

149-200 To 149-213


**SCHURTER**


## Illuminated switches, pushbutton switches EMF for panel mounting

Standards and approvals  
SEV 1005, VDE 0630, SEMKO 124, CSA C22.2/14  
UL 508, CEE 24



EMF 18 x 24



EMF 18 x 18



EMF ø 18



1-pole



2-pole



3-pole



4-pole

### General description

**EMF** is a complete illuminated pushbutton switches programme for screw on panel mounting (mounting hole diameter 16 mm). The forms of lenses are available in the dimensions rectangular 18 x 24 mm, square 18 x 18 mm and round diameter 18 mm. The pushbutton switches are equipped with snap action element and 1-4 contact blocks.

Each contact block can be used as N C or N O or change-over contact (for change-over contact ext. connection between terminals 2 and 4).

### Contacts in one section must be same polarity.

EMF illuminated pushbutton switches can be fitted with contactless elements on request.

Separation of the individual switching elements by contactless units permits high and low voltages to be applied to the same pushbutton switch. The 4 tin-plated terminals of each block are absolutely flux-proof.

The lense of EMF are available in 11 different colours and can be illuminated by Midget-Groove T 1 1/4 incandescent lamps or LED. The switching positions of the alternate version of the pushbutton switches is always indicated by the position of lens.

**By use of neon lamps with external resistor ≤ 250 V~, please consider relevant standards and approvals.**

### Approvals

SEV-Approval  
VDE-Certificate  
SEMKO-Approval

Nr 87 660112 01  
Nr 1827  
Nr 8647105

UL-Recognition No E 73407  
CSA-Certification No 47016

### Technical data

#### Switch system

each contact block has one double break, snap acting switching mechanism

#### Switch mode

momentary or alternate action, 1- to 4-pole

#### Contact material

silver for applications > 15 V and 20 mA

#### Operating travel

3,2 mm

#### Actuating force

> 1,5 N

#### Initial contact resistance (new)

< 10 mΩ test current 1 A AC according to IEC 341-1, test 1

#### Breaking capacity (at ohmic load)

250 V / 5 A AC,  
250 V / 0,2 A DC

#### Mechanical lifetime

> 2 x 10<sup>6</sup> operations

#### Electrical lifetime (at ohmic load)

5 A / 250 V AC  
4 A / 250 V AC  
2 A / 250 V AC  
1 A / 250 V AC

> 50'000 operations  
> 60'000 operations  
> 200'000 operations  
> 400'000 operations

#### Storage temperatur

-40 °C up to +85 °C

#### Operating temperatur

-40 °C up to +55 °C (with incandescent lamp)  
-40 °C up to +85 °C (without incandescent lamp)

#### Vibration resistance

IEC 68-2-6 test Fc, details on request

#### Insulation resistance

> 10<sup>4</sup> MΩ 500 V DC according to IEC 341-1

#### Test voltage

> 4'000 V, 50 Hz, 1 min. between metal plate and terminals

#### Protection class

suitable for mounting in equipments with protection class II/IEC 536

#### Degree of protection

IP40 IEC 529 (mounted from the front side)

#### Climate category

GVF with lamp, GPF without lamp according to DIN 40040

#### Terminals

Max. diameter of wire 2 x 0,8 mm  
Max. diameter of stranded cable 0,75 mm<sup>2</sup>

#### Solderability

350 °C, 2 s, IEC 68-2-20, test Ta, method 2

#### Soldering heat resistance

350 °C, 10 s, IEC 68-2-20, test Tb, method 2

#### Materials

temperature resistant thermoplastic, contact housing moulded in electrical high-grade thermosetting plastic  
current-carrying parts, Cu-alloy

