# PCB Keyswitches


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# Examples for Applications

MICON 5

RF 15

RG 85 III System

RF 15 with RK 90 System

# Standards

## CE-Conformity

The products of the Chapter "PCB Keyswitches" can – relating to the CE-conformity according to the Low-Voltage Directive 73/23/EWG – be divided into the following groups:

**All products with an operating voltage $U_B > 50$ V**
F. ex. Short-Travel Main Switch KN 19, for this product the Low-Voltage Directive 73/23/EWG applies.

**All products with an operating voltage $U_B < 50$ V**
F. ex. MICON, RACON, RF 15, RS 76, for these components no directive applies.

**Single parts, accessories and illumination**
No directive applies for these products.

**EMC-Law**
The components of this catalogue are within the meaning of the law concerning the electromagnetic conformity (= EMC-Law) "basic components as, for ex., switches, signal lamps or like" and, therefore, do not fall within the scope of the EMC-Law.

**Declarations of Conformity**
Declarations of conformity for all concerned products are available and can be delivered upon request. Please always state the exact order reference of the respective product.

**Marking**
The marking will be corresponding to the Low-Voltage Directive 73/23/EWG resp. the Directive "CE-Marking 93/68/EWG" either on the packing or on the product itself or on the shipping documents.

## UL-approval

**for MICON 5, RACON 8/12, Short-Travel Keyswitches RF 15/19**

Data entry systems wich are built with Rafi short-travel switches according to our design proposals meet the requirements of the UL approvals for the American market.

UL file no. for KN 19: E 116362
UL file no. for data entry systems: E 202520

# MICON 5 - Short-travel keyswitches

## General Data

Short-travel switch range MICON 5, with sealed contact system, clear key click and extremely reliable switching.
Use under overlay or under keycaps RK 90. THT and SMT versions which can be mounted automatically.

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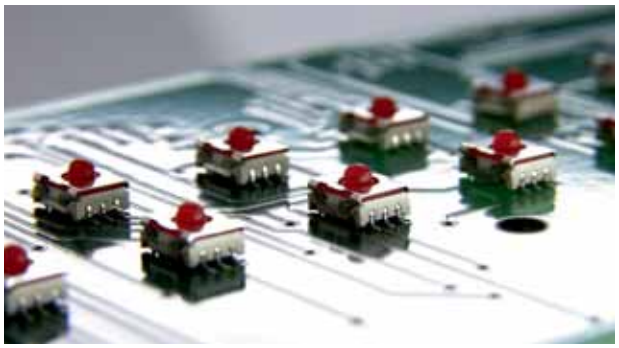
NEW

# MICON 5 - Short-travel keyswitches



## General Data

MICON 5 short-travel keyswitches offer an extremely high switching reliability while needing very little space.
They can be arranged as single keys, in rows or key blocks.
When arranged under an overlay, MICON keyswitches should be combined with plungers.

The features at a glance:
- Suitable for the most common soldering methods
  - Wave soldering bath for THT versions
  - Reflow soldering for SMT version
  - Vapour phase soldering for SMT versions
  - Manual soldering
- SMT version suitable for processing with an automatic SMT assembly machines
- IMDS listed

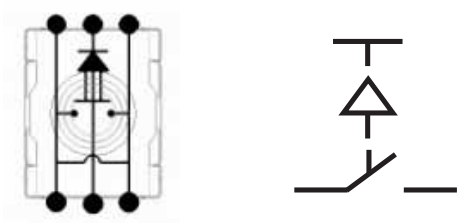
You can download actual product information from our internet site www.rafi.de / Catalogues and Downloads



## Technical Data

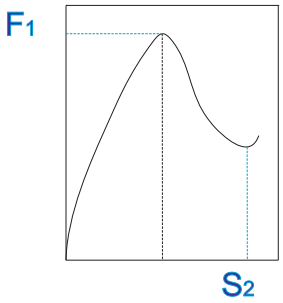
| | |
|---|---|
| **Dimensions** | |
| Length of housing | 6.4 mm |
| Width of housing | 5.1 mm |
| Overall height | see order block |
| **Mechanical design** | |
| Mounting | soldering |
| Terminals | see order block |
| Contact system | snap-action contact |
| Contact arrangement | 1 NO |
| Contact materials | Au |
| Illumination | no |
| **Mechanical characteristics** | |
| Operating force F1 (±20%) | see order block |
| Switching travel S2 (±0.15 mm) | see order block |
| **Electrical characteristics** | |
| Rated voltage min. | 0.02 V |
| Rated voltage max. | 35 V |
| Rated current min. | 0.01 mA |
| Rated current max. | 100 mA |
| Rated power max. (ohmic load) | 1 W |
| Contact resistance when new | 100 mΩ |
| Rated voltage restistance AC | 250 V |
| Insulation resistance | $10^9$ Ω |
| **Other specifications** | |
| Ambient temp. operating min. | -40 °C |
| Ambient temp. operating max. | +90 °C |
| Resistance to environment | IEC 60068-2 -14, -30,-33, -78 |
| Operating life (test force) | see order block |
| Solder heat resistance / Solderability | see order block |
| Flammability of materials | UL 94 V1 |
| Packing | see order block |
| Produkt code | see order block |

## MICON 5 Circuit Diagram

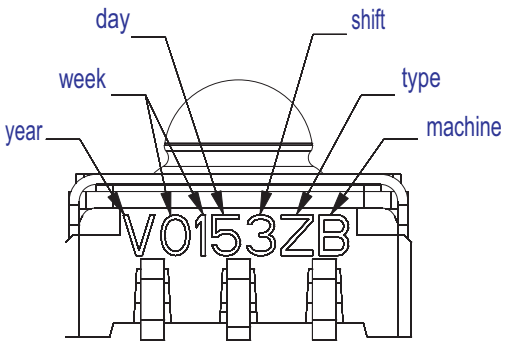


## MICON 5 Force-Travel Diagram

Operating force $F_1$: see order block
Switching travel $S_2$: see order block

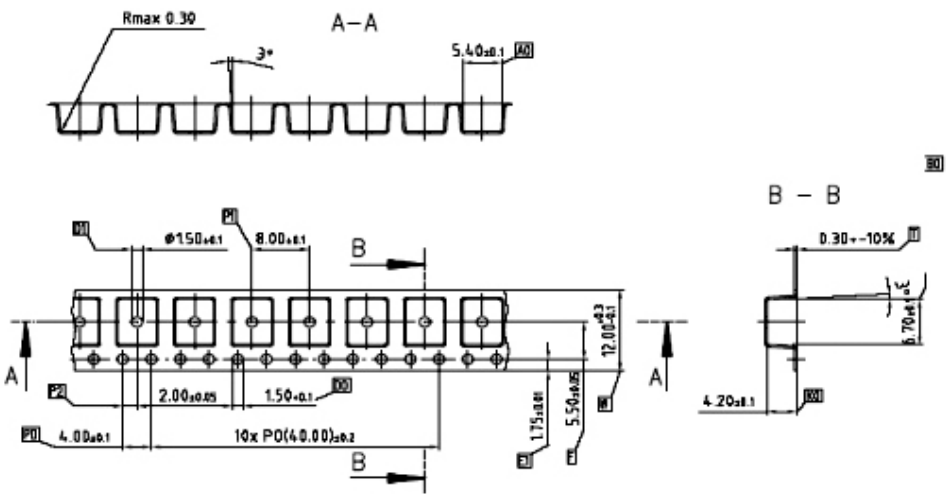



## MICON 5 Product Code acc. to DIN EN ISO 9001 (EN ISO 8402)



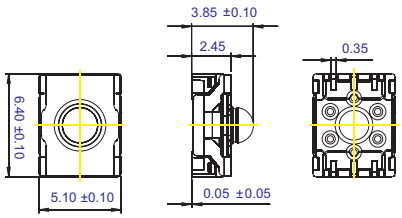

Traceability acc. to (EN ISO 8402) DIN EN ISO 9001, 2000, 7.5.3
A 7-digit code is printed on the housing of the keyswitch. This code informs about production date, production shift and type of product.

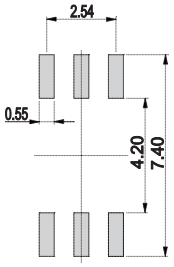
## MICON 5 SMT Version, Tape and Reel Drawing



NEW

## MICON 5 - Short-travel keyswitch, SMT Standard




| Terminals | Solder heat resistance / Solderability | Operating force F1 (±20%) | Switching travel S2 (±0,15 mm) | Operating life (test force) | Produkt code | Order no. |
|---|---|---|---|---|---|---|
| SMT | E DIN IEC 600 68-2-58 | 3.0 N | 0.7 mm | 1,000,000 (4 N) | X | **1.14.002.101/0000** |
| SMT | E DIN IEC 600 68-2-58 | 4.5 N | 0.8 mm | 250,000 (6 N) | Z | **1.14.002.001/0000** |
| SMT | E DIN IEC 600 68-2-58 | 5.5 N | 0.9 mm | 1,000,000 (8 N) | W | 1.14.002.111/0000 |
| SMT | E DIN IEC 600 68-2-58 | 8.0 N | 1.1 mm | 250,000 (12 N) | Y | 1.14.002.011/0000 |

Technical data see page 4 - 4

Packing: in tape, reel with 2100 pieces
Keycaps see RK 90

Mounting hints:
Special pipette (Siemens Siplace order no.: 348514-02), mounting with collect and place head
Recommendation for screen printing: 150 µm stencil with 10% reduction of the pad size.

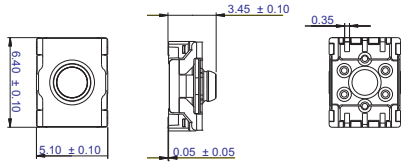


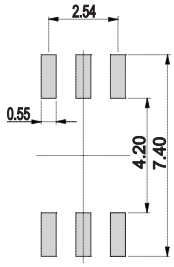


**Stock items** are marked by **bold printed order numbers.**

## MICON 5 - Short-travel keyswitch, SMT low

NEW



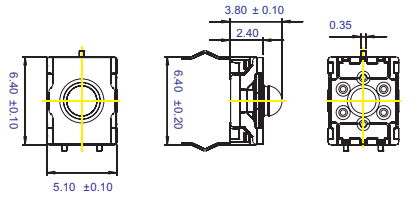

| Terminals | Solder heat resistance / Solderability | Operating force F1 (±20%) | Switching travel S2 (±0,15 mm) | Operating life (test force) | Produkt code | Order no. |
|---|---|---|---|---|---|---|
| SMT | E DIN IEC 600 68-2-58 | 3.0 N | 0.6 mm | 1,000,000 (4 N) | S | **1.14.002.103/0000** |
| SMT | E DIN IEC 600 68-2-58 | 4.5 N | 0.7 mm | 250,000 (6 N) | T | **1.14.002.003/0000** |
| SMT | E DIN IEC 600 68-2-58 | 5.5 N | 0.7 mm | 1,000,000 (8 N) | R | 1.14.002.113/0000 |

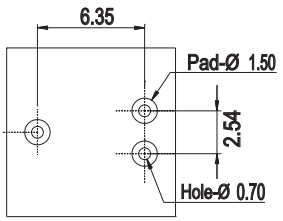
Technical data see page 4 - 4

Packing: in tape, reel with 2100 pieces
Keycaps see RK 90

Mounting hints:
Special pipette (Siemens Siplace order no.: 348514-02), mounting with collect and place head
Recommendation for screen printing: 150 µm stencil with 10% reduction of the pad size.

## MICON 5 - Short-travel keyswitch, THT Standard




| Terminals | Solder heat resistance / Solderability | Operating force F1 (±20%) | Switching travel S2 (±0,15 mm) | Operating life (test force) | Produkt code | Order no. |
|---|---|---|---|---|---|---|
| THT | E DIN IEC 600 68-2-20 | 3.0 N | 0.7 mm | 1,000,000 (4 N) | O | 1.14.002.106/0000 |
| THT | E DIN IEC 600 68-2-20 | 4.5 N | 0.8 mm | 250,000 (6 N) | Q | 1.14.002.006/0000 |
| THT | E DIN IEC 600 68-2-20 | 5.5 N | 0.9 mm | 1,000,000 (8 N) | N | 1.14.002.116/0000 |
| THT | E DIN IEC 600 68-2-20 | 8.0 N | 1.1 mm | 250,000 (12 N) | P | 1.14.002.016/0000 |

Technical data see page 4 - 4

Packing: in tubes with 102 pieces
Keycaps see RK 90

NEW

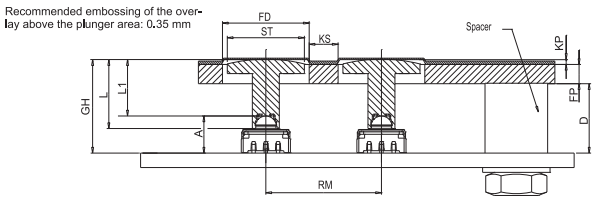




**Stock items** are marked by **bold printed order numbers.**

NEW

# MICON 5 - Plungers round, not illuminable




## General Data

A - Height of keyswitch: SMT type: 3.85 mm, THT type: 3.80 mm
D - Length of spacer D = GH - KP - FP
FD - Front panel cut-out FD = ST + 1 mm
FP - Front panel thickness
GH - Overall height: GH = A + L1 + 0.05 (SMT type), GH = A + L 1 (THT type)
KP - Thickness of overlay + embossing
KS - Glue webs for overlay, min. 3 mm
L1 - Length of plunger above keyswitch L1 = GH - A
L - Overall length of plunger L = L1 + 1.3 mm (min. 3 mm)
RM - Key grid RM = FD + KS
ST - Diameter of plunger
The plungers can only be combined with MICON 5 version Standard (red bubble).

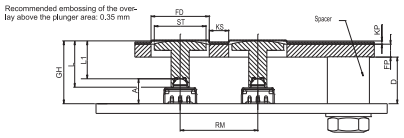
## Technical Data

**General information**

| | |
|---|---|
| Plunger diameter/size | see order block |
| Length of plunger L | see order block |

## MICON 5 - Plunger opaque, round, not illuminable

NEW




| Plunger diameter/size | Length of plunger L | Order no. |
|---|---|---|
| 6.0 mm | 3.00 mm | 5.46.001.103/0200 |
| 6.0 mm | 3.45 mm | 5.46.001.104/0200 |
| 6.0 mm | 3.95 mm | 5.46.001.105/0200 |
| 6.0 mm | 4.45 mm | 5.46.001.106/0200 |
| 6.0 mm | 7.15 mm | 5.46.001.107/0200 |
| 6.0 mm | 9.95 mm | 5.46.001.108/0200 |
| 8.0 mm | 3.00 mm | 5.46.001.123/0200 |
| 8.0 mm | 3.45 mm | 5.46.001.124/0200 |
| 8.0 mm | 3.95 mm | 5.46.001.125/0200 |
| 8.0 mm | 4.45 mm | 5.46.001.126/0200 |
| 8.0 mm | 5.50 mm | 5.46.001.121/0200 |
| 8.0 mm | 7.15 mm | 5.46.001.127/0200 |
| 8.0 mm | 9.95 mm | 5.46.001.128/0200 |
| 8.0 mm | 10.30 mm | 5.46.001.122/0200 |
| 11.5 mm | 3.00 mm | 5.46.001.143/0200 |
| 11.5 mm | 3.45 mm | 5.46.001.144/0200 |
| 11.5 mm | 3.95 mm | 5.46.001.145/0200 |
| 11.5 mm | 4.45 mm | 5.46.001.146/0200 |
| 11.5 mm | 5.50 mm | 5.46.001.141/0200 |
| 11.5 mm | 7.15 mm | 5.46.001.147/0200 |
| 11.5 mm | 9.95 mm | 5.46.001.148/0200 |
| 11.5 mm | 10.30 mm | 5.46.001.142/0200 |





**Stock items** are marked by **bold printed order numbers.**

| Plunger diameter/size | Length of plunger L | Order no. |
|---|---|---|
| 14.5 mm | 3.00 mm | 5.46.001.163/0200 |
| 14.5 mm | 3.45 mm | 5.46.001.164/0200 |
| 14.5 mm | 3.95 mm | 5.46.001.165/0200 |
| 14.5 mm | 4.45 mm | 5.46.001.166/0200 |
| 14.5 mm | 7.15 mm | 5.46.001.167/0200 |
| 14.5 mm | 9.95 mm | 5.46.001.168/0200 |
| 19.0 mm | 3.00 mm | 5.46.001.183/0200 |
| 19.0 mm | 3.45 mm | 5.46.001.184/0200 |
| 19.0 mm | 3.95 mm | 5.46.001.185/0200 |
| 19.0 mm | 4.45 mm | 5.46.001.186/0200 |
| 19.0 mm | 7.15 mm | 5.46.001.187/0200 |
| 19.0 mm | 9.95 mm | 5.46.001.188/0200 |

Technical data see page 4 - 8

Can only be combined with MICON 5 version Standard (red bubble)





**Stock items** are marked by **bold printed order numbers.**

# MICON 5: Just feel it.

**AUTOMOTIVE**

**INSTRUMENTATION-CONTROL-AUTOMATION**

**MEDICAL TECHNOLOGY**

**There is no miniature key-switch which has a better tactile and acoustic feedback than the new RAFI MICON 5 short-travel keyswitch.**

The little one shows its excellence under keycaps, membrane overlays or elastic seals. Outstanding tactile feedback and absolutely reliable switching behaviour in demanding applications, including hostile environments. MICON 5 – test it!

**For samples and information, please contact: info@rafi.de**

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D-88276 Berg/Ravensburg
Phone: +49 751 89-0, Fax: +49 751 89-13 00
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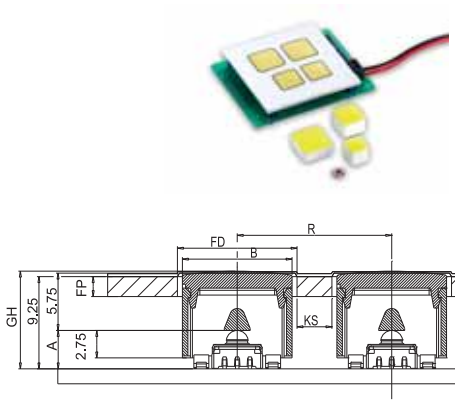
RAFI
SOLUTIONS WITH PASSION

NEW

# MICON 5 - Plungers square, illuminable






## General Data

**Description**
A - Height of keyswitch: SMT = 3.85 mm, THT = 3.80 mm
FP - Thickness of front plate
B - Width of plunger (11 x 11 mm, 14,5 x 14,5 mm or 18 x 18 mm)
FD - Front panel cut-out: B + 1 mm
KS - Glue strip min. 3 mm
R - Grid size: FD + KS
GH - Overall height: A + 5.75 mm
The plungers can only be combined with MICON 5 version Standard (red bubble).

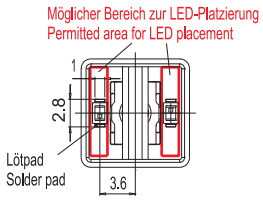
## Technical Data

**General information**

| | |
|---|---|
| Overall height GH | see order block |
| Colour of lens | see order block |

## MICON 5 - Plunger square, illuminable, 11 x 11 mm

NEW




Pic. with 2 LED OSRAM LO M676-Q1R1-24

| Overall height GH | Colour of lens | Order no. |
|---|---|---|
| 9.70 mm | red | 5.05.511.470/2300 |
| 9.70 mm | green | 5.05.511.470/2500 |
| 9.70 mm | yellow | 5.05.511.470/2400 |
| 9.70 mm | white | 5.05.511.470/2200 |
| 9.70 mm | blue | 5.05.511.470/2600 |
| 12.50 mm | red | 5.05.511.471/2300 |
| 12.50 mm | green | 5.05.511.471/2500 |
| 12.50 mm | yellow | 5.05.511.471/2400 |
| 12.50 mm | white | 5.05.511.471/2200 |
| 12.50 mm | blue | 5.05.511.471/2600 |
| 12.50 mm | opaque blue | 5.05.511.476/0600 |

Technical data see page 4 - 12

Can only be combined with MICON 5 version Standard (red bubble)

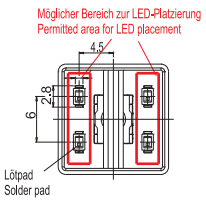




**Stock items** are marked by **bold printed order numbers.**

NEW

## MICON 5 - Plunger square, illuminable, 14.5 x 14.5 mm




Pic. with 4 LED OSRAM LO M676-Q1R1-24

| Overall height GH | Colour of lens | Order no. |
|---|---|---|
| 9.70 mm | red | 5.05.511.475/2300 |
| 9.70 mm | green | 5.05.511.475/2500 |
| 9.70 mm | yellow | 5.05.511.475/2400 |
| 9.70 mm | white | 5.05.511.475/2200 |
| 9.70 mm | blue | 5.05.511.475/2600 |
| 12.50 mm | red | 5.05.511.476/2300 |
| 12.50 mm | green | 5.05.511.476/2500 |
| 12.50 mm | yellow | 5.05.511.476/2400 |
| 12.50 mm | white | 5.05.511.476/2200 |
| 12.50 mm | blue | 5.05.511.476/2600 |

Technical data see page 4 - 12

Can only be combined with MICON 5 version Standard (red bubble)

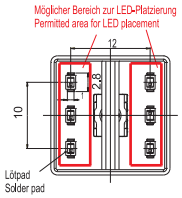




**Stock items** are marked by **bold printed order numbers.**

## MICON 5 - Plunger square, illuminable, 18 x 18 mm

NEW




Pic. with 6 LED OSRAM LO M676-Q1R1-24

| Overall height GH | Colour of lens | Order no. |
|---|---|---|
| 9.70 mm | red | 5.05.511.480/2300 |
| 9.70 mm | green | 5.05.511.480/2500 |
| 9.70 mm | yellow | 5.05.511.480/2400 |
| 9.70 mm | white | 5.05.511.480/2200 |
| 9.70 mm | blue | 5.05.511.480/2600 |
| 12.50 mm | red | 5.05.511.481/2300 |
| 12.50 mm | green | 5.05.511.481/2500 |
| 12.50 mm | yellow | 5.05.511.481/2400 |
| 12.50 mm | white | 5.05.511.481/2200 |
| 12.50 mm | blue | 5.05.511.481/2600 |

Technical data see page 4 - 12

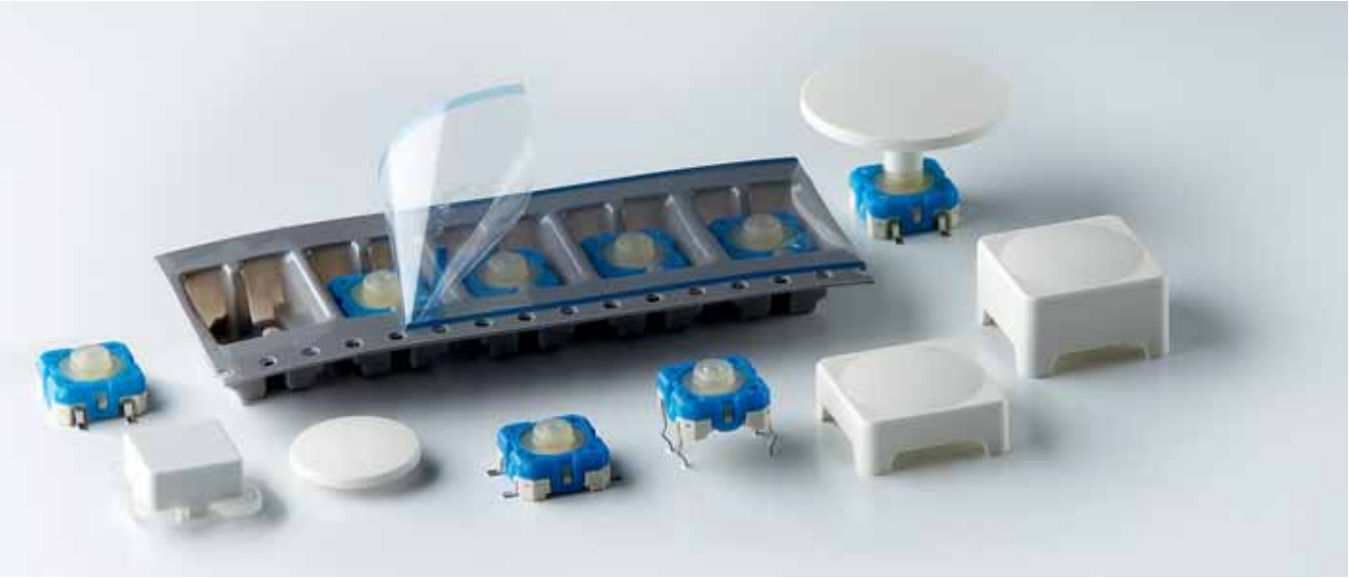
Can only be combined with MICON 5 version Standard (red bubble)





**Stock items** are marked by **bold printed order numbers.**

# RACON - Short-travel keyswitches



## General Data

RACON short-travel keyswitches with sealed contact system and distinct key click, excellent switching reliability.
For use under an overlay or with RK 90 keycaps. Print and SMD versions available (suitable for automatic assembly).

## Content


| | |
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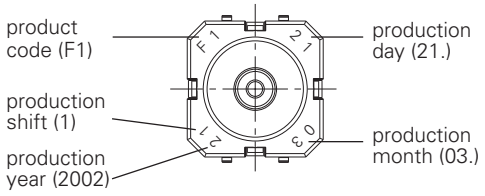
# RACON 8 - Short-travel keyswitch




## General Data

RACON 8 short-travel keyswitches offer an extremely high switching reliability while needing very little space. They can be arranged as single keys, in rows or key blocks.
When arranged under an overlay, RACON keyswitches should be combined with plungers.

The features at a glance:
- Suitable for the most common soldering methods
  - Wave soldering bath for THT versions
  - Reflow soldering for SMT version
  - Vapour phase soldering for SMT versions
  - Manual soldering
- SMT version suitable for processing with an automatic SMT assembly machine
- IMDS listed

You can download actual product information from our internet site www.rafi.de / Catalogues and Downloads

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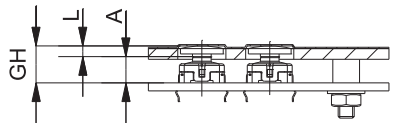
RACON

## Technical Data

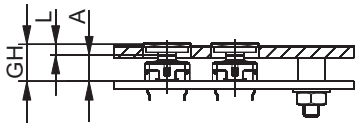
| | |
|---|---|
| **Dimensions** | |
| Length of housing | 8.4 mm |
| Width of housing | 8.4 mm |
| Height of housing | see order block |
| **Mechanical design** | |
| Mounting | soldering |
| Terminals | see order block |
| Contact system | snap-action contact |
| Contact arrangement | 1 NO |
| Contact materials | Au |
| Illumination | no |
| **Mechanical characteristics** | |
| Operating force | $3.3^{\pm 0.6}$ N |
| Switching travel | $0.34^{\pm 0.1}$ mm |
| **Electrical characteristics** | |
| Rated voltage min. | 0.02 V |
| Rated voltage max. | 35 V |
| Rated current min. | 0.01 mA |
| Rated current max. | 100 mA |
| Rated power max. (ohmic load) | 1 W |
| Contact resistance when new max. | 100 mΩ |
| Insulation resistance | $10^9$ Ω |
| **Other specifications** | |
| Ambient temp. operating min. | -40 °C |
| Ambient temp. operating max. | +90 °C |
| Resistance to environment | DIN EN 60068-2 -14, -30,-33 and -78 |
| Operating life | 1,000,000 |
| Solderability / Solder heat resistance | see order block |
| Flammability of materials | UL 94 HB |
| Packing | see order block |
| Produkt code | see order block |

## RACON 8, Typical System Assembly with Plunger under Overlay

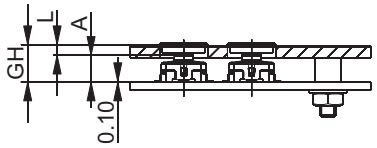
**THT terminal for PCB, outward**




**THT terminal for PCB, inward**



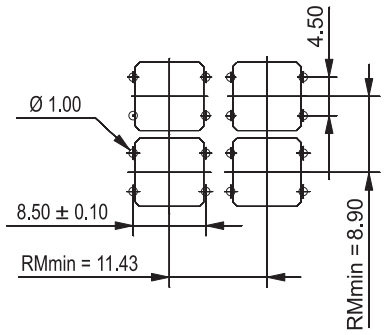

**SMT gullwing (Z) terminal**




| Variable | Declaration | THT terminal outward | THT terminal inward | SMT-terminal |
|---|---|---|---|---|
| A | Height of keyswitch | A = 4.90 +/- 0.1 mm | | |
| GH | Overall height | GH = A + L | | GH = A + L + 0.1 mm |
| L | Length of plunger | L = GH - A | | L = GH - A - 0.1 mm |

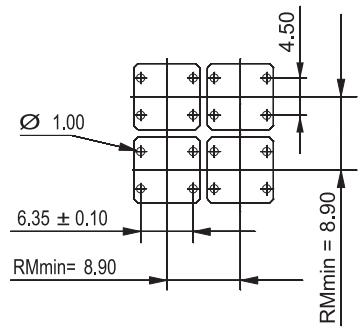
## RACON 8, PCB Hole Pattern, Smallest Grid

**THT terminal for PCB, outward**



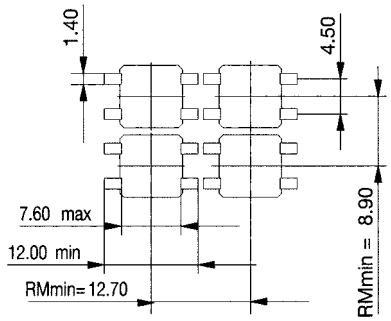

view on component side

**THT terminal for PCB, inward**



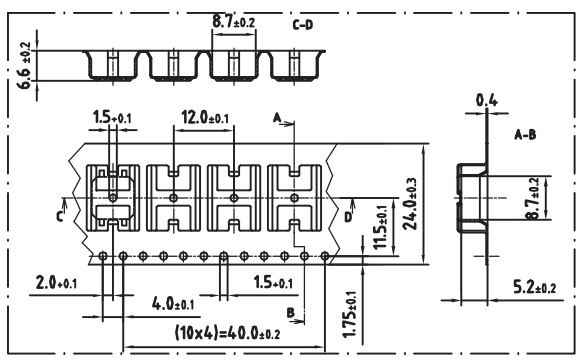

view on component side

**SMT gullwing (Z) terminal**

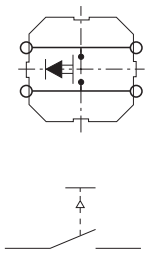



view on component side

## RACON 8, SMT Terminal, Tape and Reel Drawing

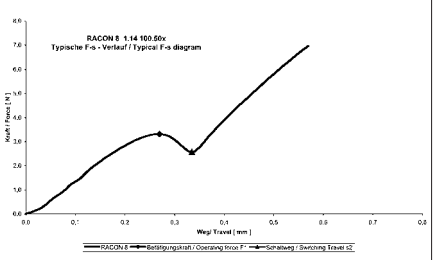



## Circuit Diagram RACON 8



Switching symbols acc. to IEC 617 form X (twice interrupting)

## Typical Force-Travel Diagram




4

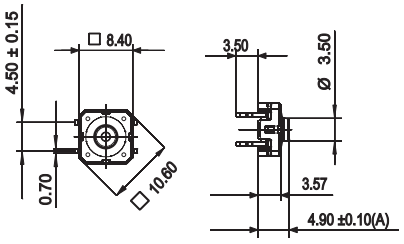
RACON

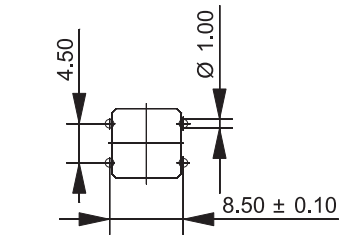
## Typical accessories RACON 8 - Short-travel keyswitch

| Description | Photo | Order no. | Additional accessories see page |
|---|---|---|---|
| Spacer, round, length 6.25 mm, red |  | **5.30.759.034/0000** | 2 - 231, 4 - 82, 5 - 30 |
| Plunger round |  | **5.46.167.311/0209** | 4 - 32 |
| RK 90 - Keycap body, for lenses 9 x 9 mm |  | 5.55.103.265/1013 | 4 - 93 |

For other plungers, refer to the chapter „RACON special accessories"; for keycaps, refer to the chapter „RK 90".

## RACON 8 - Short-travel keyswitch, THT outward



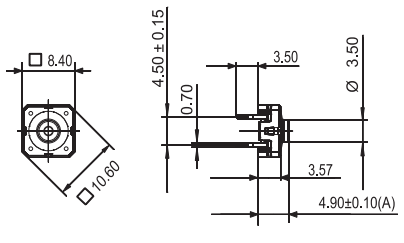

PCB footprint, view on component side

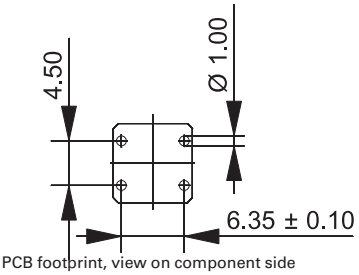
| Terminals | Operating force | Solderability / Solder heat resistance | Produkt code | Packing | Order no. |
|---|---|---|---|---|---|
| THT outward | 3.3±0.6 N | E DIN IEC 600 68-2-20 | A1 | tubes à 60 piece | **1.14.100.501/0000** |

Technical data see page 4 - 18

For keycaps refer to chapter „RK 90", plungers see „RACON special accessories".

## RACON 8 - Short-travel keyswitch, THT inward




PCB footprint, view on component side

| Terminals | Operating force | Solderability / Solder heat resistance | Produkt code | Packing | Order no. |
|---|---|---|---|---|---|
| THT inward | 3.3±0.6 N | E DIN IEC 600 68-2-20 | B1 | tubes à 60 piece | **1.14.100.502/0000** |

Technical data see page 4 - 18

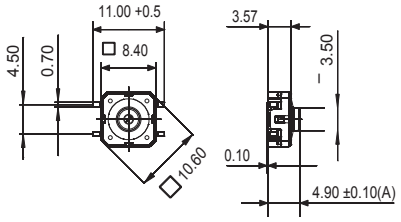
For keycaps refer to chapter „RK 90", plungers see „RACON special accessories".

