24	1.0	1.0
125	0.22	0.22
250	0.11	0.11

Technical Specifications

LED BLOCKS FOR ILLUMINATED HEADS

Characteristics	Data	Standards
Rated insulation voltage	300 V	IEC/EN 60947-5-1
Rated impulse voltage Uimp Pollution degree	4 kV (with filter block see p. 70) 3	IEC/EN 60947-1
Operating voltage	12 to 24 V AC/DC 48 V AC/DC (for LED block) 130 V AC 230 V AC	
Frequency	50 or 60 Hz	
Lifetime at rated supply voltage	Red and yellow: 100 000 hours at 25 °C Other colors: 50 000 hours at 25 °C	
Consumption of LED blocks	Voltage: - 24 V: 25 mA ± 20% - 48 V: 15 mA ± 5% - 130 V: 20 mA ± 10% - 230 V: 16 mA ± 30%	

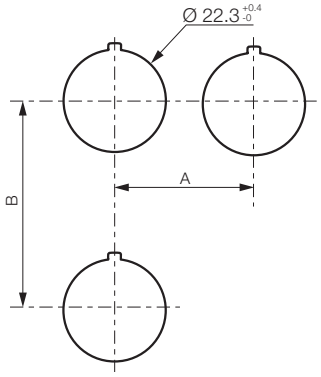
ONE PIECE PILOT LIGHT BA9S

Characteristics	Data	
Rated insulation voltage	400 V	IEC 60947-5-1
Rated impulse withstand voltage Uimp	4 kV	IEC/EN 60947-1
Bulb rating	400 V max. - 2.6 W max. 240 V max. - 2.6 W max.	IEC 60947-5-1 UL 508

Technical Specifications

PANEL CUT-OUT

DRILLING

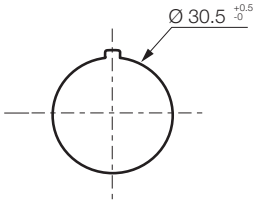


For heads equipped with electrical blocks with screw or plug-in terminals

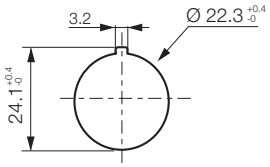
Minimum interval (mm)

A	= 30	With or without legend (usual case)
	= 33	IP 67 (silicon shroud)
	= 40	With large legend plate
	> 40	For mushroom head ø 40
	> 45	For selector switch with long handle
	= 38	For super-flush button
	= 50	With 5 position clip
B	= 45	With or without legend plate (usual case)
	= 54	With double touch
	= 77	With double touch + legend plate
	= 50	Joystick

DRILLING FOR SUPER-FLUSH BUTTON

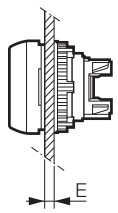


DRILLING WHEN USING THE ANTI-ROTATION RING (OPTIONAL)