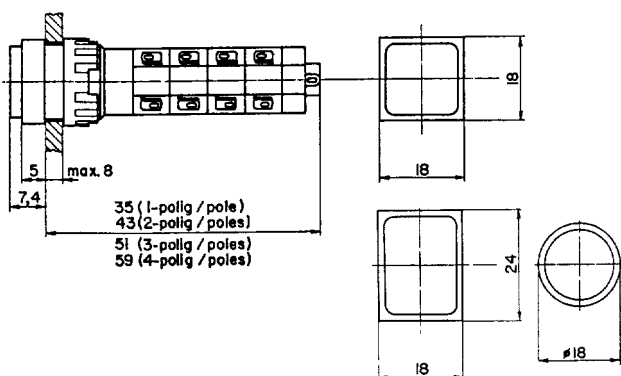
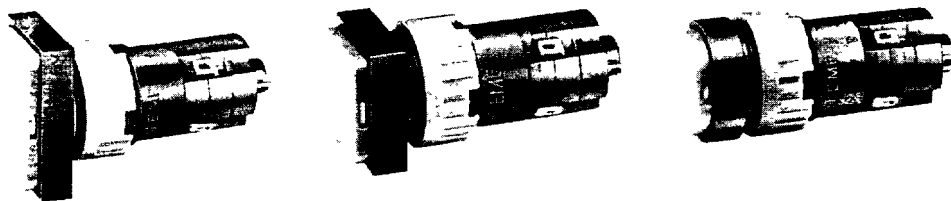
149-200 F 213



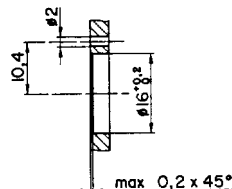
**Illuminated switches  
pushbutton switches EMF**

Case colour black

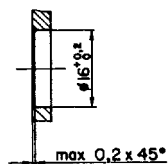
Standards and approvals  
SEV 1005, VDE 0630, SEMKO 124, CSA C22.2/14  
UL 508, CEE 24



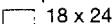
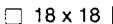
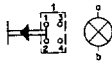
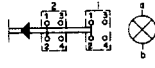
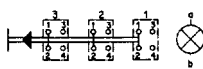
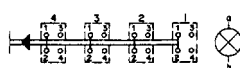
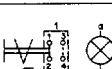
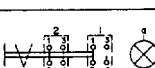
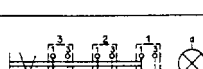
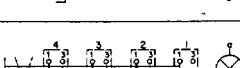
panel cutout



panel cutout



Order No. for EMF without lenses, lamps etc., accessories see page 40-42

| Description                                        | Type | Type | Contact diagram (button not depressed) for change-over contact ext connections between 2 and 4 | Length A [mm] | Order No<br>Shape of case                                                                     |                                                                                               |                                                                                            |
|----------------------------------------------------|------|------|------------------------------------------------------------------------------------------------|---------------|-----------------------------------------------------------------------------------------------|-----------------------------------------------------------------------------------------------|--------------------------------------------------------------------------------------------|
|                                                    |      |      |                                                                                                |               |  18 x 24 |  18 x 18 |  ø 18 |
| Illuminated pushbutton<br>1-pole, momentary action | 1    |      |             | 35            | 0041 2301                                                                                     | 0041 2311                                                                                     | 0041.2321                                                                                  |
| Illuminated pushbutton<br>2-pole, momentary action | 2    |      |             | 43            | 0041 2302                                                                                     | 0041 2312                                                                                     | 0041 2322                                                                                  |
| Illuminated pushbutton<br>3-pole, momentary action | 3    |      |             | 51            | 0041 2303                                                                                     | 0041 2313                                                                                     | 0041.2323                                                                                  |
| Illuminated pushbutton<br>4-pole, momentary action | 4    |      |             | 59            | 0041 2304                                                                                     | 0041.2314                                                                                     | 0041 2324                                                                                  |
| Illuminated pushbutton<br>1-pole, alternate action |      | 1    |             | 35            | 0041 2351                                                                                     | 0041.2361                                                                                     | 0041 2371                                                                                  |
| Illuminated pushbutton<br>2-pole, alternate action |      | 2    |             | 43            | 0041.2352                                                                                     | 0041 2362                                                                                     | 0041 2372                                                                                  |
| Illuminated pushbutton<br>3-pole, alternate action |      | 3    |             | 51            | 0041 2353                                                                                     | 0041 2363                                                                                     | 0041 2373                                                                                  |
| Illuminated pushbutton<br>4-pole, alternate action |      | 4    |             | 59            | 0041 2354                                                                                     | 0041 2364                                                                                     | 0041 2374                                                                                  |

