

# Complete units: Pilot lights ø 22

IP 66  
Complete units consisting of:  
- head  
- clip and screw electrical blocks assembled  
Conform to IEC 60947-5-1



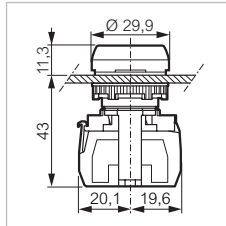
Characteristics (p. 94)  
Cross reference list (p. 311)

## PILOT LIGHTS

Cat. No.



L20SE20L



### LED blocks

#### 24 V

- Red
- Green
- Yellow
- White
- Blue

**L20SE10L**  
**L20SE20L**  
**L20SE40L**  
**L20SE50L**  
**L20SE60L**

#### 130 V

- Red
- Green
- Yellow
- White
- Blue

**L20SE10M**  
**L20SE20M**  
**L20SE40M**  
**L20SE50M**  
**L20SE60M**

#### 230V

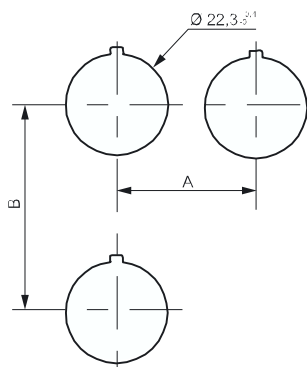
- Red
- Green
- Yellow
- White
- Blue

**L20SE10H**  
**L20SE20H**  
**L20SE40H**  
**L20SE50H**  
**L20SE60H**

One-piece pilot lights (p. 45-46)

# Bohrungen und Normen

## BOHRPLÄNE

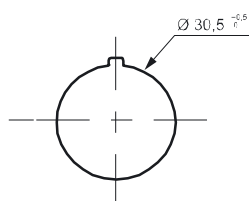


Für Geräte mit Schraubanschluss und Federzugklemme

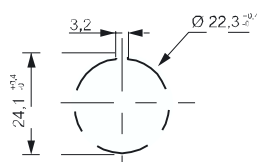
### Abmessungen

|   |      |                                        |
|---|------|----------------------------------------|
|   | = 30 | Mit oder ohne Einlegeschild (Standard) |
|   | = 33 | Für Silikondichtungshaube IP 67        |
|   | = 40 | Mit großem Einlegeschild               |
| A | > 40 | Für Not-Aus Taster Ø40                 |
|   | > 45 | Für Drehschalter mit Knebel lang       |
|   | = 38 | Für superflachen Taster                |
|   | = 50 | Bei 5-Fachadapter                      |
|   | = 45 | Mit oder ohne Einlegeschild (Standard) |
| B | = 54 | Mit Doppeldrucktaster                  |
|   | = 77 | Mit Doppeldrucktaster + Einlegeschild  |
|   | = 50 | Joystick                               |

