## Product Profile

The Series 61 is a high quality, modular switch range that includes pushbuttons, indicators, selector switches, keylock switches and Emergency-stops. Available in raised or flush mount.
Self cleaning snap-action and slow-make switching elements available.

Technical data see page 103

- IP65 Protection
- Switch Rating, 5A, 250VAC
- Raised Mounting into 16 mm cut out
- Flush Mounting into $22.5 \mathrm{~mm}, 21 \times 21 \mathrm{~mm}$ and $21 \times 27 \mathrm{~mm}$ cut out
- Illumination using midget-grooved T13/4 lamps or single chip LED's
- All standard lenses are transparent with translucent diffuser available in different colours
- For keylock switches 135 different keys are available


Ordering Guide
Choice of front bezel
determines front shape

For a complete indicator you will need to order the appropriate LED, lens and bezel (for flush mount only)


For a complete illuminated pushbutton you will need to order the appropriate contact block, LED, lens and bezel (for flush mount only)


For a complete keylock switch you will need to order the appropriate LED, lens and bezel (for flush mount only)


For a complete selector switch you will need to order the appropriate contact block, LED, lever and bezel (for flush mount only)





Choose one component from each of the coloured sections to assemble a complete switch. For other options or further information please contact your local sales office.


## For complete switch also order $\Subset$ A

For complete switch also order $\Subset \mathbf{A}$

## Contact block



Contact block for pushbuttons and 2 position keylock and selector switches, snap-action, solder/plug-in terminal

| Part No. | Contact type | Contact material |
| :--- | :--- | :--- | :--- |
| $61-8410.12$ | 1NO | Silver |
| $61-8410.22$ | 1NO | Gold |
| $61-8420.12$ | 2NO | Silver |
| $61-8420.22$ | 2NO | Gold |
| $61-8470.12$ | 1NO/1NC | Silver |
| $61-8470.22$ | 1NO/1NC | Gold |



Emergency-stop contact block, slow make, screw terminal or solder/plug-in terminal

| Image | Part No. | Contact type | Contact material |
| :--- | :--- | :--- | :--- |
| 1 | $61-8755.11$ | 2NC | Silver |
| 2 | $61-8755.17$ | 2NC | Silver |
| 1 | $61-8775.11$ | 1NO/1NC | Silver |
| 2 | $61-8775.17$ | 1NO/1NC | Silver |
|  |  |  |  |

For complete switch also order $\odot \mathbf{A}$
Selector switch


Selector switch, actuator, 2 and 3 position for raised and flush mount

|  |  |  |
| :---: | :---: | :---: |
| Graphic | Part No. | Function |
| 7 | 61-4110.0 | . 0 Momentary |
| 8 | 61-4210.0 | . 0 Maintained |
| 9 | 61-4510.0 | . 0 Momentary/Momentary |
| 10 | 61-4610.0 | . 0 Maintained/Maintained |
| 11 | 61-4710.0 | 0 Maintained/Momentary |
| 12 | 61-4810.0 | . 0 Momentary/Maintained |
|  |  |  |
|  |  |  |
|  |  |  |
|  |  |  |



Contact block, 3 position keylock and selector switch, snapaction, solder/plug-in terminal

| Part No. | Contact type | Contact material |
| :--- | :--- | :--- |
| $61-8520.12$ | 2NO | Silver |
| $61-8520.22$ | 2NO | Gold |