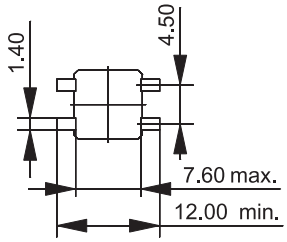




**Stock items** are marked by **bold printed order numbers.**

## RACON 8 - Short-travel keyswitch, SMT gullwing (Z) terminals




PCB footprint, view on component side

| Terminals | Operating force | Solderability / Solder heat resistance | Produkt code | Packing | Order no. |
|---|---|---|---|---|---|
| SMT Gullwing (Z) terminals | $3.3^{\pm 0.6}$ N | E DIN IEC 600 68-2-58 | C1 | tape and reel à 1000 pieces | **1.14.100.503/0000** |

Technical data see page 4 - 18

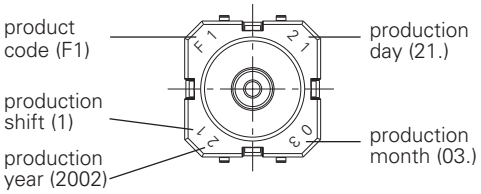
For keycaps refer to chapter „RK 90", plungers see „RACON special accessories".





**Stock items** are marked by **bold printed order numbers.**

# RACON 12 - Short-travel keyswitch




## General Data

RACON 12 short-travel keyswitches offer an extremely high switching reliability while needing very little space. They can be arranged as single keys, in rows or key blocks.
When arranged under an overlay, RACON keyswitches should be combined with plungers.

The features at a glance:
- Suitable for the most common soldering methods
  - Wave soldering bath for THT versions
  - Reflow soldering for SMT versions
  - Vapour phase soldering for SMT versions
  - Manual soldering
- SMT version suitable for processing with an automatic SMT assembly machine
- IMDS listed

4

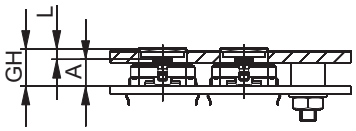
RACON

## Technical Data

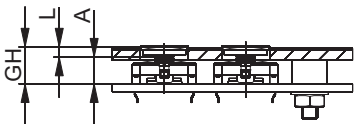
| | |
|---|---|
| **Dimensions** | |
| Length of housing | 12 mm |
| Width of housing | 12 mm |
| Overall height | see order block |
| **Mechanical design** | |
| Mounting | soldering |
| Terminals | see order block |
| Contact system | snap-action contact |
| Contact arrangement | 1 NO |
| Contact materials | Au |
| Illumination | no |
| **Mechanical characteristics** | |
| Operating force | see order block |
| Switching travel | see order block |
| **Electrical characteristics** | |
| Rated voltage min. | 0.02 V |
| Rated voltage max. | 35 V |
| Rated current min. | 0.01 mA |
| Rated current max. | 100 mA |
| Rated power max. (ohmic load) | 1 W |
| Contact resistance when new max. | 100 mΩ |
| Insulation resistance | $10^9$ Ω |
| **Other specifications** | |
| Ambient temp. operating min. | -40 °C |
| Ambient temp. operating max. | +90 °C |
| Resistance to environment | DIN EN 60068-2 -14, -30,-33 and -78 |
| Operating life | 1,000,000 |
| Solderability / Solder heat resistance | see order block |
| Flammability of materials | UL 94 HB |
| Packing | see order block |
| Produkt code | see order block |

## RACON 12, Typical System Assembly with Plunger under Overlay

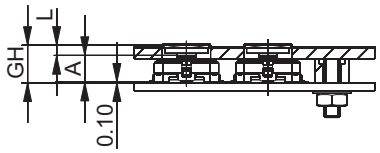
**THT terminal for PCB, outward**




**THT terminal for PCB, inward**



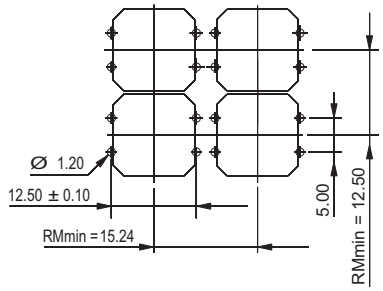

**SMT gullwing (Z) terminal**




| Variable | Declaration | THT terminal outward | THT terminal inward | SMT-terminal |
|---|---|---|---|---|
| A | Height of keyswitch | A = 4.95 +/- 0.1 mm | | |
| GH | Overall height | GH = A + L | | GH = A + L + 0.1 mm |
| L | Length of plunger | L = GH - A | | L = GH - A - 0.1 mm |

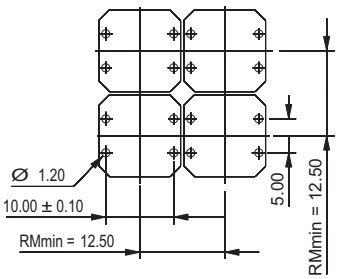
## RACON 12, PCB Hole Pattern, Smallest Grid

**THT terminal for PCB, outward**



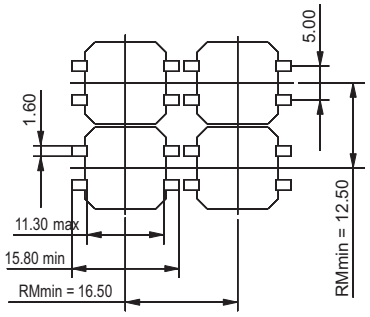

view on component side

**THT terminal for PCB, inward**



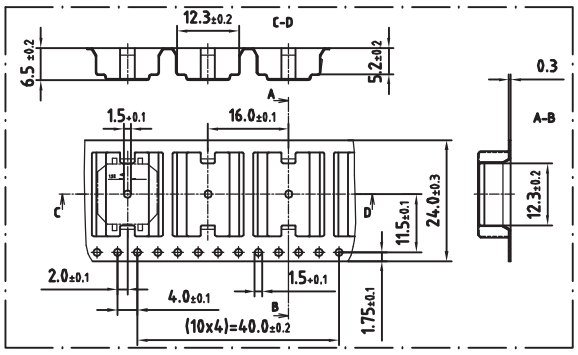

view on component side

**SMT gullwing (Z) terminal**

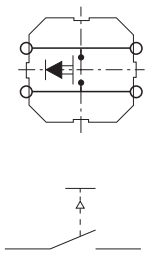



view on component side

## RACON 12, SMT Terminal, Tape and Reel Drawing

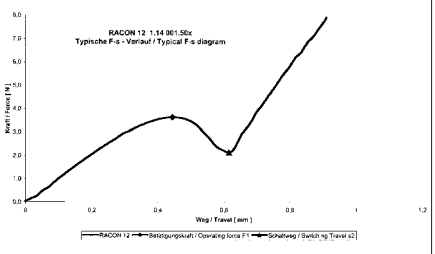



## Circuit Diagram RACON 12



Switching symbols acc. to IEC 617 form X (twice interrupting)

## Typical Force-Travel Diagram

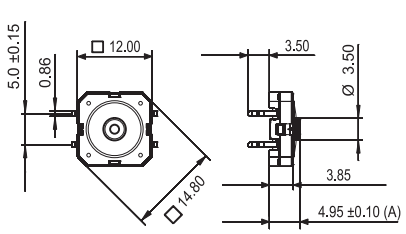


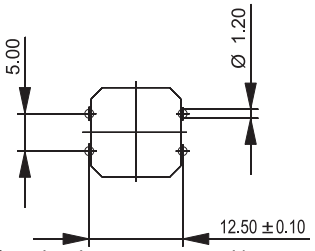
## Typical accessories RACON 12 - Short-travel keyswitch

| Description | Photo | Order no. | Additional accessories see page |
|---|---|---|---|
| Spacer, round, length 6.25 mm, red |  | **5.30.759.034/0000** | 2 - 231, 4 - 82, 5 - 30 |
| Square plunger for membrane data entry system |  | 5.46.001.057/0209 | 4 - 34 |
| Plunger round |  | 5.46.168.050/0209 | 4 - 33 |
| RK 90 - Keycap body, for lens 1 -module |  | 5.55.103.030/1013 | 4 - 95 |

For other plungers, refer to the chapter „RACON special accessories“; for keycaps, refer to the chapter „RK 90“.

## RACON 12 - Short-travel keyswitch solder terminals for PCB, outward




PCB footprint, view on component side

| Terminals | Operating force | Switching travel | Solderability / Solder heat resistance | Produkt code | Packing | Order no. |
|---|---|---|---|---|---|---|
| THT outward | $3.6^{\pm 0.7}$ N | $0.61^{\pm 0.1}$ mm | E DIN IEC 600 68-2-20 | A1 | tubes à 45 pieces | **1.14.001.501/0000** |

Technical data see page 4 - 22

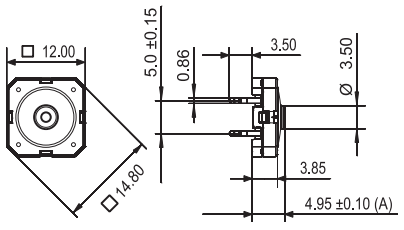
For keycaps refer to chapter „RK 90“, plungers see „RACON special accessories“.

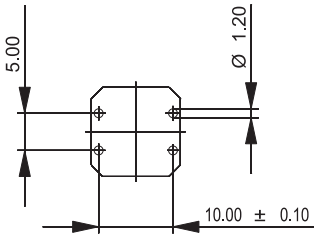




**Stock items** are marked by **bold printed order numbers.**

## RACON 12 - Short-travel keyswitch solder terminals for PCB, inward



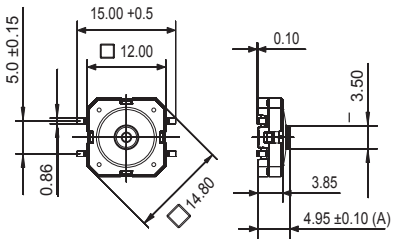

PCB footprint, view on component side

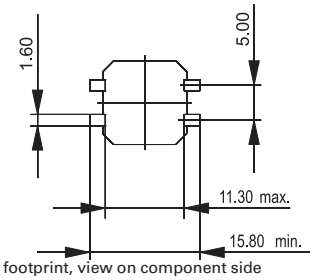
| Terminals | Operating force | Switching travel | Solderability / Solder heat resistance | Produkt code | Packing | Order no. |
|---|---|---|---|---|---|---|
| THT outward | $3.6^{\pm 0.7}$ N | $0.61^{\pm 0.1}$ mm | E DIN IEC 600 68-2-20 | B1 | tubes à 45 pieces | **1.14.001.502/0000** |

Technical data see page 4 - 22

For keycaps refer to chapter „RK 90", plungers see „RACON special accessories".

## RACON 12 - Short-travel keyswitch SMT gullwing (Z) terminals




PCB footprint, view on component side

| Terminals | Operating force | Switching travel | Solderability / Solder heat resistance | Produkt code | Packing | Order no. |
|---|---|---|---|---|---|---|
| SMT Gullwing (Z) | $3.6^{\pm 0.7}$ N | $0.61^{\pm 0.1}$ mm | E DIN IEC 600 68-2-58 | C1 | tape and reel à 750 pieces | **1.14.001.503/0000** |
| SMT Gullwing (Z) | $6.8^{\pm 1.6}$ N | $0.7^{\pm 0.1}$ mm | E DIN IEC 600 68-2-58 | ZD | tape and reel à 750 pieces | 1.14.001.916/0000 |
| SMT Gullwing (Z) | $9.7^{\pm 2.5}$ N | $0.73^{\pm 0.1}$ mm | E DIN IEC 600 68-2-58 | ZE | tape and reel à 750 pieces | 1.14.001.920/0000 |

Technical data see page 4 - 22

For keycaps refer to chapter „RK 90", plungers see „RACON special accessories".





**Stock items** are marked by **bold printed order numbers.**

# RACON 12 V - Short-travel keyswitch with vertical adapter

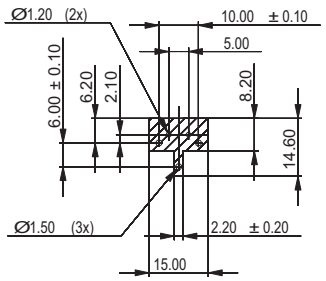
## General Data

The RACON 12 V version can be used, for example, for PC plug-in boards and for measurement and control engineering applications. The vertical mounting adapter (support element) absorbs the operating force so that the pressure on the soldered terminals is reduced. For this mounting arrangement, the keyswitch is provided with two horizontal terminals on one side.

## Technical Data

| | |
|---|---|
| **Dimensions** | |
| Length | 14.5 mm |
| Width | 13.6 mm |
| Overall height | 4.95 mm |
| **Mechanical design** | |
| Mounting | soldering |
| Terminals | THT |
| Contact system | snap-action contact |
| Contact arrangement | 1 NO |
| Contact materials | Au |
| Illumination | no |
| **Mechanical characteristics** | |
| Operating force | $3.6^{\pm 0.7}$ N |
| Switching travel | $0.61^{\pm 0.1}$ mm |
| **Electrical characteristics** | |
| Rated voltage min. | 0.02 V |
| Rated voltage max. | 35 V |
| Rated current min. | 0.01 mA |
| Rated current max. | 100 mA |
| Rated power max. (ohmic load) | 1 W |
| Contact resistance when new max. | 100 mΩ |
| Insulation resistance | $10^9$ Ω |
| **Other specifications** | |
| Ambient temp. operating min. | -40 °C |
| Ambient temp. operating max. | +80 °C |
| Storage temperature min. | -50 °C |
| Storage temperature max. (product) | +85 °C |
| Storage temperature max. (in tube) | +85 °C |
| Environmental restistance | acc. to IEC 60068-2 -14, -30, -33 and -78 |
| Operating life | 1,000,000 |
| Solderability / solder heat resistance | E DIN IEC 600 68-2-20 |
| Flammability of materials | UL 94 HB |
| Packing | in boxes à 100 pieces |
| Produkt code | F 1 |

## PCB footprint RACON 12V

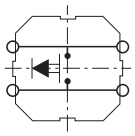



view on component side

Drilling hole diagramm
view on component side

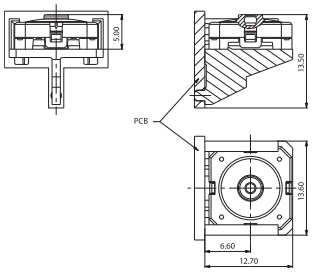
Hatched areas:
In this area no
components and
no conductor tracks

## Circuit Diagram RACON 12V



Switching symbols acc. to IEC 617 form X
(twice interrupting)

## RACON 12 V - Short-travel keyswitch with vertical adapter




| Terminals | Contact arrangement | Produkt code | Packing | Order no. |
|---|---|---|---|---|
| THT | 1 NO | F 1 | in boxes à 100 pieces | 1.14.001.505/0000 |

Technical data see page 4 - 26

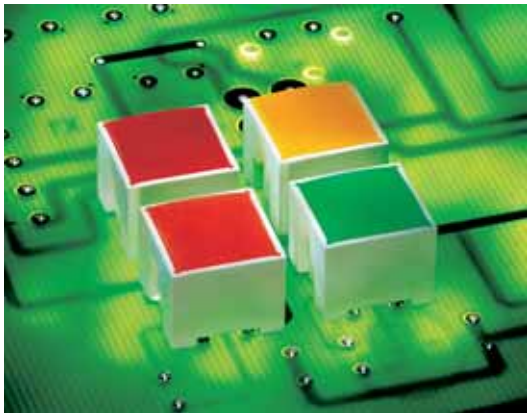
Plungers for overall height of 6.5 mm may not be used.





**Stock items** are marked
by **bold printed order numbers.**

# RACON 12 i - Short-travel keyswitch



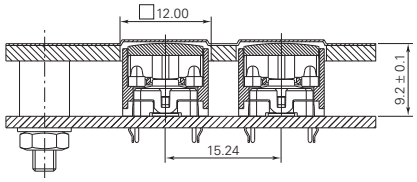
## General Data

**Application note**
Low-profile keyboards with RACON 12 i components should be designed with a grid spacing of 15.24 mm. With this grid, frame webs remain free between the individual keys. The overlay can be glued onto these frame webs; we recommend area embossing over the keys for the overlays. If our RK 90 system design is used, we recommend the 9 x 9 mm keycaps.

## Technical Data

| | |
|---|---|
| **General information** | |
| Colour of lens | see order block |
| Recommended key grid | 15.24 x 15.24 mm |
| Key grid min. | 12.5 x 12.5 mm |
| **Dimensions** | |
| Length | 11.35 mm |
| Width | 11.35 mm |
| Overall height | 9.7 mm |
| **Mechanical design** | |
| Mounting | soldering |
| Terminals | THT |
| Contact system | snap-action contact |
| Contact arrangement | 1 NO |
| Contact materials | Au |
| Illumination | fully illuminated<br>2 LED |
| LED colour | see order block |
| LED type | standard 2 mm |
| **Mechanical characteristics** | |
| Operating force | $3.3^{\pm 0.6}$ N |
| Switching travel | $0.34^{\pm 0.1}$ mm |
| **Electrical characteristics** | |
| Rated voltage min. | 0.02 V |
| Rated voltage max. | 35 V |
| Rated current min. | 0.01 mA |
| Rated current max. | 100 mA |
| Rated power max. (ohmic load) | 1 W |
| Contact resistance when new max. | 100 mΩ |
| Dielectric strength AC min. | 750 V |
| Insulation resistance | $10^9$ Ω |
| **Electrical characteristics of LED** | |
| LED rated current max. $I_F$ at 25 °C | red/green: 30, yellow: 50 mA |
| LED current reduction beginning with 50 degree C | red: 0.5 mA/degree C, yellow 0.8 mA/ degree C |
| LED wavelength typ. | red 639, green 510-535, yellow 590 |
| LED forward voltage $U_F$ at 20 mA | red: 1.8 V/20 mA, yellow: 1.9 V/20 mA |
| LED breakdown voltage $U_R$ at 25 °C | min. 5 V/0.1 mA |
| **Other specifications** | |
| Ambient temp. operating min. | -40 °C |
| Ambient temp. operating max. | +80 °C |
| Storage temperature min. | see order block |
| Storage temperature max. (product) | see order block |
| Storage temperature max. (intube) | see order block |
| Environmental restistance | acc. to IEC 60068-2 -14, -30, -33 and -78 |
| Operating life | 1,000,000 |
| Solderability / solder heat resistance | E DIN IEC 600 68-2-20 |
| Flammability of materials | UL 94 HB |
| Packing | tubes à 45 pieces |

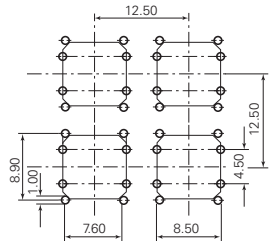
## RACON 12i typical system assembly




view on component side

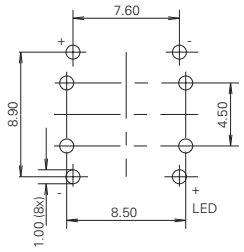
Explanation
Recommended area embossing 0.35 mm at glue spacer thickness of 0.15 mm

## RACON 12i smallest grid



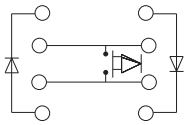

view on component side

## LED hole patterns

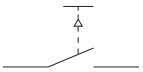



view on component side

## Circuit Diagram RACON 12i



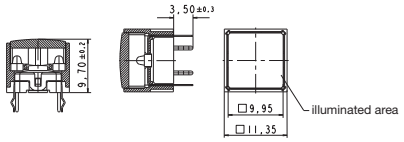
Switching symbols acc. to IEC 60 617 form (twice interrupting)



4

RACON

## RACON 12 i - Short-travel keyswitch




lens red

| Terminals | Contact arrangement | Illumination | Colour of lens | LED colour | Order no. |
|---|---|---|---|---|---|
| THT | 1 NO | fully illuminated 2 LED | red | red | 1.14.001.551/0000 |
| THT | 1 NO | fully illuminated 2 LED | green | green | 1.14.001.552/0000 |
| THT | 1 NO | fully illuminated 2 LED | yellow | yellow | 1.14.001.553/0000 |
| THT | 1 NO | fully illuminated 2 LED | orange | yellow | 1.14.001.554/0000 |

Technical data see page 4 - 28

If keycaps are used we recommend RK 90 keycaps 9 x 9 mm.





**Stock items** are marked by **bold printed order numbers.**

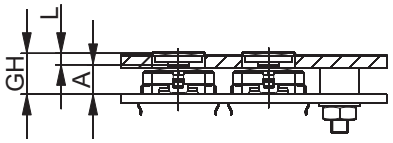
## RACON - Special accessories

Pict.: 8 mm

## General Data

GH = „L" lenth oh plunger + „A" height of keyswitch (+ 0.1 mm for SMT versions)
Front panel cut-out = size of plunger + 1 mm

## Plunger round




Pict.: 8 mm

| Plunger diameter/size | RACON version | Length of plunger L | Order no. |
|---|---|---|---|
| 8 mm | RACON 8 | 1,4 mm | **5.46.167.301/0209** |
| 8 mm | RACON 8 | 1.5 mm | 5.46.167.102/0209 |
| 8 mm | RACON 8 | 1.6 mm | 5.46.167.101/0209 |
| 8 mm | RACON 8/12 | 1,9 mm | **5.46.167.090/0209** |
| 8 mm | RACON 8/12 | 2 mm | 5.46.167.106/0209 |
| 8 mm | RACON 8/12 | 2.1 mm | 5.46.167.107/0209 |
| 8 mm | RACON 8/12 | 4,6 mm | **5.46.167.091/0209** |
| 8 mm | RACON 8/12 | 4.7 mm | **5.46.167.311/0209** |
| 8 mm | RACON 8/12 | 4.8 mm | **5.46.167.094/0209** |
| 8 mm | RACON 8/12 | 7,4 mm | **5.46.167.092/0209** |
| 8 mm | RACON 8/12 | 7.5 mm | 5.46.167.099/0209 |
| 8 mm | RACON 8/12 | 7.6 mm | 5.46.167.096/0209 |





**Stock items** are marked by **bold printed order numbers.**

| Plunger diameter/size | RACON version | Length of plunger L | Order no. |
|---|---|---|---|
| 11.5 mm | RACON 8 | 1,4 mm | **5.46.167.227/0209** |
| 11.5 mm | RACON 8 | 1.5 mm | **5.46.167.061/0209** |
| 11.5 mm | RACON 8 | 1.6 mm | 5.46.167.060/0209 |
| 11.5 mm | RACON 8/12 | 2 mm | 5.46.167.067/0209 |
| 11.5 mm | RACON 8/12 | 2.1 mm | 5.46.167.064/0209 |
| 11.5 mm | RACON 8/12 | 4,6 mm | **5.46.167.043/0209** |
| 11.5 mm | RACON 8/12 | 4.7 mm | 5.46.167.050/0209 |
| 11.5 mm | RACON 8/12 | 4.8 mm | 5.46.167.047/0209 |
| 11.5 mm | RACON 8/12 | 7.5 mm | 5.46.167.059/0209 |
| 11.5 mm | RACON 8/12 | 7.6 mm | 5.46.167.058/0209 |
| 14.5 mm | RACON 8 | 1,4 mm | **5.46.168.227/0209** |
| 14.5 mm | RACON 8 | 1.5 mm | **5.46.168.061/0209** |
| 14.5 mm | RACON 8 | 1.6 mm | 5.46.168.060/0209 |
| 14.5 mm | RACON 8/12 | 2 mm | 5.46.168.067/0209 |
| 14.5 mm | RACON 8/12 | 2.1 mm | 5.46.168.064/0209 |
| 14.5 mm | RACON 8/12 | 4,6 mm | **5.46.168.043/0209** |
| 14.5 mm | RACON 8/12 | 4.7 mm | 5.46.168.050/0209 |
| 14.5 mm | RACON 8/12 | 4.8 mm | 5.46.168.047/0209 |
| 14.5 mm | RACON 8/12 | 7,4 mm | **5.46.168.044/0209** |
| 14.5 mm | RACON 8/12 | 7.5 mm | 5.46.168.059/0209 |
| 14.5 mm | RACON 8/12 | 7.6 mm | 5.46.168.058/0209 |
| 19 mm | RACON 8 | 1.5 mm | **5.46.169.061/0209** |
| 19 mm | RACON 8 | 1.6 mm | **5.46.169.060/0209** |
| 19 mm | RACON 8/12 | 2 mm | **5.46.169.067/0209** |
| 19 mm | RACON 8/12 | 2.1 mm | **5.46.169.064/0209** |
| 19 mm | RACON 8/12 | 4.7 mm | 5.46.169.050/0209 |
| 19 mm | RACON 8/12 | 4.8 mm | 5.46.169.047/0209 |
| 19 mm | RACON 8/12 | 7.5 mm | **5.46.169.059/0209** |



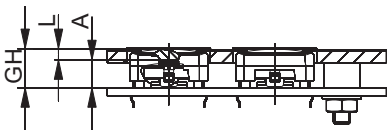


**Stock items** are marked by **bold printed order numbers.**

| Plunger diameter/size | RACON version | Length of plunger L | Order no. |
|---|---|---|---|
| 19 mm | RACON 8/12 | 7.6 mm | 5.46.169.058/0209 |

Front panel cut-out = Plunger diameter + 1 mm.

## Square plunger for membrane data entry system




| Plunger diameter/size | RACON version | Length of plunger L | Order no. |
|---|---|---|---|
| 14 x 14 mm | RACON 12THT | 2.1 mm | 5.46.001.064/0209 |
| 14 x 14 mm | RACON 12THT | 4.8 mm | 5.46.001.060/0209 |
| 14 x 14 mm | RACON 12THT | 7.6 mm | 5.46.001.063/0209 |
| 14 x 14 mm | RACON 12 SMT | 2 mm | 5.46.001.057/0209 |
| 14 x 14 mm | RACON 12 SMT | 4.7 mm | **5.46.001.058/0209** |
| 14 x 14 mm | RACON 12 SMT | 7.5 mm | 5.46.001.059/0209 |

Front panel cut-out = 15 x 15 mm.

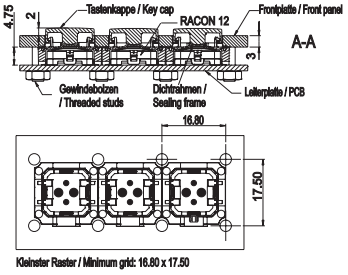


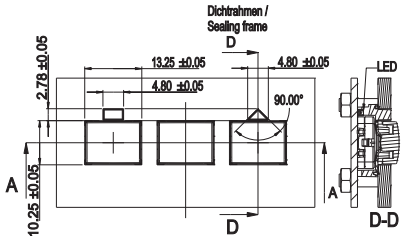


**Stock items** are marked by **bold printed order numbers.**

NEW

# RK 90 II, Key cap system for RACON 12 with individual sealing




## Technical Data

**General information**

| | |
|---|---|
| Thickness of front panel | 3.00 mm |
| Light conductor | see order block |
| Key grid | min. 16.8 x 17.5 mm |
| Degree of protection | IP 65 |

The key cap system RK 90 II has been developed especially fort he short-travel keyswitch RACON 12. The lenses are snapped onto the sealing frame and then set onto the RACON 12 keyswitches. The PCB presses this units against the front panel, so they are sealed.
Two versions of the sealing frames are provided with light conductors, either in square ore triangle form.
The lenses can be legended directly with laser. For bright letters (see picture) first white lenses are painted in dark, then the letters are cut out of the dark colour with laser.

## RK 90 II - Sealing frame

Sealing frame with square light conductor


with snapped-on lens

| Thickness of front panel | Light conductor | Order no. without lens | Note |
|---|---|---|---|
| 3.00 mm | square | 5.05.004.901/0000 | Please order lens separately. |
| 3.00 mm | triangular | 5.05.004.902/0000 | Please order lens separately. |
| 3.00 mm | - | 5.05.004.903/0000 | Please order lens separately. |

Technical data see page 4 - 36

**Lenses:**
Lens RK 90 II, white: 5.46.654.192/0200
Lens RK 90 II, red: 5.46.654.192/0300
Lens RK 90 II, green: 5.46.654.192/0500
Lens RK 90 II, blue: 5.46.654.192/0600
Lens RK 90 II, yellow: 5.46.654.192/0400
Lens RK 90 II, grey: 5.46.654.192/0700
Lens RK 90 II, iron grey (varnished): 5.46.654.192/6033
Lens RK 90 II, grey (varnished): 5.46.654.192/6032

Legended lenses on request.





**Stock items** are marked by **bold printed order numbers.**

# RF - Short-travel keyswitches

## General Data

RF 15 (15 x 15 mm) and RF 19 (19 x 19 mm) with distinct key click, for use under an overlay or with RK 90 keycaps.
Can be fully illuminated.

## Content


| | |
|---|---|
| **RF 15 - Short-travel keyswitch** | **4 - 42** |
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| RF 15 - Short-travel keyswitch, fully illuminated with 2 LED | 4 - 45 |
| RF 15 - Short-travel keyswitch, 1 LED spot-illumination | 4 - 46 |
| **RF 15 N - Short-travel keyswitch** | **4 - 48** |
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| **RF 15 - Signal indicator** | **4 - 62** |
| RF 15 - Signal indicator, fully illuminated, 1 LED | 4 - 64 |
| **RF 19 - Short-travel keyswitch** | **4 - 66** |
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| RF 19 - Short-travel keyswitch, 1 LED spot-illumination | 4 - 71 |
| **RF 19 H - Short-travel keyswitch** | **4 - 72** |
| RF 19 H - Keyswitch, non-illuminated | 4 - 74 |
| RF 19 H - Short-travel keyswitch, fully illuminated | 4 - 75 |
| **RF 19 - Signal indicator** | **4 - 76** |
| RF 19 - Signal indicator, ½ x 1-module | 4 - 78 |
| RF 19 - Signal indicator, ½ x 2-module | 4 - 78 |
| RF 19 - Signal indicator, 1 x 1-module | 4 - 79 |
| RF 19 - Signal indicator, 1 x 2-module | 4 - 79 |

**RF 15/19 - Special accessories** **4 - 80**
RF 15 N - Extension plunger, round head 4 - 80
RF 15 N - Extension plunger, round head, with recess for LED 4 - 81
RF 15 - Keycap, snap-on, for overall height 12.5 mm 4 - 81
Spacers, round 4 - 82
Spacers, triangular 4 - 83
RF 15 N - LED spacer 4 - 84

# Specifications LED

## 3 mm LED

| (valid for 25 °C) | Red LED | Green LED | Yellow LED |
|---|---|---|---|
| Max. forward current $I_F$: | 30 mA | 30 mA | 20 mA |
| Current reduction from: $T_0$ = 50 °C: | approx 0.5 mA/°C | approx 0.5 mA/°C | approx 0.2 mA/°C |
| Wavelength typ: | 635 nm | 565 nm | 586 nm |
| Forward voltage $U_F/I_F$ typ: | 2 V/10 mA | 2 V/10 mA | 2 V/10 mA |
| Reverse voltage $U_R/I_F$ typ: | 5 V/100 µA min. | 5 V/100 µA min. | 5 V/100 µA min. |
| Ambient temperature, operating: | - 20 °C . . . + 80 °C | - 20 °C . . . + 80 °C | - 20 °C . . . + 80 °C |
| | **Blue LED** | **White LED** | **Green LED superbright** |
| Max. forward current $I_F$: | 20 mA | 25 mA | 30 mA |
| Current reduction from: $T_0$ = 50 °C: | approx 0.6 mA/°C | - | - |
| Wavelength typ: | 470 nm | - | 510-545 nm |
| Forward voltage $U_F/I_F$ typ: | 2.7 V/10 mA | 3.6 V/20 mA | 3.5 V/20 mA |
| Reverse voltage $U_R/I_F$ typ: | 5V/100 µA min. | - | - |
| Ambient temperature, operating: | - 20 °C . . . + 80 °C | - 20 °C . . . + 80 °C | -30 °C . . . + 100 °C |

## 2 mm LED (full illumination of RF 15/19)

| (valid for 25 °C) | Red LED | Green LED | Yellow LED |
|---|---|---|---|
| Max. forward current $I_F$: | 30 mA | 30 mA | 50 mA |
| Current reduction from: $T_0$ = 50 °C: | 0.5 mA/°C | 0.5 mA/°C | 0.8 mA/°C |
| Light current $f_V/I_F$ typ: | - | - | 250 mlm/20 mA |
| Wavelength typ: | 637 nm | 569 nm | 590 nm |
| Forward voltage $U_F/I_F$ typ: | 1.8 V/20 mA | 2.1 V/10 mA | 1.9 V/20 mA |
| Reverse voltage $U_R/I_F$ typ: | 5 V/100 µA min. | 5 V/100 µA min. | 5 V/100 µA min. |
| Ambient temperature, operating: | - 55 °C . . . + 100 °C | - 40 °C . . . + 100 °C | -40 °C . . . + 100 °C |
| | **Blue LED** | **Multi-colour LED** | |
| Max. forward current $I_F$: | 30 mA | 30 mA | |
| Current reduction from: $T_0$ = 50 °C: | - | approx 0.6 mA/°C | |
| Light current $f_V/I_F$ typ: | - | - | |
| Wavelength typ: | 464-485 nm | 635/565 nm | |
| Forward voltage $U_F/I_F$ typ: | 3.6 V/20 mA | 2 V/10 mA | |
| Reverse voltage $U_R/I_F$ typ: | | - | |
| Ambient temperature, operating: | - 20 °C . . . + 80 °C | - 20 °C . . . + 80 °C | |

Calculating the series resistor:

$$R_V = \frac{U_B - U_F}{I_F}$$

Rated power of series:

$$P_V = I_F^2 \times R_V$$

Example for 5 Volt:

$$R_V = \frac{5V - 2{,}0\,V}{0{,}02\,A} = 150\ \Omega \text{ (= standard value)}$$

# RF 15 - Short-travel keyswitch

## General Data

Low-profile keyboards with RF 15 components should be designed with a 19.05 mm grid. With this grid, frame webs remain free between the individual keys. The overlay can be glued onto these frame webs; we recommend area embossing over the keys for the overlays.