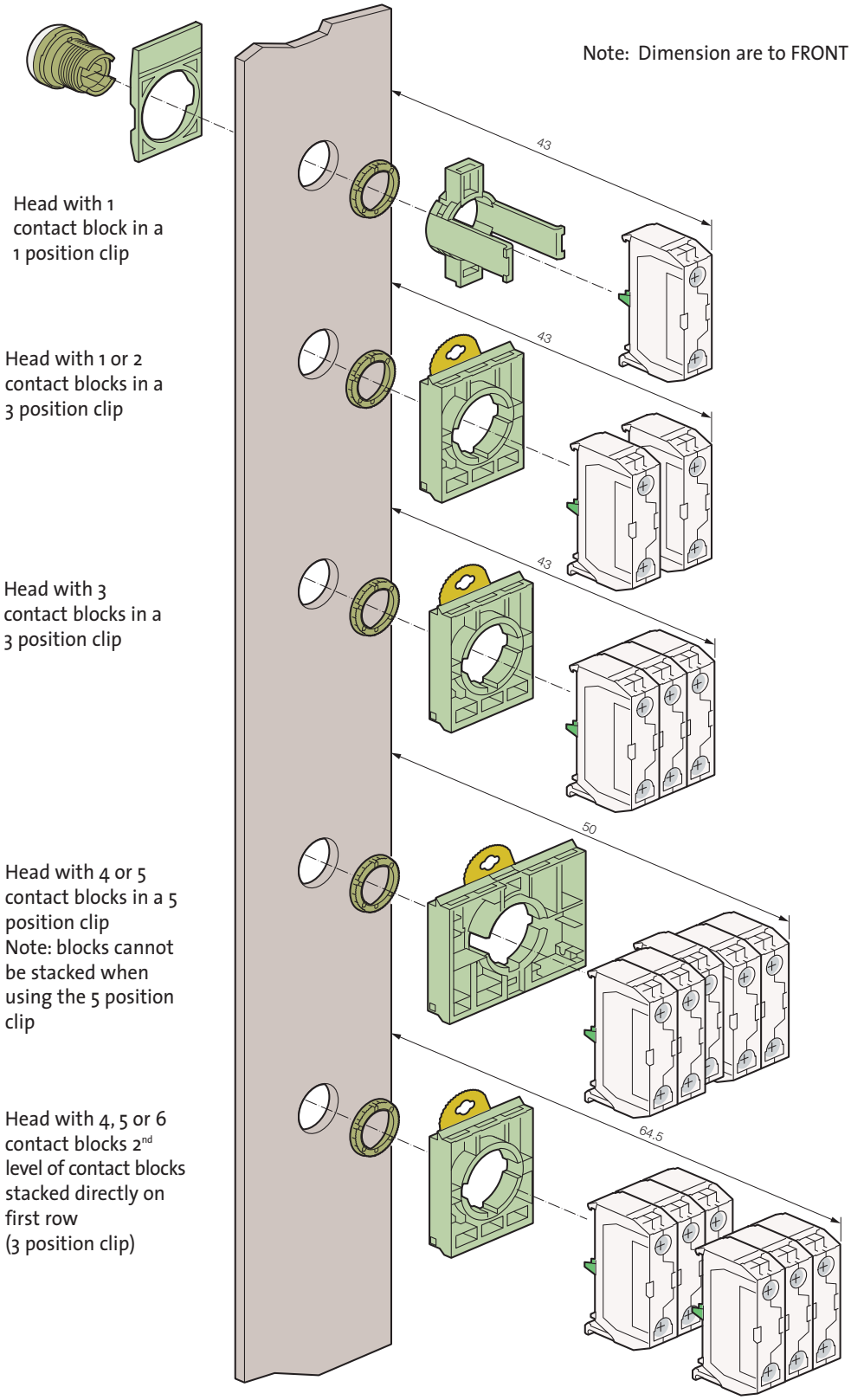
THICKNESS OF PANEL (E)