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A
ACCESSORIES

| © LED |  |  | 1 Accessories |  |  |  |  |  |
| :---: | :---: | :---: | :---: | :---: | :---: | :---: | :---: | :---: |
|  |  |  |  |  |  |  |  |  |
| LED, T13/4 <br> Also availa | MG, single chip, ble in 6 Volt, 24 | 28 Volt. <br> 48 Volt | Lens, plastic and pushbut | ic for raised utton actuat | indicator | Lens, plastic and pushb | tic for raised utton actuat |  |
| Colour | Part No. | Voltage | Colour | Part No. | for switch | Colour | Part No. | for switch |
| ORed | 10-2J09.1062 | 12VAC/DC, 7/14mA | ORed | 61-9331.2 | $18 \times 24 \mathrm{~mm}$ | ORed | 61-9351.2 | $24 \times 24 \mathrm{~mm}$ |
| Yellow | 10-2J09.1064 | 12VAC/DC, 7/14mA | O Yellow | 61-9331.4 | $18 \times 24 \mathrm{~mm}$ | O Yellow | 61-9351.4 | $24 \times 24 \mathrm{~mm}$ |
| Green | 10-2.09.1065 | 12VAC/DC, 7/14mA | Green | 61-9331.5 | $18 \times 24 \mathrm{~mm}$ | Green | 61-9351.5 | $24 \times 24 \mathrm{~mm}$ |
| Blue | 10-2J09.1066 | 12VAC/DC, 7/14mA | O Blue | 61-9331.6 | $18 \times 24 \mathrm{~mm}$ | O Blue | 61-9351.6 | $24 \times 24 \mathrm{~mm}$ |
| Ohite | 10-2.J09.1069 | 12VAC/DC, 7/14mA | $\bigcirc$ Clear | 61-9331.7 | $18 \times 24 \mathrm{~mm}$ | $\bigcirc$ Clear | 61-9351.7 | $24 \times 24 \mathrm{~mm}$ |
| Red | 10-2J13.1062 | 28VAC/DC, 7/14mA |  |  |  |  |  |  |
| O Yellow | 10-2J13.1064 | 28VAC/DC, 7/14mA |  |  |  |  |  |  |
| Green | 10-2J13.1065 | 28VAC/DC, $7 / 14 \mathrm{~mA}$ |  |  |  |  |  |  |
| Blue | 10-2J13.1066 | 28VAC/DC, 7/14mA |  |  |  |  |  |  |
| OWhite | 10-2J13.1069 | 28VAC/DC, $7 / 14 \mathrm{~mA}$ |  |  |  |  |  |  |




Choose one component from each of the coloured sections to assemble a complete switch. For other options or further information please contact your local sales office.


Choose one component from each of the coloured sections to assemble a complete switch. For other options or further information please contact your local sales office.


ACCESSORIES




Choose one component from each of the coloured sections to assemble a complete switch. For other options or further information please contact your local sales office.
Accessories


Emergency-stop switch enclosure with 16 mm mounting hole, $65 \mathrm{~mm}(\mathrm{w}) \times 65 \mathrm{~mm}$ (h) $\times 57 \mathrm{~mm}$ (d) and cable gland M16, IP66

| Image | Part No. | Thread |
| :--- | :--- | :--- |
| 1 | $61-9480.5$ |  |
| 2 | $61-9481.6$ | M16 |
|  |  |  |
|  |  |  |
|  |  |  |
|  |  |  |
|  |  |  |
|  |  |  |



Lens remover for flush mount, mounting tool, lens remover for raised, contact block remover and LED remover

| Image | Part No. | Product description |
| :--- | :--- | :--- |
| 1 | $61-9730.0$ | Lens remover for flush mount |
| 2 | $01-907$ | Mounting tool |
| 3 | $02-905$ | Lens remover for raised |
| 4 | $61-9711.0$ | Contact block remover |
| 5 | $61-9740.0$ | LED remover |
|  |  |  |
|  |  |  |
|  |  |  |
|  |  |  |
|  |  |  |
|  |  |  |



Legend plate, adhesive, natural anodised aluminium finish for flush mount round pushbuttons, 25 mm mounting hole

| Image | Part No. | Size | Colour |
| :--- | :--- | :--- | :--- |
| 1 | $61-9980.0$ | $50 \times 30 \mathrm{~mm} \varnothing$ | Black |
| 2 | 704.968 .0 |  | Aluminium |
| 3 | 704.968 .1 |  | Black |
|  |  |  |  |
|  |  |  |  |
|  |  |  |  |
|  |  |  |  |


| Accessories |
| :--- |

## Actuator with snap-action switching element

## Switching system

Self-cleaning, double-break snap-action switching system with contact opening width $2 \times 0.5 \mathrm{~mm}$ (switch with small contact opening width as per EN IEC 61058-1).
The switching elements are optionally equipped with the following switching functions:
One to three normally open (NO) or normally closed (NC), or any combination of NO and NC plus connections for T1 3/4 LED or lamp. The number of switching elements cannot exceed three.
The switching elements provided for the 3-position switch actuators are equipped with max. 2 NC or 2 NO or any combination. The number of switching elements cannot exceed two.