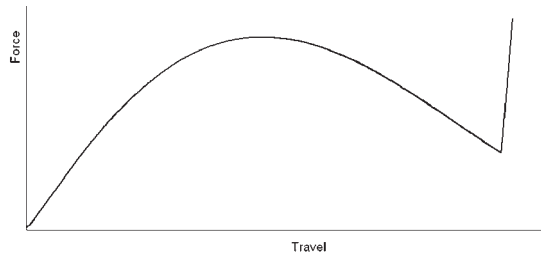
## Technical Data

| | |
|---|---|
| **General information** | |
| Colour of lens | see order block |
| Recommended key grid | 19.05 mm |
| **Dimensions** | |
| Length | 15 mm |
| Width | 15 mm |
| Overall height | 9.7 mm |
| **Mechanical design** | |
| Mounting | soldering in PCB |
| Terminals | THT |
| Contact system | snap-action contact |
| Contact arrangement | 1 NO |
| Contact materials | see order block |
| Illumination | see order block |
| LED colour | see order block |
| LED type | see order block |
| **Mechanical characteristics** | |
| Operating force max. | $2.9^{\pm 0.6}$ N |
| Switching travel | $0.5^{+0.2}$ mm |
| Robustness min. | with through-plated PCB 100 N |

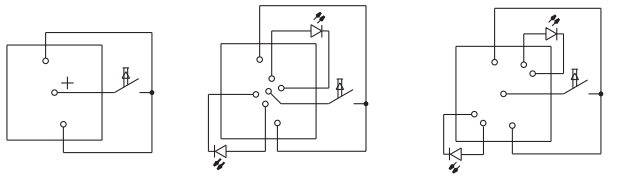
| | |
|---|---|
| **Electrical characteristics** | |
| Rated voltage min. | Au: 0.02 V, Ag: 3 V |
| Rated voltage max. | Au: 35 V, Ag: 50 V |
| Rated current min. | Au: 0.01 mA, Ag: 0.1 mA |
| Rated current max. | Au: 100 mA, Ag: 250 mA |
| Rated power max. (ohmic load) | Au: 2 W, Ag: 12.5 W |
| Contact resistance when new max. | 100 mΩ |
| Insulation resistance | $10^9$ Ω |
| **Other specifications** | |
| Ambient temp. operating min. | -25 °C |
| Ambient temp. operating max. | +70 °C |
| Environmental restistance | acc. to IEC 60068-2 -14, -30, -33 and -78 |
| Operating life min. (operations) | 1,000,000 |
| Solderability / solder heat resistance | according to E DIN IEC 600 28-2-20 |
| Wave soldering | 260 °C max. |
| Manual soldering | 350 °C / 5 sec. max. |

## Force/Travel Diagram – Keyswitch RF 15

**Operation characteristic limits RF**




## Circuit Diagram – Keyswitch RF 15

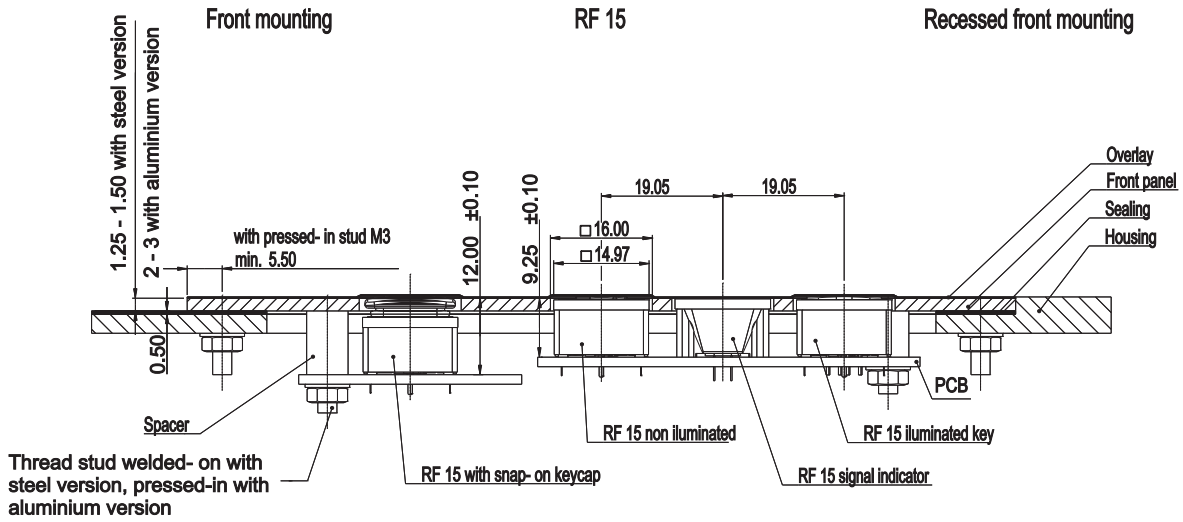


Keyswitch, non-illuminated

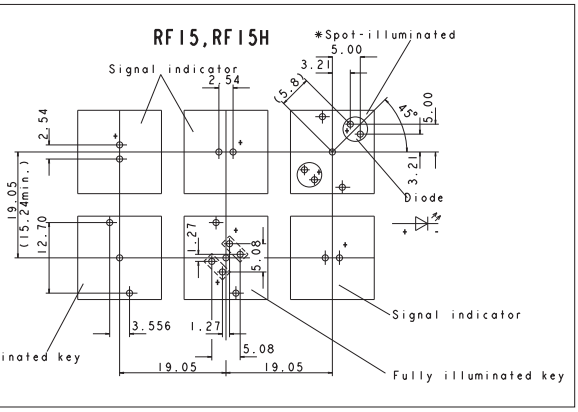
Keyswitch, fully illuminated

Keyswitch, spot-illuminated

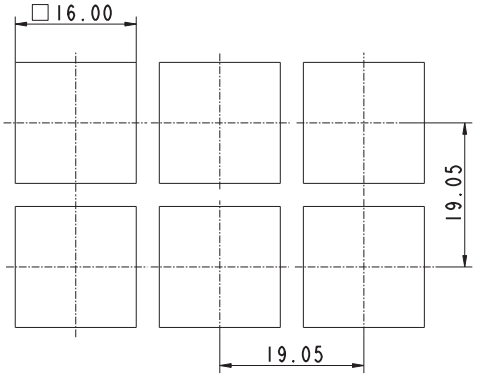
## Dimensional Drawing RF 15




## Hole Pattern RF 15

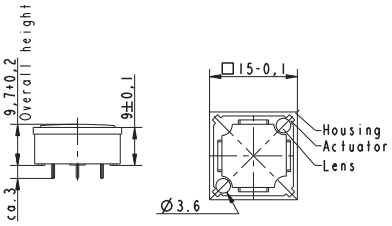



## Hole Pattern – Front Panel




View on component side, all hole diameters 1,1 $^{+/- 0,1}$ mm

## RF 15 - Short-travel keyswitch, non-illuminated




| Contact materials | Illumination | Colour of lens | LED colour | LED type | Order no. |
|---|---|---|---|---|---|
| Au | not illuminated | transparent | - | - | **3.14.100.001/0000** |
| Ag | not illuminated | transparent | - | - | **3.14.100.006/0000** |

Technical data see page 4 - 42

For keycaps, refer to chapter accessories and system RK 90.

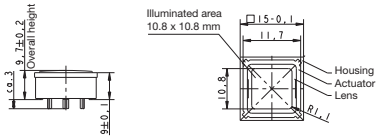
If exchangeable legends are required, or if an overall height of 12.5 mm is required, a keycap can be mounted on the non-illuminated keys. The keycap legend is visible through a window in the overlay. You can change the legend by replacing the keycap.





**Stock items** are marked by **bold printed order numbers.**

## RF 15 - Short-travel keyswitch, fully illuminated with 2 LED




Pict.: red

| Contact materials | Illumination | Colour of lens | LED colour | LED type | Order no. |
|---|---|---|---|---|---|
| Au | fully illuminated 2 LED | red | red | 2 mm | **3.14.200.011/0000** |
| Au | fully illuminated 2 LED | green | green | 2 mm | **3.14.200.012/0000** |
| Au | fully illuminated 2 LED | yellow | yellow | 2 mm | **3.14.200.013/0000** |
| Au | fully illuminated 2 LED | orange | yellow | 2 mm | 3.14.200.014/0000 |
| Au | fully illuminated 2 LED | blue | blue | 2 mm | 3.14.200.015/0000 |
| Ag | fully illuminated 2 LED | red | red | 2 mm | **3.14.200.021/0000** |
| Ag | fully illuminated 2 LED | green | green | 2 mm | **3.14.200.022/0000** |
| Ag | fully illuminated 2 LED | yellow | yellow | 2 mm | **3.14.200.023/0000** |
| Ag | fully illuminated 2 LED | orange | yellow | 2 mm | 3.14.200.024/0000 |
| Ag | fully illuminated 2 LED | blue | blue | 2 mm | 3.14.200.025/0000 |

Technical data see page 4 - 42

For keycaps, refer to RK 90 system design.

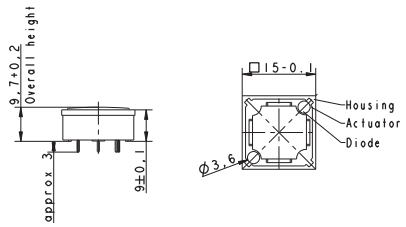
Technical data of LED see seperate page at the beginning of this chapter.





**Stock items** are marked by **bold printed order numbers.**

## RF 15 - Short-travel keyswitch, 1 LED spot-illumination




| Contact materials | Illumination | Colour of lens | LED colour | LED type | Order no. |
|---|---|---|---|---|---|
| Au | spot illumination 1 LED | opaque white | blue | 3 mm | 3.14.100.030/0000 |
| Au | spot illumination 1 LED | opaque white | red | 3 mm | **3.14.100.031/0000** |
| Au | spot illumination 1 LED | opaque white | green | 3 mm | **3.14.100.032/0000** |
| Au | spot illumination 1 LED | opaque white | yellow | 3 mm | **3.14.100.033/0000** |
| Ag | spot illumination 1 LED | opaque white | blue | 3 mm | 3.14.100.040/0000 |
| Ag | spot illumination 1 LED | opaque white | red | 3 mm | **3.14.100.041/0000** |
| Ag | spot illumination 1 LED | opaque white | green | 3 mm | **3.14.100.042/0000** |
| Ag | spot illumination 1 LED | opaque white | yellow | 3 mm | **3.14.100.043/0000** |

Technical data see page 4 - 42

Double-spot LED illumination available on request

Technical data of LED see seperate page at the beginning of this chapter.





**Stock items** are marked by **bold printed order numbers.**

# RF 15 N - Short-travel keyswitch

## General Data

The RF 15N keyswitch provides a minimum overall height of 6.2 mm. The overall height can be varied by extension plungers which are inserted into the cross-like notches on the actuator tops.
LEDs can only be arranged separately next to the keyswitches up to an overall height of 10 mm (i.e. without plunger or with small plunger).
Keyswitches with overall heights of 12 mm or more can be provided with a maximum of 2 LEDs which are inserted into the recesses of the keyswitch housing. LEDs of keyswitches with overall heights of 12.5 mm or more should be placed onto LED spacers in order to obtain satisfactory illumination.

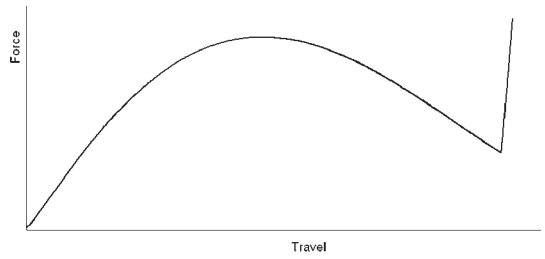
## Technical Data

| | |
|---|---|
| **General information** | |
| Colour of lens | see order block |
| Recommended key grid | 19.05 mm |
| **Dimensions** | |
| Length | 15 mm |
| Width | 15 mm |
| Overall height | 6.2 mm |
| **Mechanical design** | |
| Mounting | soldering in PCB |
| Terminals | THT |
| Contact system | snap-action contact |
| Contact arrangement | 1 NO |
| Contact materials | see order block |
| Illumination | external 3 mm LED possible if height more than 12 mm |
| **Mechanical characteristics** | |
| Operating force max. | $2.9^{\pm 0.6}$ N |
| Switching travel | $0.5^{+0.2}$ mm |
| Robustness min. | 100 with through-plated PCB N |

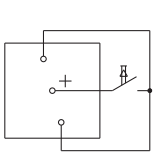
| | |
|---|---|
| **Electrical characteristics** | |
| Rated voltage min. | Au: 0.02 V, Ag: 3 V |
| Rated voltage max. | Au: 35 V, Ag: 50 V |
| Rated current min. | Au: 0.01 mA, Ag: 0.1 mA |
| Rated current max. | Au: 100 mA, Ag: 250 mA |
| Rated power max. (ohmic load) | Au: 2 W, Ag: 12.5 W |
| Contact resistance when new max. | 100 mΩ |
| Insulation resistance | $10^9$ Ω |
| **Other specifications** | |
| Ambient temp. operating min. | -25 °C |
| Ambient temp. operating max. | +70 °C |
| Storage temperature max. (in tube) | +50 °C |
| Environmental restistance | acc. to IEC 60068-2 -14, -30, -33 and -78 |
| Operating life min. (operations) | 1,000,000 |
| Solderability / solder heat resistance | according to E DIN IEC 600 28-2-20 |
| Wave soldering | 260 °C max. |
| Manual soldering | 350 °C / 5 sec. max. |

## Force/Travel Diagram – Keyswitch RF 15 N

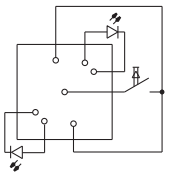
**Operation characteristic limits RF**




## Circuit Diagram – Keyswitch RF 15 N

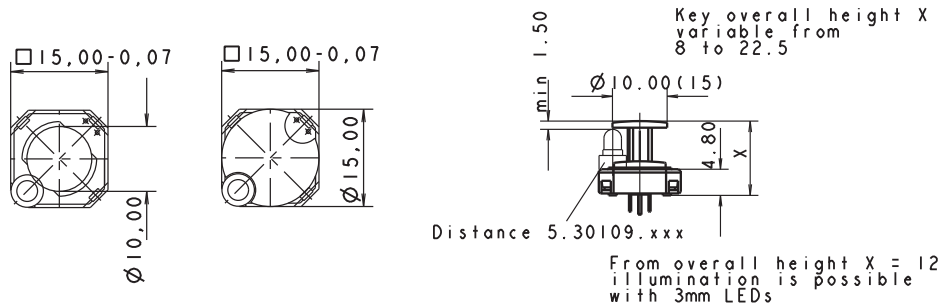


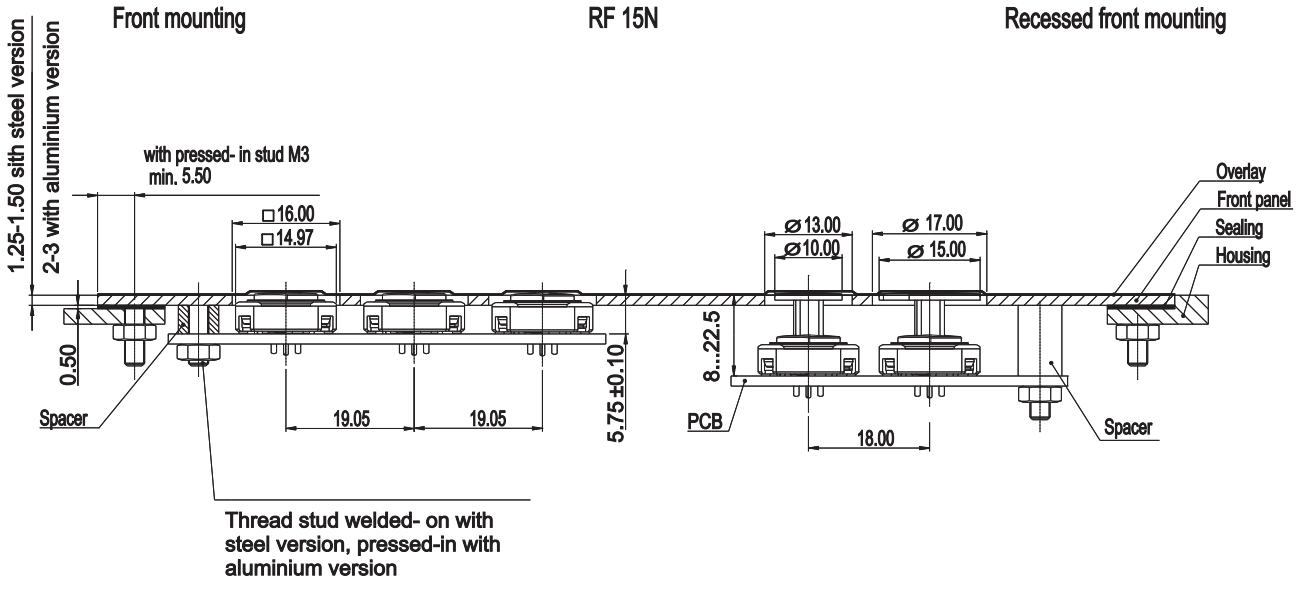
Keyswitch,
non illuminated



Keyswitch,
spot-illuminated

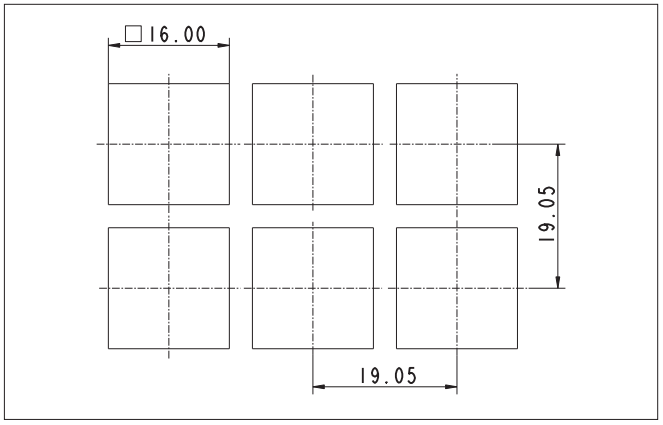
## Dimensional Drawings RF 15 N



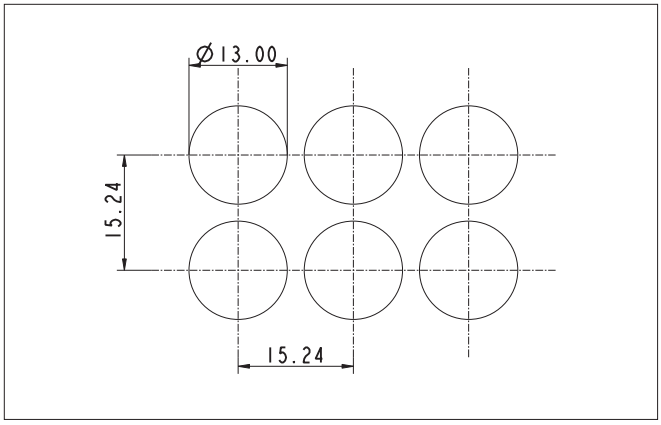



## Hole Patterns – Front Panel RF 15 N

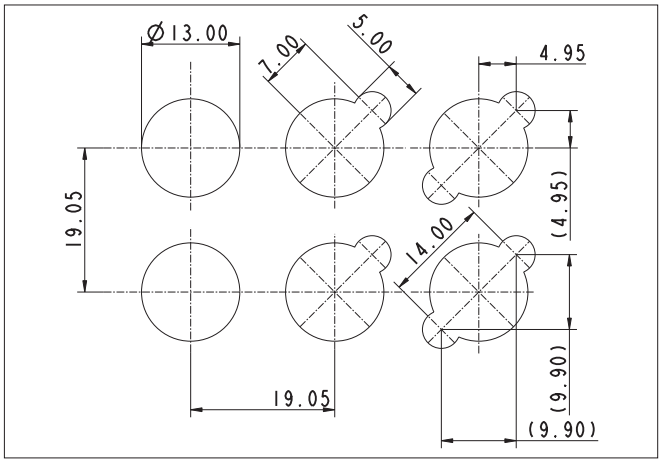
RF 15 N without plunger



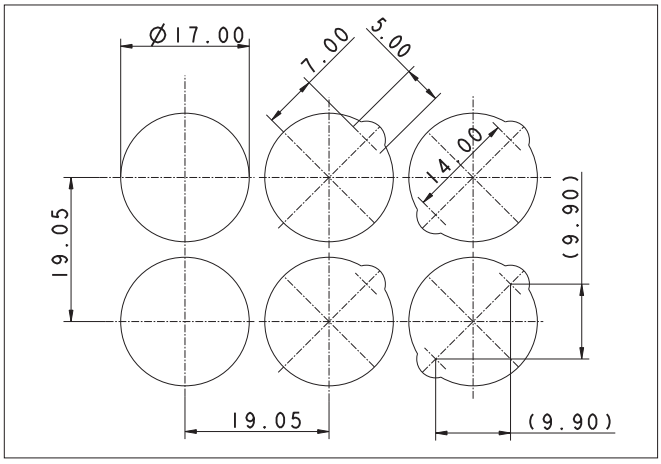

RF 15 N with plunger ø 10 mm, non-illuminated



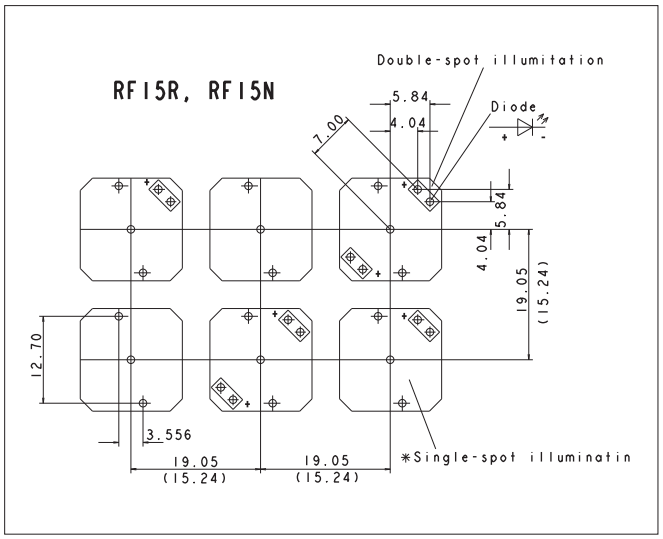

RF 15 N with plunger ø 10 mm, illuminated




RF 15 N with plunger ø 15 mm, illuminated




## Hole Pattern RF 15 N

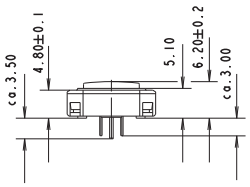


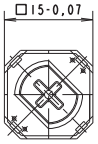

View on component side
All hole diameters 1.1 $^{+/-0.1}$ mm
PCB layout keyswitch 1/400" grid

## Typical accessories RF 15 N - Short-travel keyswitch

| Description | Photo | Order no. | Additional accessories see page |
|---|---|---|---|
| RF 15 N - LED spacer Ø 5 mm, spacing length 2.2 mm, light grey, for use with overall height of 12.5 mm |  | 5.30.109.010/0756 | 4 - 84 |
| RF 15 N - Extension plunger, Ø 10 mm, overall height 22.5 mm |  | **5.46.011.028/0710** | 4 - 80 |
| RF 15 N - Extension plunger, Ø 15 mm, overall height 22.5 mm |  | 5.46.017.028/0710 | 4 - 81 |

## RF 15 N - Short-travel keyswitch, non-illuminated




| Contact materials | Illumination | Recommended key grid | Overall height | Order no. |
|---|---|---|---|---|
| Au | external 3 mm LED possible if height more than 12 mm | 19.05 mm | 6.2 mm | **3.14.100.601/0000** |
| Ag | external 3 mm LED possible if height more than 12 mm | 19.05 mm | 6.2 mm | **3.14.100.606/0000** |

Technical data see page 4 - 48

For keycaps, refer to RK 90 system design.
Double-spot LED illumination available on request.

# RF 15 R - Short-travel keyswitch

Pict.: with 2 mm LED, red

with 3 mm LED, green

## General Data

The round actuator of the RF 15 R keyswitch requires round front panel cut-outs. These make it possible to use a narrow keyboard grid of only 15.24 mm with sufficiently large frame webs between the individual keys. We recommend area embossing over the actuators for the overlay.

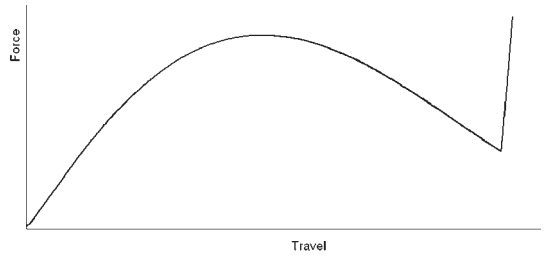
## Technical Data

| | |
|---|---|
| **General information** | |
| Recommended key grid | 15.24 mm |
| **Dimensions** | |
| Length | 15 mm |
| Width | 15 mm |
| Overall height | see order block |
| **Mechanical design** | |
| Mounting | soldering in PCB |
| Terminals | THT |
| Contact system | snap-action contact |
| Contact arrangement | 1 NO |
| Contact materials | see order block |
| Illumination | see order block |
| LED colour | see order block |
| LED type | see order block |
| **Mechanical characteristics** | |
| Operating force max. | $2.9^{\pm 0.6}$ N |
| Switching travel | $0.5^{+0.2}$ mm |
| Robustness min. | with through-plated PCB 100 N |

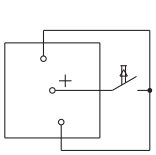
| | |
|---|---|
| **Electrical characteristics** | |
| Rated voltage min. | Au: 0.02 V, Ag: 3 V |
| Rated voltage max. | Au: 35 V, Ag: 50 V |
| Rated current min. | Au: 0.01 mA, Ag: 0.1 mA |
| Rated current max. | Au: 100 mA, Ag: 250 mA |
| Rated power max. (ohmic load) | Au: 2 W, Ag: 12.5 W |
| Contact resistance when new max. | 100 mΩ |
| Insulation resistance | $10^9$ Ω |
| **Other specifications** | |
| Ambient temp. operating min. | -25 °C |
| Ambient temp. operating max. | +70 °C |
| Environmental restistance | acc. to IEC 60068-2 -14, -30, -33 and -78 |
| Operating life min. (operations) | 1,000,000 |
| Solderability / solder heat resistance | according to E DIN IEC 600 28-2-20 |
| Wave soldering | 260 °C max. |
| Manual soldering | 350 °C / 5 sec. max. |

## Force/Travel Diagram – Keyswitch RF 15 R

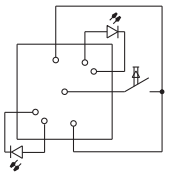
**Operation characteristic limits RF**




## Circuit Diagram – Keyswitch RF 15 R

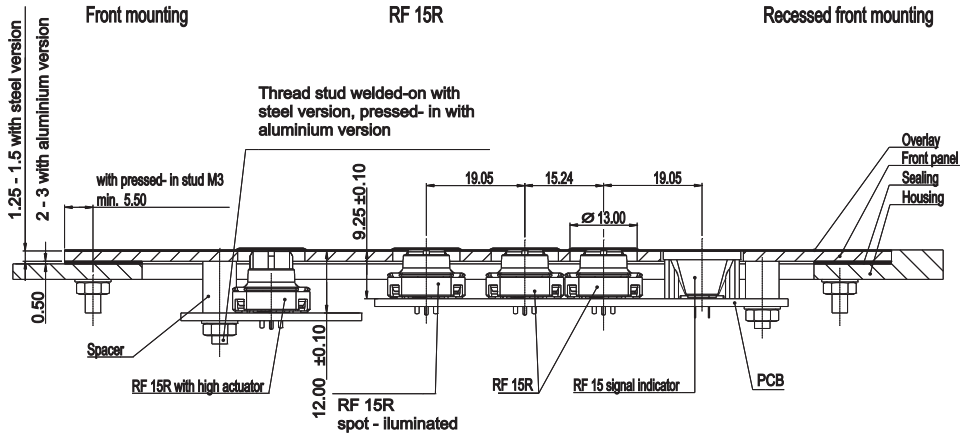


Keyswitch,
non-illuminated

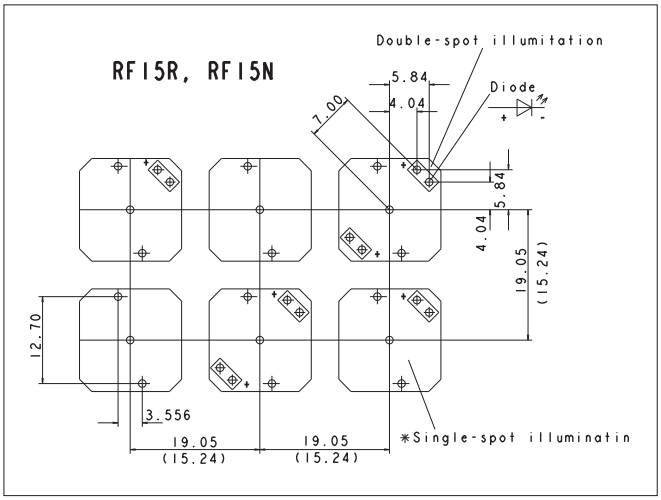


Keyswitch,
spot-illuminated

## Dimensional Drawing RF 15 R



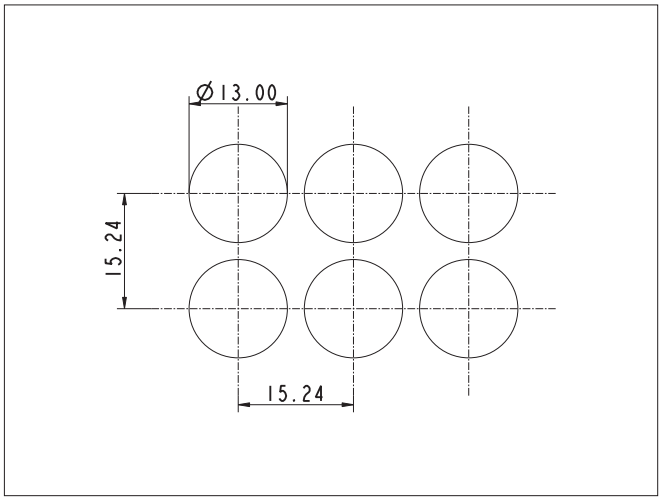

## Hole Pattern RF 15 R



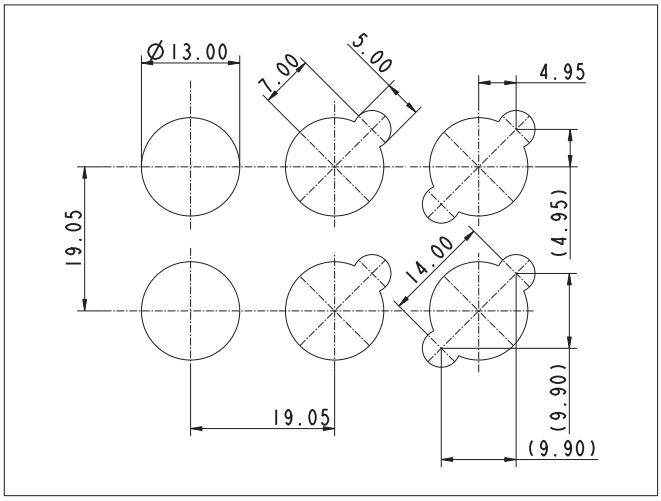

View on component side
All hole diameters 1.1 $^{+/- 0.1}$ mm
PCB layout keyswitch 1/400" grid

## Hole Pattern – Front Panel RF 15 R

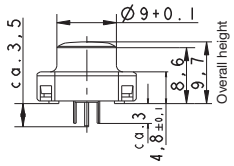
RF 15 R, non-illuminated

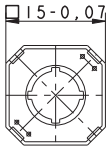



RF 15 R, illuminated



## RF 15 R - Low short-travel keyswitch, non-illuminated

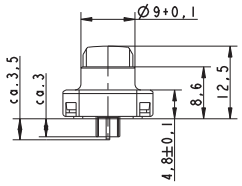


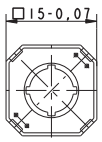




| Contact materials | Overall height | Illumination | LED type | LED colour | Order no. |
|---|---|---|---|---|---|
| Au | 9.7 mm | not illuminated | - | - | **3.14.100.501/0000** |
| Ag | 9.7 mm | not illuminated | - | - | **3.14.100.506/0000** |

Technical data see page 4 - 52

## RF 15 R - High short-travel keyswitch, non-illuminated




| Contact materials | Overall height | Illumination | LED type | LED colour | Order no. |
|---|---|---|---|---|---|
| Au | 12.5 mm | not illuminated | - | - | **3.14.100.801/0000** |
| Ag | 12.5 mm | not illuminated | - | - | **3.14.100.806/0000** |

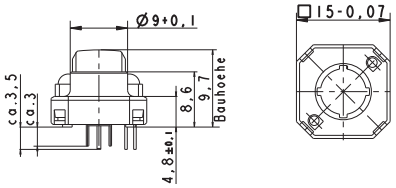
Technical data see page 4 - 52





**Stock items** are marked by **bold printed order numbers.**

## RF 15 R - Low short-travel keyswitch, 1 LED spot-illumination




Pict.: with 2 mm LED, red

| Contact materials | Overall height | Illumination | LED type | LED colour | Order no. |
|---|---|---|---|---|---|
| Au | 9.7 mm | spot illumination 1 LED | 2 mm | red | 3.14.100.531/0000 |
| Au | 9.7 mm | spot illumination 1 LED | 2 mm | green | **3.14.100.532/0000** |
| Au | 9.7 mm | spot illumination 1 LED | 2 mm | yellow | **3.14.100.533/0000** |
| Ag | 9.7 mm | spot illumination 1 LED | 2 mm | red | 3.14.100.541/0000 |
| Ag | 9.7 mm | spot illumination 1 LED | 2 mm | green | 3.14.100.542/0000 |
| Ag | 9.7 mm | spot illumination 1 LED | 2 mm | yellow | 3.14.100.543/0000 |

Technical data see page 4 - 52

Versions with 2 LEDs available on request.

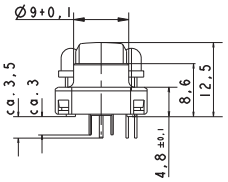
Technical data of LED see seperate page at the beginning of this chapter.

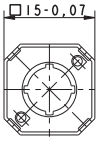




**Stock items** are marked by **bold printed order numbers.**

## RF 15 R - High short-travel keyswitch, 1 LED spot-illumination




Pict.: with 3 mm LED, green

| Contact materials | Overall height | Illumination | LED type | LED colour | Order no. |
|---|---|---|---|---|---|
| Au | 12.5 mm | spot illumination 1 LED | 3 mm | blue | 3.14.100.830/0000 |
| Au | 12.5 mm | spot illumination 1 LED | 3 mm | red | 3.14.100.831/0000 |
| Au | 12.5 mm | spot illumination 1 LED | 3 mm | green | 3.14.100.832/0000 |
| Au | 12.5 mm | spot illumination 1 LED | 3 mm | yellow | 3.14.100.833/0000 |

Technical data see page 4 - 52

Versions with 2 LEDs available on request.

Technical data of LED see seperate page at the beginning of the chapter.





**Stock items** are marked by **bold printed order numbers.**

# RF 15 H - Short-travel keyswitch

## General Data

**Application notes:**
The RF 15 H key has an overall height of 12.5 mm and can be fully illuminated. When designing membrane keyboards, we recommend using a key grid of at least 20 mm and a 0.13 mm overlay with area embossing over the keys.
You can use the O-ring (accessory) to block the key and use it as an indicator field or blank spaceholder.