## BOHRUNG FÜR SUPERFLACHEN DRUCKTASTER

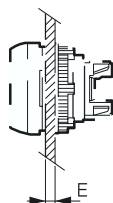


## BOHRUNG BEI VERWENDUNG DES VERDREHUNGSSCHUTZES (OPTIONAL)



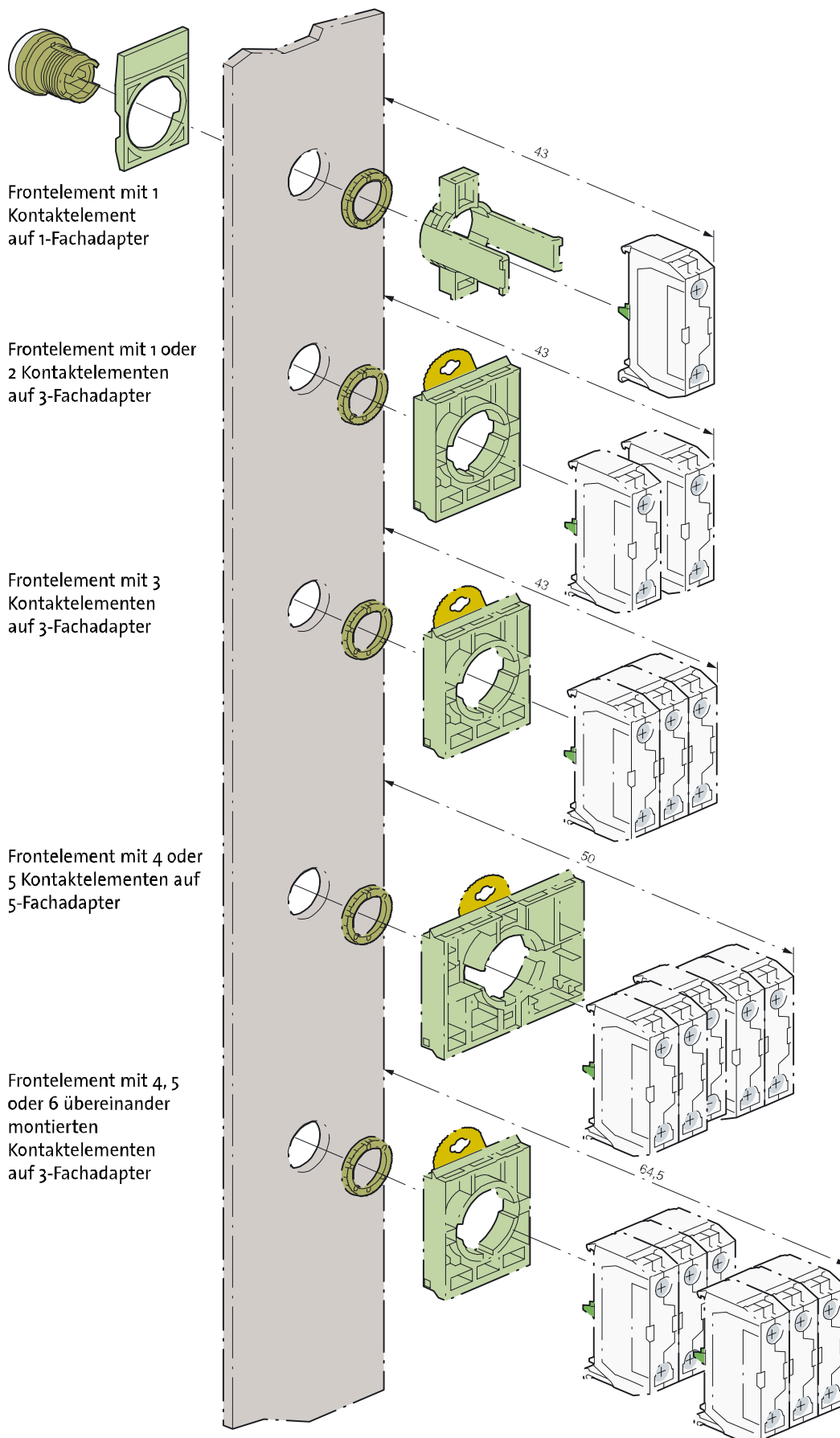
## FRONTPLATTENSTÄRKE

E = 1 bis 6 mm



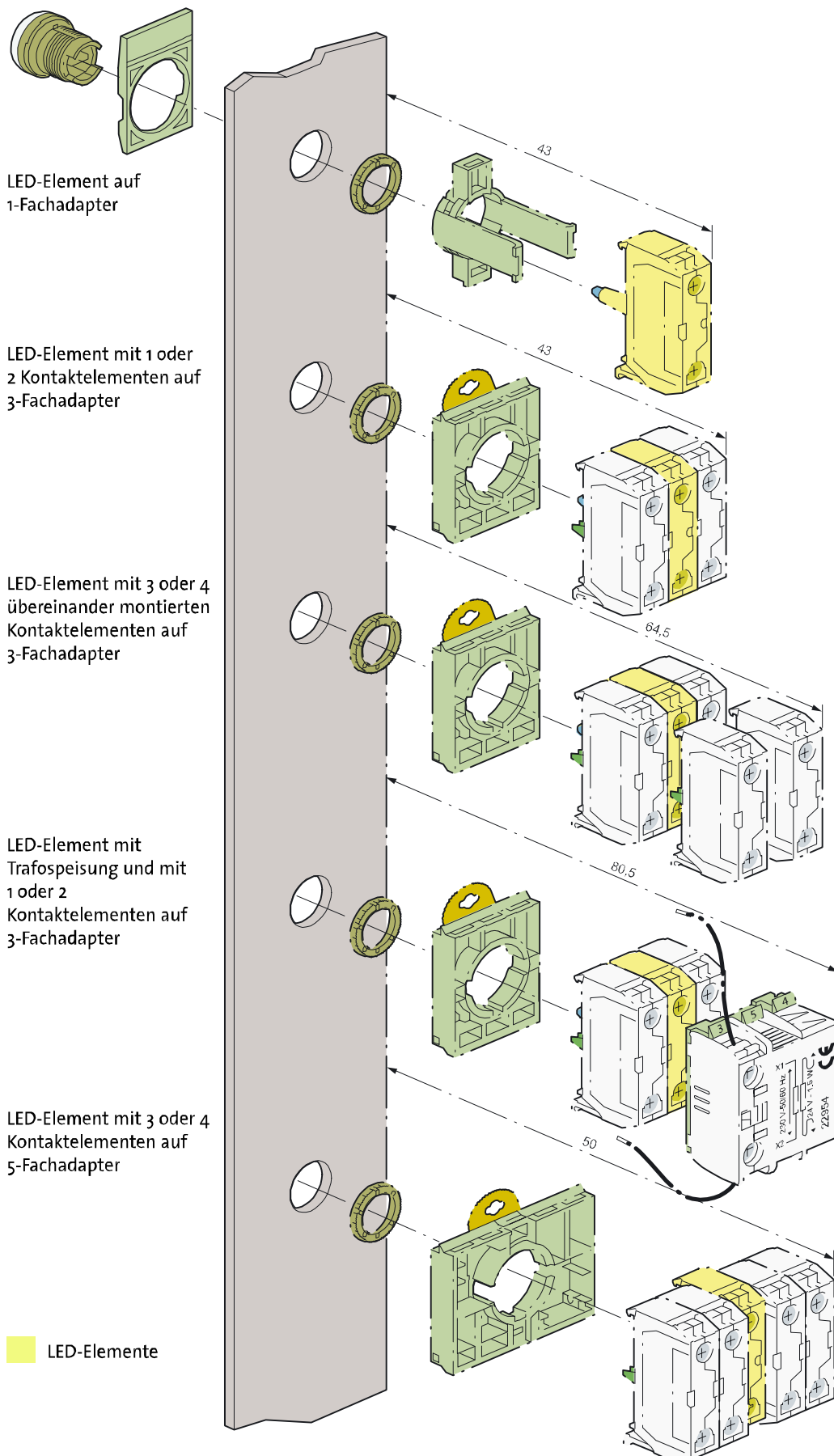
# Montageanweisung $\varnothing 22$

NICHT BELEUCHTBAR



# Montageanweisung ø 22

## BELEUCHTBAR



# Technische Daten

## ▶ ALLGEMEIN

| Eigenschaften                       | Daten                                                                                                                                                                                                                                                                            | Normen                                                                               |
|-------------------------------------|----------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|--------------------------------------------------------------------------------------|
| ▶ Lagertemperatur                   | - 40 °C bis + 70 °C                                                                                                                                                                                                                                                              |                                                                                      |
| ▶ Temperatur bei Verwendung         | - 25 °C bis + 70 °C                                                                                                                                                                                                                                                              |                                                                                      |
| ▶ Klimabeständigkeit                | konstant feuchtwarm<br>zyklisch feuchtwarm<br>Beständigkeit bei Salzwassernebel                                                                                                                                                                                                  | IEC 60068-2-3<br>IEC 60068-2-30<br>IEC 60068-2-52                                    |
| ▶ Schutzart                         | IP 66 für Standardfrontelemente<br>IP 67 für Frontelemente mit Dichtungshauben<br>IP 66 für Gehäuse mit eingebauten Tasten<br>IP 20 für Kontaktelemente für Kontaktelemente und Kompakt-Meldeleuchten<br>Nema 4X, 12 und 13 für Frontelemente und Gehäuse mit eingebauten Tasten | IEC 60529<br><br><br><br>NEMA Norm                                                   |
| ▶ Schutz gegen mechanischen Schläge | IK 05 beleuchtbare und nicht beleuchtbare Frontelemente<br>IK 07 Leergehäuse                                                                                                                                                                                                     | IEC 50102                                                                            |
| ▶ Berührungsschutz                  | Klasse II                                                                                                                                                                                                                                                                        | IEC 60947-5-1                                                                        |
| ▶ Klemmenbezeichnung                |                                                                                                                                                                                                                                                                                  | IEC 60947-1                                                                          |
| ▶ Anzugsdrehmoment                  | für Muttern: 3 Nm empfohlen<br>Klemmen: 1,2 Nm                                                                                                                                                                                                                                   |                                                                                      |
| ▶ Zulassungen                       | UL USA und Kanada<br>BV Bureau Veritas<br>OC/CB-Zertifizierung                                                                                                                                                                                                                   | <b>UL 508</b><br>Réglement Marine<br>IEC 60947-5-1<br>IEC 60947-5-5<br>IEC 60947-5-4 |
| ▶ Rüttelfestigkeit                  | 3 Achsen                                                                                                                                                                                                                                                                         | IEC 60068-2-6                                                                        |