## Material

## Lens

Raised mounting Polymethylmethacrylat (PMMA), as per UL 94 HB, flush mounting Polycarbonat (PC), as per UL 94 V0, or Aluminium anodized

Front bezel
Polyetherimid (PEI), as per UL 94 V0, or Aluminium anodized

## Front ring

Aluminium anodized

## Material of contact

Silver or silver with gold plating

## Switching element

Diallylphthalate (DAP), as per UL 94 V0 and Polyamide (PA 66), as per UL 94 V0

## Actuator housing

Polyetherimide (PEI), as per UL 94 V0, self-extinguishing

## Mechanical characteristics

Terminals

| - Solder | rigid | flexible | superflexible |
| :--- | :--- | :--- | :--- |
| 1 wire | $0.5 \ldots 1.5 \mathrm{~mm}^{2}$ | $0.5 \ldots 0.75 \mathrm{~mm}^{2}$ | $0.5 \mathrm{~mm}^{2}$ |
| 2 wires | $0.75 \mathrm{~mm}^{2}$ | $0.5 \mathrm{~mm}^{2}$ |  |

Actuating torque
Selector-/Keylock switch $\quad 2.5$... 10 Ncm

## Actuating force

Pushbutton 2.7 ... 3.6N

## Actuating travel

Pushbutton 3 mm

| Selector-/ keylock switch | 2 positions <br> approx. $42^{\circ}$ | 3 positions <br> Momentary action |
| :--- | :--- | :--- |
| approx. $2 \times 42^{\circ}$ |  |  |
| Maintained action | approx. $90^{\circ}$ | approx. $2 \times 90^{\circ}$ |

## Rebound time

The rebound times apply to normal manual activation

| Contact making | 3 ms |
| :--- | :--- |
| Contact breaking | 5 ms |

## Mechanical lifetime

as per DIN IEC 60512-5-6 and EN IEC 60947-5-1

| Pushbutton maintained action | 1 million | cycles of operation |
| :--- | :--- | :--- |
| Pushbutton momentary action | 2 million | cycles of operation <br> Keylock switch |
| 50000 | cycles of operation |  |

## Selector switch

 00000 cycles of operation
## Electrical characteristics

## Standards

The devices comply with: EN IEC 61058-1 and EN IEC 60947-5-1
Rated Operational Voltage Ue
250VAC/DC as per EN IEC 60947-1

## Rated Insulation Voltage Ui

320VAC, as per EN IEC 60947-5-1

## Rated Impulse Withstand Voltage Uimp

4 kV , as per EN IEC 60947-5-1

## Contact resistance

New state with silver contact $\leq 100 \mathrm{~m} \Omega$
as per DIN IEC 60512-2-4, measured at $100 \mathrm{~mA}, 10 \mathrm{~V}$
New state with gold plated contact $\leq 50 \mathrm{~m} \Omega$
as per DIN IEC 60512-2-3, measured at 20 mV , 10 mA
Electrical life
$\geq 50000$ cycles of operation at 250 VAC, $5 \mathrm{~A}, \cos \phi 0.95$, as per EN IEC 60947-5-1

## Electrostatic discharge

Keylock switch
11 kV

## Conventional free air thermal current lth

5A, as per EN IEC 60947-5-1
the maximum current in continuous operation and at ambient temperature must not exceed the quoted maximum values.

## Switch rating

Switch rating AC with silver contact or silver contact with gold plating, service category AC-15, as per EN IEC 60947-5-1

| Voltage | 125 VAC | 250 VAC |
| :--- | :--- | :--- |
| Current | 2.5 A | 2 A |

Switch rating DC for silver contact or silver contact with gold plating, service category DC-13, as per EN IEC 60947-5-1

| Voltage | 250 VDC |
| :--- | :--- |
| Current | 0.15 A |


| Recommended minimum operational data |  |  |
| :--- | :--- | :--- |
| Material of contact | Silver | Silver with gold plating |
| Voltage | $20 \mathrm{VAC} / \mathrm{DC}$ | $5 \mathrm{VAC} / \mathrm{DC}$ |
| Current | 100 mA | 10 mA |