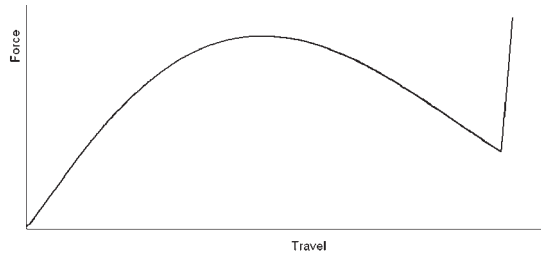
## Technical Data

| | |
|---|---|
| **General information** | |
| Colour of lens | see order block |
| Recommended key grid | 20 mm |
| **Dimensions** | |
| Length | 15 mm |
| Width | 15 mm |
| Overall height | 12.5 mm |
| **Mechanical design** | |
| Mounting | soldering in PCB |
| Terminals | THT |
| Contact system | snap-action contact |
| Contact arrangement | 1 NO |
| Contact materials | see order block |
| Illumination | see order block |
| LED colour | see order block |
| LED type | see order block |
| **Mechanical characteristics** | |
| Operating force max. | $2.9^{\pm 0.6}$ N |
| Switching travel | $0.5^{+0.2}$ mm |
| Robustness min. | with through-plated PCB 100 N |

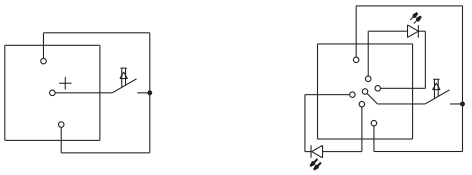
| | |
|---|---|
| **Electrical characteristics** | |
| Rated voltage min. | Au: 0.02 V, Ag: 3 V |
| Rated voltage max. | Au: 35 V, Ag: 50 V |
| Rated current min. | Au: 0.01 mA, Ag: 0.1 mA |
| Rated current max. | Au: 100 mA, Ag: 250 mA |
| Rated power max. (ohmic load) | Au: 2 W, Ag: 12.5 W |
| Contact resistance when new max. | 100 mΩ |
| Insulation resistance | $10^9$ Ω |
| **Other specifications** | |
| Ambient temp. operating min. | -25 °C |
| Ambient temp. operating max. | +70 °C |
| Environmental restistance | acc. to IEC 60068-2 -14, -30, -33 and -78 |
| Operating life min. (operations) | 1,000,000 |
| Solderability / solder heat resistance | according to E DIN IEC 600 28-2-20 |
| Wave soldering | 260 °C max. |
| Manual soldering | 350 °C / 5 sec. max. |

## Force/Travel Diagram – Keyswitch RF 15 H

**Operation characteristic limits RF**



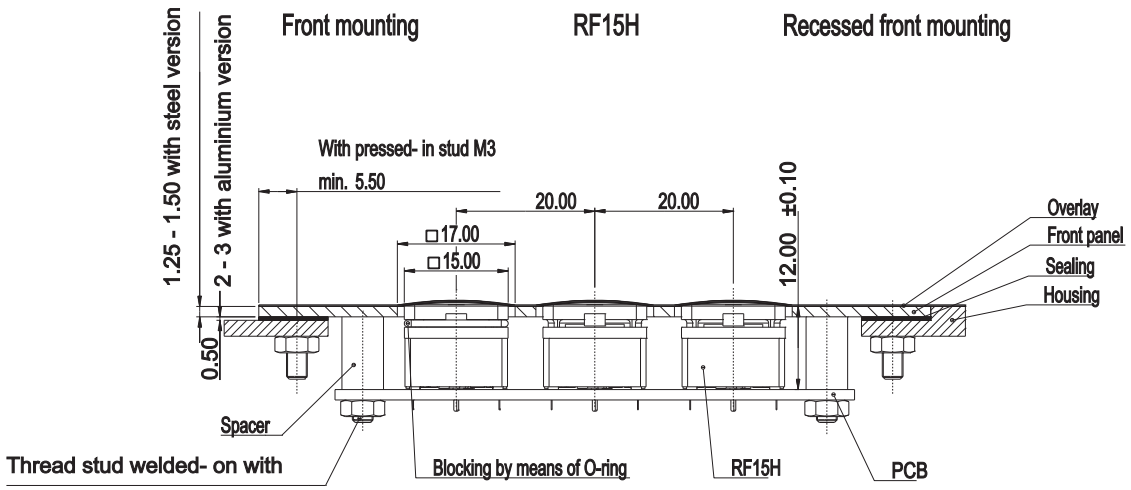

## Circuit Diagram – Keyswitch RF 15 H



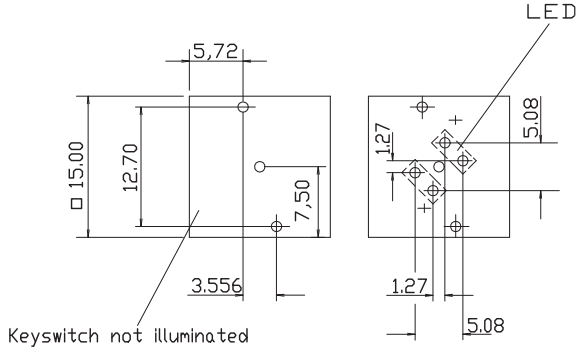
Keyswitch, non-illuminated

Keyswitch, fully illuminated

## Dimensional Drawing

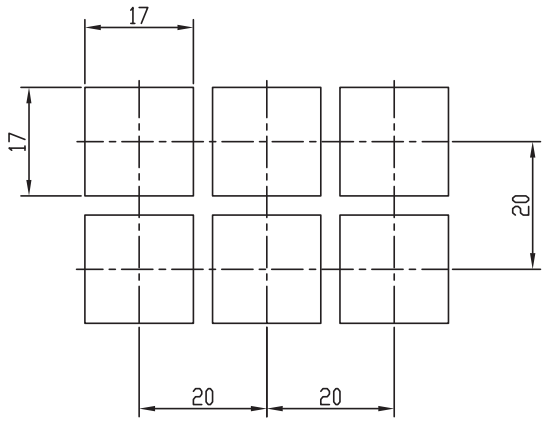



## Hole Pattern




View on component side. All hole diameters 1,1 $^{+/-0,1}$ mm.
PCB layout keyswitch 1/400 grid.

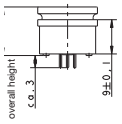
## Hole Pattern – Front Panel

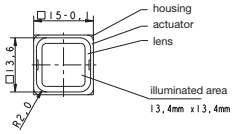


## Typical accessories RF 15 H - Short-travel keyswitch

| Description | Photo | Order no. | Additional accessories see page |
|---|---|---|---|
| O-ring, black, for blocking the operating stroke |  | 5.30.120.009/0100 | 5 - 25 |

## RF 15 H - Short-travel keyswitch, non-illuminated




| Contact materials | Illumination | Colour of lens | LED colour | LED type | Order no. |
|---|---|---|---|---|---|
| Au | not illuminated | white | - | - | 3.14.100.702/0000 |
| Ag | not illuminated | white | - | - | 3.14.100.707/0000 |

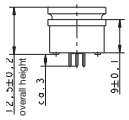
Technical data see page 4 - 58

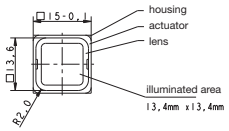




**Stock items** are marked by **bold printed order numbers.**

## RF 15 H - Short-travel keyswitch, fully illuminated




Pict.: yellow

| Contact materials | Illumination | Colour of lens | LED colour | LED type | Order no. |
|---|---|---|---|---|---|
| Au | fully illuminated 2 LED | red | red | 2 mm | 3.14.200.731/0000 |
| Au | fully illuminated 2 LED | green | green | 2 mm | **3.14.200.732/0000** |
| Au | fully illuminated 1 LED | green | green super bright | 3 mm | 3.14.200.736/0000 |
| Au | fully illuminated 2 LED | yellow | yellow | 2 mm | **3.14.200.733/0000** |
| Au | fully illuminated 1 LED | white | white | 3 mm | **3.14.200.735/0000** |
| Au | fully illuminated 2 LED | orange | yellow | 2 mm | 3.14.200.738/0000 |
| Au | fully illuminated 1 LED | blue | blue | 3 mm | 3.14.200.739/0000 |
| Au/Ag | fully illuminated 2 LED | yellow | multi colour | 3 mm | 3.14.101.903/0000 |
| Ag | fully illuminated 2 LED | red | red | 2 mm | **3.14.200.741/0000** |
| Ag | fully illuminated 2 LED | green | green | 2 mm | **3.14.200.742/0000** |
| Ag | fully illuminated 1 LED | green | green super bright | 3 mm | **3.14.200.746/0000** |
| Ag | fully illuminated 2 LED | yellow | yellow | 2 mm | **3.14.200.743/0000** |
| Ag | fully illuminated 1 LED | white | white | 3 mm | 3.14.200.745/0000 |
| Ag | fully illuminated 2 LED | orange | yellow | 2 mm | 3.14.200.748/0000 |
| Ag | fully illuminated 1 LED | blue | blue | 3 mm | 3.14.200.749/0000 |
| Ag | fully illuminated 2 LED | white | multi colour | 3 mm | 3.14.100.744/0000 |

Technical data see page 4 - 58

When using the keyswitches with multicolour LEDs the illumination colour can be varied from red to green by change of polarity. Due to the frequency of the polarity-changes the colours red, green, yellow as well as all secondary colours from these are possible.

Technical data of LED see separate page at the beginning of this chapter.

# RF 15 - Signal indicator

## Technical Data

**General information**

| | |
|---|---|
| Colour of lens | see order block |
| Recommended key grid | 19.05 mm |

**Dimensions**

| | |
|---|---|
| Length | 15 mm |
| Width | 15 mm |
| Overall height | 9.7 mm |

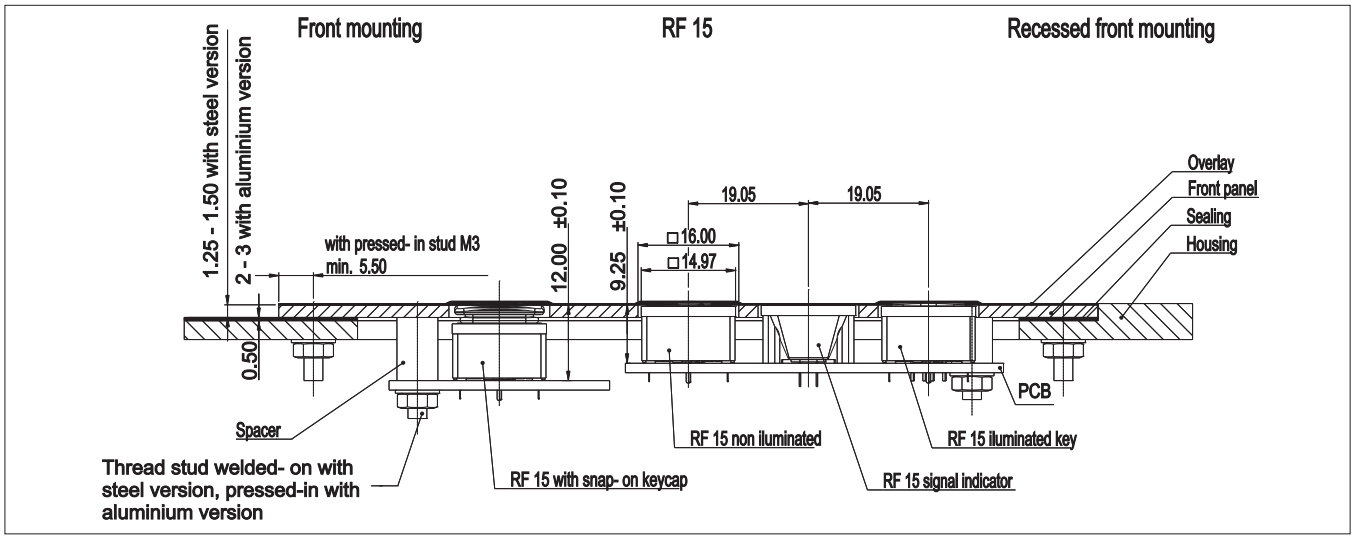
**Mechanical design**

| | |
|---|---|
| Mounting | THT soldering in PCB |
| Illumination | fully illuminated<br>1 LED |
| LED colour | see order block |
| LED type | 2 mm |

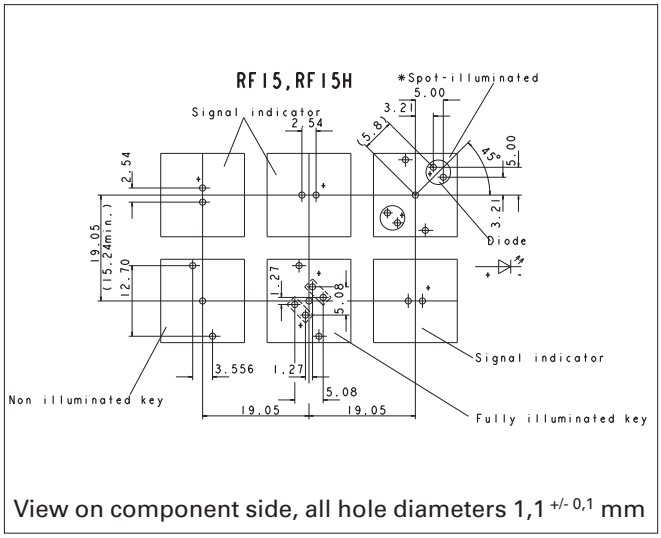
**Other specifications**

| | |
|---|---|
| Ambient temp. operating min. | -25 °C |
| Ambient temp. operating max. | +70 °C |
| Environmental restistance | acc. to IEC 60068-2<br>-14, -30, -33 and -78 |
| Solderability / solder heat resistance | according to E DIN IEC 600 28-2-20 |
| Wave soldering | 260 °C max. |
| Manual soldering | 350 °C / 5 sec. max. |

## Dimensional Drawing Signal Indicator RF 15

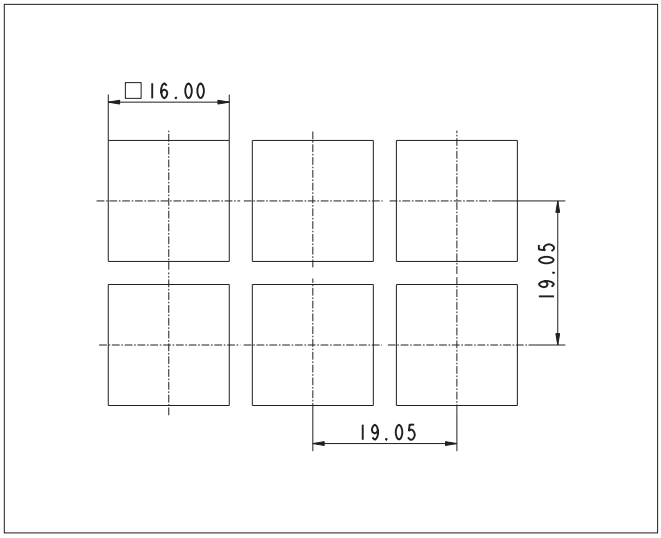



## Hole Pattern




View on component side, all hole diameters 1,1 +/- 0,1 mm

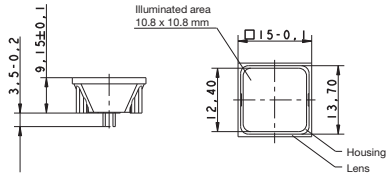
## Hole Pattern – Front Panel




4

RF

## RF 15 - Signal indicator, fully illuminated, 1 LED




Pict.: green

| Overall height | Illumination | Colour of lens | LED colour | LED type | Order no. |
|---|---|---|---|---|---|
| 9.7 mm | fully illuminated 1 LED | red | red | 2 mm | **3.14.200.051/0000** |
| 9.7 mm | fully illuminated 1 LED | green | green | 2 mm | **3.14.200.052/0000** |
| 9.7 mm | fully illuminated 1 LED | yellow | yellow | 2 mm | **3.14.200.053/0000** |
| 9.7 mm | fully illuminated 1 LED | orange | yellow | 2 mm | 3.14.200.054/0000 |
| 9.7 mm | fully illuminated 1 LED | blue | blue | 2 mm | 3.14.200.055/0000 |

Technical data see page 4 - 62

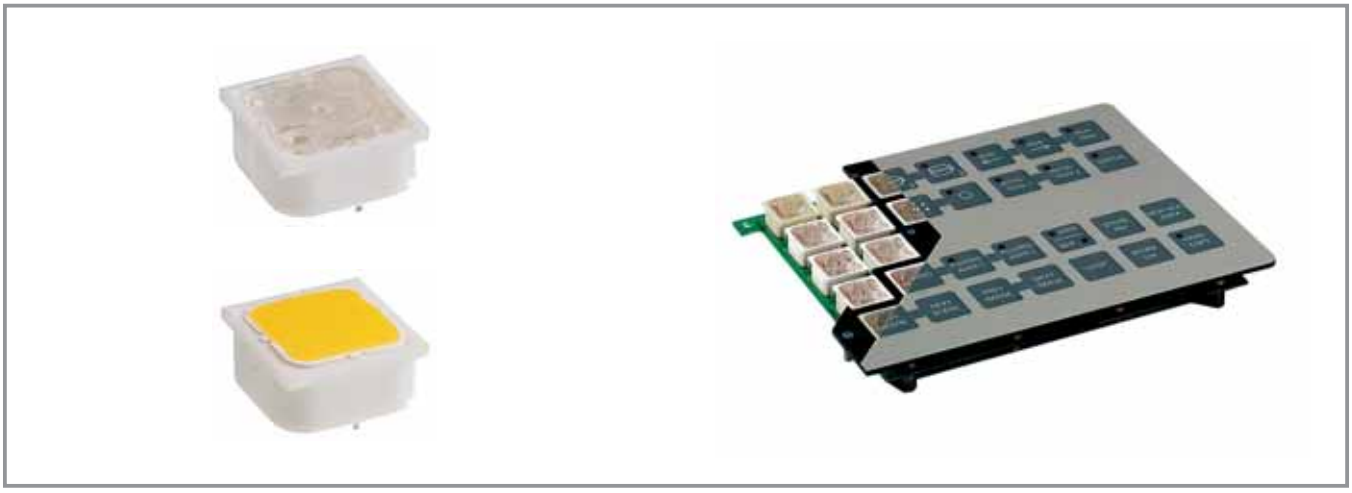
Technical data of LED see separate page at the beginning of chapter 4 PCB Keyswitches.





**Stock items** are marked by **bold printed order numbers.**

# RF 19 - Short-travel keyswitch



## General Data

**Application notes:**
RF 19 keys offer a large actuation area. When designing low-profile keyboards with a grid of >= 23 mm, frame webs remain free between the individual keys.
The overlay can be glued onto these frame webs; we recommend area embossing over the keys for the overlay.

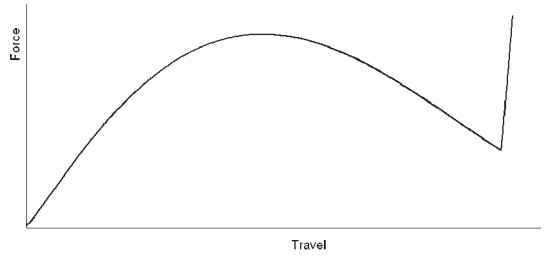
## Technical Data

| | |
|---|---|
| **General information** | |
| Colour of lens | see order block |
| Recommended key grid | 23 mm |
| **Dimensions** | |
| Length | 19.05 mm |
| Width | 19.05 mm |
| Overall height | 9.7 mm |
| **Mechanical design** | |
| Mounting | soldering in PCB |
| Terminals | THT |
| Contact system | snap-action contact |
| Contact arrangement | 1 NO |
| Contact materials | see order block |
| Illumination | see order block |
| LED colour | see order block |
| LED type | see order block |
| **Mechanical characteristics** | |
| Operating force max. | $2.9^{\pm 0.6}$ N |
| Switching travel | $0.5^{+0.2}$ mm |
| Robustness min. | with through-plated PCB 100 N |

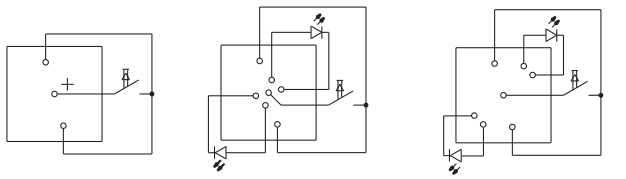
| | |
|---|---|
| **Electrical characteristics** | |
| Rated voltage min. | Au: 0.02 V, Ag: 3 V |
| Rated voltage max. | Au: 35 V, Ag: 50 V |
| Rated current min. | Au: 0.01 mA, Ag: 0.1 mA |
| Rated current max. | Au: 100 mA, Ag: 250 mA |
| Rated power max. (ohmic load) | Au: 2 W, Ag: 12.5 W |
| Contact resistance when new max. | 100 mΩ |
| Insulation resistance | $10^9$ Ω |
| **Other specifications** | |
| Ambient temp. operating min. | -25 °C |
| Ambient temp. operating max. | +70 °C |
| Environmental restistance | acc. to IEC 60068-2 -14, -30, -33 and -78 |
| Operating life min. (operations) | 1,000,000 |
| Solderability / solder heat resistance | according to E DIN IEC 600 28-2-20 |
| Wave soldering | 260 °C max. |
| Manual soldering | 350 °C / 5 sec. max. |

## Force/Travel Diagram – Keyswitch RF 19

**Operation characteristic limits RF**

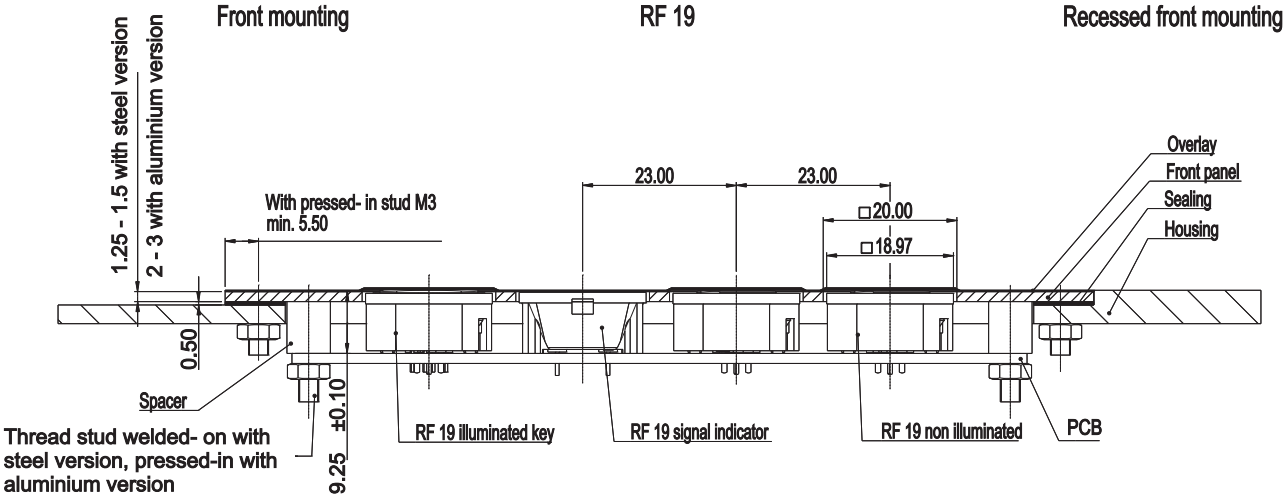



## Circuit Diagram – Keyswitch RF 19

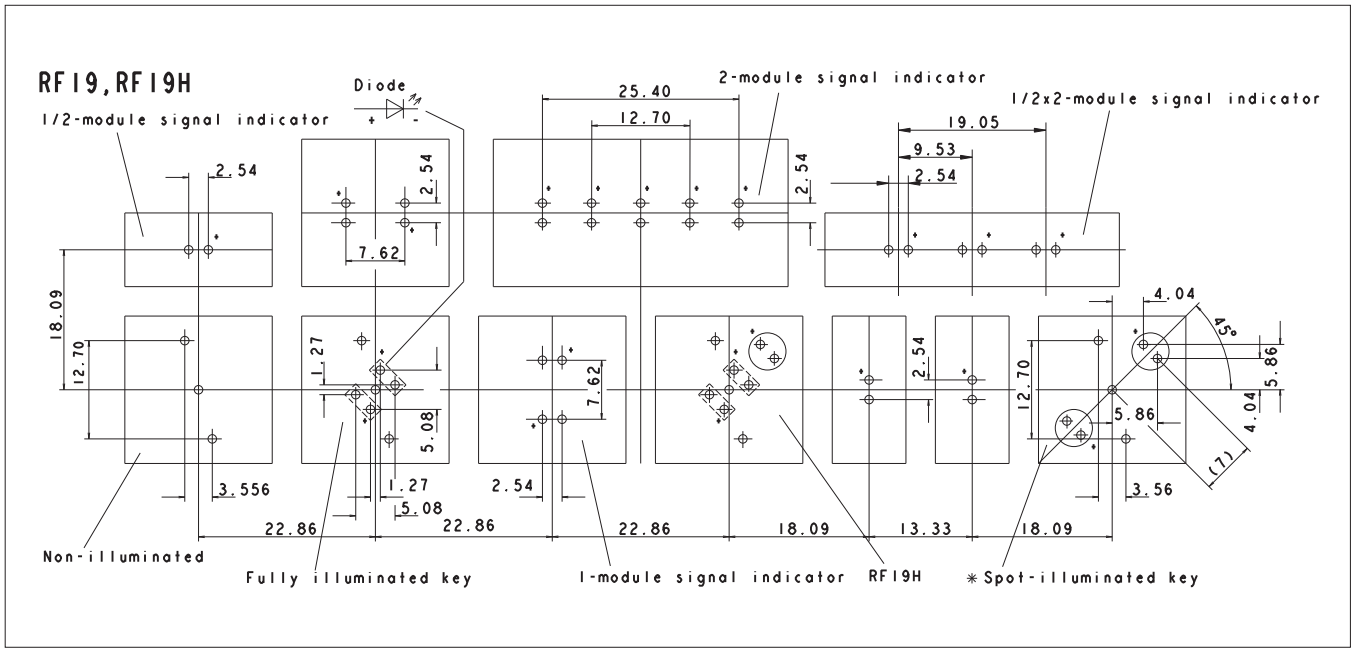


Keyswitch, non-illuminated | Keyswitch, fully illuminated | Keyswitch, spot-illuminated

## Dimensional Drawing

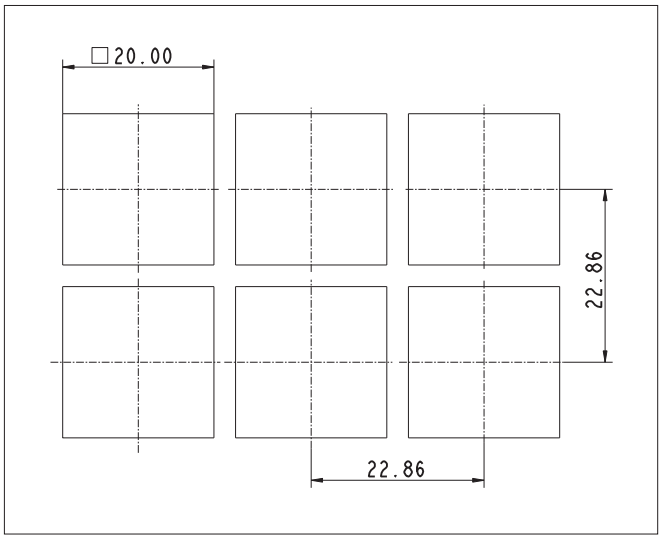


## Hole Patterns RF 19

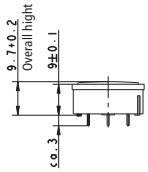


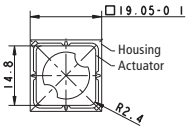

*The LED may be positioned either on the left-hand or right-hand side.
Standard version: LED on left-hand side
View on component side, all hole diameters 1.1 +/- 0.1 mm

## Hole Patterns – Front Panel RF 19



## RF 19 - Short-travel keyswitch, non-illuminated




| Contact materials | Illumination | Colour of lens | LED colour | LED type | Order no. |
|---|---|---|---|---|---|
| Au | not illuminated | transparent | - | - | **3.14.001.001/0000** |
| Ag | not illuminated | transparent | - | - | **3.14.001.006/0000** |

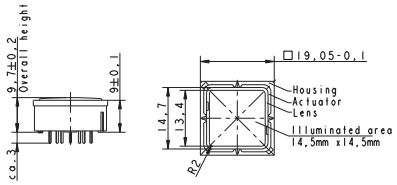
Technical data see page 4 - 66





**Stock items** are marked by **bold printed order numbers.**

## RF 19 - Short-travel keyswitch, fully illuminated with 2 LED




| Contact materials | Illumination | Colour of lens | LED colour | LED type | Order no. |
|---|---|---|---|---|---|
| Au | fully illuminated 2 LED | red | red | 2 mm | **3.14.002.011/0000** |
| Au | fully illuminated 2 LED | green | green | 2 mm | **3.14.002.012/0000** |
| Au | fully illuminated 2 LED | opaque white | green | 2 mm | 3.14.002.901/0000 |
| Au | fully illuminated 2 LED | yellow | yellow | 2 mm | **3.14.002.013/0000** |
| Au | fully illuminated 2 LED | orange | yellow | 2 mm | 3.14.002.014/0000 |
| Au | fully illuminated 2 LED | blue | blue | 2 mm | 3.14.002.015/0000 |
| Ag | fully illuminated 2 LED | red | red | 2 mm | **3.14.002.021/0000** |
| Ag | fully illuminated 2 LED | green | green | 2 mm | **3.14.002.022/0000** |
| Ag | fully illuminated 2 LED | yellow | yellow | 2 mm | **3.14.002.023/0000** |
| Ag | fully illuminated 2 LED | orange | yellow | 2 mm | 3.14.002.024/0000 |
| Ag | fully illuminated 2 LED | blue | blue | 2 mm | 3.14.002.025/0000 |
| Ag | fully illuminated 2 LED | opaque white | green | 2 mm | 3.14.002.944/0000 |
| Ag | fully illuminated 2 LED | white | green | 2 mm | **3.14.002.026/0000** |
| Ag | fully illuminated 2 LED | white | yellow | 2 mm | **3.14.002.027/0000** |

Technical data see page 4 - 66

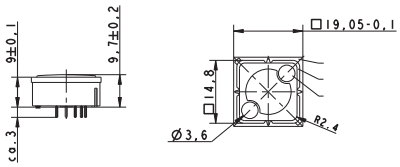
Technical data of LED see separate page at the beginning of this chapter.





**Stock items** are marked by **bold printed order numbers.**

## RF 19 - Short-travel keyswitch, 1 LED spot-illumination




Pict.: red

| Contact materials | Illumination | Colour of lens | LED colour | LED type | Order no. |
|---|---|---|---|---|---|
| Au | spot illumination 1 LED | opaque white | blue | 3 mm | 3.14.001.030/0000 |
| Au | spot illumination 1 LED | opaque white | red | 3 mm | **3.14.001.031/0000** |
| Au | spot illumination 1 LED | opaque white | green | 3 mm | **3.14.001.032/0000** |
| Au | spot illumination 1 LED | opaque white | yellow | 3 mm | **3.14.001.033/0000** |
| Ag | spot illumination 1 LED | opaque white | blue | 3 mm | 3.14.001.040/0000 |
| Ag | spot illumination 1 LED | opaque white | red | 3 mm | **3.14.001.041/0000** |
| Ag | spot illumination 1 LED | opaque white | green | 3 mm | **3.14.001.042/0000** |
| Ag | spot illumination 1 LED | opaque white | yellow | 3 mm | **3.14.001.043/0000** |

Technical data see page 4 - 66

Versions with 2 LEDs available on request.

Technical data of LED see separate page at the beginning of this chapter.





**Stock items** are marked by **bold printed order numbers.**

# RF 19 H - Short-travel keyswitch

## General Data

**Application notes:**
The RF 19H key has an overall height of 12.5 mm and can be fully illuminated. When designing membrane keyboards, we recommend using a key grid of at least 24 mm and a 0.13 mm overlay with area embossing over the keys.
You can use the O-ring (accessory) to block the key and use it as an indicator field or blank spaceholder.