# Technische Daten

## ► KONTAKTELEMENTE

| Eigenschaften für Schraubanschluss und Federzugklemme  | Daten                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                        |                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                | Normen                   |
|--------------------------------------------------------|------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|----------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|--------------------------|
| ► Bemessungsisolationsspannung<br>Verschmutzungsgrad 3 | 690 V AC<br>600 V AC                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                         |                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                | IEC/EN 60947-1<br>UL 508 |
| ► NC-Kontakt                                           | positive Öffnung gemäß                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                       |                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                | IEC/EN 60947-5-1         |
| ► Bemessungsstoßspannungsfestigkeit U <sub>imp</sub>   | 6 kV                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                         |                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                |                          |
| ► Thermischer Dauerstrom, konventionell, im Freien     | AC15: 10 A<br>DC13: 2,5 A                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                    |                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                | IEC 60947-5-1            |
| ► Elektrische Leistung                                 | <b>Wechselstrom</b><br>AC15 - A 600<br>U <sub>e</sub> = 120 V, I <sub>e</sub> = 6 A<br>U <sub>e</sub> = 240 V, I <sub>e</sub> = 3 A<br>U <sub>e</sub> = 380 V, I <sub>e</sub> = 1,9 A<br>U <sub>e</sub> = 480 V, I <sub>e</sub> = 1,5 A<br>U <sub>e</sub> = 500 V, I <sub>e</sub> = 1,4 A<br>U <sub>e</sub> = 600 V, I <sub>e</sub> = 1,2 A<br><br><b>Mindestbetriebsstrom</b><br>- Standardelemente<br>U <sub>e</sub> = 24 V DC und I <sub>e</sub> = 5 mA<br>Ausfallrate < 10 <sup>-8</sup><br><br><b>Elektrische Lebensdauer</b><br>1 Mio. Zyklen für:<br>- AC15 - B 300<br>U <sub>e</sub> = 120 V, I <sub>e</sub> = 3 A<br>U <sub>e</sub> = 240 V, I <sub>e</sub> = 1,5 A | <b>Gleichstrom</b><br>DC13 - Q 600<br>U <sub>e</sub> = 125 V, I <sub>e</sub> = 0,55 A<br>U <sub>e</sub> = 250 V, I <sub>e</sub> = 0,27 A<br>U <sub>e</sub> = 400 V, I <sub>e</sub> = 0,15 A<br>U <sub>e</sub> = 500 V, I <sub>e</sub> = 0,13 A<br>U <sub>e</sub> = 600 V, I <sub>e</sub> = 0,1 A<br><br>- Elemente mit vergoldeten Kontakten<br>U <sub>e</sub> = 5 V DC und I <sub>e</sub> = 1 mA<br>Ausfallrate < 10 <sup>-8</sup><br><br>- DC13 - R 300<br>U <sub>e</sub> = 125 V, I <sub>e</sub> = 0,22 A<br>U <sub>e</sub> = 250 V, I <sub>e</sub> = 0,1 A | IEC 60947-5-1            |
| ► Anschlussquerschnitte                                | Feindrähtig ohne Aderendhülse: 0,5 mm <sup>2</sup> bis 2 x 2,5 mm <sup>2</sup><br>Feindrähtig mit Aderendhülse: 0,5 mm <sup>2</sup> bis 2 x 1,5 mm <sup>2</sup>                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                              |                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                |                          |

| Eigenschaften Elemente mit Flachsteckanschluss         | Daten                                                                                                                                                                                                                                                                                                                                                                                                                                          |                                                                                                                                                                                                                                                                     | Normen                  |
|--------------------------------------------------------|------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|---------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|-------------------------|
| ► Bemessungsisolationsspannung<br>Verschmutzungsgrad 3 | 320 V AC<br>300 V AC                                                                                                                                                                                                                                                                                                                                                                                                                           |                                                                                                                                                                                                                                                                     | IEC/EN60947-1<br>UL 508 |
| ► NC-Kontakt                                           | positive Öffnung gemäß                                                                                                                                                                                                                                                                                                                                                                                                                         |                                                                                                                                                                                                                                                                     | IEC/EN 60947-5-1        |
| ► Bemessungsstoßspannungsfestigkeit U <sub>imp</sub>   | 6 kV                                                                                                                                                                                                                                                                                                                                                                                                                                           |                                                                                                                                                                                                                                                                     |                         |
| ► Thermischer Dauerstrom, konventionell, im Freien     | AC 15: 10 A<br>DC 13: 2,5 A                                                                                                                                                                                                                                                                                                                                                                                                                    |                                                                                                                                                                                                                                                                     | IEC 60947-5-1           |
| ► Elektrische Leistung                                 | <b>Wechselstrom</b><br>AC15 - A 300<br>U <sub>e</sub> = 120 V, I <sub>e</sub> = 6 A<br>U <sub>e</sub> = 240 V, I <sub>e</sub> = 3 A<br><br><b>Mindestbetriebsstrom</b><br>U <sub>e</sub> = 24 V DC und I <sub>e</sub> = 5 mA<br>Ausfallrate < 10 <sup>-8</sup><br><br><b>Elektrische Lebensdauer</b><br>1 Mio. Zyklen für:<br>- AC15 - B 300<br>U <sub>e</sub> = 120 V, I <sub>e</sub> = 3 A<br>U <sub>e</sub> = 240 V, I <sub>e</sub> = 1,5 A | <b>Gleichstrom</b><br>DC13 - Q 300<br>U <sub>e</sub> = 125 V, I <sub>e</sub> = 0,55 A<br>U <sub>e</sub> = 250 V, I <sub>e</sub> = 0,27 A<br><br>- DC13 - R 300<br>U <sub>e</sub> = 125 V, I <sub>e</sub> = 0,22 A<br>U <sub>e</sub> = 250 V, I <sub>e</sub> = 0,1 A | IEC 60947-5-1           |
| ► Größe Flachsteckanschluss                            | 6,35 mm oder 2 x 2,8 mm                                                                                                                                                                                                                                                                                                                                                                                                                        |                                                                                                                                                                                                                                                                     |                         |