## Electric strength

2500 VAC, 50 Hz , 1 min., as per DIN IEC 60512-2-11
between all terminals and earth
Overvoltage category
ill, as per EN IEC 60947-5-1
Protection class
Class II, as per EN IEC 61058-1
Degree of pollution
3, as per EN IEC 60947-1

## Environmental conditions

Storage temperature
$-40^{\circ} \mathrm{C} \ldots+85^{\circ} \mathrm{C}$
Operating temperature
$-25^{\circ} \mathrm{C} \ldots+55^{\circ} \mathrm{C}$
Protection degree
as per EN IEC 60529
Frontside IP65 | rear side IP40

## Shock resistance

(semi-sinusoidal)
max. $100 \mathrm{~m} / \mathrm{s}^{2}$, pulse width $11 \mathrm{~ms}, 3$-axis, as per
EN IEC 60068-2-27

## Vibration resistance

(sinusoidal)
max. $100 \mathrm{~m} / \mathrm{s}^{2}$ at $10 \mathrm{~Hz} \ldots 500 \mathrm{~Hz}$, as per EN IEC 60068-2-6

## Climate resistance

Damp heat, cyclic
96 hours, $+25^{\circ} \mathrm{C} / 97 \%,+55^{\circ} \mathrm{C} / 93 \%$ relative humidity, as per EN IEC
60068-2-30

Damp heat, state
56 days, $+40^{\circ} \mathrm{C} / 93 \%$ relative humidity, as per EN IEC 60068-2-78

Rapid change of temperature
100 cycles, $-40^{\circ} \mathrm{C} \ldots+80^{\circ} \mathrm{C}$, as per EN IEC 60068-2-14

## Approvals

## Approbations

CB (IEC 60947)
CB (IEC 61058)
CSA
ENEC (EN 61058)
Germanischer Lloyd
GOST
UL
VDE
Declaration of conformity
CE

## Actuator with slow-make switching element

## Switching system

Double-break slow-make system, contact opening width $2 \times 1.5 \mathrm{~mm}$, with $2 \times 2$ contact points per switching element.
NC-contact elements in the slow-make elements fulfill requirements of switches with forced opening as per EN IEC 60947-5-1 2.17
The slow-make elements are optionally obtainable with the following switching functions: 1 NO or $2 \mathrm{NO}, 1 \mathrm{NC}$ or $2 \mathrm{NC}, 1 \mathrm{NO}+1 \mathrm{NC}$.

## Material

## Lens

Raised mounting Polymethylmethacrylat (PMMA), as per
UL 94 HB, flush mounting Polycarbonat (PC), as per UL 94 V0, or
Aluminium anodized

## Front bezel

Polyetherimid (PEI), as per UL 94 V0, or Aluminium anodized

## Front ring

Aluminium anodized
Material of contact
Silver or gold (specified for operation for low level switching)

## Switching element

Diallylphthalate (DAP), as per UL 94 V0 and Polyamide (PA 66), as per UL 94 V0
Actuator housing
Polyetherimide (PEI), as per UL 94 V0, self-extinguishing

## Mechanical characteristics

| Terminals |  |  |  |
| :---: | :---: | :---: | :---: |
| - Solder | rigid | flexible | superflexible |
| 1 wire | $0.5 \ldots 1.5 \mathrm{~mm}^{2}$ | $0.5 \ldots 0.75 \mathrm{~mm}^{2}$ | $0.5 \mathrm{~mm}^{2}$ |
| 2 wires | $0.75 \mathrm{~mm}^{2}$ | $0.5 \mathrm{~mm}^{2}$ |  |
| - Screw |  |  |  |
| 1 wire | $0.5 \ldots 1.5 \mathrm{~mm}^{2}$ | $0.5 \ldots 0.75 \mathrm{~mm}^{2}$ | $0.5 \mathrm{~mm}^{2}$ |
| 2 wires | $0.75 \mathrm{~mm}^{2}$ | $0.5 \mathrm{~mm}^{2}$ | $0.5 \mathrm{~mm}^{2}$ |
| Actuating torque |  |  |  |
| Selector-/ | ylock switch | $4 . .16 \mathrm{Ncm}$ |  |
| Actuating force |  |  |  |
| Pushbutton |  | $3.5 \ldots 11 \mathrm{~N}$ |  |
| Emergenc | top switch | max. 65 N |  |
| Actuating travel |  |  |  |
| Pushbutton |  | 3 mm |  |
| Emergency-stop switch |  | 10 mm |  |
| Selector-/ keylock switch |  | 2 positions | 3 positions |
| Momentary action |  | approx. $42^{\circ}$ | approx. $2 \times 42^{\circ}$ |
| Maintained action |  | approx. $90^{\circ}$ | approx. $2 \times 90^{\circ}$ |