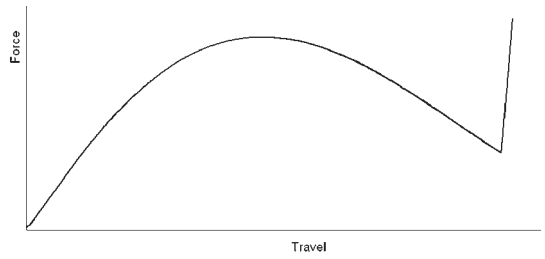
## Technical Data

| | |
|---|---|
| **General information** | |
| Colour of lens | see order block |
| Recommended key grid | 24 mm |
| **Dimensions** | |
| Length | 19.05 mm |
| Width | 19.05 mm |
| Overall height | 12.5 mm |
| **Mechanical design** | |
| Mounting | soldering in PCB |
| Terminals | THT |
| Contact system | snap-action contact |
| Contact arrangement | 1 NO |
| Contact materials | see order block |
| Illumination | see order block |
| LED colour | see order block |
| LED type | see order block |
| **Mechanical characteristics** | |
| Operating force max. | $2.9^{\pm 0.6}$ N |
| Switching travel | $0.5^{+0.2}$ mm |
| Robustness min. | with through-plated PCB 100 N |

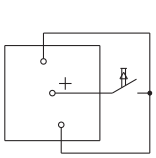
| | |
|---|---|
| **Electrical characteristics** | |
| Rated voltage min. | Au: 0.02 V, Ag: 3 V |
| Rated voltage max. | Au: 35 V, Ag: 50 V |
| Rated current min. | Au: 0.01 mA, Ag: 0.1 mA |
| Rated current max. | Au: 100 mA, Ag: 250 mA |
| Rated power max. (ohmic load) | Au: 2 W, Ag: 12.5 W |
| Contact resistance when new max. | 100 mΩ |
| Insulation resistance | $10^9$ Ω |
| **Other specifications** | |
| Ambient temp. operating min. | -25 °C |
| Ambient temp. operating max. | +70 °C |
| Environmental restistance | acc. to IEC 60068-2 -14, -30, -33 and -78 |
| Operating life min. (operations) | 1,000,000 |
| Solderability / solder heat resistance | according to E DIN IEC 600 28-2-20 |
| Wave soldering | 260 °C max. |
| Manual soldering | 350 °C / 5 sec. max. |

## Force/Travel Diagram – Keyswitch RF 19 H

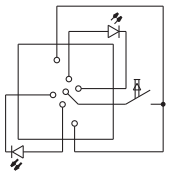
**Operation characteristic limits RF**




## Circuit Diagram – Keyswitch RF 19 H

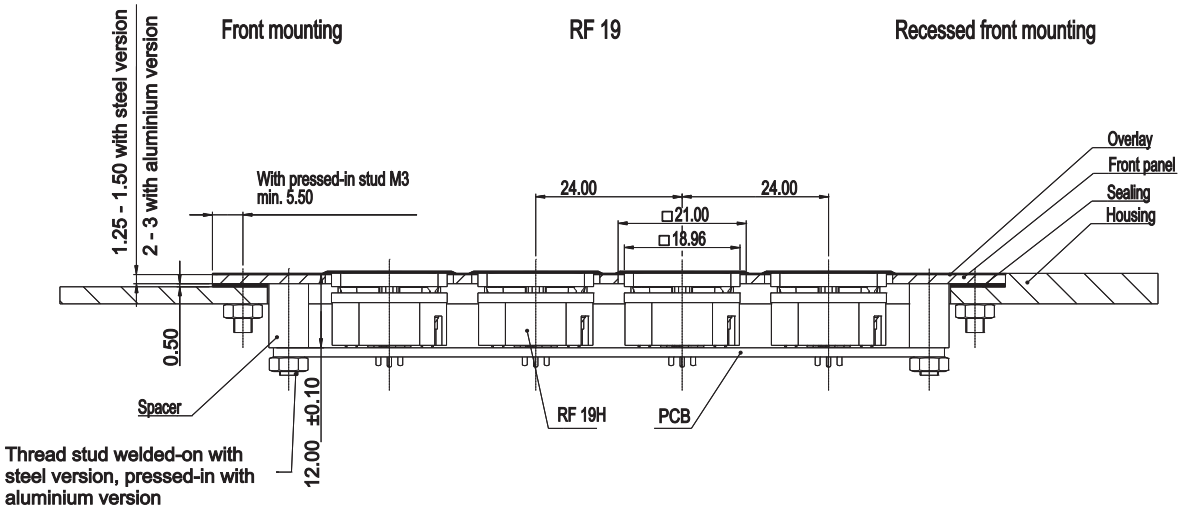


Keyswitch,
non illuminated



Keyswitch,
fully illuminated

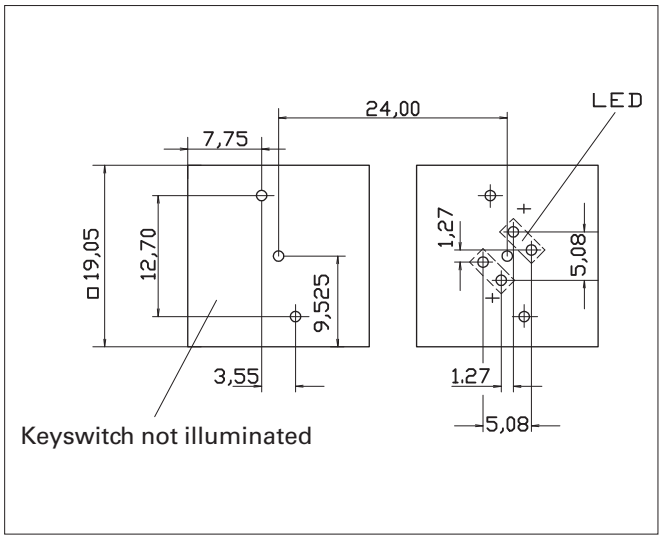
## Dimensional Drawing



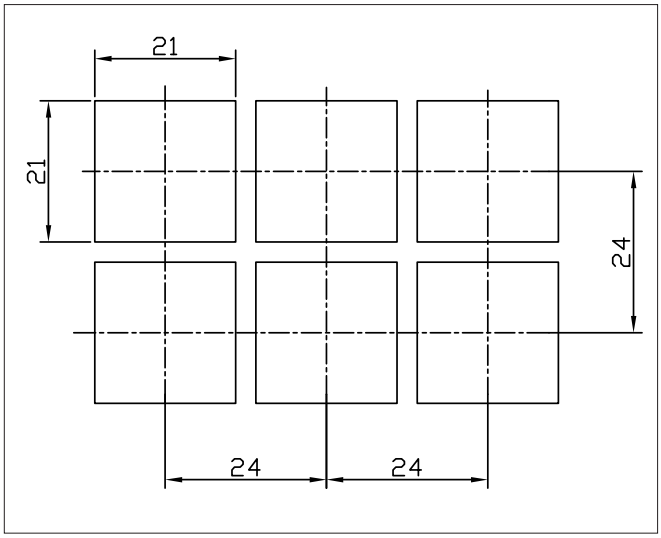

4

RF

## Hole Pattern RF 19 H




## Hole Pattern – Front Panel RF 19 H




*The LED may be positioned either on the left-hand or right-hand side.
Standard version: LED on left-hand side
View on component side, all hole diameters 1.1 +/- 0.1 mm

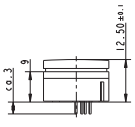
4

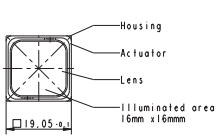
## Typical accessories RF 19 H - Short-travel keyswitch

| Description | Photo | Order no. | Additional accessories see page |
|---|---|---|---|
| O-ring, black, 16.0 x 1, for blocking RF 19H keys |  | 5.30.125.007/0100 | 5 - 25 |

RF

## RF 19 H - Keyswitch, non-illuminated





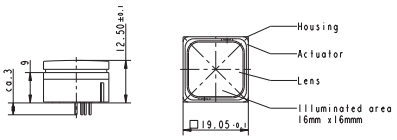

| Contact materials | Illumination | Colour of lens | LED colour | LED type | Order no. |
|---|---|---|---|---|---|
| Au | not illuminated | white | - | - | 3.14.001.501/0000 |
| Ag | not illuminated | white | - | - | 3.14.001.506/0000 |

Technical data see page 4 - 72



**Stock items** are marked by **bold printed order numbers.**

## RF 19 H - Short-travel keyswitch, fully illuminated




| Contact materials | Illumination | Colour of lens | LED colour | LED type | Order no. |
|---|---|---|---|---|---|
| Au | fully illuminated 2 LED | red | red | 2 mm | 3.14.002.613/0000 |
| Au | fully illuminated 2 LED | green | green | 2 mm | **3.14.002.632/0000** |
| Au | fully illuminated 1 LED | green | green super bright | 3 mm | **3.14.002.633/0000** |
| Au | fully illuminated 2 LED | yellow | yellow | 2 mm | 3.14.002.653/0000 |
| Au | fully illuminated 1 LED | white | white | 3 mm | **3.14.002.684/0000** |
| Au | fully illuminated 2 LED | orange | yellow | 2 mm | 3.14.002.673/0000 |
| Au | fully illuminated 2 LED | white | multi colour | 3 mm | 3.14.001.672/0000 |
| Au | fully illuminated 1 LED | blue | blue | 3 mm | 3.14.002.683/0000 |
| Ag | fully illuminated 2 LED | red | red | 2 mm | 3.14.002.623/0000 |
| Ag | fully illuminated 2 LED | green | green | 2 mm | 3.14.002.642/0000 |
| Ag | fully illuminated 1 LED | green | green super bright | 3 mm | 3.14.002.643/0000 |
| Ag | fully illuminated 1 LED | blue | blue | 3 mm | 3.14.002.688/0000 |
| Ag | fully illuminated 2 LED | yellow | yellow | 2 mm | 3.14.002.663/0000 |
| Ag | fully illuminated 1 LED | white | white | 3 mm | **3.14.002.689/0000** |
| Ag | fully illuminated 2 LED | orange | yellow | 2 mm | 3.14.002.678/0000 |
| Ag | fully illuminated 2 LED | white | multi colour | 3 mm | **3.14.001.682/0000** |

Technical data see page 4 - 72

When using the keyswitches with multicolour LEDs the illumination colour can be varied from red to green by change of polarity. Due to the frequency of the polarity-changes the colours red, green, yellow as well as all secondary colours from these are possible.

Technical data of LED see separate page at the beginning of this chapter.





**Stock items** are marked by **bold printed order numbers.**

# RF 19 - Signal indicator

Pict.: 0.5 x 1-module

0,5 x 2-module

1 x 1-module

1 x 2-module

## Technical Data

**General information**

| | |
|---|---|
| Colour of lens | see order block |
| Recommended key grid | 23/x mm |

**Dimensions**

| | |
|---|---|
| Length | see order block |
| Width | see order block |
| Overall height | 9.15 mm |

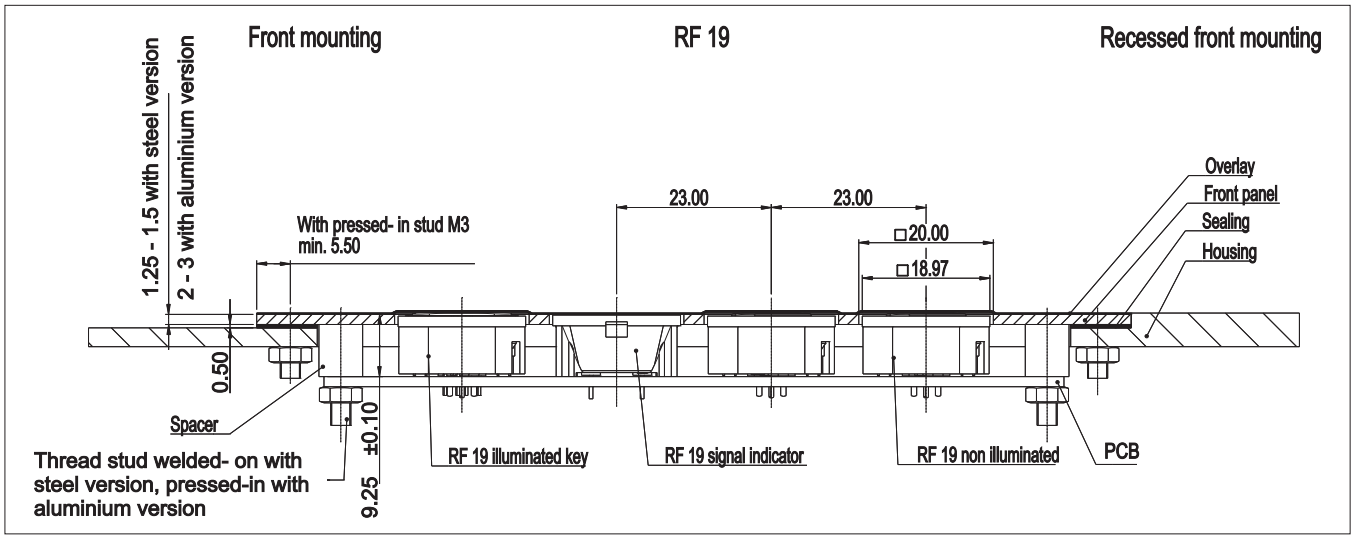
**Mechanical design**

| | |
|---|---|
| Mounting | THT soldering in PCB |
| Illumination | see order block |
| LED colour | see order block |
| LED type | see order block |

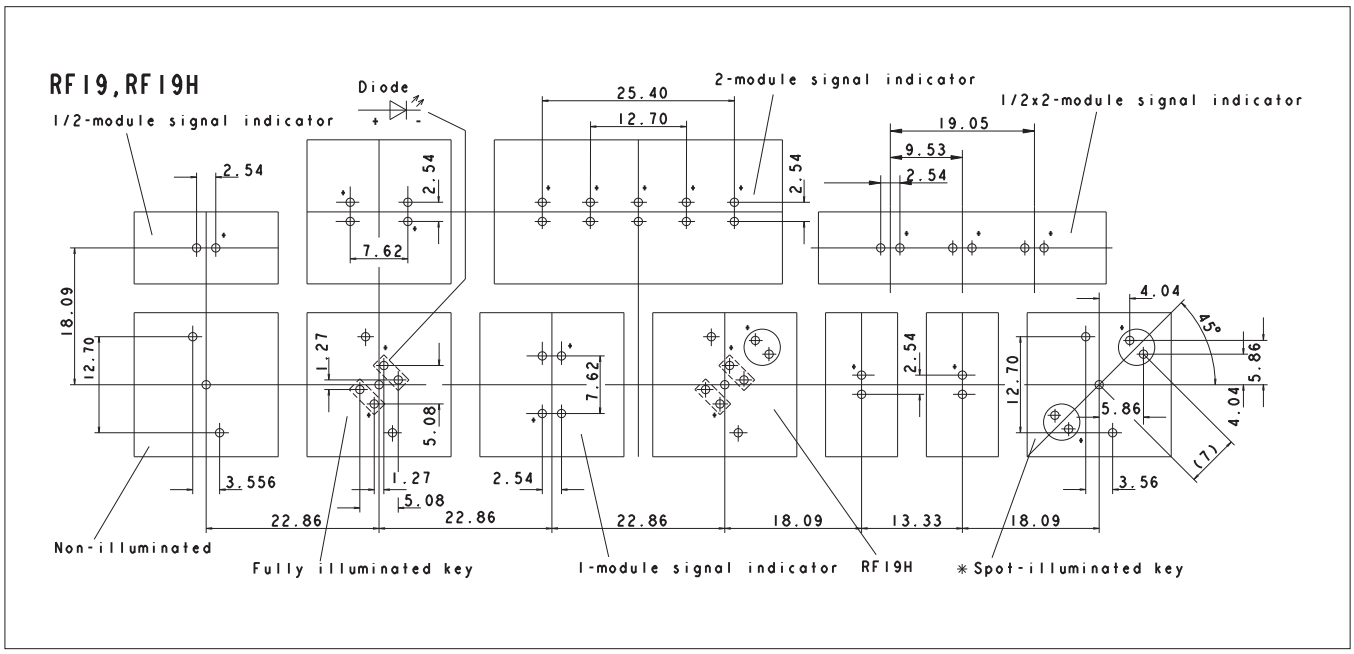
**Other specifications**

| | |
|---|---|
| Ambient temp. operating min. | -25 °C |
| Ambient temp. operating max. | +70 °C |
| Environmental restistance | acc. to IEC 60068-2 -14, -30, -33 and -78 |
| Solderability / solder heat resistance | according to E DIN IEC 600 28-2-20 |
| Wave soldering | 260 °C max. |
| Manual soldering | 350 °C / 5 sec. max. |

## Dimensional Drawing Signal Indicator RF 19



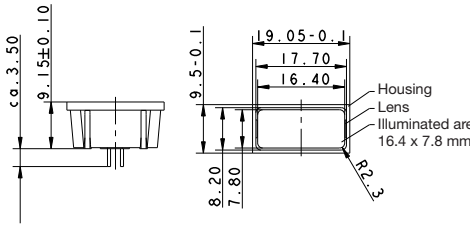

## Hole Pattern RF 19




*The LED may be positioned either on the left-hand or right-hand side.
Standard version: LED on left-hand side
View on component side, all hole diameters 1.1 +/- 0.1 mm

Front panel cut-out = outer keyswitch size + 1 mm

## RF 19 - Signal indicator, ½ x 1-module



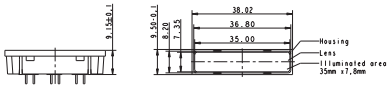

Pict.: 0.5 x 1-module

| Illumination | Colour of lens | LED colour | LED type | Order no. |
|---|---|---|---|---|
| fully illuminated 1 LED | red | red | 2 mm | **3.14.002.061/0000** |
| fully illuminated 1 LED | green | green | 2 mm | 3.14.002.062/0000 |
| fully illuminated 1 LED | yellow | yellow | 2 mm | 3.14.002.063/0000 |
| fully illuminated 1 LED | orange | yellow | 2 mm | 3.14.002.064/0000 |

Technical data see page 4 - 76

Technical data of LED see separate page at the beginning of chapter 4 PCB Keyswitches.

## RF 19 - Signal indicator, ½ x 2-module




Pict.: 0,5 x 2-module

| Illumination | Colour of lens | LED colour | LED type | Order no. |
|---|---|---|---|---|
| fully illuminated 3 LED | red | red | 2 mm | 3.14.002.908/0000 |
| fully illuminated 3 LED | green | green | 2 mm | 3.14.002.909/0000 |
| fully illuminated 3 LED | yellow | yellow | 2 mm | 3.14.002.910/0000 |
| fully illuminated 3 LED | orange | yellow | 2 mm | 3.14.002.911/0000 |

Technical data see page 4 - 76

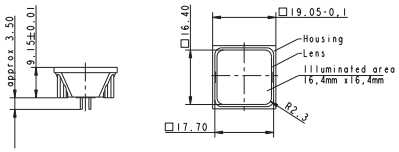
Technical data of LED see separate page at the beginning of chapter 4 PCB Keyswitches.





**Stock items** are marked by **bold printed order numbers.**

## RF 19 - Signal indicator, 1 x 1-module




Pict.: 1 x 1-module

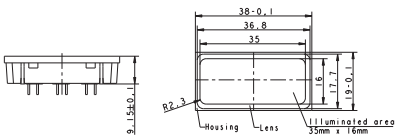
| Illumination | Colour of lens | LED colour | LED type | Order no. |
|---|---|---|---|---|
| fully illuminated 2 LED | red | red | 2 mm | **3.14.002.051/0000** |
| fully illuminated 2 LED | green | green | 2 mm | **3.14.002.052/0000** |
| fully illuminated 2 LED | yellow | yellow | 2 mm | **3.14.002.053/0000** |
| fully illuminated 2 LED | orange | yellow | 2 mm | 3.14.002.054/0000 |
| fully illuminated 2 LED | blue | blue | 2 mm | 3.14.001.659/0000 |

Technical data see page 4 - 76

For technical data of the LED see separate page at the beginning of chapter „RF short-travel keyswitches“

Suitable for RK 90 system design, illuminated for 2-module keycap.

## RF 19 - Signal indicator, 1 x 2-module




Pict.: 1 x 2-module

| Illumination | Colour of lens | LED colour | LED type | Order no. |
|---|---|---|---|---|
| fully illuminated 5 LED | red | red | 2 mm | 3.14.002.071/0000 |
| fully illuminated 5 LED | green | green | 2 mm | 3.14.002.072/0000 |
| fully illuminated 5 LED | yellow | yellow | 2 mm | 3.14.002.073/0000 |
| fully illuminated 5 LED | orange | yellow | 2 mm | 3.14.002.074/0000 |

Technical data see page 4 - 76

For technical data of the LED see separate page at the beginning of chapter „RF short-travel keyswitches“





**Stock items** are marked by **bold printed order numbers.**

# RF 15/19 - Special accessories

Pict.: opaque light grey

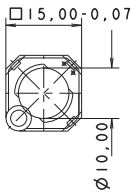
round and triangular versions

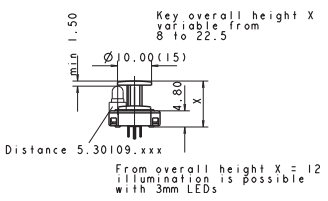
## Technical Data

| | | | |
|---|---|---|---|
| **Dimensions** | | Overall height | see order block |
| Length | see order block | Diameter | see order block |
| Width | see order block | Colour | see order block |

## RF 15 N - Extension plunger, round head

Pict.: opaque light grey




| Length | Width | Overall height | Diameter | Colour | Order no. |
|---|---|---|---|---|---|
| - | - | 9 mm | 10 mm | - | 5.46.011.036/0710 |
| - | - | 9.7 mm | 10 mm | - | 5.46.011.030/0710 |
| - | - | 12.5 mm | 10 mm | - | 5.46.011.037/0710 |
| - | - | 13 mm | 10 mm | - | 5.46.011.038/0710 |
| - | - | 22.5 mm | 10 mm | - | **5.46.011.028/0710** |

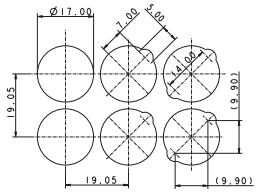
Length of plunger = Overall height - 4.25 mm.

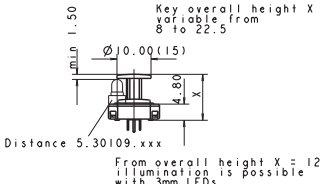




**Stock items** are marked by **bold printed order numbers.**

## RF 15 N - Extension plunger, round head, with recess for LED



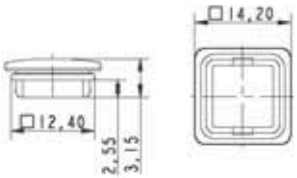




| Length | Width | Overall height | Diameter | Colour | Order no. |
|---|---|---|---|---|---|
| - | - | 9 mm | 15 mm | - | 5.46.017.036/0710 |
| - | - | 9.7 mm | 15 mm | - | 5.46.017.030/0710 |
| - | - | 12.5 mm | 15 mm | - | 5.46.017.037/0710 |
| - | - | 22.5 mm | 15 mm | - | 5.46.017.028/0710 |
| - | - | 13 mm | 15 mm | - | 5.46.017.038/0710 |

Technical data see page 4 - 80

Length of plunger = Overall height - 4.25 mm.

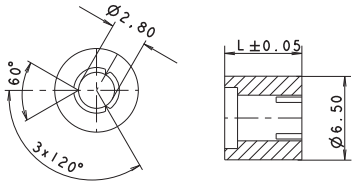
## RF 15 - Keycap, snap-on, for overall height 12.5 mm

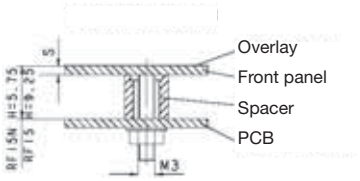



| Length | Width | Overall height | Diameter | Colour | Order no. |
|---|---|---|---|---|---|
| 14.2 mm | 14.2 mm | 12.5 mm | - | beige | 5.46.654.059/0227 |

Technical data see page 4 - 80

## Spacers, round




| Length | Width | Overall height | Diameter | Colour | Order no. |
|---|---|---|---|---|---|
| 3.50 mm | - | - | - | blue transparent | 5.30.759.023/0000 |
| 4 mm | - | - | - | green | 5.30.759.025/0000 |
| 4.25 mm | - | - | - | blue | 5.30.759.026/0000 |
| 4.50 mm | - | - | - | red | 5.30.759.027/0000 |
| 4.75 mm | - | - | - | blue transparent | 5.30.759.028/0000 |
| 5 mm | - | - | - | black | 5.30.759.029/0000 |
| 5.25 mm | - | - | - | yellow orange transparent | 5.30.759.030/0000 |
| 5.50 mm | - | - | - | yellow | 5.30.759.031/0000 |
| 5.75 mm | - | - | - | green | **5.30.759.032/0000** |
| 6 mm | - | - | - | blue | **5.30.759.033/0000** |
| 6.2 mm | - | - | - | blue | 5.30.759.251/0000 |
| 6.25 mm | - | - | - | red | **5.30.759.034/0000** |
| 6.50 mm | - | - | - | blue transparent | **5.30.759.035/0000** |
| 6.75 mm | - | - | - | black | **5.30.759.036/0000** |
| 7 mm | - | - | - | yellow orange transparent | **5.30.759.037/0000** |
| 7.25 mm | - | - | - | yellow | **5.30.759.038/0000** |
| 7.50 mm | - | - | - | green | **5.30.759.039/0000** |
| 7.75 mm | - | - | - | blue | **5.30.759.040/0000** |
| 8 mm | - | - | - | red | **5.30.759.041/0000** |
| 8.25 mm | - | - | - | blue transparent | **5.30.759.042/0000** |
| 10.00 mm | - | - | - | black | **5.30.759.043/0104** |

Technical data see page 4 - 80

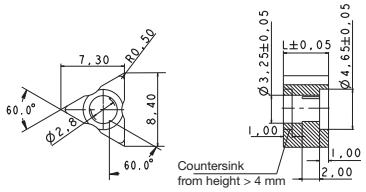
Required spacer length = Overall height of key - front panel thickness - 0.5 mm (area embossing).

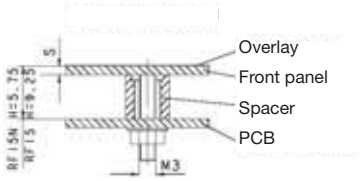




**Stock items** are marked by **bold printed order numbers.**

## Spacers, triangular




| Length | Width | Overall height | Diameter | Colour | Order no. |
|---|---|---|---|---|---|
| 2.50 mm | - | - | - | blue | 5.30.759.094/0000 |
| 2.75 mm | - | - | - | red | 5.30.759.095/0000 |
| 3 mm | - | - | - | blue transparent | 5.30.759.096/0000 |
| 3.25 mm | - | - | - | black | 5.30.759.097/0000 |
| 3.50 mm | - | - | - | yellow orange transparent | 5.30.759.098/0000 |
| 3.75 mm | - | - | - | yellow | 5.30.759.099/0000 |
| 4 mm | - | - | - | green | 5.30.759.100/0000 |
| 4.25 mm | - | - | - | blue | 5.30.759.101/0000 |
| 4.50 mm | - | - | - | red | 5.30.759.102/0000 |
| 4.75 mm | - | - | - | blue transparent | 5.30.759.103/0000 |
| 5 mm | - | - | - | black | 5.30.759.104/0000 |
| 5.25 mm | - | - | - | yellow orange transparent | 5.30.759.105/0000 |
| 5.50 mm | - | - | - | yellow | 5.30.759.106/0000 |
| 5.75 mm | - | - | - | green | 5.30.759.107/0000 |
| 6 mm | - | - | - | blue | 5.30.759.108/0000 |
| 6.2 mm | - | - | - | blue | 5.30.759.253/0000 |
| 6.25 mm | - | - | - | red | 5.30.759.109/0000 |
| 6.50 mm | - | - | - | blue transparent | 5.30.759.110/0000 |
| 6.75 mm | - | - | - | black | 5.30.759.111/0000 |
| 7 mm | - | - | - | yellow orange transparent | 5.30.759.112/0000 |
| 7.25 mm | - | - | - | yellow | 5.30.759.113/0000 |
| 7.50 mm | - | - | - | green | 5.30.759.114/0000 |
| 7.75 mm | - | - | - | blue | 5.30.759.115/0000 |

| Length | Width | Overall height | Diameter | Colour | Order no. |
|---|---|---|---|---|---|
| 8 mm | - | - | - | red | 5.30.759.116/0000 |
| 8.25 mm | - | - | - | blue transparent | 5.30.759.117/0000 |
| 9 mm | - | - | - | blue | 5.30.759.254/0000 |
| 10.00 mm | - | - | - | black | 5.30.759.124/0000 |
| 10.25 mm | - | - | - | yellow orange transparent | 5.30.759.125/0000 |

Technical data see page 4 - 80

Required spacer length = Overall height of key - front panel thickness - 0.5 mm (area embossing).

## RF 15 N - LED spacer

Pict.: opaque light grey

| Length | Width | Overall height | Diameter | Colour | Order no. |
|---|---|---|---|---|---|
| 2.2 mm | - | 12.5 mm | 5 mm | light grey | 5.30.109.010/0756 |
| 12 mm | - | 22.5 mm | 5 mm | black | 5.30.109.019/0105 |

Technical data see page 4 - 80





**Stock items** are marked by **bold printed order numbers.**

# KN 19 - Short-travel main switch


## General Data

Short-travel main switch for use in membrane keyboards under the overlay or with RK 90 keycaps, 250V, 4A max.
A cut-out in the overlay is not required!

## Content

**KN 19 - Short-travel main switch** **4 - 86**
KN 19 - Short-travel main switch 4 - 88

# KN 19 - Short-travel main switch

Pict.: 1Ö + 1S

2Ö / 2S

## General Data

The KN 19 makes it possible to implement a power switch directly in a low-profile data entry system. This eliminates the need for extra switches on the device and additional openings in the overlay. In this way, you can achieve an optimum of safety and a consistent design.
The contact opening widths comply with the VDE standards. The KN 19 can also be employed underneath RK 90 keycaps. Other actuation functions (momentary, latching/momentary) available on request.

## Technical Data

| | |
|---|---|
| **General information** | |
| Recommended key grid | 19.05 x 38.1 mm |
| **Dimensions** | |
| Length | 37.8 mm |
| Width | 18.8 mm |
| Overall height | 9.7 mm |
| **Mechanical design** | |
| Mounting | on PCB |
| Terminals | THT solder terminals |
| Contact system | snap-action bridge contact |
| Contact arrangement | see order block |
| Contact materials | Ag |
| Illumination | 1 LED (max. 3 mm) possible |
| Degree of protection | IP40 |
| Hot wire ignition acc. to IEC 60695-2-1 | 850 °C |
| **Mechanical characteristics** | |
| Operating force max. | $9^{\pm 3}$ N |
| Operating travel | $0.55^{\pm 0.15}$ mm |
| Robustness max. | 100 N |

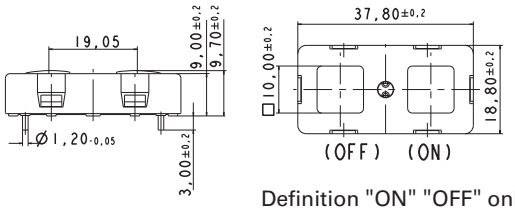
| | |
|---|---|
| **Electrical characteristics** | |
| Rated voltage AC min. | 12 V |
| Rated voltage DC min. | 12 V |
| Rated voltage AC max. | 250 V |
| Rated voltage DC max. | 50 V |
| Ohmic load AC | 6 A |
| Ohmic load DC min. | 0.1 A |
| Ohmic load DC max. | 10 A |
| Contact resistance when new max. | 50 mΩ |
| Capacity input current AC max. | 100 A |
| Rated motor current AC | 4 A |
| Rated filament lamp current AC | 2.4 A |
| Bouncing time max. | 10 ms |
| **Other specifications** | |
| Ambient temp. operating min. | -25 °C |
| Ambient temp. operating max. | +70 °C |
| Environmental restistance | acc. to IEC 60068-2 -14, -30, -33 and -78 |
| Operating life AC | AC 250 V: 200.000/ 2A; 100.000 /6A |
| Operating life DC | 50,000(10 A / 50 V=) |
| Soldering time max. | 3 s |
| Soldering temperature max. | 350 °C |
| Flame class acc. to UL 94 | UL 94 VO |

## Circuit Diagram

1 Ö + 1 S

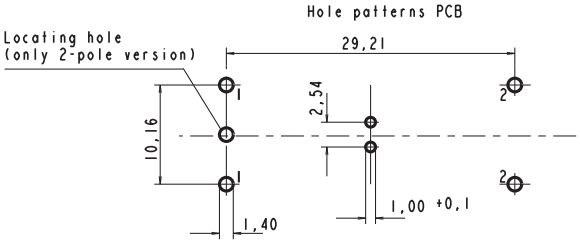
2 Ö/2 S

## Dimensional Drawing




Definition "ON" "OFF" only valid for 2-pole version.

## Hole Pattern




Locating hole only version 2 NO/2 NC

View on component side.

**Approvals**

IEC 61058

UL 508,C22.2 No. 14-M91

**Approvals**

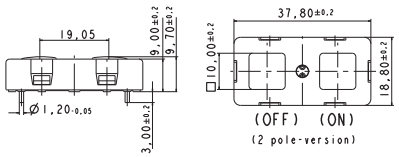
IEC 61058

UL 508,C22.2 No. 14-M91

## Typical accessories KN 19 - Short-travel main switch

| Description | Photo | Order no. | Additional accessories see page |
|---|---|---|---|
| KN19 - Absorption rubber | | 5.30.729.009/0000 | |

## KN 19 - Short-travel main switch



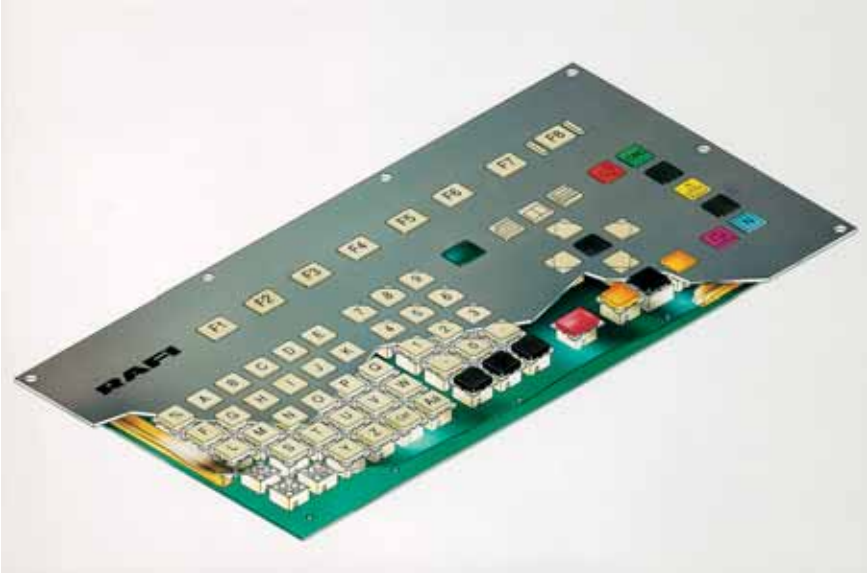

Pict.: 1 NC + 1 NO

| Contact arrangement | Rated voltage AC max. | Order no. |
|---|---|---|
| 1 NC + 1 NO | 250 V | **1.12.000.001/0000** |
| 2 NC / 2 NO | 250 V | **1.12.000.501/0000** |

Technical data see page 4 - 86

**Accessoires:**
KN19 - Absorption rubber: 5.30.729.009/0000

For keycaps, refer to RK 90 system design.
Positive opening NC contacts to IEC 60 947-5-1.
1-LED spot-illumination (max. 3 mm) possible.



## General Data

**Keycaps for RACON, RF 15 / RF 19 and KN 19 short-travel keyswitches**
• You can insert a legend insert betweenlens and pressure paol of the transparent keycaps.