E = 1 to 6 mm



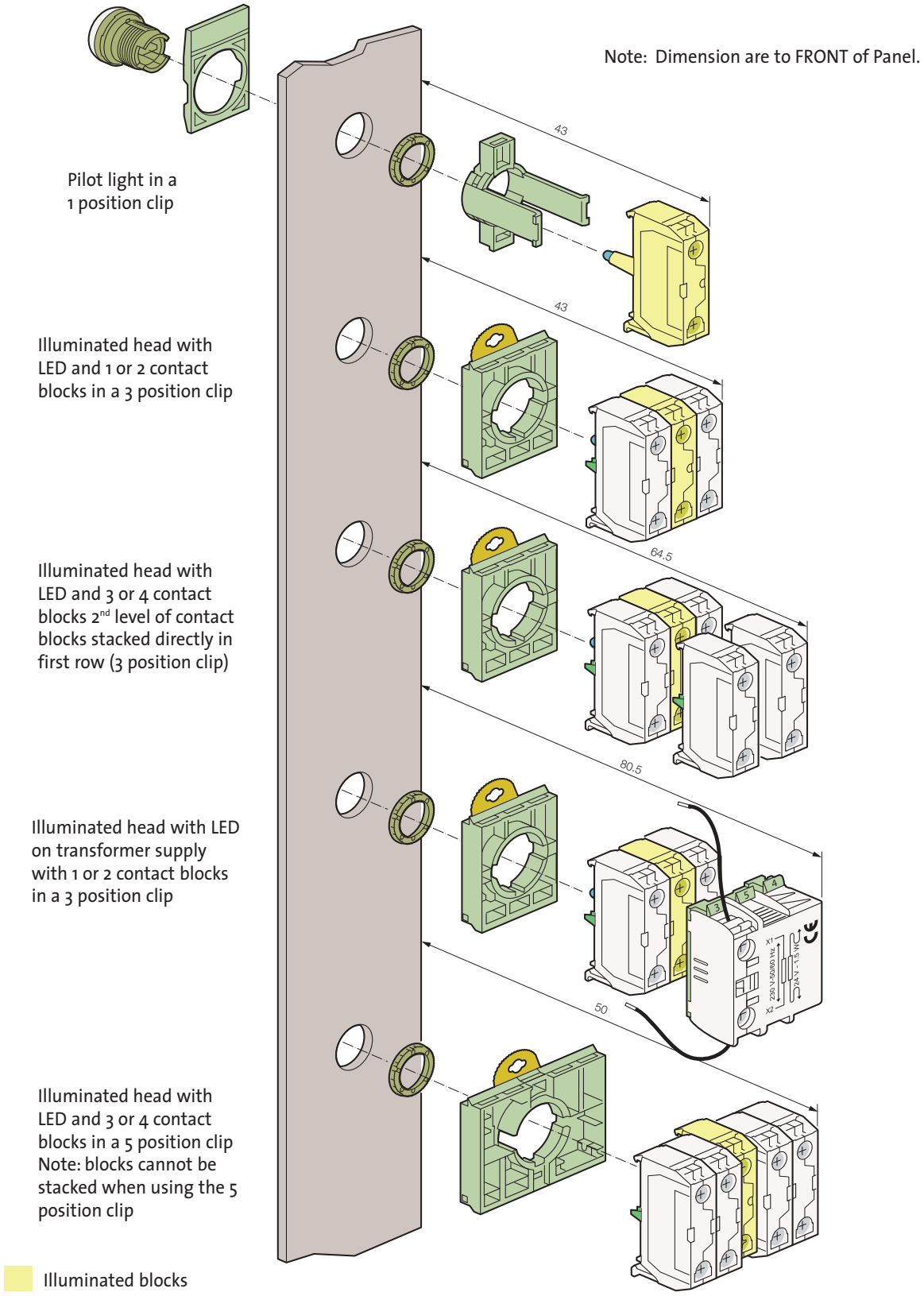
Technical Specifications

NON-ILLUMINATED



Technical Specifications

ILLUMINATED

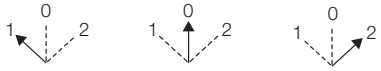


Technical Specifications

MECHANICAL OPERATION

For 3 position selector switches

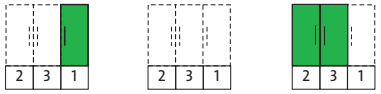
Handle position
(view from front of panel)



Non operated block

Operated block

Contacts block actuation
(clip position)



MECHANICAL OPERATION

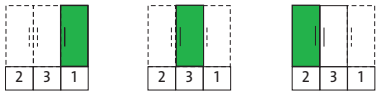
For twin/triple touch switches

Operator View
(highlighted button is depressed)

Non operated block

Operated block

Contacts block actuation
(clip position)



MECHANICAL OPERATION

For Joysticks

2 position

TWO BLOCK CLIP (LME3 - STANDARD WITH JOYSTICK HEAD)

LM11 in Clip Location	Terminal Numbers	Position A	O	B
1	3-4	X	O	O
	1-2	O	O	X
2	3-4	O	O	X
	1-2	X	O	O

FOUR BLOCK CLIP (LME5)

LM11 in Clip Location	Terminal Numbers	Position A	O	B
1	3-4	X	O	O
	1-2	O	O	X
2	3-4	O	O	X
	1-2	X	O	O
3	3-4	X	O	O
	1-2	O	O	X
4	3-4	O	O	X
	1-2	X	O	O

4 position

TWO BLOCK CLIP (LME3 - STANDARD WITH JOYSTICK HEAD)

LM11 in Clip Location	Terminal Numbers	Position A	B	O	C	D
1	3-4	O	O	O	O	X
	1-2	O	O	O	X	O
2	3-4	O	X	O	O	O
	1-2	X	O	O	O	O

FOUR BLOCK CLIP (LME5)

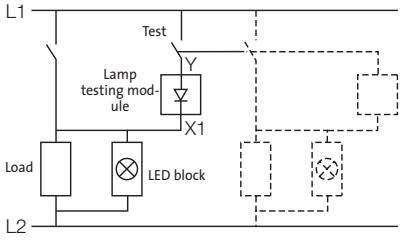
LM11 in Clip Location	Terminal Numbers	Position A	B	O	C	D
1	3-4	O	O	O	O	X
	1-2	O	O	O	X	O
2	3-4	O	X	O	O	O
	1-2	X	O	O	O	O
3	3-4	O	O	O	O	X
	1-2	O	O	O	X	O
4	3-4	O	X	O	O	O
	1-2	X	O	O	O	O