## Rebound time

2 ms , contact making and contact breaking the rebound times apply to normal manual activation

## Mechanical lifetime

as per DIN IEC 60512-5-6 and EN IEC 60947-5-1

| Pushbutton maintained action | 1 million | cycles of operation |
| :--- | :--- | :--- |
| Pushbutton momentary action | 2 million | cycles of operation |
| Emergency-stop pushbutton | 6050 | cycles of operation |
| Keylock switch | 50000 | cycles of operation |
| Selector switch | 100000 | cycles of operation |

## Technical Data

## Electrical characteristics

## Standards

The devices comply with: EN IEC 61058-1 and EN IEC 60947-5-1, EN
IEC 60947-5-5 (Emergency-stop)

## Electrical life

$\geq 50000$ cycles of operation at $250 \mathrm{VAC}, 5 \mathrm{~A}, \cos \phi 0.95$, as per EN IEC 60947-5-1
Switching Element of Emergency-stop 6050 cycles of operation, as per EN IEC 60947-5-5
Electrostatic discharge
Keylock switch 11 kV

Electric strength
4000 VAC, 50 Hz , 1 min., as per DIN IEC 60512-2
between all terminals and earth

## Overvoltage category

III, as per EN IEC 60947-5-1

## Protection class

Class II, as per EN IEC 61058-1
Degree of pollution
3, as per EN IEC 60947-1

## Electrical characteristics for silver contacts

## Rated Operational Voltage Ue

250VAC/DC as per EN IEC 60947-1
Rated Insulation Voltage Ui
320VAC, as per EN IEC 60947-5-1
Rated Impulse Withstand Voltage Uimp
4 kV , as per EN IEC 60947-5-1

## Contact resistance

New state $\leq 50 \mathrm{~m} \Omega$, as per DIN IEC 60512-2-4, measured at 100 mA , 10V

## Conventional free air thermal current lth

5A, as per EN IEC 60947-5-1
the maximum current in continuous operation and at ambient
temperature must not exceed the quoted maximum values.

## Switch rating

Switch rating AC with silver contact and srew terminal, service
category AC-15, as per EN IEC 60947-5-1

| Voltage | 125 VAC | 250 VAC |
| :--- | :--- | :--- |
| Current | $3 A$ | $2 A$ |

Switch rating with silver contact and screw terminal, service category DC-13, as per EN IEC 60947-5-1
Voltage 250VDC
Current 0.2A

Recommended minimum operational data
20VAC/DC, 100 mA


## 61 Indicator

Flush, Round, Square, Rectangular


## 61 Illuminated Pushbutton

Raised, Round, Square, Rectangular


## 61 Illuminated Pushbutton

Flush, Round, Square, Rectangular

$\varnothing 25 \mathrm{~mm}$


Snap-action switching element
Slow-make switching element Soldering terminal

Slow-make switching element Screw terminal

## 61 Emergency-stop switch

ISO 1385, Twist release, Key release


## 61 Keylock switch

2 \& 3-Position, Raised, Round, Square, Rectangular



## 61 Selector switch

2 \& 3-Position, Raised, Round, Square, Rectangular

$\rightarrow 1 \quad$ max. 8


Snap-action switching element Soldering terminal

$\varnothing 18$ mm

low-make switching element Soldering terminal


Slow-make switching element
Screw terminal

## 61 Keylock switch

2 \& 3-Position, Flush, Round, Square, Rectangular


Snap-action switching element Soldering terminal

$\varnothing 25 \mathrm{~mm}$


Slow-make switching element Soldering terminal

$24 \times 24 \mathrm{~mm}$


Slow-make switching element Screw terminal

## 61 Cut-outs

Raised Indicators, Pushbuttons, Keylocks and Selectors


## 61 Cut-outs

Indicator Flush, Pushbutton Flush


61 Cut-outs, Emergency-Stop
ISO 13850, Twist release, Key release