Contacts in one section must be same polarity

Suitable holders AF for signal lamps see page 66

Availability: ex warehouse or prompt delivery



## Accessories EMF

Lenses / plate inserts



| Colours | 18 x 24 | 18 x 18 | ø 18 |
|---------|---------|---------|------|
|---------|---------|---------|------|

|                 |           |           |           |
|-----------------|-----------|-----------|-----------|
| clear glass     | 0854 0581 | 0854 0601 | 0854 0621 |
| clear red       | 0854 0582 | 0854 0602 | 0854 0622 |
| clear green     | 0854 0583 | 0854 0603 | 0854 0623 |
| clear yellow    | 0854 0584 | 0854 0604 | 0854 0624 |
| clear blue      | 0854 0585 | 0854 0605 | 0854 0625 |
| pearl           | 0854 0591 | 0854 0611 | 0854 0631 |
| diffused red    | 0854 0592 | 0854 0612 | 0854 0632 |
| diffused green  | 0854 0593 | 0854 0613 | 0854 0633 |
| diffused yellow | 0854 0594 | 0854 0614 | 0854 0634 |
| diffused blue • | 0854 0595 | 0854 0615 | 0854 0635 |
| black •         | 0854 0596 | 0854 0616 | 0854 0636 |

• not recommended for illuminated switches

### Order No. legend plate inserts

|  | 18 x 24   | 18 x 18   | ø 18      |
|--|-----------|-----------|-----------|
|  | 0854 0871 | 0854 0872 | 0854.0873 |
|  | 0854 1402 | 0854.1602 | 0854 1802 |
|  | 0854 1403 | 0854 1603 | 0854.1803 |
|  | 0854 1404 | 0854.1604 | 0854 1804 |
|  | 0854.1405 | 0854 1605 | 0854 1805 |
|  | 0854 1406 | 0854 1606 | 0854.1806 |
|  | 0854.1407 | 0854 1607 | 0854.1807 |
|  | 0854 1408 | 0854 1608 | 0854 1808 |
|  | 0854 1409 | 0854.1609 | 0854.1809 |
|  | 0854 1410 | 0854.1610 | 0854 1810 |
|  | 0854 1411 | 0854 1611 | 0854 1811 |
|  | 0854.1412 | 0854 1612 | 0854 1812 |
|  | 0854 1413 | 0854 1613 | 0854 1813 |

|  | 18 x 24   | 18 x 18   | ø 18      |
|--|-----------|-----------|-----------|
|  | 0854 1414 | 0854 1614 | 0854 1814 |
|  | 0854 1415 | 0854 1615 | 0854 1815 |
|  | 0854 1416 | 0854.1616 | 0854.1816 |
|  | 0854.1417 | 0854.1617 | 0854.1817 |
|  | 0854 1418 | 0854.1618 | 0854.1818 |
|  | 0854 1419 | 0854.1619 | 0854 1819 |
|  | 0854.1420 | 0854.1620 | 0854.1820 |
|  | 0854 1421 | 0854.1621 | 0854 1821 |
|  | 0854.1422 | 0854.1622 | 0854 1822 |
|  | 0854.1423 | 0854 1623 | 0854.1823 |

The white / translucent legend plate with black inscriptions use only with clear glass lenses.