# Technische Daten

## ► KONTAKTELEMENTE

| Eigenschaften Elemente mit Printanschluss              | Daten                                                                                                                    |                                                                                                     | Normen                         |
|--------------------------------------------------------|--------------------------------------------------------------------------------------------------------------------------|-----------------------------------------------------------------------------------------------------|--------------------------------|
| ► Bemessungsisolationsspannung<br>Verschmutzungsgrad 3 | 250 V AC<br>250 V AC                                                                                                     |                                                                                                     | IEC/EN60947-1<br>UL 508        |
| ► NC-Kontakt                                           | positive Öffnung gemäß                                                                                                   |                                                                                                     | IEC/EN 60947-5-1               |
| ► Bemessungsstoßspannungsfestigkeit Uimp               | 4 kV                                                                                                                     |                                                                                                     |                                |
| ► Thermischer Dauerstrom, konventionell, im Freien     | AC15: 5 A<br>DC13: 1 A                                                                                                   |                                                                                                     | IEC 60947-5-1                  |
| ► Elektrische Leistung                                 | <b>Wechselstrom</b><br>AC 15 - B 300<br>Ue = 120 V, Ie = 3 A<br>Ue = 240 V, Ie = 1,5 A                                   | <b>Gleichstrom</b><br>DC13 - R 300<br>Ue = 125 V, Ie = 0,22 A<br>Ue = 250 V, Ie = 0,1 A             | IEC 60947-5-1<br>IEC 60947-5-4 |
|                                                        | <b>Mindestbetriebsstrom</b><br>- Standardelemente<br>Ue = 24 V DC und Ie = 5 mA<br>Ausfallrate < 10 <sup>-8</sup>        | - Elemente mit vergoldeten Kontakten<br>Ue = 5 V DC und Ie = 1 mA<br>Ausfallrate < 10 <sup>-8</sup> |                                |
|                                                        | <b>Elektrische Lebensdauer</b><br>1 Mio. Zyklen für:<br>- AC15 - B 300<br>Ue = 120 V, Ie = 3 A<br>Ue = 240 V, Ie = 1,5 A | - DC13 - R 300<br>Ue = 125 V, Ie = 0,22 A<br>Ue = 250 V, Ie = 0,1 A                                 |                                |
|                                                        |                                                                                                                          |                                                                                                     |                                |
|                                                        |                                                                                                                          |                                                                                                     |                                |
| ► Durchmesser Printstifte                              | Ø 1 mm                                                                                                                   |                                                                                                     |                                |

## ► LED-ELEMENTE FÜR BELEUCHTBARE FRONTELEMENTE UND LED-KOMPAKT-MELDELEUCHTEN

| Eigenschaften                                          | Daten                                                                                                  | Normen           |
|--------------------------------------------------------|--------------------------------------------------------------------------------------------------------|------------------|
| ► Bemessungsisolationsspannung<br>Verschmutzungsgrad 3 | 300 V                                                                                                  | IEC/EN 60947-5-1 |
| ► Bemessungsstoßspannungsfestigkeit Uimp               | 4 kV (mit Filterelement Seite 64)                                                                      | IEC/EN 60947-1   |
| ► Betriebsspannung                                     | 12 bis 24 V AC/DC<br>48 V AC/DC (für LED-Element)<br>130 V AC<br>230 V AC                              |                  |
| ► Frequenz                                             | 50 oder 60 Hz                                                                                          |                  |
| ► Lebensdauer bei Speisung mit Nennspannung            | Rot und gelb: 100 000 Stunden bei 25 °C<br>Andere Farben: 50 000 Stunden bei 25 °C                     |                  |
| ► Verbrauch der LED-Elemente                           | Spannung:<br>- 24 V: 25 mA ± 20%<br>- 48 V: 15 mA ± 5%<br>- 130 V: 20 mA ± 10%<br>- 230 V: 16 mA ± 30% |                  |

# Technische Daten

## ► KOMPAKT-MELDELEUCHTEN BA9S

| Eigenschaften                            | Daten      | Normen         |
|------------------------------------------|------------|----------------|
| ► Bemessungsisolationsspannung           | 300 V      | IEC 60947-5-1  |
| ► Bemessungsstoßspannungsfestigkeit Uimp | 4 kV       | IEC/EN 60947-1 |
| ► Lampenleistung                         | 2,6 W max. |                |

## ► FRONTELEMENTE

| Eigenschaften                                    | Daten                                                                                                                                                                                                                                                                                                              | Normen |
|--------------------------------------------------|--------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|--------|
| ► Mechanische Lebensdauer (in Mio. Betätigungen) | Taster: 5<br>Drücken-Drücken: 0,5<br>Drehschalter: 0,3<br>Not-Aus Taster rastend EN418: 0,10<br>Not-Aus Taster rastend: 0,15                                                                                                                                                                                       |        |
| ► Betätigungskraft in N                          | Impuls + NO: 6,5<br>Impuls + NC: 4,5<br>Zusätzlicher NO-Kontakt: 4,5<br>Zusätzlicher NC-Kontakt: 3,0<br>Not-Aus Taster Zugentriegelung + NO + NC: 27<br>Not-Aus Taster Drehentriegelung + NO + NC: 22<br>Not-Aus Taster Zugentriegelung EN418 + NO + NC: 37<br>Not-Aus Taster Drehentriegelung EN418 + NO + NC: 60 |        |
| ► Betätigungskraft in Nm                         | Drehschalter + NO: 0,04<br>Zusätzlicher NO-Kontakt: 0,03                                                                                                                                                                                                                                                           |        |

## ► NOT-AUS TASTER - ÜBERLISTUNGSSICHER NACH EN418

Not-Aus Taster entsprechen der IEC 60947-5-5 und DIN EN 60204. Sie sind durch einen zwangsgeführten mechanischen Bewegungsablauf überlistungssicher nach EN418. Zum Schutz gegen versehentliches Betätigen muss ein Druckpunkt überwunden werden. Die Tasten rasten in gedrückter Stellung ein und werden durch eine Rechtsdrehung entriegelt. Durch die Formgebung des Betätigungselementes ist die Schalttaste blockiergeschützt. Das heißt, ein eingeleiteter Not-Aus-Vorgang kann nicht durch verklemmende Gegenstände unterbrochen werden.



# Schaltpläne

## ARBEITSWEISE DER KONTAKTE

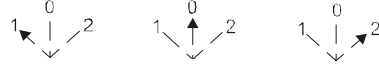
Für Drehschalter 3 Stellungen  
Aktivierte Elemente

Kontakt von vorn betrachtet

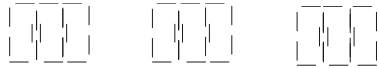
Nicht aktiviert

Aktiviert

Stellung des Knebels  
(von vorn betrachtet)

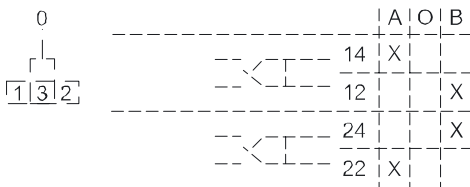


Zustand der Kontakte  
(von vorn betrachtet)