## Content


| | |
|---|---|
| **RK 90 - Keycaps, plastic, 9 x 9 mm** | **4 - 92** |
| RK 90 - Keycap body plastic, for lenses 9 x 9 mm | 4 - 93 |
| **RK 90 - Keycaps, plastic, 14 mm** | **4 - 94** |
| RK 90 - Keycap body plastic, for lenses 14 mm, 1-module | 4 - 95 |
| RK 90 - Keycap body plastic, for lenses 1¼-module | 4 - 95 |
| RK 90 - Keycap body plastic, for lenses 14 mm, 1½-module | 4 - 96 |
| RK 90 - Keycap body plastic, for lenses 2-module | 4 - 96 |
| **RK 90 - Keycaps, aluminum, 14 x 14 mm** | **4 - 98** |
| RK 90 - Keycaps, aluminum, 14 mm, 1-module | 4 - 98 |
| RK 90 - Keycaps, aluminum, 14 mm, 1½-module | 4 - 99 |
| RK 90 - Keycaps, aluminum, 14 mm, 2-module | 4 - 99 |
| **RK 90 - Special accessories** | **4 - 100** |
| RK 90 - Fin, to avoid inadvertent operation | 4 - 100 |
| RK 90 - Spacer M 4 | 4 - 101 |
| RK 90 - Silicone foil 600 x 590 x 0.45 mm | 4 - 101 |

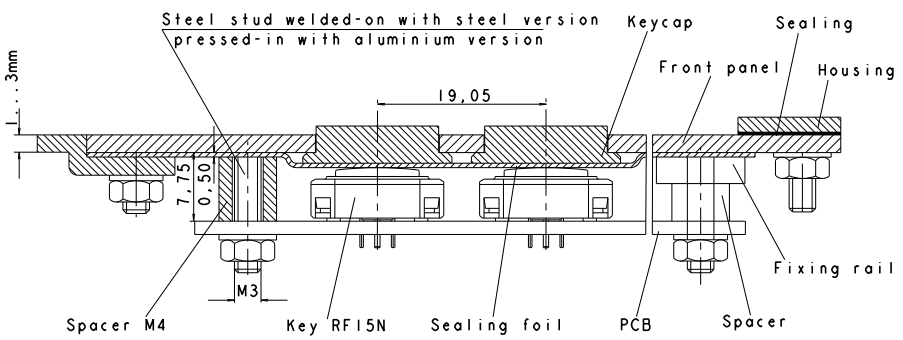
## Keycap system RK 90

Example with RF 15 keyswitches. Instead of RF 15 following keyswitches can be used:
- MICON 5
- RACON 8/12
- RF 15 keyswitches and signal indicators
- RF 19 keyswitches and signal indicators
- Short-travel main switch KN 19

The RK 90 system was granted the prize of the Design Forum of the Hannover Fair.
**Degree of protection: IP65 according to DIN in front of the panel, with silicone sealing.**

## Installation methods

Installation from front




Installation from rear

**Mounting from front**
Sealing foil between RK 90 keyboard and customer's front panel.

**Mounting from rear**
Sealing foil is screwed to RK 90 panel with fixing rails; sealing between keyboard and customer's front panel has to be provided.

## Legending

- **Laser printing:** This labelling method is possible for opaque keycaps. The symbols are engraved in the keycaps with laser.
- When using transparent lenses, the pressure pad can be legended by printing.

  As the legending is protected by the lens, it is friction-proof.
- **Engraving:** With this method the keycaps are engraved with the required symbol and then inlaid with ink.

## Recommendations

- **Front panel thickness:**
  - **Aluminum:** 2 mm (1.5 mm min, 3 mm max.)
    (Fixing with M 3 pressed-in studs)
  - **Steel:** 2 mm (3 mm max.): V2A: 1.25 mm
    (Fixing with M 3 welded-on studs)
    The keytop surface is flush with the keyboard at a panel thickness of 3.5 mm.

- **Silicone sealing:**
  Material: Silicone transparent
  Type: A-SY 40-79
  Hardness: 30° shore +/- 5°
  Thickness: 0.45 +/- 0.05 mm

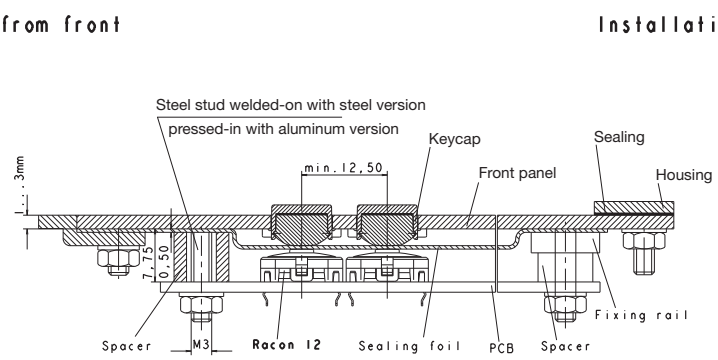
- **Installation:** Ensure that the keyboard slopes slightly so that any liquid can drain away between front panel and silicone sealing; if necessary, provide additional drain holes in the front panel.

## Cleaning liquids

For the cleaning of the plastic keycaps please do not use cleaning liquids based on alcohol or acid.

# RK 90 - Keycaps, plastic, 9 x 9 mm

Pict.: with colourless lens




## General Data

You can design especially small input fields with the small keycap 9 x 9 mm. For example, controls for measurement and laboratory equipment which do not offer much space for input fields because of their small size. RK 90 keycaps 9 x 9 mm and RACON short-travel keyswitches can be used to implement key grids of only 12.5 mm. The keycaps can be legended by laser-printing, engraving or standard printing.
This keycap is our first choice in a combination with the illuminated RACON 12 i short-travel keyswitch.

**Please note:** For the cleaning of the plastic keycaps please do not use cleaning liquids based on alcohol or acid.

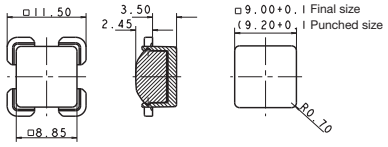
## Technical Data

| **General information** | |
|---|---|
| Colour of lens | see order block |
| Size | 1-module |
| Degree of protection (with silicon seal) | IP65 |
| Illuminability | see order block |

| **Dimensions** | |
|---|---|
| Dimension keycap in front of front panel | 8.85 x 8.85 mm |
| Dimension keycap behind front panel | 11.5 x 11.5 mm |
| Dimension (c) hole patterns final size | 9.00 x 9.00 mm |
| Dimension hole patterns punched size | 9.20 x 9.20 mm |

Please order lens separately.

## RK 90 - Keycap body plastic, for lenses 9 x 9 mm




Pict.: with lens, light grey

| Size | Illuminability | Dimension keycap behind front panel | Dimension keycap in front of front panel | Dimension (c) hole patterns final size | Order no. without lens | Note |
|---|---|---|---|---|---|---|
| 1-module | yes | 11.5 x 11.5 mm | 8.85 x 8.85 mm | 9.00 x 9.00 mm | 5.55.103.265/1013 | Please order lenses separately. |

Technical data see page 4 - 92

**Lenses:**
RK 90 - Lens, 9 x 9 mm, opaque red: 5.46.651.015/0309
RK 90 - Lens, 9 x 9 mm, opaque yellow: 5.46.651.015/0409
RK 90 - Lens, 9 x 9 mm, opaque green: 5.46.651.015/0514
RK 90 - Lens, 9 x 9 mm, opaque blue: 5.46.651.015/0611
RK 90 - Lens, 9 x 9 mm, opaque light grey: 5.46.651.015/0700
RK 90 - Lens, 9 x 9 mm, transparent colourless: 5.46.651.019/1002
RK 90 - Lens, 9 x 9 mm, transparent red: 5.46.651.019/1307
RK 90 - Lens, 9 x 9 mm, transparent yellow: 5.46.651.019/1403
RK 90 - Lens, 9 x 9 mm, transparent green: 5.46.651.019/1510

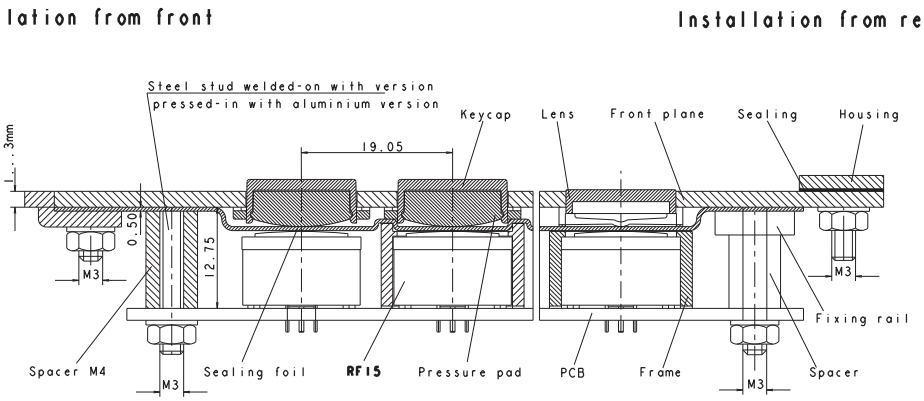




**Stock items** are marked by **bold printed order numbers.**

# RK 90 - Keycaps, plastic, 14 mm

Pict.: with lens, opaque green




## General Data

Keycap system for 19.05 mm grid. The keycaps can be legended by laser-printing, engraving or standard printing. Keycaps / sets with legends and other keycap shapes / colours available on request.

**Please note:** For the cleaning of the plastic keycaps please do not use cleaning liquids based on alcohol or acid.

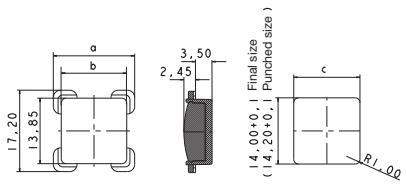
## Technical Data

| **General information** | |
|---|---|
| Colour of lens | see order block |
| Size | see order block |
| Degree of protection (with silicon seal) | IP65 |
| Illuminability | yes |

| **Dimensions** | |
|---|---|
| Dimension (b) in front of front panel | see order block |
| Dimension (a) behind front panel | see order block |
| Dimension (c) hole patterns final size | see order block |
| Dimension hole patterns punched size | see order block |

## RK 90 - Keycap body plastic, for lenses 14 mm, 1-module

Pict.: with lens, opaque green

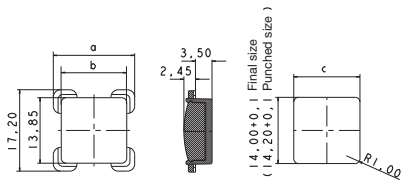



| Size | Illuminability | Dimension (a) behind front panel | Dimension (b) in front of front panel | Dimension (c) hole patterns final size | Order no. without lens | Note |
|---|---|---|---|---|---|---|
| 1-module | yes | 17.20 x 17.20 mm | 13.85 x 13.85 mm | 14.00 x 14.00 mm | 5.55.103.030/1013 | Please order lenses separately. |

Technical data see page 4 - 94

**Lenses:**
RK 90 - Lens, 14 mm, 1-module, opaque red: 5.46.681.001/0309
RK 90 - Lens, 14 mm, 1-module, opaque yellow: 5.46.681.001/0409
RK 90 - Lens, 14 mm, 1-module, opaque green: 5.46.681.001/0514
RK 90 - Lens, 14 mm, 1-module, opaque blue: 5.46.681.001/0611
RK 90 - Lens, 14 mm, 1-module, opaque light grey: 5.46.681.001/0700
RK 90 - Lens, 14 mm, 1-module, transparent colourless: 5.46.681.021/1002
RK 90 - Lens, 14 mm, 1-module, transparent red: 5.46.681.021/1307
RK 90 - Lens, 14 mm, 1-module, transparent yellow: 5.46.681.021/1403
RK 90 - Lens, 14 mm, 1-module, transparent green: 5.46.681.021/1510

## RK 90 - Keycap body plastic, for lenses 1¼-module




| Size | Illuminability | Dimension (a) behind front panel | Dimension (b) in front of front panel | Dimension (c) hole patterns final size | Order no. without lens | Note |
|---|---|---|---|---|---|---|
| 1 1¼-module | yes | 17.20 x 20.7 mm | 13.85 x 17.35 mm | 14,00 x 17,5 mm | 5.55.103.031/1013 | Please order lenses separately. |

Technical data see page 4 - 94

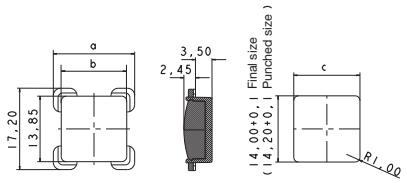
**Lenses:**
RK 90 - Lens, 14 mm, 1.25-module, opaque red: 5.46.681.002/0309
RK 90 - Lens, 14 mm, 1.25-module, opaque light grey: 5.46.681.002/0700
RK 90 - Lens, 14 mm, 1.25-module, transparent colourless: 5.46.681.022/1002
RK 90 - Lens, 14 mm, 1.25-module, transparent red: 5.46.681.022/1307
RK 90 - Lens, 14 mm, 1.25-module, transparent yellow: 5.46.681.022/1403
RK 90 - Lens, 14 mm, 1.25-module, transparent green: 5.46.681.022/1510





**Stock items** are marked by **bold printed order numbers.**

## RK 90 - Keycap body plastic, for lenses 14 mm, 1½-module

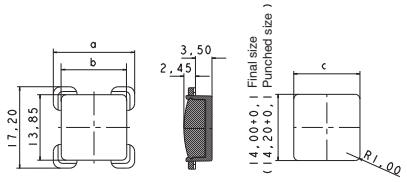

Pict.: with lens, opaque light grey

| Size | Illuminability | Dimension (a) behind front panel | Dimension (b) in front of front panel | Dimension (c) hole patterns final size | Order no. without lens | Note |
|---|---|---|---|---|---|---|
| 1½-module | yes | 17.20 x 24.20 mm | 13.85 x 20.85 mm | 14.00 x 21.00 mm | 5.55.103.032/1013 | Please order lenses separately. |

Technical data see page 4 - 94

**Lenses:**
RK 90 - Lens, 14 mm, 1.5-module, opaque red: 5.46.681.003/0309
RK 90 - Lens, 14 mm, 1.5-module, opaque yellow: 5.46.681.003/0409
RK 90 - Lens, 14 mm, 1.5-module, opaque green: 5.46.681.003/0514
RK 90 - Lens, 14 mm, 1.5-module, opaque blue: 5.46.681.003/0611
RK 90 - Lens, 14 mm, 1.5-module, opaque light grey: 5.46.681.003/0700
RK 90 - Lens, 14 mm, 1.5-module, transparent colourless: 5.46.681.023/1002
RK 90 - Lens, 14 mm, 1.5-module, transparent red: 5.46.681.023/1307
RK 90 - Lens, 14 mm, 1.5-module, transparent yellow: 5.46.681.023/1403
RK 90 - Lens, 14 mm, 1.5-module, transparent green: 5.46.681.023/1510

## RK 90 - Keycap body plastic, for lenses 2-module




Pict.: with lens, transparent yellow

| Size | Illuminability | Dimension (a) behind front panel | Dimension (b) in front of front panel | Dimension (c) hole patterns final size | Order no. without lens | Note |
|---|---|---|---|---|---|---|
| 2-module | yes | 17.20 x 31.20 mm | 13.85 x 27.85 mm | 14.00 x 28.00 mm | 5.55.103.077/1013 | Please order lenses separately. |

Technical data see page 4 - 94

**Lenses:**
RK 90 - Lens, 14 mm, 2-module, opaque red: 5.46.681.004/0309
RK 90 - Lens, 14 mm, 2-module, opaque yellow: 5.46.681.004/0409
RK 90 - Lens, 14 mm, 2-module, opaque green: 5.46.681.004/0514
RK 90 - Lens, 14 mm, 2-module, opaque blue: 5.46.681.004/0611
RK 90 - Lens, 14 mm, 2-module, opaque light grey: 5.46.681.004/0700
RK 90 - Lens, 14 mm, 2-module, transparent colourless: 5.46.681.024/1002
RK 90 - Lens, 14 mm, 2-module, transparent red: 5.46.681.024/1307
RK 90 - Lens, 14 mm, 2-module, transparent yellow: 5.46.681.024/1403
RK 90 - Lens, 14 mm, 2-module, transparent green: 5.46.681.024/1510

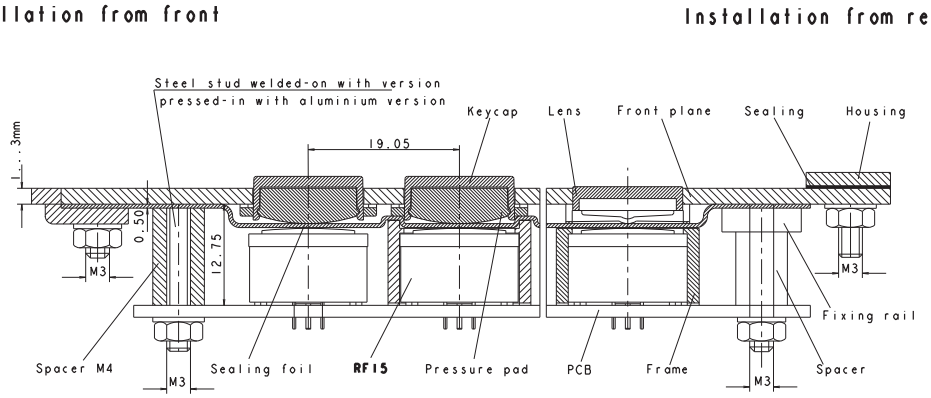




**Stock items** are marked by **bold printed order numbers.**

## RK 90 - Keycaps, aluminum, 14 x 14 mm

Pict.: natural anodized




### General Data

The RK 90 system design with metal keycaps is fairly safe against mechanical, thermal or chemical effects. Combined with a metal front panel, this data entry system offers maximum protection against vandalism. Tried and tested MICON 5, RACON 8/12 or RF 15/19 PCB keyswitches are used underneath the metal keycaps.
The keycaps can be provided with engraved, coloured anodized or laser-printed legends. This means that the legend is durable and cannot be removed by mechanical or chemical means.

4

### Technical Data

**General information**

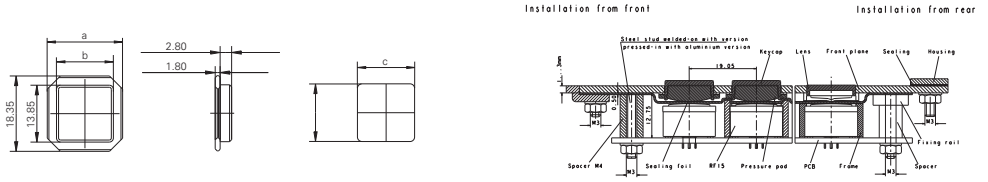
| | |
|---|---|
| Colour of lens | aluminum colourless anodized |
| Size | see order block |
| Degree of protection (with silicon seal) | IP65 |

**Dimensions**

| | |
|---|---|
| Dimension (b) in front of front panel | see order block |
| Dimension (a) behind front panel | see order block |
| Dimension (c) hole patterns final size | see order block |
| Dimension hole patterns punched size | see order block |

## RK 90 - Keycaps, aluminum, 14 mm, 1-module

Pict.: natural anodized

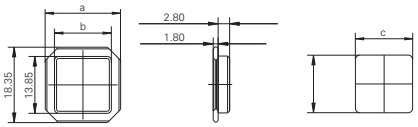


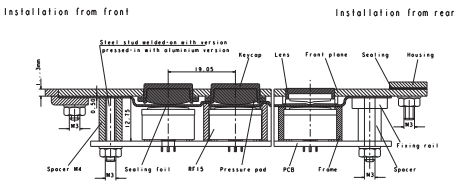

| Size | Colour of lens | Dimension (a) behind front panel | Dimension (b) in front of front panel | Dimension (c) hole patterns final size | Order no. |
|---|---|---|---|---|---|
| 1-module | aluminum colourless anodized | 18.35 x 18.35 mm | 13.85 x 13.85 mm | 14.00 x 14.00 mm | 5.46.500.001/4010 |



**Stock items** are marked by **bold printed order numbers.**

## RK 90 - Keycaps, aluminum, 14 mm, 1½-module

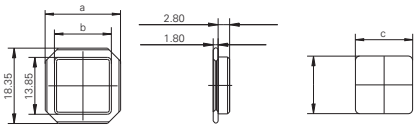


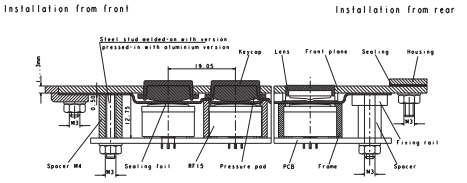




| Size | Colour of lens | Dimension (a) behind front panel | Dimension (b) in front of front panel | Dimension (c) hole patterns final size | Order no. |
|---|---|---|---|---|---|
| 1½-module | aluminum colourless anodized | 18.35 x 25.35 mm | 13.85 x 20.85 mm | 14.00 x 21.00 mm | 5.46.500.003/4010 |

Technical data see page 4 - 98

## RK 90 - Keycaps, aluminum, 14 mm, 2-module




| Size | Colour of lens | Dimension (a) behind front panel | Dimension (b) in front of front panel | Dimension (c) hole patterns final size | Order no. |
|---|---|---|---|---|---|
| 2-module | aluminum colourless anodized | 18.35 x 32.35 mm | 13.85 x 27.85 mm | 14.00 x 28.00 mm | 5.46.500.004/4010 |

Technical data see page 4 - 98





**Stock items** are marked by **bold printed order numbers.**

## RK 90 - Special accessories

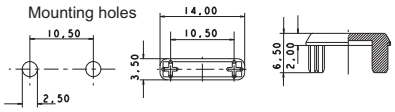
Pict.: charcoal grey

### Technical Data

**General information**
Colour — see order block

**Dimensions**
Dimensions — see order block

## RK 90 - Fin, to avoid inadvertent operation




Pict.: charcoal grey

| Short text | Feature 1 | Feature 2 | Order no. |
|---|---|---|---|
| RK 90 - Fin, to avoid inadvertent operation, light grey | - | - | 5.55.103.079/0700 |
| RK 90 - Fin, to avoid inadvertent operation, charcoal grey | - | - | **5.55.103.079/0152** |





**Stock items** are marked by **bold printed order numbers.**

## RK 90 - Spacer M 4

| Short text | Feature 1 | Feature 2 | Order no. |
|---|---|---|---|
| RK 90 - Spacer M 4 withRF 15 keys, height 12.50 mm, mounting from front (1 pc. per stud) | - | 12.5 mm overall height for RF 15 | 5.30.764.040/0000 |
| RK 90 - Spacer M 4 withRF 15 keys, height 9.25 mm, mounting from rear (1 pc. per stud) | - | 9.25 mm overall height, for RF 15 | 5.30.764.027/0000 |
| RK 90 - Spacer M 4 withRF 15 N keys, height 5.50 mm, mounting from rear (1 pc. per stud) | - | 5.5 mm overall height, for RF15 N | 5.30.764.010/0000 |
| RK 90 - Spacer M 4 with RACON 8/12 keys, height 7.50 mm, mounting from front (1 pc. per stud) | - | 7.5 mm overall height for RACON 8/12 | 5.30.764.018/0000 |
| RK 90 - Spacer M 4 with RACON 8/12 keys, height 4.25 mm, mounting from rear (1 pc. per stud) | - | 4.25 mm overall height, for RACON 8/12 | 5.30.764.005/0000 |

Technical data see page 4 - 100

## RK 90 - Silicone foil 600 x 590 x 0.45 mm

| Short text | Feature 1 | Feature 2 | Order no. |
|---|---|---|---|
| RK 90 - Silicone foil 600 x 590 x 0.45 mm | transparent | 600 x 590 x 0.45 mm | 7.16.102.006/0000 |

Technical data see page 4 - 100





**Stock items** are marked by **bold printed order numbers.**


## General Data

**Vandal-proof input system, ideally suited for elevator controls, info terminals, vending machines, etc.**
- Edge illumination and symbol illumination possible
- Connection: Each module individually with an 8-pin Micro-Match socket connector
- Modular fixing system with quick fasteners or single fixing
- Contact arrangement: 1 NO contact or 1 NC + 1 NO contact
- 50 V/250 mA max.
- Degree of protection IP65 (keylock switch IP40).

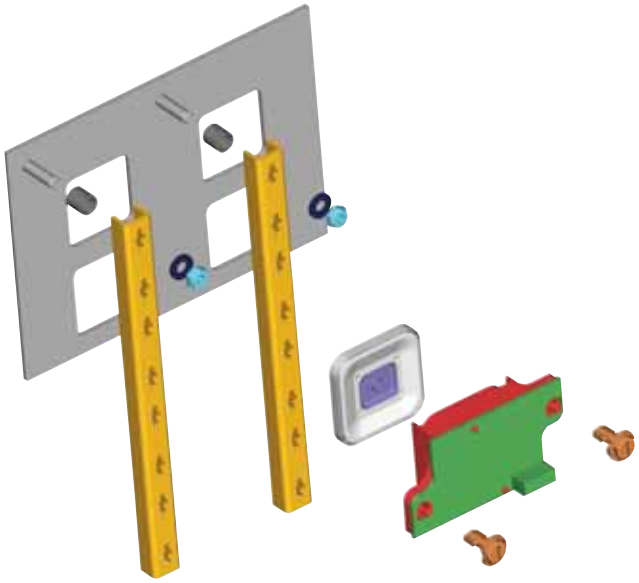
## Content


| | |
|---|---|
| **RG 85 III - Keyswitch** | **4 - 106** |
| RG 85 III - Keyswitch, round design, without lens | 4 - 107 |
| RG 85 III - Keyswitch, square design, without lens | 4 - 108 |
| **RG 85 III - Keylock switch** | **4 - 110** |
| RG 85 III - Keylock switch, round design, without lens | 4 - 111 |
| RG 85 III - Keylock switch, square design, without lens | 4 - 112 |
| **RG 85 III - Signal indicator, without lens** | **4 - 114** |
| RG 85 III - Signal indicator, without lens | 4 - 115 |
| **RG 85 III - Accessories** | **4 - 116** |
| RG 85 III - Lenses for keyswitches, round | 4 - 116 |
| RG 85 III - Lenses for keyswitches, square | 4 - 118 |
| RG 85 III - Lenses for keylock switches, round | 4 - 121 |
| RG 85 III - Lenses for keylock switches, square | 4 - 121 |
| RG 85 III - Lens, round, for signal indicators | 4 - 121 |
| RG 85 III - Lens, square, for signal indicators | 4 - 122 |
| RG 85 III - Lens, triangular, for signal indicators | 4 - 122 |
| Cable, 8 wires, with socket connectors on both ends | 4 - 122 |
| Fixing rail, length 490 mm | 4 - 123 |
| Spacer | 4 - 123 |
| Fixing piece for mounting the elements with the rail fixing method | 4 - 123 |

## System Features

Perfectly suited for: elevator controls, info terminals, vending machines, etc.

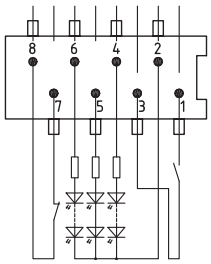
- Vandal proof construction
- Modular fixing system with quick fasteners or single fixing method using thread studs
- Connection with keyed 8-pin micro-match connector
- Degree of protection: IP40/65



## Keylock Switch Features

- Round or square design and lens shape
- Edge illumination in one or two colours with 4 LED for each colour
- Lens material: Aluminum or stainless steel with plastic inlays
- Contact arrangement: 1 NO
- Cylinder lock with pin tumblers
- Two switching positions: 0 and 90 degrees, key can be removed in any position
- Lock type 5201 – other lock types on request
- Included: 2 keys

## Micro-Match Connector Pin Assignment




**1/3** NO contact

**2** 0 V – LED

**4** Edge illuminat./signal indicator 1st colour + 24 V DC +/- 20%

**5** Symbol illumination + 24 V DC +/- 20%

**6** Edge illuminat./signal indicator 2nd colour + 24 V DC +/- 20%

**7/8** NC contact

## Pushbutton Features

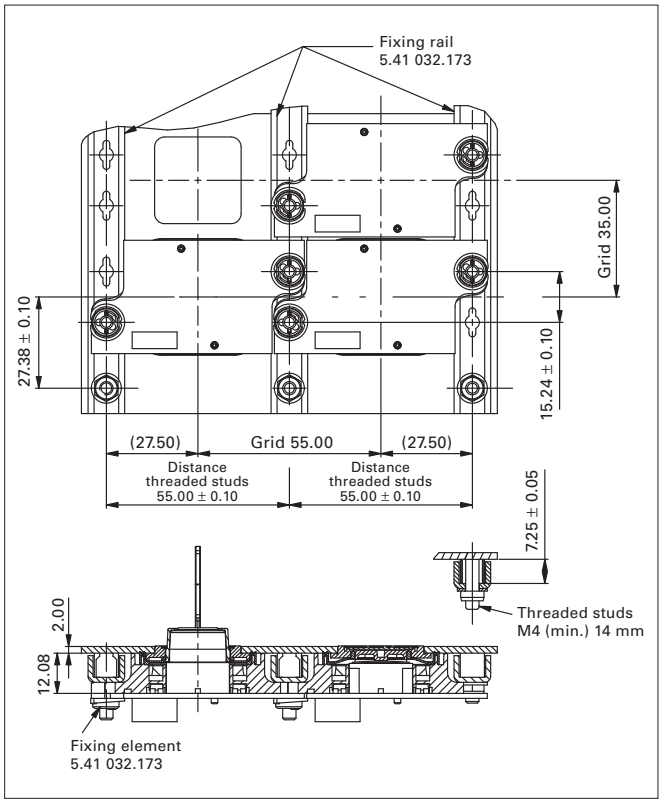
- Round or square design and lens shape
- Edge illumination in one or two colours with 4 LED for each colour
- Pushbutton with 1 NO contact: Additional illumination of the symbol with 2 LED possible
- Lens material: Aluminum or stainless steel with plastic inlays
- Switching element: short-travel keyswitch RF 19
  - 1 NO contact, non-illuminated
  - 1 NO contact, fully illuminated
  - 1 NC contact and 1 NO contact, non-illuminated

## Signal Indicator Features

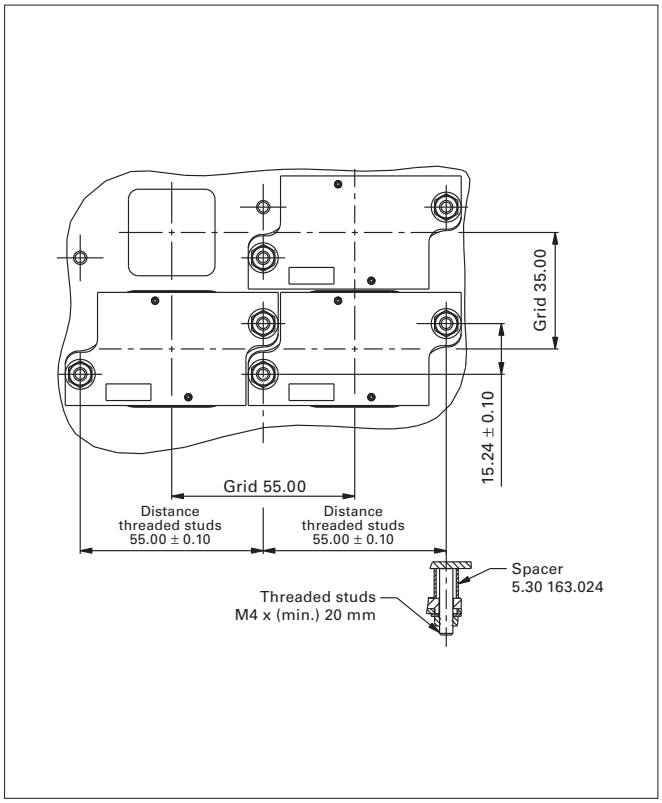
- Lens shape round, square or triangular (arrow shape)
- Lens material: Translucent plastic material
- Fully illuminated with 5 LED

## Installation plan

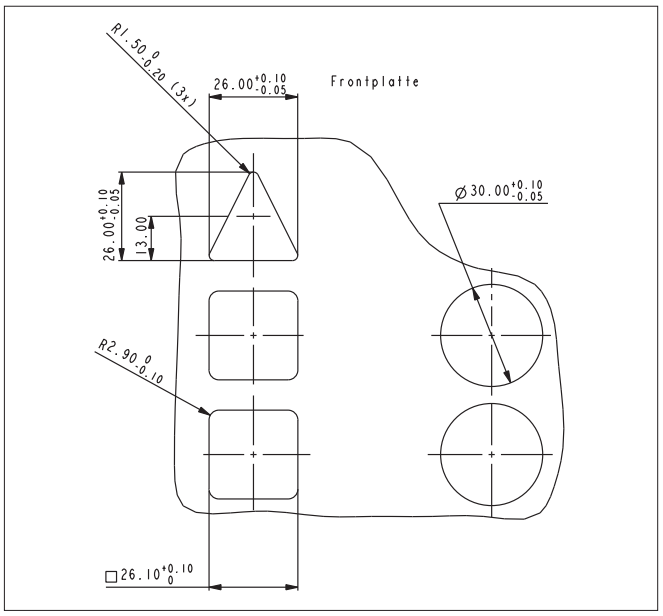
### Rail fixing method




### Single fixing method



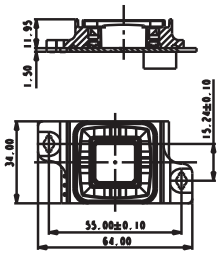

## Front panel




4

RG 85 III

# RG 85 III - Keyswitch




## Technical Data

| | |
|---|---|
| **Dimensions** | |
| Mounting grid min. | 55 x 35 mm |
| Length | 64 mm |
| Width | 34 mm |
| **Mechanical design** | |
| Version | see order block |
| Mounting | on U-rails or single mounting |
| Terminals | 8-pin Micro-Match® female connector |
| Contact system | snap-action (1 NO ) or bridge contact (1 NC + 1 NO ) |
| Contact arrangement | see order block |
| Contact materials | Ag |
| Symbol illumination | see order block |
| Edge illumination | see order block |
| **Mechanical characteristics** | |
| Operating force | 3.5 N |
| Operating travel | 1 mm |
| Switching travel NO | 1 mm |
| Switching travel NC | 0.6 mm |

| | |
|---|---|
| **Electrical characteristics** | |
| Rated voltage min. | 3 V |
| Rated voltage max. | 50 V |
| Rated current min. | 0.1 mA |
| Rated current max. | 250 mA |
| Rated power max. | 12.5 W |
| Contact resistance when new max. | 100 mΩ |
| Contact resistance acc. to life max. | 3 Ω |
| Bouncing time max. | 10 ms |
| Operating voltage for LED | 24±20% V |
| Input current LED | per colour/LED row 9 - 16 mA |
| **Other specifications** | |
| Ambient temp. operating min. | -25 °C |
| Ambient temp. operating max. | +70 °C |
| Storage temperature min. | -40 °C |
| Storage temperature max. | +80 °C |
| Environmental restistance | acc. to IEC 60068-2 -14, -30, -33 and -78 |
| Operating life min. (operations) | 1,000,000 |
| Degree of protection rail mounting | IP40 |
| Degree of protection single mounting | IP65 |
| Flammability of materials | according to UL 94 HB |

## Typical accessories RG 85 III - Keyswitch

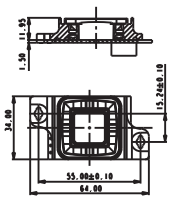
| Description | Photo | Order no. | Additional accessories see page |
|---|---|---|---|
| Cable, 8 wires, with socket connectors on both ends, length 1 m |  | 5.03.772.261/0000 | 4 - 122 |
| RG 85 III - Lenses for keyswitches, round, stainless steel |  | 5.04.914.000/2000 | 4 - 117 |
| RG 85 III - Lenses for keyswitches, square, aluminum |  | 5.04.915.100/2000 | 4 - 118 |

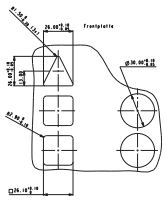




**Stock items** are marked by **bold printed order numbers.**

## RG 85 III - Keyswitch, round design, without lens





| Contact arrangement | Edge illumination | Symbol illumination | Version | Order no. |
|---|---|---|---|---|
| 1 NO | 4 LED white | - | round | 3.99.400.111/2000 |
| 1 NO | 4 LED red | - | round | 3.99.400.111/3000 |
| 1 NO | 4 LED yellow | - | round | 3.99.400.111/4000 |
| 1 NO | 4 LED green | - | round | 3.99.400.111/5000 |
| 1 NO | 4 LED blue | - | round | 3.99.400.111/6000 |
| 1 NO | 4 LED white, 4 LED blue | - | round | 3.99.400.111/7000 |
| 1 NO | 4 LED green, 4 LED red | - | round | 3.99.400.111/8000 |
| 1 NO | 4 LED white | 2 LED yellow | round | 3.99.400.111/2400 |
| 1 NO | 4 LED red | 2 LED red | round | 3.99.400.111/3300 |
| 1 NO | 4 LED yellow | 2 LED green | round | 3.99.400.111/4500 |
| 1 NO | 4 LED green | 2 LED green | round | 3.99.400.111/5500 |
| 1 NO | 4 LED blue | 2 LED blue | round | 3.99.400.111/6600 |
| 1 NO | 4 LED white, 4 LED blue | 2 LED blue | round | 3.99.400.111/7600 |
| 1 NO | 4 LED green, 4 LED red | 2 LED red | round | 3.99.400.111/8300 |
| 1 NC + 1 NO | 4 LED white | - | round | 3.99.400.131/2000 |
| 1 NC + 1 NO | 4 LED red | - | round | 3.99.400.131/3000 |
| 1 NC + 1 NO | 4 LED yellow | - | round | 3.99.400.131/4000 |
| 1 NC + 1 NO | 4 LED green | - | round | 3.99.400.131/5000 |
| 1 NC + 1 NO | 4 LED blue | - | round | 3.99.400.131/6000 |
| 1 NC + 1 NO | 4 LED white, 4 LED blue | - | round | 3.99.400.131/7000 |
| 1 NC + 1 NO | 4 LED green, 4 LED red | - | round | 3.99.400.131/8000 |

Technical data see page 4 - 106

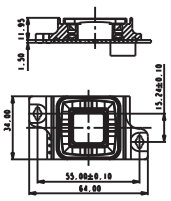
Please order lenses (round shape) separately.