Other legends on plate inserts available on request.  
Availability: ex warehouse or prompt delivery



## Accessories EMF

Incandescent lamps

LED's

Mounting tools

### Incandescent lamp T 1<sup>3</sup>/<sub>4</sub> Midget Groove



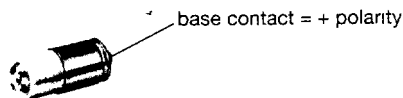
Order No.

|           | voltage | consumption | brightness | lifetime<br>AC | DC       |
|-----------|---------|-------------|------------|----------------|----------|
| 0913 4001 | 6.3 V   | 200 mA      | 40 MSCP    | 50'000 h       | 25'000 h |
| 0913 4002 | 14 V    | 80 mA       | 20 MSCP    | 15'000 h       | 7'000 h  |
| 0913 4003 | 28 V    | 40 mA       | 20 MSCP    | 10'000 h       | 5'000 h  |
| 0913 4004 | 48 V    | 25 mA       | 20 MSCP    | 5'000 h        | 2'000 h  |
| 0913 4005 | 60 V    | 20 mA       | 30 MSCP    | 1'000 h        | 1'000 h  |
| 0913.4006 | 24 V    | 50 mA       | 18 MSCP    | 10'000 h       | 5'000 h  |

The use of incandescent lamps > 60 V is limited by different standards

Series resistors for incandescent lamps and capacitors for the reduction of lamp voltage available on request. The permission for other ratings must be clarified according to the international testing laboratories. Incandescent lamps with lower power consumption on request

### LED T 1<sup>3</sup>/<sub>4</sub> Midget Groove



Order No.

|                  | Operating<br>voltage<br>U <sub>B</sub><br>[V] | Reverse<br>voltage<br>U <sub>R</sub><br>[V] | Operating<br>current<br>I <sub>F</sub><br>[mA] | Operating<br>temperat<br>°C | Storage<br>temperat.<br>°C | Power<br>dissipation<br>P <sub>tot</sub><br>[mW] | Peak wave<br>length<br>λ <sub>peak</sub><br>[nm] | Reverse<br>current<br>I <sub>R</sub><br>[μA] | Lumin<br>intensity<br>I <sub>V</sub><br>[mcd] |
|------------------|-----------------------------------------------|---------------------------------------------|------------------------------------------------|-----------------------------|----------------------------|--------------------------------------------------|--------------------------------------------------|----------------------------------------------|-----------------------------------------------|
| 0925 0104 red    | 6                                             | 8                                           | 30                                             | -25 °C<br>up to<br>+70 °C   | -25 °C<br>up to<br>+85 °C  | 250                                              | 700                                              | 100                                          | 7                                             |
| 0925 0105 green  | 6                                             | 8                                           | 30                                             |                             |                            | 250                                              | 555                                              | 100                                          | 30                                            |
| 0925 0106 yellow | 6                                             | 8                                           | 30                                             |                             |                            | 250                                              | 570                                              | 100                                          | 22                                            |
| 0925 0107 red    | 12                                            | 16                                          | 15                                             |                             |                            | 250                                              | 700                                              | 100                                          | 7                                             |
| 0925 0108 green  | 12                                            | 16                                          | 15                                             |                             |                            | 250                                              | 555                                              | 100                                          | 30                                            |
| 0925 0109 yellow | 12                                            | 16                                          | 15                                             |                             |                            | 250                                              | 570                                              | 100                                          | 22                                            |
| 0925 0110 red    | 28                                            | 16                                          | 10                                             |                             |                            | 300                                              | 700                                              | 100                                          | 7                                             |
| 0925.0111 green  | 28                                            | 16                                          | 10                                             |                             |                            | 300                                              | 555                                              | 100                                          | 30                                            |
| 0925.0112 yellow | 28                                            | 16                                          | 10                                             |                             |                            | 300                                              | 570                                              | 100                                          | 22                                            |

### Lamp extractor



Order No.

0853.0621

Availability: ex warehouse or prompt delivery

### Mounting key



Order No.