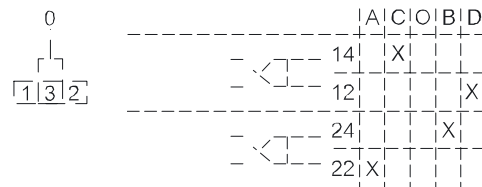


## FUNKTIONSWEISE JOYSTICK

2 Stellungen

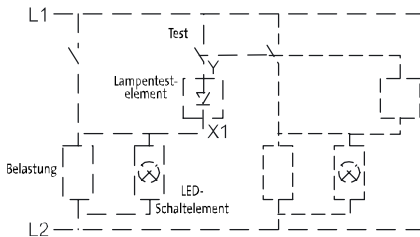


4 Stellungen

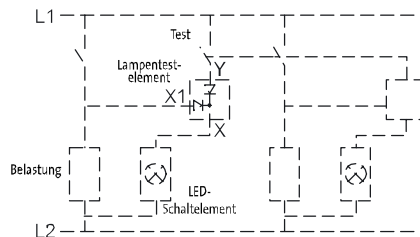


## ANSCHLUSSSCHALTPLAN LAMPENTESTELEMENT UND LED-ELEMENT

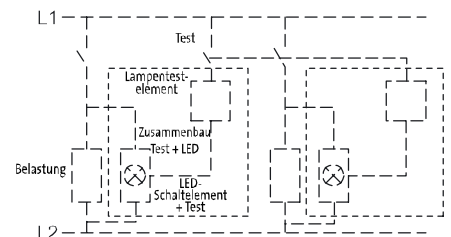
Für Speisung 24 V und 48 V AC/DC  
Test mit 1 Diode



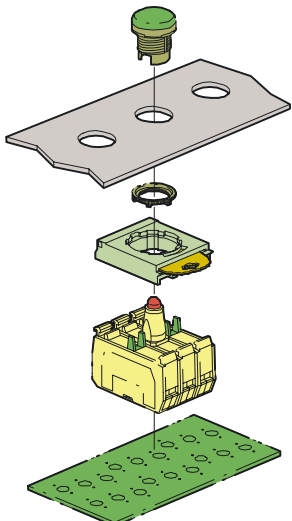
Für Speisung 24 V und 48 V AC/DC  
Test mit 2 Dioden



Für Speisung 130 V und 48 V AC  
Zusammenbau Test + LED (auf Anfrage)



## MONTAGE AUF LEITERPLATTE



# Komplettgeräte: Meldeleuchten ø 22

IP 66  
Komplettgeräte bestehend aus: Frontelemente, Adapter und  
Kontaktelemente mit Schraubanschluss  
Nach Norm EN-IEC 60947-5-1



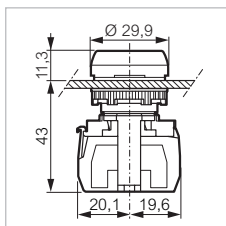
Technische Daten (Seite 94)  
Vergleichstabelle (Seite 311)

## ► MELDELEUCHTEN

Bestell-Nr.



L20SE20L



### Meldeleuchten



#### LED-Elemente

##### 24 V

- Rot
- Grün
- Gelb
- Weiß
- Blau

L20SE10L  
L20SE20L  
L20SE40L  
L20SE50L  
L20SE60L

##### 130 V

- Rot
- Grün
- Gelb
- Weiß
- Blau

L20SE10M  
L20SE20M  
L20SE40M  
L20SE50M  
L20SE60M

##### 230 V

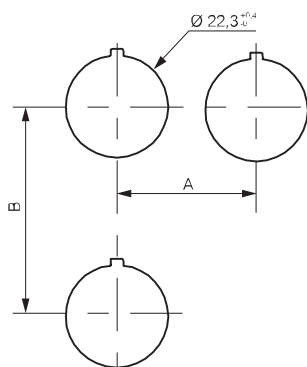
- Rot
- Grün
- Gelb
- Weiß
- Blau

L20SE10H  
L20SE20H  
L20SE40H  
L20SE50H  
L20SE60H

kompakt-Meldeleuchten (Seite 45-46)

# Panel cut-out

## DRILLING

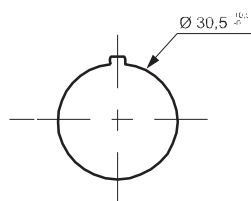


For heads equipped with electrical blocks with screw or plug-in terminals

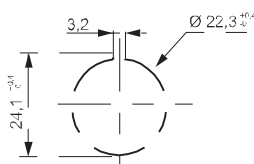
### Minimum interval (mm)

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

## DRILLING FOR SUPER-FLUSH BUTTON

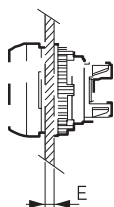


## DRILLING WHEN USING THE ANTI-ROTATION RING (OPTIONAL)



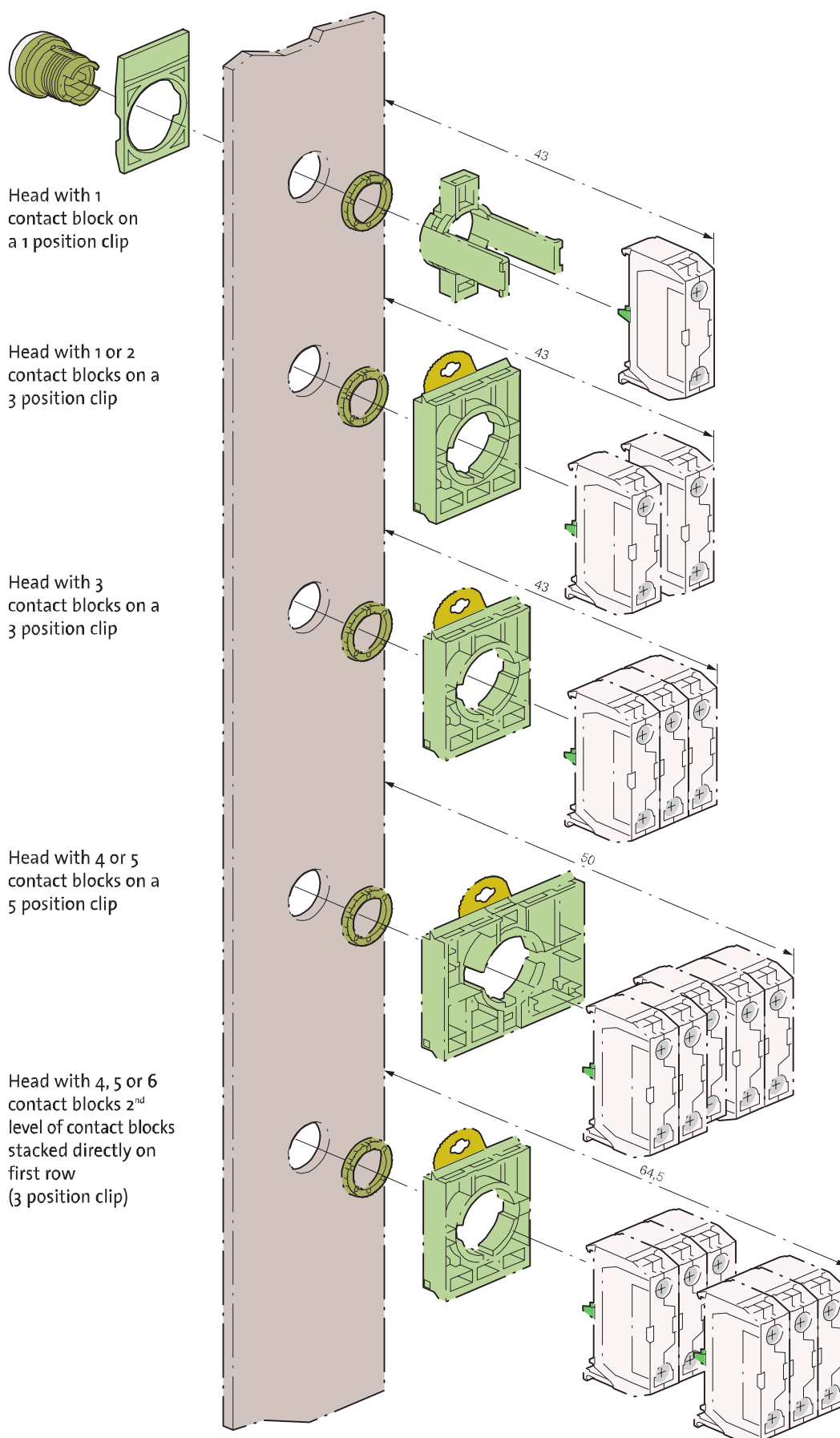
## THICKNESS OF PANEL (E)