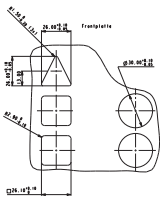




**Stock items** are marked by **bold printed order numbers.**

## RG 85 III - Keyswitch, square design, without lens





| Contact arrangement | Edge illumination | Symbol illumination | Version | Order no. |
|---|---|---|---|---|
| 1 NO | 4 LED white | - | square | 3.99.400.112/2000 |
| 1 NO | 4 LED red | - | square | 3.99.400.112/3000 |
| 1 NO | 4 LED yellow | - | square | 3.99.400.112/4000 |
| 1 NO | 4 LED green | - | square | 3.99.400.112/5000 |
| 1 NO | 4 LED blue | - | square | 3.99.400.112/6000 |
| 1 NO | 4 LED white, 4 LED blue | - | square | 3.99.400.112/7000 |
| 1 NO | 4 LED green, 4 LED red | - | square | 3.99.400.112/8000 |
| 1 NO | 4 LED white | 2 LED yellow | square | 3.99.400.112/2400 |
| 1 NO | 4 LED red | 2 LED red | square | 3.99.400.112/3300 |
| 1 NO | 4 LED yellow | 2 LED green | square | 3.99.400.112/4500 |
| 1 NO | 4 LED green | 2 LED green | square | 3.99.400.112/5500 |
| 1 NO | 4 LED blue | 2 LED blue | square | 3.99.400.112/6600 |
| 1 NO | 4 LED white, 4 LED blue | 2 LED blue | square | 3.99.400.112/7600 |
| 1 NO | 4 LED green, 4 LED red | 2 LED red | square | 3.99.400.112/8300 |
| 1 NC + 1 NO | 4 LED white | - | square | 3.99.400.132/2000 |
| 1 NC + 1 NO | 4 LED red | - | square | 3.99.400.132/3000 |
| 1 NC + 1 NO | 4 LED yellow | - | square | 3.99.400.132/4000 |
| 1 NC + 1 NO | 4 LED green | - | square | 3.99.400.132/5000 |
| 1 NC + 1 NO | 4 LED blue | - | square | 3.99.400.132/6000 |
| 1 NC + 1 NO | 4 LED white, 4 LED blue | - | square | 3.99.400.132/7000 |
| 1 NC + 1 NO | 4 LED green, 4 LED red | - | square | 3.99.400.132/8000 |

Technical data see page 4 - 106

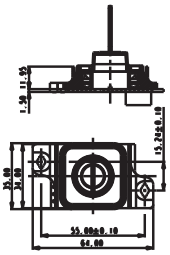
Please order lenses (square shape) separately.





**Stock items** are marked by **bold printed order numbers.**

# RG 85 III - Keylock switch



## Technical Data

| | |
|---|---|
| **Dimensions** | |
| Mounting grid min. | 55 x 35 mm |
| Length | 64 mm |
| Width | 34 mm (35 mm with sealing) |
| Mounting depth | see order block |
| **Mechanical design** | |
| Version | see order block |
| Mounting | on U-rails or single mounting |
| Terminals | 8-pin Micro-Match® female connector |
| Contact system | cross contact |
| Contact arrangement | 1 NO |
| Contact materials | Au alloy |
| Symbol illumination | none |
| Edge illumination | see order block |
| Lock | cylinder lock, lock type 5201 |
| Key removal position | Pos. 0 + 1 |
| **Mechanical characteristics** | |
| Rotating angle | 1 x 90° |
| Switching travel NO | 1 mm |
| Switching travel NC | see order block |

| | |
|---|---|
| **Electrical characteristics** | |
| Rated voltage min. | 3 V |
| Rated voltage max. | 35 V |
| Rated current min. | 0.1 mA |
| Rated current max. | 100 mA |
| Rated power max. | 1 W |
| Contact resistance when new max. | 100 mΩ |
| Contact resistance acc. to life max. | 3 Ω |
| Bouncing time max. | 10 ms |
| Operating voltage for LED | $24^{\pm 20\%}$ V |
| Input current LED | per colour/LED row 9 - 16 mA |
| **Other specifications** | |
| Ambient temp. operating min. | -25 °C |
| Ambient temp. operating max. | +70 °C |
| Storage temperature min. | -40 °C |
| Storage temperature max. | +80 °C |
| Environmental restistance | acc. to IEC 60068-2 -14, -30, -33 and -78 |
| Operating life min. (operations) | 50,000 |
| Degree of protection rail mounting | IP40 |
| Degree of protection single mounting | IP65 |
| Flammability of materials | according to UL 94 HB |

## Typical accessories RG 85 III - Keylock switch

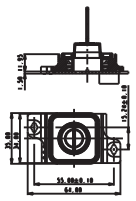
| Description | Photo | Order no. | Additional accessories see page |
|---|---|---|---|
| RG 85 III - Lenses for keylock switches, round, stainless steel |  | 5.04.914.200/2000 | 4 - 121 |
| RG 85 III - Lenses for keylock switches, square, aluminum |  | 5.04.915.201/2000 | 4 - 121 |





**Stock items** are marked by **bold printed order numbers.**

## RG 85 III - Keylock switch, round design, without lens



| Contact arrangement | Edge illumination | Rotating angle | Version | Order no. |
|---|---|---|---|---|
| 1 NO | 4 LED white | 1 x 90° | round | **3.99.400.141/2000** |
| 1 NO | 4 LED red | 1 x 90° | round | **3.99.400.141/3000** |
| 1 NO | 4 LED yellow | 1 x 90° | round | 3.99.400.141/4000 |
| 1 NO | 4 LED green | 1 x 90° | round | 3.99.400.141/5000 |
| 1 NO | 4 LED blue | 1 x 90° | round | **3.99.400.141/6000** |
| 1 NO | 4 LED white, 4 LED blue | 1 x 90° | round | 3.99.400.141/7000 |
| 1 NO | 4 LED green, 4 LED red | 1 x 90° | round | 3.99.400.141/8000 |

Technical data see page 4 - 110

**Accessoires:**
RG 85 III - Lenses for keylock switches, round, stainless steel: 5.04.914.200/2000

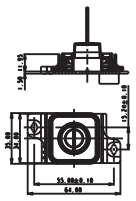
Please order lenses (round shape) separately.





**Stock items** are marked
by **bold printed order numbers.**

## RG 85 III - Keylock switch, square design, without lens



| Contact arrangement | Edge illumination | Rotating angle | Version | Order no. |
|---|---|---|---|---|
| 1 NO | 4 LED white | 1 x 90° | square | 3.99.400.142/2000 |
| 1 NO | 4 LED red | 1 x 90° | square | 3.99.400.142/3000 |
| 1 NO | 4 LED yellow | 1 x 90° | square | 3.99.400.142/4000 |
| 1 NO | 4 LED green | 1 x 90° | square | 3.99.400.142/5000 |
| 1 NO | 4 LED blue | 1 x 90° | square | 3.99.400.142/6000 |
| 1 NO | 4 LED white, 4 LED blue | 1 x 90° | square | 3.99.400.142/7000 |
| 1 NO | 4 LED green, 4 LED red | 1 x 90° | square | 3.99.400.142/8000 |

Technical data see page 4 - 110

**Accessoires:**
RG 85 III - Lenses for keylock switches, square, stainless steel: 5.04.914.201/2000

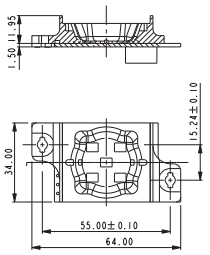
Please order lenses (square shape) separately.





**Stock items** are marked
by **bold printed order numbers.**

# RG 85 III - Signal indicator, without lens




## Technical Data

**Dimensions**

| | |
|---|---|
| Mounting grid min. | 55 x 35 mm |
| Length | 64 mm |
| Width | 34 mm |

**Mechanical design**

| | |
|---|---|
| Version | according to lens |
| Mounting | on U-rails or single mounting |
| Terminals | 8-pin Micro-Match® female connector |
| Illumination | see order block |

**Electrical characteristics**

| | |
|---|---|
| Operating voltage for LED | 24±20% V |
| Input current LED | depending on LED colour 20 - 30 mA |

**Other specifications**

| | |
|---|---|
| Ambient temp. operating min. | -25 °C |
| Ambient temp. operating max. | +70 °C |
| Storage temperature min. | -40 °C |
| Storage temperature max. | +80 °C |
| Environmental restistance | acc. to IEC 60068-2 -14, -30, -33 and -78 |
| Degree of protection rail mounting | IP40 |
| Degree of protection single mounting | IP65 |
| Flammability of materials | according to UL 94 HB |

## Typical accessories RG 85 III - Signal indicator, without lens

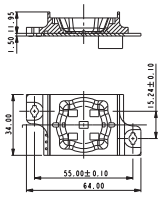
| Description | Photo | Order no. | Additional accessories see page |
|---|---|---|---|
| Cable, 8 wires, with socket connectors on both ends, length 2 m |  | 5.03.772.262/0000 | 4 - 122 |
| RG 85 III - Lens, square, for signal indicators |  | 5.04.903.009/0000 | 4 - 122 |
| RG 85 III - Lens, round, for signal indicators |  | 5.04.903.010/0000 | 4 - 121 |
| RG 85 III - Lens, triangular, for signal indicators |  | **5.04.903.011/0000** | 4 - 122 |





**Stock items** are marked by **bold printed order numbers.**

## RG 85 III - Signal indicator, without lens



| Illumination | Order no. |
|---|---|
| 5 LED white | 3.99.400.100/2000 |
| 5 LED red | 3.99.400.100/3000 |
| 5 LED yellow | 3.99.400.100/4000 |
| 5 LED green | 3.99.400.100/5000 |
| 5 LED blue | 3.99.400.100/6000 |
| 5 LED white, 5 LED blue | 3.99.400.100/7000 |
| 5 LED green, 5 LED red | 3.99.400.100/8000 |

Technical data see page 4 - 114

Please order round, square or triangular lenses separately.





**Stock items** are marked
by **bold printed order numbers.**

## RG 85 III - Accessories


## RG 85 III - Lenses for keyswitches, round


| Version | Form of lens | Legending colour | Legending | Order no. |
|---|---|---|---|---|
| aluminum | round | - | - | 5.04.915.000/2000 |
| aluminum | round | opaque black | 1 | 5.04.915.001/0100 |
| aluminum | round | translucent white | 1 | 5.04.915.001/2000 |
| aluminum | round | opaque black | 2 | 5.04.915.002/0100 |
| aluminum | round | translucent white | 2 | 5.04.915.002/2000 |
| aluminum | round | opaque black | 3 | 5.04.915.003/0100 |
| aluminum | round | translucent white | 3 | 5.04.915.003/2000 |
| aluminum | round | opaque black | 4 | 5.04.915.004/0100 |
| aluminum | round | translucent white | 4 | 5.04.915.004/2000 |
| aluminum | round | opaque black | 5 | 5.04.915.005/0100 |
| aluminum | round | translucent white | 5 | 5.04.915.005/2000 |
| aluminum | round | opaque black | 6 | 5.04.915.006/0100 |
| aluminum | round | translucent white | 6 | 5.04.915.006/2000 |
| aluminum | round | opaque black | U | 5.04.915.021/0100 |
| aluminum | round | translucent white | U | 5.04.915.021/2000 |





**Stock items** are marked by **bold printed order numbers.**

| Version | Form of lens | Legending colour | Legending | Order no. |
|---|---|---|---|---|
| aluminum | round | opaque black | K | 5.04.915.022/0100 |
| aluminum | round | translucent white | K | 5.04.915.022/2000 |
| aluminum | round | opaque black | E | 5.04.915.023/0100 |
| aluminum | round | translucent white | E | 5.04.915.023/2000 |
| aluminum | round | opaque yellow | symbol „bell“ | 5.04.915.024/0400 |
| aluminum | round | opaque black | symbol „open door“ | 5.04.915.025/0100 |
| aluminum | round | translucent white | symbol „open door“ | 5.04.915.025/2000 |
| aluminum | round | opaque black | symbol „close door“ | 5.04.915.026/0100 |
| aluminum | round | translucent white | symbol „close door“ | 5.04.915.026/2000 |
| aluminum | round | opaque black | symbol „ventilator“ | 5.04.915.027/0100 |
| aluminum | round | translucent white | symbol „ventilator“ | 5.04.915.027/2000 |
| aluminum | round | opaque black | symbol „arrow“ | 5.04.915.028/0100 |
| aluminum | round | translucent white | symbol „arrow“ | 5.04.915.028/2000 |
| stainless steel | round | - | - | 5.04.914.000/2000 |
| stainless steel | round | opaque black | 1 | 5.04.914.001/0100 |
| stainless steel | round | translucent white | 1 | 5.04.914.001/2000 |
| stainless steel | round | opaque black | 2 | 5.04.914.002/0100 |
| stainless steel | round | translucent white | 2 | 5.04.914.002/2000 |
| stainless steel | round | opaque black | 3 | 5.04.914.003/0100 |
| stainless steel | round | translucent white | 3 | 5.04.914.003/2000 |
| stainless steel | round | opaque black | 4 | 5.04.914.004/0100 |
| stainless steel | round | translucent white | 4 | 5.04.914.004/2000 |
| stainless steel | round | opaque black | 5 | 5.04.914.005/0100 |
| stainless steel | round | translucent white | 5 | 5.04.914.005/2000 |
| stainless steel | round | opaque black | 6 | 5.04.914.006/0100 |
| stainless steel | round | translucent white | 6 | 5.04.914.006/2000 |
| stainless steel | round | opaque black | U | 5.04.914.021/0100 |
| stainless steel | round | translucent white | U | 5.04.914.021/2000 |





**Stock items** are marked by **bold printed order numbers.**

| Version | Form of lens | Legending colour | Legending | Order no. |
|---|---|---|---|---|
| stainless steel | round | opaque black | K | 5.04.914.022/0100 |
| stainless steel | round | translucent white | K | 5.04.914.022/2000 |
| stainless steel | round | opaque black | E | 5.04.914.023/0100 |
| stainless steel | round | translucent white | E | 5.04.914.023/2000 |
| stainless steel | round | opaque yellow | symbol „bell“ | 5.04.914.024/0400 |
| stainless steel | round | opaque black | symbol „open door“ | 5.04.914.025/0100 |
| stainless steel | round | translucent white | symbol „open door“ | 5.04.914.025/2000 |
| stainless steel | round | opaque black | symbol „close door“ | 5.04.914.026/0100 |
| stainless steel | round | translucent white | symbol „close door“ | 5.04.914.026/2000 |
| stainless steel | round | opaque black | symbol „ventilator“ | 5.04.914.027/0100 |
| stainless steel | round | translucent white | symbol „ventilator“ | 5.04.914.027/2000 |
| stainless steel | round | opaque black | symbol „arrow“ | 5.04.914.028/0100 |
| stainless steel | round | translucent white | symbol „arrow“ | 5.04.914.028/2000 |

Technical data see page 4 - 114

The lenses without legending can not be engraved - other than the mentioned legends on request.



## RG 85 III - Lenses for keyswitches, square

| Version | Form of lens | Legending colour | Legending | Order no. |
|---|---|---|---|---|
| aluminum | square | - | - | 5.04.915.100/2000 |
| aluminum | square | opaque black | 1 | 5.04.915.101/0100 |
| aluminum | square | translucent white | 1 | 5.04.915.101/2000 |
| aluminum | square | opaque black | 2 | 5.04.915.102/0100 |
| aluminum | square | translucent white | 2 | 5.04.915.102/2000 |
| aluminum | square | opaque black | 3 | 5.04.915.103/0100 |





**Stock items** are marked by **bold printed order numbers.**

| Version | Form of lens | Legending colour | Legending | Order no. |
|---|---|---|---|---|
| aluminum | square | translucent white | 3 | 5.04.915.103/2000 |
| aluminum | square | opaque black | 4 | 5.04.915.104/0100 |
| aluminum | square | translucent white | 4 | 5.04.915.104/2000 |
| aluminum | square | opaque black | 5 | 5.04.915.105/0100 |
| aluminum | square | translucent white | 5 | 5.04.915.105/2000 |
| aluminum | square | opaque black | 6 | 5.04.915.106/0100 |
| aluminum | square | translucent white | 6 | 5.04.915.106/2000 |
| aluminum | square | opaque black | U | 5.04.915.121/0100 |
| aluminum | square | translucent white | U | 5.04.915.121/2000 |
| aluminum | square | opaque black | K | 5.04.915.122/0100 |
| aluminum | square | translucent white | K | 5.04.915.122/2000 |
| aluminum | square | opaque black | E | 5.04.915.123/0100 |
| aluminum | square | translucent white | E | 5.04.915.123/2000 |
| aluminum | square | opaque yellow | symbol „bell“ | 5.04.915.124/0400 |
| aluminum | square | opaque black | symbol „open door“ | 5.04.915.125/0100 |
| aluminum | square | translucent white | symbol „open door“ | 5.04.915.125/2000 |
| aluminum | square | opaque black | symbol „close door“ | 5.04.915.126/0100 |
| aluminum | square | translucent white | symbol „close door“ | 5.04.915.126/2000 |
| aluminum | square | opaque black | symbol „ventilator“ | 5.04.915.127/0100 |
| aluminum | square | translucent white | symbol „ventilator“ | 5.04.915.127/2000 |
| aluminum | square | opaque black | symbol „arrow“ | 5.04.915.128/0100 |
| aluminum | square | translucent white | symbol „arrow“ | 5.04.915.128/2000 |
| stainless steel | square | - | - | 5.04.914.100/2000 |
| stainless steel | square | opaque black | 1 | 5.04.914.101/0100 |
| stainless steel | square | translucent white | 1 | 5.04.914.101/2000 |
| stainless steel | square | opaque black | 2 | 5.04.914.102/0100 |
| stainless steel | square | translucent white | 2 | 5.04.914.102/2000 |
| stainless steel | square | opaque black | 3 | 5.04.914.103/0100 |





**Stock items** are marked by **bold printed order numbers.**

| Version | Form of lens | Legending colour | Legending | Order no. |
|---|---|---|---|---|
| stainless steel | square | translucent white | 3 | 5.04.914.103/2000 |
| stainless steel | square | opaque black | 4 | 5.04.914.104/0100 |
| stainless steel | square | translucent white | 4 | 5.04.914.104/2000 |
| stainless steel | square | opaque black | 5 | 5.04.914.105/0100 |
| stainless steel | square | translucent white | 5 | 5.04.914.105/2000 |
| stainless steel | square | opaque black | 6 | 5.04.914.106/0100 |
| stainless steel | square | translucent white | 6 | 5.04.914.106/2000 |
| stainless steel | square | opaque black | U | 5.04.914.121/0100 |
| stainless steel | square | translucent white | U | 5.04.914.121/2000 |
| stainless steel | square | opaque black | K | 5.04.914.122/0100 |
| stainless steel | square | translucent white | K | 5.04.914.122/2000 |
| stainless steel | square | opaque black | E | 5.04.914.123/0100 |
| stainless steel | square | translucent white | E | 5.04.914.123/2000 |
| stainless steel | square | opaque yellow | symbol „bell“ | 5.04.914.124/0400 |
| stainless steel | square | opaque black | symbol „open door“ | 5.04.914.125/0100 |
| stainless steel | square | translucent white | symbol „open door“ | 5.04.914.125/2000 |
| stainless steel | square | opaque black | symbol „close door“ | 5.04.914.126/0100 |
| stainless steel | square | translucent white | symbol „close door“ | 5.04.914.126/2000 |
| stainless steel | square | opaque black | symbol „ventilator“ | 5.04.914.127/0100 |
| stainless steel | square | translucent white | symbol „ventilator“ | 5.04.914.127/2000 |
| stainless steel | square | opaque black | symbol „arrow“ | 5.04.914.128/0100 |
| stainless steel | square | translucent white | symbol „arrow“ | 5.04.914.128/2000 |

The lenses without legending can not be engraved - other than the mentioned legends on request.





**Stock items** are marked by **bold printed order numbers.**

## RG 85 III - Lenses for keylock switches, round

| Version | Form of lens | Legending colour | Legending | Order no. |
|---|---|---|---|---|
| aluminum | round | - | - | **5.04.915.200/2000** |
| stainless steel | round | - | - | 5.04.914.200/2000 |

## RG 85 III - Lenses for keylock switches, square

| Version | Form of lens | Legending colour | Legending | Order no. |
|---|---|---|---|---|
| aluminum | square | - | - | 5.04.915.201/2000 |
| stainless steel | square | - | - | 5.04.914.201/2000 |

## RG 85 III - Lens, round, for signal indicators

| Version | Form of lens | Legending colour | Legending | Order no. |
|---|---|---|---|---|
| plastic translucent | round | - | - | 5.04.903.010/0000 |

## RG 85 III - Lens, square, for signal indicators

| Version | Form of lens | Legending colour | Legending | Order no. |
|---|---|---|---|---|
| plastic translucent | square | - | - | 5.04.903.009/0000 |

## RG 85 III - Lens, triangular, for signal indicators

| Version | Form of lens | Legending colour | Legending | Order no. |
|---|---|---|---|---|
| plastic translucent | triangular | - | - | **5.04.903.011/0000** |

## Cable, 8 wires, with socket connectors on both ends

| Version | Form of lens | Legending colour | Legending | Order no. |
|---|---|---|---|---|
| length: 1 m | - | - | - | 5.03.772.261/0000 |
| length: 2 m | - | - | - | 5.03.772.262/0000 |





**Stock items** are marked by **bold printed order numbers.**

## Fixing rail, length 490 mm

| Version | Form of lens | Legending colour | Legending | Order no. |
|---|---|---|---|---|
| length: 490 mm | - | - | - | 5.41.032.173/7500 |

## Spacer

| Version | Form of lens | Legending colour | Legending | Order no. |
|---|---|---|---|---|
| mounting on rails | - | - | - | 5.30.163.021/6000 |
| single mounting | - | - | - | 5.30.163.024/6000 |

## Fixing piece for mounting the elements with the rail fixing method

| Version | Form of lens | Legending colour | Legending | Order no. |
|---|---|---|---|---|
| - | - | - | - | 5.55.104.208/0459 |

## General Data

The RS 76 full-travel keyswitches are designed for configuring keyboards. They offer very comfortable operation with an overall height of 15.5 / 15.9 mm and a key travel of 4 mm. The modular system with a grid of 3/4“ = 19.05 mm enables you to design any key block you may want.

**Mechanical contact system RS 76 M**
A gold alloy is used as the contact material and provides high contact reliability, low contact resistance and short bouncing time.
**Solid-state contact system RS 76 C**
The solid-state switch in Hall-IC technology ensures bounce-free and wear-free switching and a long operating life. Function: When pressing the keys, a permanent magnet changes its position relative to the Hall-IC and thereby generates an output signal. Their use is especially recommended in hostile environments and for heavy duty applications.

## Content


| | |
|---|---|
| **RS 76 M - Full-travel keyswitch, not illuminable** | **4 - 132** |
| RS 76 M - Full-travel keyswitch, not illuminable | 4 - 133 |
| RS 76 M - Full-travel keyswitch, with diode, not illuminable | 4 - 133 |
| **RS 76 M - Full-travel keyswitch, illuminable** | **4 - 134** |
| RS 76 M - Full-travel keyswitch, illuminable, momentary | 4 - 135 |
| RS 76 M - Full-travel keyswitch, illuminable, latching | 4 - 135 |
| RS 76 MX - Full-travel keyswitch, fully illuminable | 4 - 136 |
| **RS 76 C - Full-travel keyswitch, not illuminable** | **4 - 138** |
| RS 76 C - Full-travel keyswitch, not illuminable | 4 - 139 |
| **RS 76 C - Full-travel keyswitch, illuminable** | **4 - 140** |
| RS 76 C - Full-travel keyswitch, illuminable, momentary | 4 - 141 |
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| **RS 76 - Keycaps, not illuminable** | **4 - 142** |
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| **RS 76 - Keycaps, illuminable** | **4 - 144** |
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| RS 76 - Keycap, illuminable, with legend insert | 4 - 144 |
| RS 76 - Keycap, illuminable, with nail protection and legend insert | 4 - 145 |
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| RS 76 MX - Keycap, fully illuminable | 4 - 146 |
| **RS 76 - Keycaps, with legend, two-shot moulded/keycap sets** | **4 - 148** |
| RS 76 - Keycap set, symbols A-Z | 4 - 148 |
| RS 76 - Keycap set, symbols 0-9 | 4 - 149 |
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The RAFI full-travel keyswitches RS 76 are modular systems for designing individual key blocks and keyboards in the 3/4 inch (= 19.05 mm) grid.

**Definitions**

**Momentary keyswitches**
Momentary keyswitches return to their initial position after being pressed (momentary action).

**Latching keyswitches**
Latching keyswitches lock when actuated and are returned to their initial position when pressed again (push-push action).

**Keycap materials**
Keycap without legend insert: ABS
Keycap with legend insert:
– Keycap body: ABS
– Lens: PC

**Keycap, n-module**
A 2-module keycap f. ex. has the twofold length of a 1-module keycap.

**Contact principle**
There are two contact principles:
– **Mechanical (M):** Cross contact (RS 76 M)
Bridge contact
(RS 76 M, illuminated)
– **Contactless (C):** Based on Hall-IC (RS 76 C)

**Manual Soldering**
The soldering temperature should not exceed 300 °C and the soldering time should be less than 5 seconds.

## Legending of keycaps

Keycaps can be legended by different methods:

**Two-shot moulding**
Using this method the symbol is separately manufactured from a plastic and then the appropriate keycap form is moulded round it. Advantage: The character becomes a integrated part of the keycap, thus eliminating abrasion. All RAFI keycap sets with standard legending are manufatured by this method.
Customer specific two-shot moulded keycaps on request.

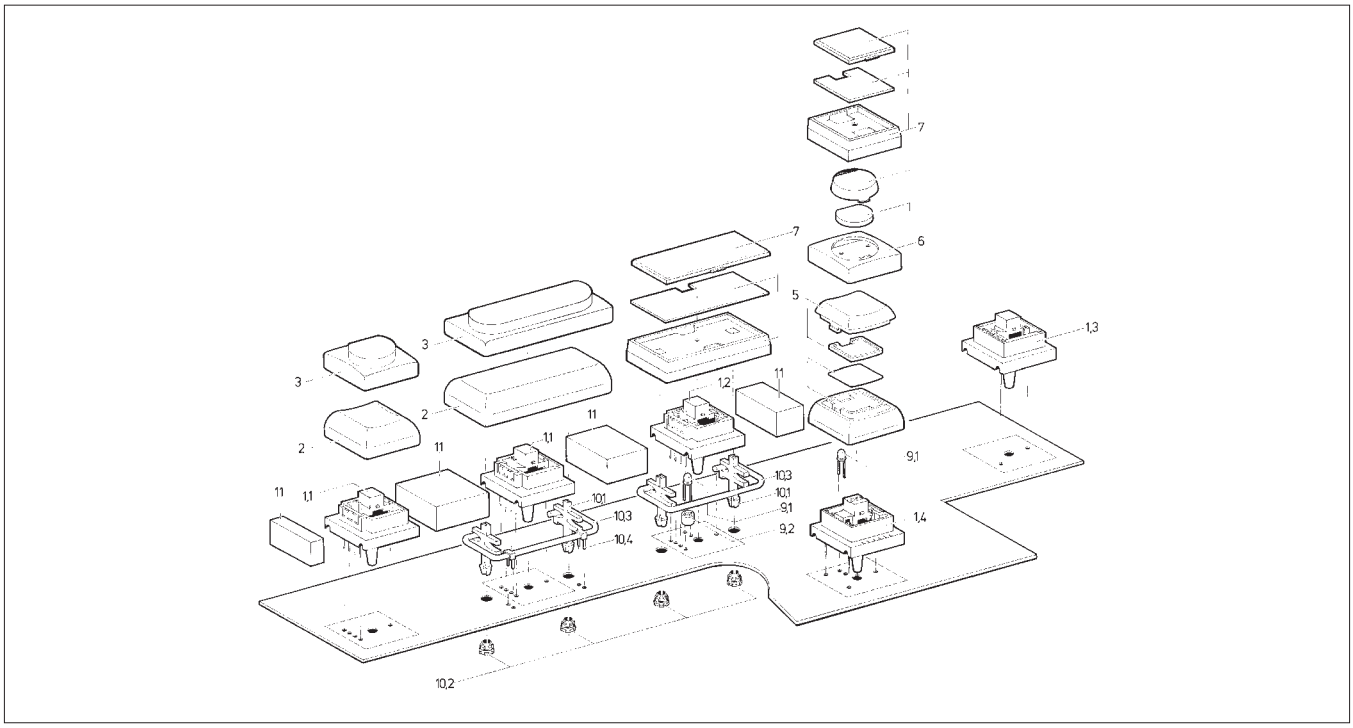
**Printing**
Keycaps can be printed with a two-component ink on request. The abrasin of this kind of legending is high. This method of legending is suitable for average volumes.

**Engraving**
In this labour intensive process the keycaps are engraved with the required symbol, then inlaid with ink. Only used for small volumes.

**Laser-printing**
This method of legending can be recommended when complete keyboards are required in different keyboard layouts for which RAFI will develop the respective software. The keyboards can then be legended within a short time. This method of legending ist particularly recommended for average to large volumes.

**Legend inserts**
In the case of keycaps with replaceable legend inserts it is possible to print or engrave the legend inserts. As these insets are protected by the lens, there can be no abrasion here either.

## Design




**No. Description**

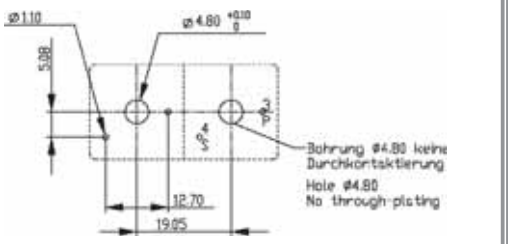
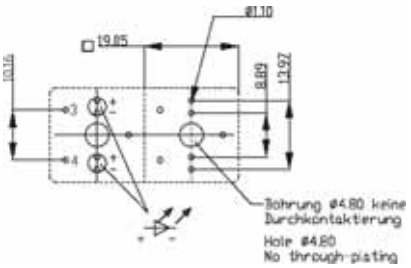
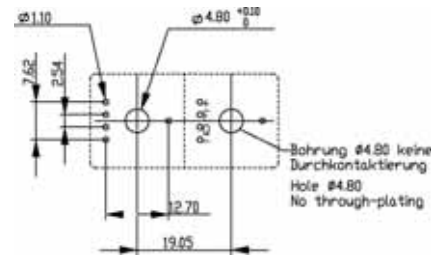
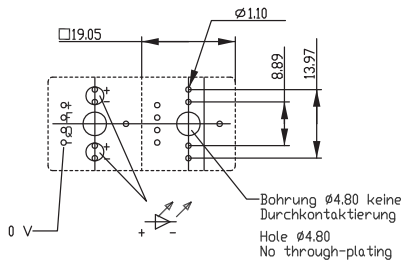
1.1 Keyswitch RS 76 C
1.2 Keyswitch RS 76 C with LED
1.3 Keyswitch RS 76 M
1.4 Keyswitch R 76 M with LED
2 Keycap, 1- resp. multi-module
3 Keycap with nail protection, 1- resp. multi-module
5 Keycap, illuminated
6 Keycap, illuminated
7 Keycap, illuminated
9.1 LED
9.2 Spacer for LED (for RS 76 C only)
10.1 Plunger for mult-moduel keycaps*
10.2 Sleeve for multi-moduel keycaps*
10.3 Metal lever for multi-module keycaps*
10.4 Bearing bracket for multi-module keycaps*
11 Covers

*These parts are included as a complete packet in the delivery of keycaps ≥ 2-module.