Technical Specifications

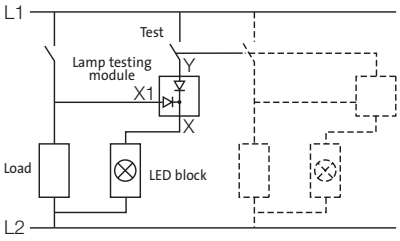
▶ DIAGRAMS

PUSH-TO-TEST LED PILOT LIGHT DIAGRAMS

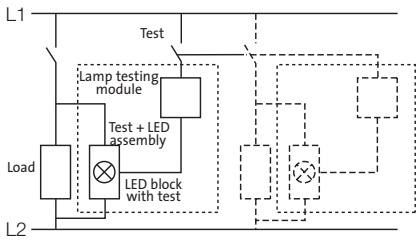
Lamp-testing module with 1 diode (33ET) for direct supply 24 V and 48V



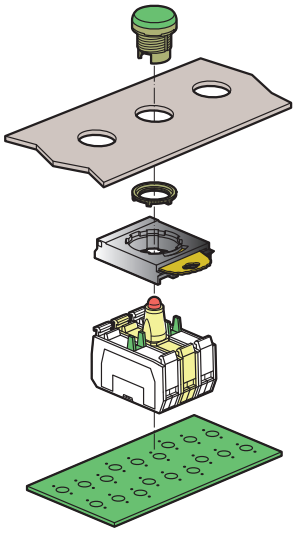
Lamp-testing module with 2 diodes (33ETT) for direct supply 24 V and 48 V



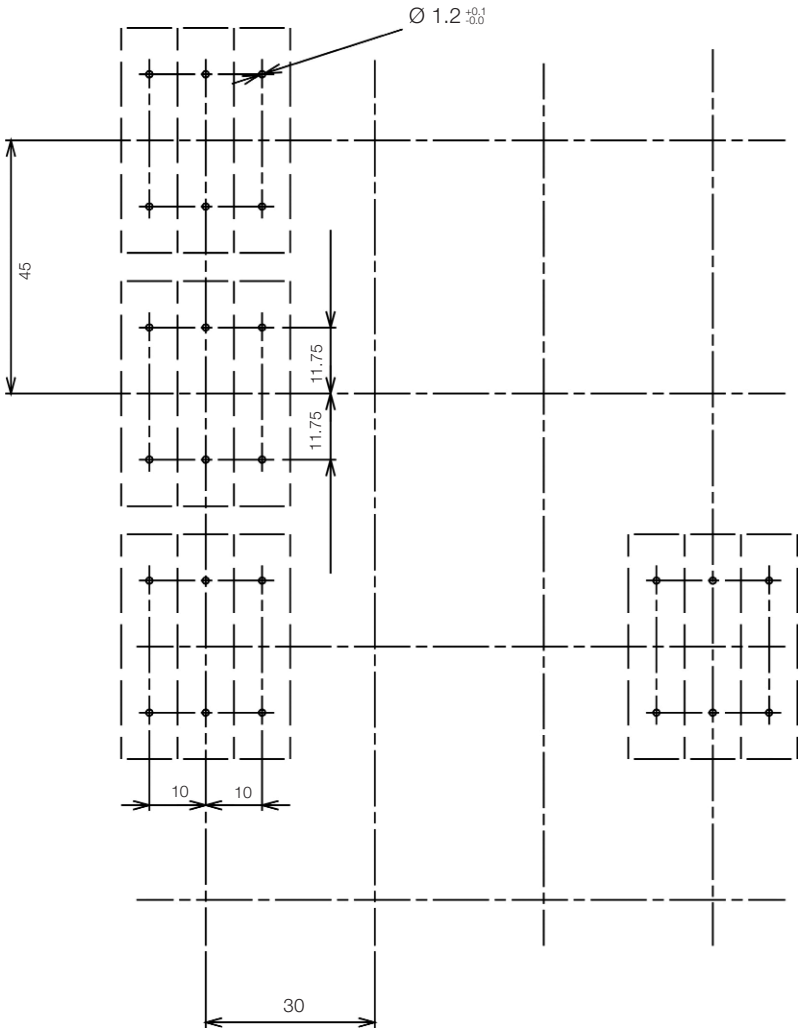
Lamp-testing assembly for direct supply 130 V and 240 V



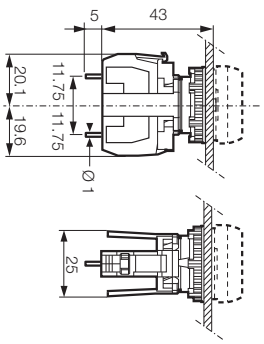
PRINTED CIRCUIT BOARD MOUNTING



PCB Board Drill Plan



PCB Terminal - single clip



PCB Terminal - 3 position clip