E = 1 to 6 mm



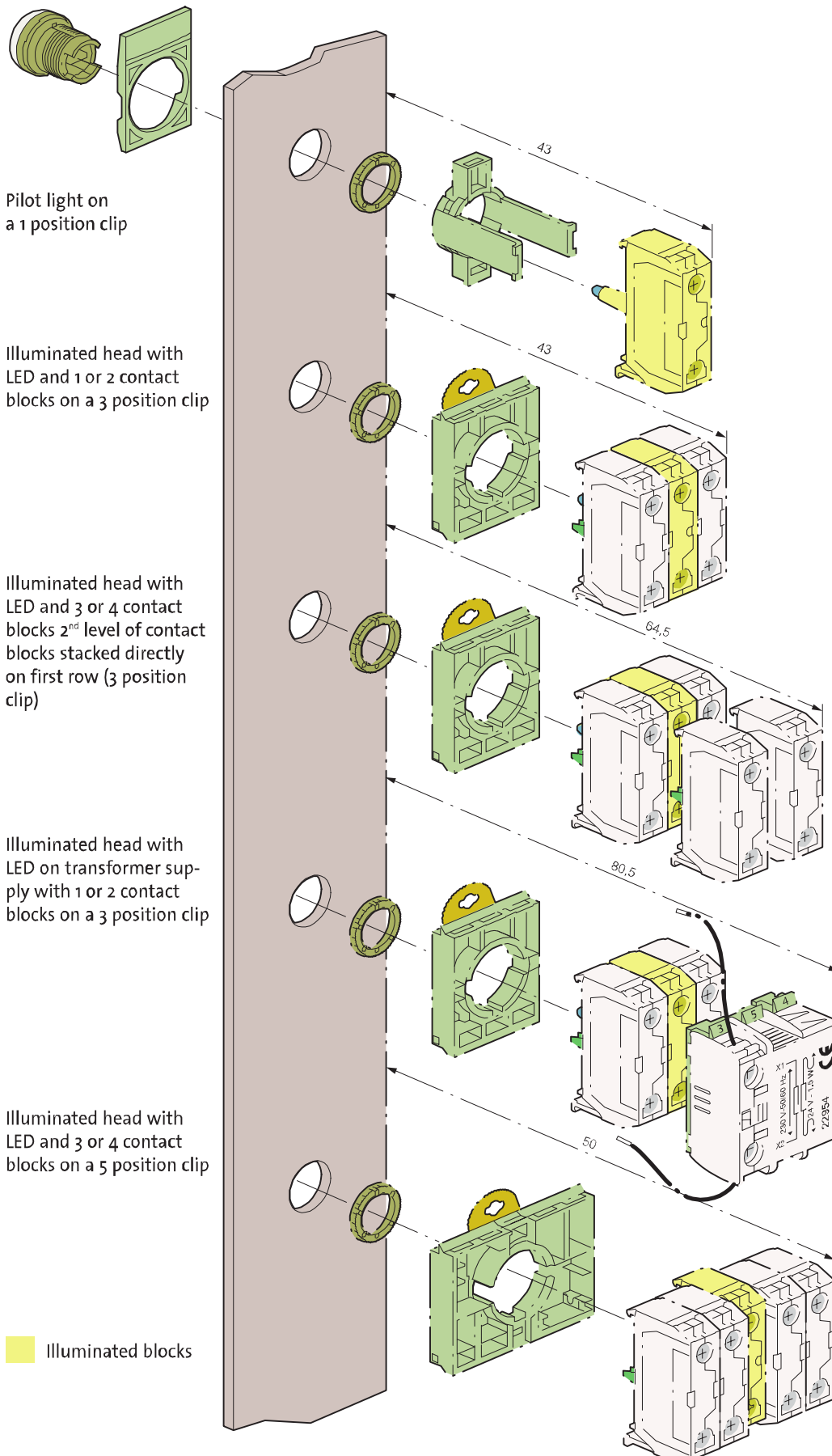
# Mounting blocks $\varnothing 22$

NON ILLUMINATED



# Mounting blocks $\varnothing 22$

## ILLUMINATED



# Technical characteristics

## ► GENERAL

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

# Technical characteristics

## ► CONTACT BLOCKS

| Screw and plug-in connection characteristics                 | Data                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                     |                                                                                                                                                                                                                                                                                                                                                                                                                      | Standards                |
|--------------------------------------------------------------|----------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|----------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|--------------------------|
| ► Rated insulation voltage                                   | 690 V AC<br>600 V AC                                                                                                                                                                                                                                                                                                                                                                                                                                                                                     |                                                                                                                                                                                                                                                                                                                                                                                                                      | IEC/EN 60947-1<br>UL 508 |
| ► NC contacts                                                | Positive opening                                                                                                                                                                                                                                                                                                                                                                                                                                                                                         |                                                                                                                                                                                                                                                                                                                                                                                                                      | IEC/EN 60947-5-1         |
| ► Rated impulse voltage U <sub>imp</sub><br>Pollution degree | 6 kV<br>3                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                |                                                                                                                                                                                                                                                                                                                                                                                                                      |                          |
| ► Conventional thermal current in free air conditions        | AC15: 10 A<br>DC13: 2,5 A                                                                                                                                                                                                                                                                                                                                                                                                                                                                                |                                                                                                                                                                                                                                                                                                                                                                                                                      | IEC 60947-5-1            |
| ► Electrical ratings                                         | <b>Alternating current</b><br>AC15 - A 600<br>U <sub>e</sub> = 120 V, I <sub>e</sub> = 6 A<br>U <sub>e</sub> = 240 V, I <sub>e</sub> = 3 A<br>U <sub>e</sub> = 380 V, I <sub>e</sub> = 1,9 A<br>U <sub>e</sub> = 480 V, I <sub>e</sub> = 1,5 A<br>U <sub>e</sub> = 500 V, I <sub>e</sub> = 1,4 A<br>U <sub>e</sub> = 600 V, I <sub>e</sub> = 1,2 A<br><br><b>Minimum operating current</b><br>- standard blocks<br>U <sub>e</sub> = 24 V DC and I <sub>e</sub> = 5 mA<br>Failure rate < 10 <sup>-8</sup> | <b>Direct current</b><br>DC13 - Q 600<br>U <sub>e</sub> = 125 V, I <sub>e</sub> = 0,55 A<br>U <sub>e</sub> = 250 V, I <sub>e</sub> = 0,27 A<br>U <sub>e</sub> = 400 V, I <sub>e</sub> = 0,15 A<br>U <sub>e</sub> = 500 V, I <sub>e</sub> = 0,13 A<br>U <sub>e</sub> = 600 V, I <sub>e</sub> = 0,1 A<br><br>- golden contacts<br>U <sub>e</sub> = 5 V DC and I <sub>e</sub> = 1 mA<br>Failure rate < 10 <sup>-8</sup> | IEC 60947-5-1            |
| ► Electrical operating life                                  | <b>1 million cycles for:</b><br>- AC15 - B 300<br>U <sub>e</sub> = 120 V, I <sub>e</sub> = 3 A<br>U <sub>e</sub> = 240 V, I <sub>e</sub> = 1,5 A                                                                                                                                                                                                                                                                                                                                                         | - DC13 - R 300<br>U <sub>e</sub> = 125 V, I <sub>e</sub> = 0,22 A<br>U <sub>e</sub> = 250 V, I <sub>e</sub> = 0,1 A                                                                                                                                                                                                                                                                                                  |                          |
| ► Applicable wire sizes                                      | Rigid or flexible wire without ferrule: 0,5 mm <sup>2</sup> to 2 x 2,5 mm <sup>2</sup><br>Rigid or flexible wire with ferrule: 0,5 mm <sup>2</sup> to 2 x 1,5 mm <sup>2</sup>                                                                                                                                                                                                                                                                                                                            |                                                                                                                                                                                                                                                                                                                                                                                                                      |                          |

| Faston connection                                                         | Data                                                                                                                                                                                                                                                                     |                                                                                                                                                                                                                                                                        | Standards               |