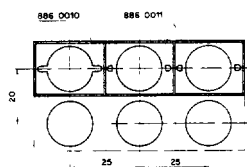
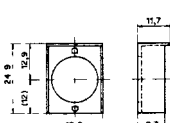
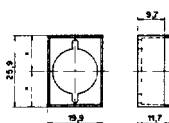
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## Accessories EMF

Protection shields

### Protection shield against inadvertent operation (thermoplastic)

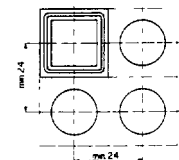
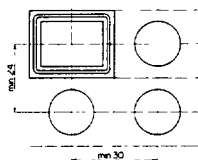
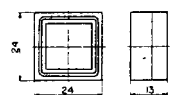
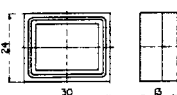
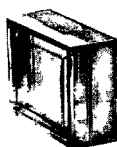


Order No.

0886.0010 single mounting

0886.0011 in-line mounting

### Splash guards IP64 (PVC)



Order No.

0886.0002

0886.0001

### Blanking plate black



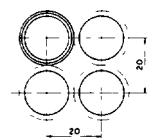
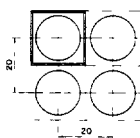
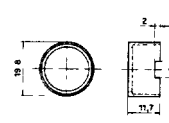
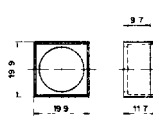
Order No.

0886.0005 (18 x 24)

0886.0006 (18 x 18)

Availability: ex warehouse or prompt delivery

### Protection shield against inadvertent operation

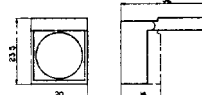
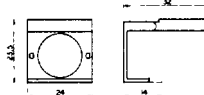


Order No.

0886.0012

0886.0013

### Protection cap (lockable with lead seal)



Order No.

0886.0004

0886.0003

### Blanking plate black



Order No.

0886.0007 (Ø 18)



## Signal-lamps AF for panel mounting

### Standards and approvals

SEV 1060, VDE 0710, SEMKO 103, UL 508, CSA C 22.2-14

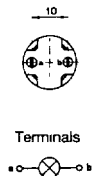
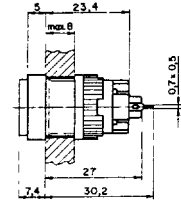
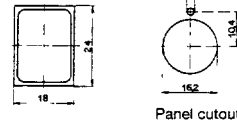
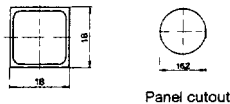
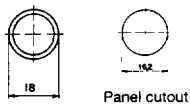
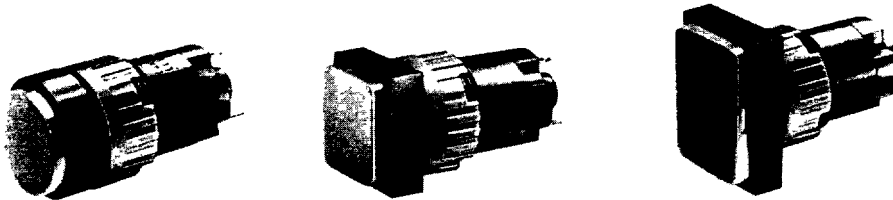


- Holders **AF** for interchangeable incandescent lamps and LED's (T1<sup>3/4</sup> Midget Groove)
- Available for voltages 6,3 V, 14 V, 28 V, 48 V and 60 V
- Technical data of incandescent and LED's see page 41

- Selector chart of technical data see page 48
- Case colour black
- Combination terminals for solder or PCB mounting
- Accessories for lamp holders have to be ordered separately, see page 40–42 (EMF)
- Approvals.

SEV-Approval  
VDE-Mark  
SEMKO-Approval  
UL-Recognition  
CSA-Certification

No 91 550698 01  
No. 42343  
No 8410021  
No E 73407  
No LR 47016



### Order No.

|           |         |           |              |
|-----------|---------|-----------|--------------|
| Socket AF | ø 18 mm | Socket AF | □ 18 x 18 mm |
| 0035 5521 |         | 0035.5511 |              |

### Order No.

|           |              |
|-----------|--------------|
| Socket AF | □ 18 x 24 mm |
| 0035 5501 |              |

Availability: ex warehouse or prompt delivery