|---------------------------------------------------------------------------|--------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|-------------------------|
| ► Rated insulation voltage                                                | 320 V AC<br>300 V AC                                                                                                                                                                                                                                                     |                                                                                                                                                                                                                                                                        | IEC/EN60947-1<br>UL 508 |
| ► NC contacts                                                             | Positive opening                                                                                                                                                                                                                                                         |                                                                                                                                                                                                                                                                        | IEC/EN 60947-5-1        |
| ► Rated impulse withstanding voltage U <sub>imp</sub><br>Pollution degree | 6 kV<br>3                                                                                                                                                                                                                                                                |                                                                                                                                                                                                                                                                        |                         |
| ► Conventional thermal current in free air conditions                     | AC 15: 10 A<br>DC 13: 2,5 A                                                                                                                                                                                                                                              |                                                                                                                                                                                                                                                                        | IEC 60947-5-1           |
| ► Electrical ratings                                                      | <b>Alternating current</b><br>AC15 - A 300<br>U <sub>e</sub> = 120 V, I <sub>e</sub> = 6 A<br>U <sub>e</sub> = 240 V, I <sub>e</sub> = 3 A<br><br><b>Minimum current of use</b><br>U <sub>e</sub> = 24 V DC and I <sub>e</sub> = 5 mA<br>Failure rate < 10 <sup>-8</sup> | <b>Direct current</b><br>DC13 - Q 300<br>U <sub>e</sub> = 125 V, I <sub>e</sub> = 0,55 A<br>U <sub>e</sub> = 250 V, I <sub>e</sub> = 0,27 A<br><br>- DC13 - R 300<br>U <sub>e</sub> = 125 V, I <sub>e</sub> = 0,22 A<br>U <sub>e</sub> = 250 V, I <sub>e</sub> = 0,1 A | IEC 60947-5-1           |
| ► Electrical operating life                                               | <b>1 million cycles for:</b><br>- AC15 - B 300<br>U <sub>e</sub> = 120 V, I <sub>e</sub> = 3 A<br>U <sub>e</sub> = 240 V, I <sub>e</sub> = 1,5 A                                                                                                                         | - DC13 - R 300<br>U <sub>e</sub> = 125 V, I <sub>e</sub> = 0,22 A<br>U <sub>e</sub> = 250 V, I <sub>e</sub> = 0,1 A                                                                                                                                                    |                         |
| ► Faston size                                                             | 6,35 mm or 2 x 2,8 mm                                                                                                                                                                                                                                                    |                                                                                                                                                                                                                                                                        |                         |

# Technical characteristics

## ▶ CONTACT BLOCKS

| Pin-style connection (for PCB)                                | Data                                                                                                                |                                                                                            | Standards                      |
|---------------------------------------------------------------|---------------------------------------------------------------------------------------------------------------------|--------------------------------------------------------------------------------------------|--------------------------------|
| ▶ Rated insulation voltage                                    | 250 V AC<br>250 V AC                                                                                                |                                                                                            | IEC/EN60947-1<br>UL 508        |
| ▶ NC contacts                                                 | Positive opening                                                                                                    |                                                                                            | IEC/EN 60947-5-1               |
| ▶ Rated impulse withstanding voltage Uimp<br>Pollution degree | 4 kV<br>3                                                                                                           |                                                                                            |                                |
| ▶ Conventional thermal current in free air conditions         | AC 15: 5 A<br>DC 13: 1 A                                                                                            |                                                                                            | IEC 60947-5-1                  |
| ▶ Electrical ratings                                          | <b>Alternating current</b><br>AC 15 - B 300<br>Ue = 120 V, Ie = 3 A<br>Ue = 240 V, Ie = 1,5 A                       | <b>Direct current</b><br>DC13 - R 300<br>Ue = 125 V, Ie = 0,22 A<br>Ue = 250 V, Ie = 0,1 A | IEC 60947-5-1<br>IEC 60947-5-4 |
|                                                               | <b>Minimum current of use</b><br>- standard blocks<br>Ue = 24 V DC and Ie = 5 mA<br>Failure rate < 10 <sup>-8</sup> | - golden contacts<br>Ue = 5 V DC and Ie = 1 mA<br>Failure rate < 10 <sup>-8</sup>          |                                |
| ▶ Electrical operating life                                   | <b>1 million cycles for:</b><br>- AC15 - B 300<br>Ue = 120 V, Ie = 3 A<br>Ue = 240 V, Ie = 1,5 A                    | - DC13 - R 300<br>Ue = 125 V, Ie = 0,22 A<br>Ue = 250 V, Ie = 0,1 A                        |                                |
| ▶ Pin diameter                                                | Ø 1 mm                                                                                                              |                                                                                            |                                |

## ▶ LED BLOCKS FOR ILLUMINATED HEADS AND ONE PIECE LED PILOT LIGHTS

| Characteristics                                  | Data                                                                                                  | Standards        |
|--------------------------------------------------|-------------------------------------------------------------------------------------------------------|------------------|
| ▶ Rated insulation voltage                       | 300 V                                                                                                 | IEC/EN 60947-5-1 |
| ▶ Rated impulse voltage Uimp<br>Pollution degree | 4 kV (with filter block see p. 64)<br>3                                                               | IEC/EN 60947-5-1 |
| ▶ Operating voltage                              | 12 to 24 V AC/DC<br>48 V AC/DC (for LED block)<br>130 V AC<br>230 V AC                                |                  |
| ▶ Frequency                                      | 50 or 60 Hz                                                                                           |                  |
| ▶ Lifetime at rated supply voltage               | Red and yellow: 100 000 hours at 25 °C<br>Other colours: 50 000 hours at 25 °C                        |                  |
| ▶ Consumption of LED blocks                      | Voltage:<br>- 24 V: 25 mA ± 20%<br>- 48 V: 15 mA ± 5%<br>- 130 V: 20 mA ± 10%<br>- 230 V: 16 mA ± 30% |                  |



# Technical characteristics

## ▶ ONE PIECE PILOT LIGHT BA9S

| Characteristics                        | Data                                               | Standards               |
|----------------------------------------|----------------------------------------------------|-------------------------|
| ▶ 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.<br>240 V max. - 2,6 W max. | IEC 60947-5-1<br>UL 508 |

## ▶ HEADS

| Characteristics                            | Data                                                                                                                                                                                                                                                                                             | Standards |
|--------------------------------------------|--------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|-----------|
| ▶ Mechanical endurance (in million cycles) | Spring return: 5<br>Push-push: 0,5<br>Selector switches: 0,3<br>Mushroom head maintained function EN 418: 0,10<br>Mushroom head maintained function: 0,15                                                                                                                                        |           |
| ▶ Activation force in N                    | Spring return + NO: 6,5<br>Spring return + NC: 4,5<br>Additional NO contact: 4,5<br>Additional NC contact: 3,0<br>Push-pull mushroom head + NO + NC: 27<br>Push-turn mushroom head + NO + NC: 22<br>Push-pull mushroom head EN 418 + NO + NC: 37<br>Push-turn mushroom head EN 418 + NO + NC: 60 |           |
| ▶ Activation force in Nm                   | Selector switch + NO: 0,04<br>Additional NO contact: 0,03                                                                                                                                                                                                                                        |           |

## ▶ EMERGENCY STOP ACTUATORS - EN 418:

For equipment subject to Machine Security Directive CE 98/37 and EN60204 standard.

BACO emergency stop switches EN418 and contact blocks meet the requirements of the European Machine Directive EN 418 and EN60947-5-5 specification.

Our E-stops provide the "fool-proof" or "tease-proof" emergency stop switch feature - described below, that latches in the emergency stop command and then switches the contact state to open the circuit and shut down the equipment.

"After the emergency stop command has been generated during actuation of the emergency stop device, the command shall be maintained by engagement (latching-in) of the actuating means. The emergency stop command shall be maintained until the emergency stop device is reset (disengaged). It shall not be possible for the emergency stop device to engage without generating the stop command."

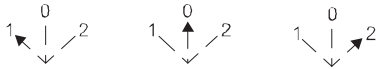
Simply stated, this directive indicates that the latching mechanism of the switch is activated when the actuator is pushed to a certain point. The switch will continue to remain in this latched position until manually reset by twisting to release.

# Diagrams

## MECHANICAL OPERATION

For 3 position selector switches

Handle position  
(front side view)



Contacts block actuation  
(back view)



Back side view

Non operated block



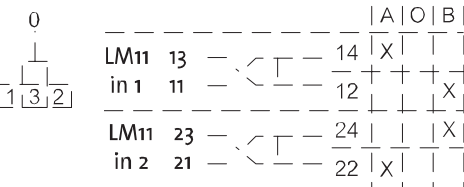
Operated block



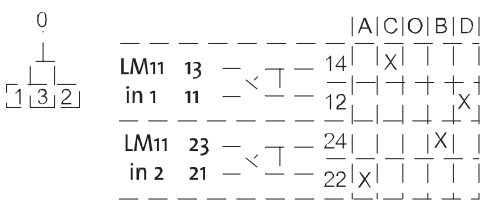
## MECHANICAL OPERATION

For Joysticks

2 positions

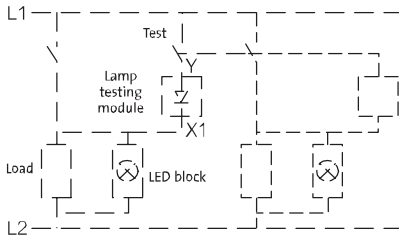


4 positions

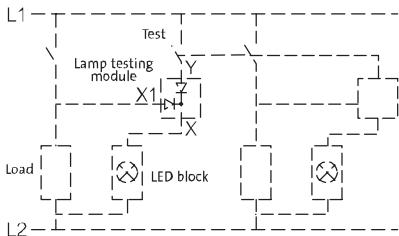


## PUSH-TO-TEST LED PILOT LIGHT DIAGRAMS

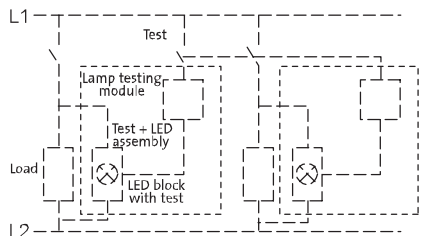
Lamp-testing module with  
1 diode (33ET) for direct  
supply 24 V and 48 V



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  
(Consult us - see page 79)



## PRINTED CIRCUIT BOARD MOUNTING