## Hole Pattern PCB RS 76 M/RS 76 C

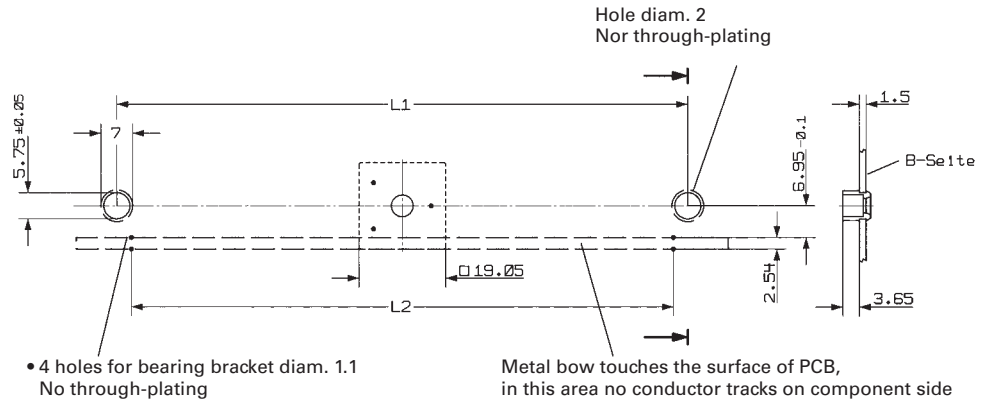
The hole patterns apply to the horizontal position of the keycaps only. Should they be in a vertical position, the momentary keyswitch must be mounted accordingly, i. e. rotated by 90°.

### For 1 – 1¾-module keycaps (view on component side)

| | Momentary keyswitch, non-illuminated | Momentary keyswitch, illuminated |
|---|---|---|
| RS 76 M |  |  |
| RS 76 C |  |  |

### For 2-, 3- and 8-module keycaps (view on component side)

RS 76 M/C

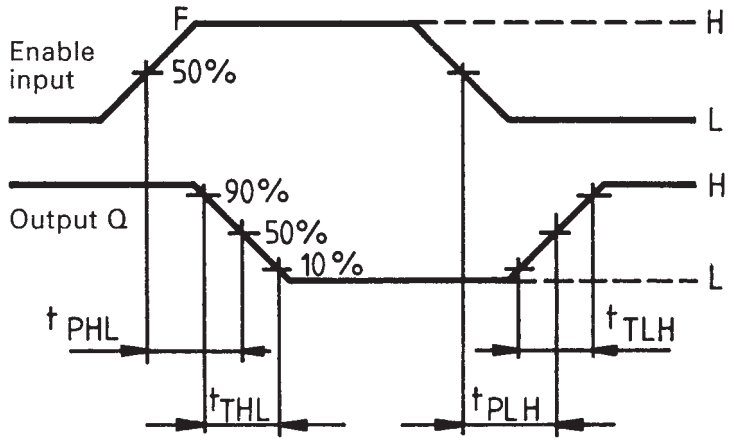



| Keycap | L 1 mm | L 2 mm |
|---|---|---|
| 2-module | 25,40 | 22,86 |
| 3-module | 30,48 | 24,13 |
| 5-module | 68,58 | 68,58 |

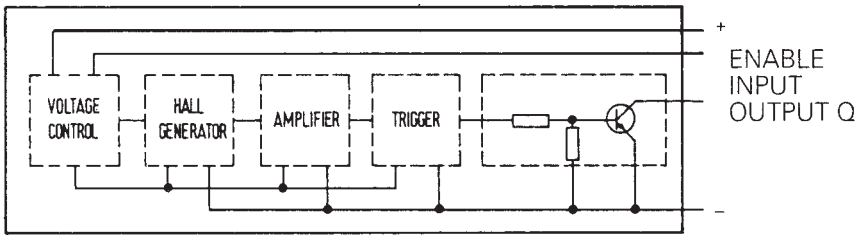
**Important note:** In the case of 2-, 3- and 8-module keycaps, additional holes must be provided for the accessories.
In the case of keycaps < 2-module, neither accessories nor holes are required.

## Specific Technical Data RS 76 C

| **Output pulse diagram**<br>**Dynamic characteristics** (max.) | | **Tw = 25 °C** | **Tw = 50 °C** | **Tw = 70 °C** |
|---|---|---|---|---|
| Turn-on delay time | $t_{PHL}$ | 3 µs | 7 µs | 10 µs |
| Turn-off delay time | $t_{PHL}$ | 4 µs | 5 µs | 6 µs |
| Fall/rise time | $t_{PHL}$ | 2 µs | 2,5 µs | 3 µs |
| | $t_{PHL}$ | 1 µs | 1,5 µs | 2,5 µs |




Block diagram
Hall IC

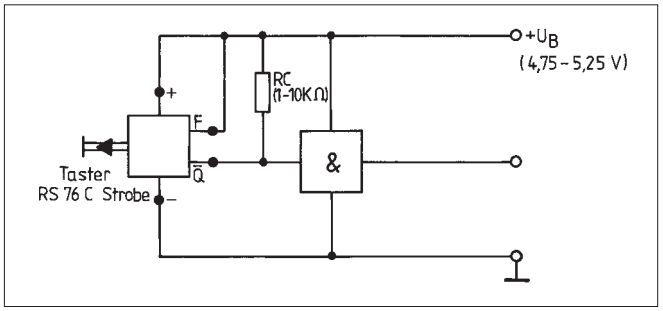



Static with Enable Input

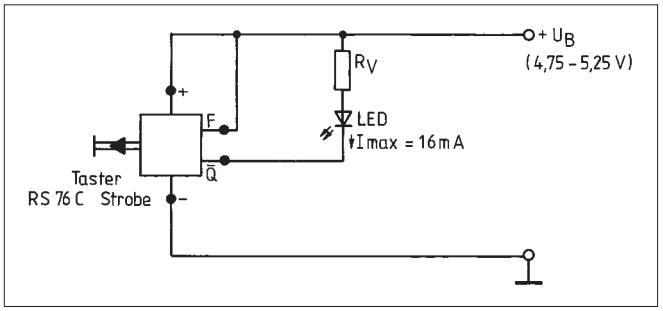
4

RS 76

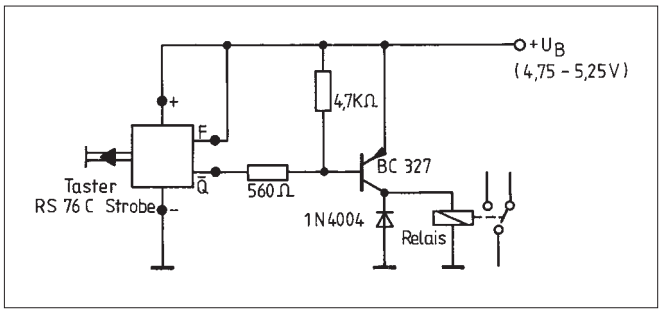
## Examples for Application RS 76 C



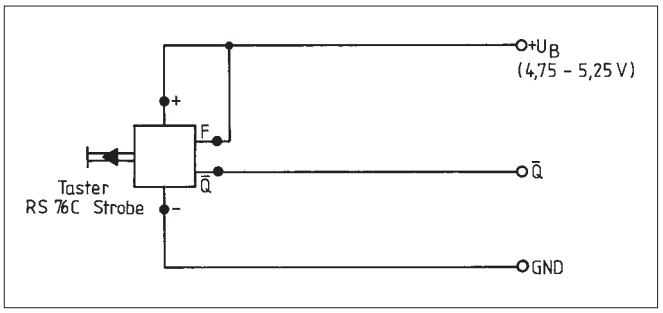

Driving of logic components



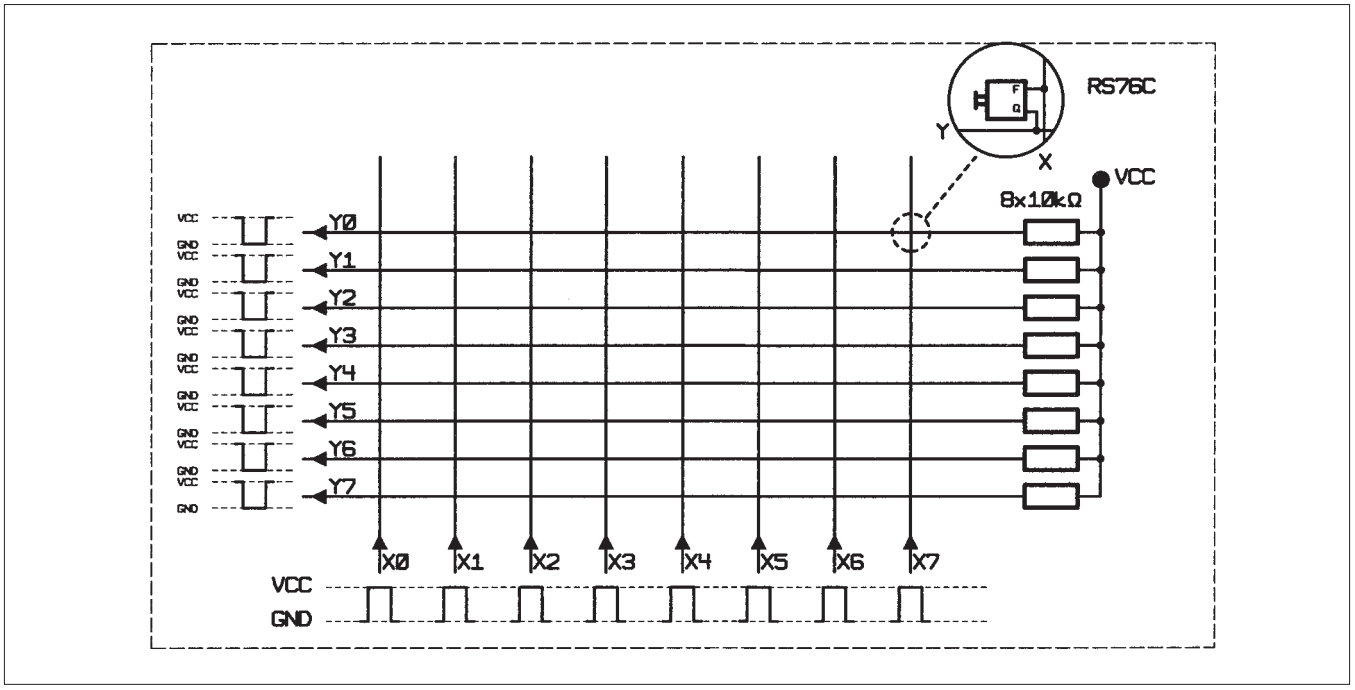

Indication of logical states




Driving of a PNP transistor




Use as static key with open collector output.
Output transistor (NPN) is conductive when actuated.




Use in keyboards

## RS 76 M - Full-travel keyswitch, not illuminable

### Technical Data

**General information**

| | |
|---|---|
| Recommended key grid | 19.05 mm |

**Mechanical design**

| | |
|---|---|
| Contact function | momentary |
| Mounting | soldering |
| Terminals | solder terminals, tin-plated |
| Contact system | cross contact |
| Contact arrangement | 1 NO |
| Contact materials | Au alloy |
| Illumination | no |

**Mechanical characteristics**

| | |
|---|---|
| Operating force max. | see order block |
| Operating travel | 4 mm |
| Switching travel | 1.5 - 2.8 mm |
| Robustness min. | 100 N |

**Electrical characteristics**

| | |
|---|---|
| Rated voltage min. | 2 V (with Diode 3 V) |
| Rated voltage max. | 35 V |
| Rated current min. | 0.01 mA |
| Rated current max. | 100 mA |
| Rated power max. | 1 W |
| Contact resistance when new max. | 100 mΩ (without diode) |
| Contact resistance acc. to life max. | 3 Ω (without diode) |
| Insulation resistance | $10^9$ Ω |
| ESD strength max. | 8 kV |
| Bouncing time max. | 5 ms |

**Other specifications**

| | |
|---|---|
| Ambient temp. operating min. | -25 °C |
| Ambient temp. operating max. | +70 °C |
| Storage temperature min. | -40 °C |
| Storage temperature max. (product) | +80 °C |
| Storage temperature max. (rail) | +50 °C |
| Environmental restistance | acc. to IEC 60068-2 -14, -30, -33 and -78 |
| Operating life min. (operations) | $10^7$ |
| Degree of protection | IP40 |
| Flammability of materials | UL 94 HB |

### Typical accessories RS 76 M - Full-travel keyswitch, not illuminable

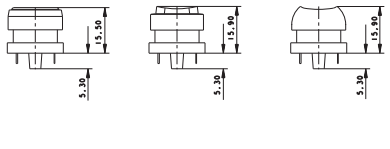
| Description | Photo | Order no. | Additional accessories see page |
|---|---|---|---|
| RS 76 C - Keycap with legend insert |  | **5.04.665.221/5520** | 4 - 143 |
| RS 76 C - Keycap, opaque, with nail protection |  | 5.80.000.000/0152 | 4 - 142 |
| RS 76 C - Keycap, opaque |  | **5.82.000.000/0152** | 4 - 142 |

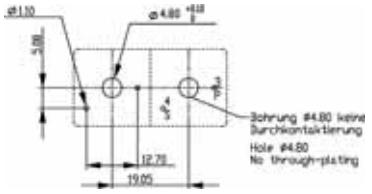




**Stock items** are marked by **bold printed order numbers.**

## RS 76 M - Full-travel keyswitch, not illuminable



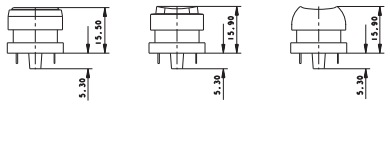


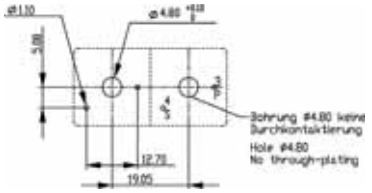

| Contact function | Illumination | Contact arrangement | Contact materials | Operating travel | Operating force max. | Bestell-Nr. |
|---|---|---|---|---|---|---|
| momentary | no | 1 NO | Au alloy | 4 mm | 0.9 N | **3.13.002.502/0000** |
| momentary | no | 1 NO | Au alloy | 4 mm | 1.4 N | **3.13.002.512/0000** |

Technical data see page 4 - 132

For accessories, refer to RS 76 special accessories.
For keycaps, see keycaps for RS 76.

## RS 76 M - Full-travel keyswitch, with diode, not illuminable






| Contact function | Illumination | Contact arrangement | Contact materials | Operating travel | Operating force max. | Bestell-Nr. |
|---|---|---|---|---|---|---|
| momentary | no | 1 NO | Au alloy | 4 mm | 0.9 N | **3.13.005.001/0000** |
| momentary | no | 1 NO | Au alloy | 4 mm | 1.4 N | 3.13.005.011/0000 |

Technical data see page 4 - 132

For accessories, refer to RS 76 special accessories.
For keycaps, see keycaps for RS 76.





**Stock items** are marked by **bold printed order numbers.**

## RS 76 M - Full-travel keyswitch, illuminable

Pict.: RS 76M, for spot illumination

RS 76MX, for full illumination

RS 76MX, keyboard fully illuminated

## Technical Data

| | |
|---|---|
| **General information** | |
| Recommended key grid | 19.05 mm |
| **Mechanical design** | |
| Contact function | see order block |
| Mounting | soldering |
| Terminals | solder terminals, tin-plated |
| Contact system | bridge contact |
| Contact arrangement | 1 NO |
| Contact materials | Au alloy |
| Illumination | see order block |
| **Mechanical characteristics** | |
| Operating force max. | 1 N |
| Operating travel | 4 mm |
| Switching travel | 1.5 - 2.8 mm |
| Robustness min. | 100 N |
| **Electrical characteristics** | |
| Rated voltage min. | 2 V |
| Rated voltage max. | 35 V |
| Rated current min. | 0.01 mA |
| Rated current max. | 100 mA |
| Rated power max. | 1 W |
| Contact resistance when new max. | 200 mΩ |
| Contact resistance acc. to life max. | 3 Ω |
| Insulation resistance | $10^9$ Ω |
| ESD strength max. | 8 kV |
| Bouncing time max. | 10 ms |
| **Other specifications** | |
| Ambient temp. operating min. | -25 °C |
| Ambient temp. operating max. | +70 °C |
| Storage temperature min. | -40 °C |
| Storage temperature max. (product) | +80 °C |
| Storage temperature max. (rail) | +50 °C |
| Environmental restistance | acc. to IEC 60068-2 -14, -30, -33 and -78 |
| Operating life min. (operations) | $10^7$ momentary, $10^5$ latching |
| Degree of protection | IP40 |
| Flammability of materials | UL 94 HB |

## Typical accessories RS 76 M - Full-travel keyswitch, illuminable

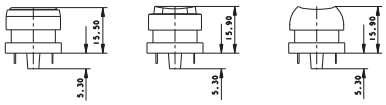
| Description | Photo | Order no. | Additional accessories see page |
|---|---|---|---|
| RS 76 - Cover IP40, 1-module, charcoal grey |  | 5.04.520.174/0152 | 4 - 151 |
| RS 76 C - Keycap, illuminated, with legend insert |  | **5.04.665.521/5520** | 4 - 144 |
| RS 76 C - Keycap, illuminated, with nail protection and legend insert |  | **5.04.665.911/5520** | 4 - 145 |
| RS 76 C - Keycap with light bar |  | **5.82.110.000/0242** | 4 - 144 |

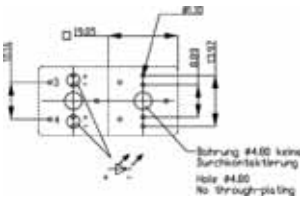




**Stock items** are marked by **bold printed order numbers.**

## RS 76 M - Full-travel keyswitch, illuminable, momentary





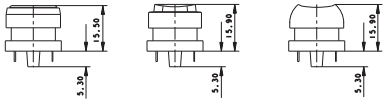
Pict.: RS 76M, for spot illumination

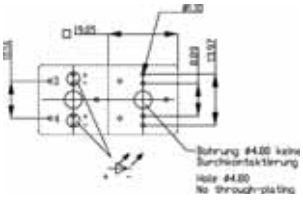
| Contact function | Contact system | Illumination | Recommended key grid | Order no. |
|---|---|---|---|---|
| momentary | bridge contact | spot illumination possible with 3 LED | 19.05 mm | **3.13.002.102/0000** |

Technical data see page 4 - 134

For accessories, refer to RS 76 special accessories.
For keycaps, see keycaps for RS 76.

## RS 76 M - Full-travel keyswitch, illuminable, latching





| Contact function | Contact system | Illumination | Recommended key grid | Order no. |
|---|---|---|---|---|
| latching | bridge contact | spot illumination possible with 3 LED | 19.05 mm | **3.13.002.022/0000** |

Technical data see page 4 - 134

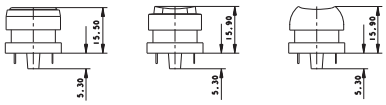
For accessories, refer to RS 76 special accessories.
For keycaps, see keycaps for RS 76.

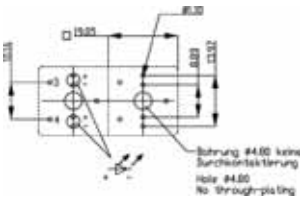




**Stock items** are marked by **bold printed order numbers.**

## RS 76 MX - Full-travel keyswitch, fully illuminable





Pict.: RS 76MX, for full illumination

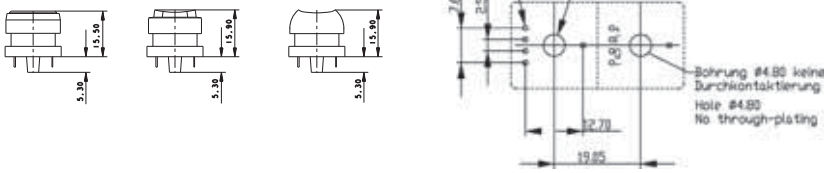
| Contact function | Contact system | Illumination | Recommended key grid | Order no. |
|---|---|---|---|---|
| momentary | bridge contact | 2 SMT LED needed | 19.05 mm | 3.13.002.922/0000 |

Technical data see page 4 - 134

**Accessoires:**
RS 76 MX - Keycap, fully illuminated: 5.05.511.168/0209
RS 76 MX - Keycap, fully illuminated: 5.05.511.168/0754

For accessories, refer to RS 76 special accessories.
For keycaps, see keycaps for RS 76.
The SMT LEDs are soldered on the back of the printed circuit board and shine through openings in the board and keyswitch housing.

# RS 76 C - Full-travel keyswitch, not illuminable




## Technical Data

**General information**

| | |
|---|---|
| Recommended key grid | 19.05 mm |

**Mechanical design**

| | |
|---|---|
| Contact function | momentary |
| Mounting | soldering |
| Terminals | solder terminals, tin-plated |
| Contact system | contactless with Hall-IC |
| Illumination | no |

**Mechanical characteristics**

| | |
|---|---|
| Switching travel off | 0.8 ... 2.4 mm |
| Operating force max. | see order block |
| Operating travel | 4 mm |
| Switching travel on | 1.5 - 2.8 mm |
| Robustness min. | 100 N |

**Electrical characteristics**

| | |
|---|---|
| Operating voltage DC | 4.75 ... 5.25 V |
| Supply current max. at $U_{IL}$ = 0 V | 0.5 mA |
| Supply current max. at $U_{IH}$ = 5 V | 5 mA |
| Input voltage (F) at $U_{IL}$ = 0 V | 0.4 V |
| Input voltage (F) at $U_{IH}$ = 2.4V | 5.25 V |
| Output load current (Q) max. | 16 mA |
| Output residual current (Q) max. | 10 µA |
| Output saturation voltage (Q) max. bei 16 mA | 0.4 V |
| ESD strength max. | 8 kV |
| Output switching times (Q) at 25 °C, $t_{PHL}$ | 3 µs |
| Output switching times (Q) at 25 °C, $t_{PLH}$ | 4 µs |
| Output switching times (Q) at 25 °C, $t_{THL}$ | 1 µs |
| Output switching times (Q) at 25 °C, $t_{TLH}$ | 2 µs |

**Other specifications**

| | |
|---|---|
| Reliability of Hall-IC at 25 °C | $\lambda = 2.5 \times 10^{-7}\ h^{-1}$ |
| Ambient temp. operating min. | 0 °C |
| Ambient temp. operating max. | +70 °C |
| Storage temperature min. | -40 °C |
| Storage temperature max. (product) | +80 °C |
| Storage temperature max. (rail) | +50 °C |
| Environmental restistance | acc. to IEC 60068-2 -14, -30, -33 and -78 |
| Operating life min. (operations) | see order block |
| Degree of protection | IP40 |
| Flammability of materials | UL 94 HB |

## Typical accessories RS 76 C - Full-travel keyswitch, not illuminable

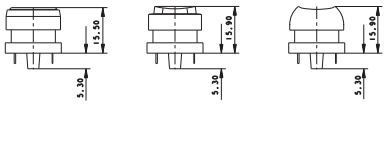
| Description | Photo | Order no. | Additional accessories see page |
|---|---|---|---|
| RS 76 C - Keycap with legend insert |  | **5.04.665.221/5520** | 4 - 143 |
| RS 76 C - Keycap, opaque, with nail protection |  | 5.80.000.000/0152 | 4 - 142 |
| RS 76 C - Keycap, opaque |  | **5.82.000.000/0152** | 4 - 142 |





**Stock items** are marked by **bold printed order numbers.**

## RS 76 C - Full-travel keyswitch, not illuminable



| Contact function | Operating life min. (operations) | Illumination | Operating force max. | Operating travel | Order no. |
|---|---|---|---|---|---|
| momentary | $10^8$ | no | 0.7 N | 4 mm | **3.13.001.010/0000** |
| momentary | $10^8$ | no | 1 N | 4 mm | **3.13.001.210/0000** |

Technical data see page 4 - 138

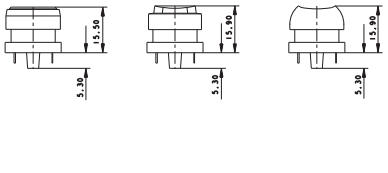
For accessories and keycaps, refer to RS 76. For applications, refer to the general description of RS 76.

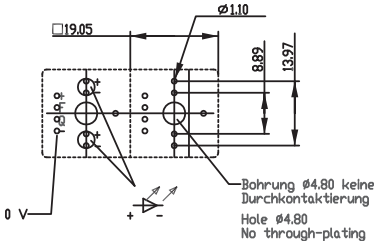




**Stock items** are marked by **bold printed order numbers.**

# RS 76 C - Full-travel keyswitch, illuminable




## Technical Data

**General information**

| | |
|---|---|
| Recommended key grid | 19.05 mm |

**Mechanical design**

| | |
|---|---|
| Contact function | see order block |
| Mounting | soldering |
| Terminals | solder terminals, tin-plated |
| Contact system | contactless with Hall-IC |
| Illumination | with LED |
| LED colour | see order block |

**Mechanical characteristics**

| | |
|---|---|
| Switching travel on | 1.5 - 2.8 mm |
| Switching travel off | 0.8 ... 2.4 mm |
| Operating force max. | 0.7 N |
| Operating travel | 4 mm |
| Robustness min. | 100 N |

**Electrical characteristics**

| | |
|---|---|
| Number of LED | see order block |
| Operating voltage DC | 4.75 ... 5.25 V |
| Supply current max. at $U_{IL}$ = 0 V | 0.5 mA |
| Supply current max. at $U_{IH}$ = 5 V | 5 mA |
| Input voltage (F) at $U_{IL}$ = 0 V | 0.4 V |
| Input voltage (F) at $U_{IH}$ = 2.4V | 5.25 V |
| Output load current (Q) max. | 16 mA |
| Output residual current (Q) max. | 10 µA |
| Output saturation voltage (Q) max. bei 16 mA | 0.4 V |
| ESD strength max. | 8 kV |
| Output switching times (Q) at 25 °C, $t_{PHL}$ | 3 µs |
| Output switching times (Q) at 25 °C, $t_{PLH}$ | 4 µs |
| Output switching times (Q) at 25 °C, $t_{THL}$ | 1 µs |
| Output switching times (Q) at 25 °C, $t_{TLH}$ | 2 µs |

**Other specifications**

| | |
|---|---|
| Reliability of Hall-IC at 25 °C | $\lambda = 2.5 \times 10^{-7}\ h^{-1}$ |
| Ambient temp. operating min. | 0 °C |
| Ambient temp. operating max. | +70 °C |
| Storage temperature min. | -40 °C |
| Storage temperature max. (product) | +80 °C |
| Storage temperature max. (rail) | +50 °C |
| Environmental restistance | acc. to IEC 60068-2 -14, -30, -33 and -78 |
| Operating life min. (operations) | see order block |
| Degree of protection | IP40 |
| Flammability of materials | UL 94 HB |

## Typical accessories RS 76 C - Full-travel keyswitch, illuminable

| Description | Photo | Order no. | Additional accessories see page |
|---|---|---|---|
| RS 76 - Cover IP40, 1-module, light grey |  | 5.04.520.174/0242 | 4 - 151 |
| RS 76 C - Keycap, illuminated, with legend insert |  | **5.04.665.521/5520** | 4 - 144 |
| RS 76 C - Keycap, illuminated, with nail protection and legend insert |  | **5.04.665.911/5520** | 4 - 145 |



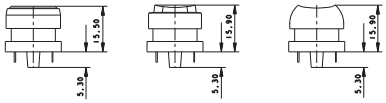


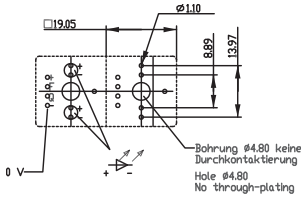
**Stock items** are marked by **bold printed order numbers.**

## Typical accessories RS 76 C - Full-travel keyswitch, illuminable

| Description | Photo | Order no. | Additional accessories see page |
|---|---|---|---|
| RS 76 C - Keycap with light bar |  | **5.82.110.000/0242** | 4 - 144 |

## RS 76 C - Full-travel keyswitch, illuminable, momentary

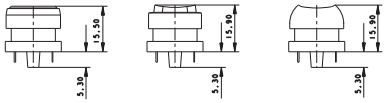


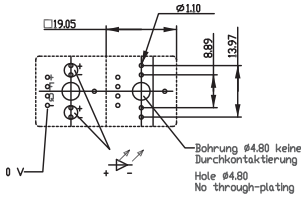



| Contact function | Operating life min. (operations) | Illumination | Operating force max. | Operating travel | Order no. |
|---|---|---|---|---|---|
| momentary | $10^8$ | with LED | 0.7 N | 4 mm | **3.13.001.110/0000** |

Technical data see page 4 - 140

## RS 76 C - Full-travel keyswitch, illuminable, latching






| Contact function | Operating life min. (operations) | Illumination | Operating force max. | Operating travel | Order no. |
|---|---|---|---|---|---|
| latching | $10^5$ | with LED | 0.7 N | 4 mm | 3.13.001.130/0000 |

Technical data see page 4 - 140





**Stock items** are marked by **bold printed order numbers.**

## RS 76 - Keycaps, not illuminable

Pict.: light beige


opaque with nail protection charcoal grey / white

transparent colourless

## RS 76 - Keycap, opaque

Pict.: dark grey

light beige

| Size of keycap | Illumination | Colour of keycap / legending | Colour of lens / legend insert | Order no. |
|---|---|---|---|---|
| 1-module | no | charcoal grey/- | - | **5.82.000.000/0152** |
| 1-module | no | light grey/- | - | **5.82.000.000/0242** |

Keycap sets available in two-shot moulded design.

Other keycap sizes, e.g. 1.25-, 1.5-, 1.75-, 2-, 3-, 5- and 8-module versions available on request.

## RS 76 - Keycap, opaque, with nail protection

Pict.: light beige


opaque with nail protection charcoal grey / white

| Size of keycap | Illumination | Colour of keycap / legending | Colour of lens / legend insert | Order no. |
|---|---|---|---|---|
| 1-module | no | charcoal grey/- | - | 5.80.000.000/0152 |
| 1-module | no | light grey/- | - | 5.80.000.000/0242 |

Keycap sets available in two-shot moulded design.

Other keycap sizes, e.g. 1.25-, 1.5-, 1.75-, 2-, 3- and 8-module versions available on request.





**Stock items** are marked by **bold printed order numbers.**

## RS 76 - Keycap with legend insert

Pict.: transparent colourless

| Size of keycap | Illumination | Colour of keycap / legending | Colour of lens / legend insert | Order no. |
|---|---|---|---|---|
| 1-module | no | charcoal grey/- | colourless/white | **5.04.665.221/5520** |
| 1-module | no | light grey/- | colourless/white | 5.04.665.230/5520 |

Supplied as single parts: Mat lens, legend insert, keycap body.

Other colours on request.

## RS 76 - Keycaps, illuminable

light beige

## RS 76 - Keycap with light bar

Pict.: light beige

| Size of keycap | Illumination | Colour of keycap / legending | Colour of lens / legend insert | Order no. |
|---|---|---|---|---|
| 1-module | yes | light grey/- | - | **5.82.110.000/0242** |
| 1-module | yes | charcoal grey/- | - | **5.82.110.000/0152** |

Other colours on request.

## RS 76 - Keycap, illuminable, with legend insert

| Size of keycap | Illumination | Colour of keycap / legending | Colour of lens / legend insert | Order no. |
|---|---|---|---|---|
| 1-module | yes | charcoal grey/- | colourless/white | **5.04.665.521/5520** |
| 1-module | yes | light grey/- | colourless/white | 5.04.665.530/5520 |

Supplied as single parts: Mat lens, legend insert, diffuser foil, keycap body.
Other colours on request.





**Stock items** are marked by **bold printed order numbers.**

## RS 76 - Keycap, illuminable, with nail protection and legend insert

Pict.: light grey, yellow lens

| Size of keycap | Illumination | Colour of keycap / legending | Colour of lens / legend insert | Order no. |
|---|---|---|---|---|
| 1-module | yes | charcoal grey/- | colourless/white | **5.04.665.911/5520** |
| 1-module | yes | light grey/- | colourless/white | **5.04.665.920/5520** |

Supplied as single parts: Mat lens, legend insert, keycap body.
Other colours on request.

## RS 76 - Keycap, illuminable, with legend insert

Pict.: red

| Size of keycap | Illumination | Colour of keycap / legending | Colour of lens / legend insert | Order no. |
|---|---|---|---|---|
| 1-module | yes | charcoal grey/- | colourless/white | **5.04.665.161/5520** |
| 1-module | yes | light grey/- | colourless/white | 5.04.665.170/5520 |

Supplied as single parts: Mat lens, legend insert, diffuser foil, keycap body.
Other colours on request.

## RS 76 MX - Keycap, fully illuminable

RS 76MX, keyboard fully illuminated

| Size of keycap | Illumination | Colour of keycap / legending | Colour of lens / legend insert | Order no. |
|---|---|---|---|---|
| 1-module | yes | white/- | white translucent/- | 5.05.511.168/0209 |
| 1-module | yes | light grey/- | white translucent/- | 5.05.511.168/0754 |
| 1¼-module | yes | white/- | white translucent/- | 5.05.511.169/0209 |
| 1½-module | yes | white/- | white translucent/- | 5.05.511.170/0209 |
| 1¾-module | yes | white/- | white translucent/- | 5.05.511.171/0209 |
| 1¼-module with light conductor | yes | white/- | white translucent/- | 5.05.511.173/0209 |

Laser-printed versions available on request.







**Stock items** are marked by **bold printed order numbers.**

## RS 76 - Keycaps, with legend, two-shot moulded/keycap sets


Pict.: opaque light beige / brown


opaque light beige / brown

## RS 76 - Keycap set, symbols A-Z


Pict.: opaque light beige / brown

A B C D E F G H I J K L M
N O P Q R S T U V W X Y Z


light beige

| Size of keycap | Form of lens | Colour of keycap / legending | Symbol | Order no. |
|---|---|---|---|---|
| 1-module | keycap opaque with nail protection | charcoal grey/white | A-Z | 5.00.999.500/0000 |
| 1-module | keycap opaque with nail protection | light grey/black | A-Z | 5.00.999.824/0000 |
| 1-module | keycap opaque | charcoal grey/white | A-Z | **5.00.999.525/0000** |
| 1-module | keycap opaque | light grey/black | A-Z | **5.00.999.825/0000** |

Other symbols and colours on request.







**Stock items** are marked by **bold printed order numbers.**

## RS 76 - Keycap set, symbols 0-9

Pict.: opaque light beige / brown

0 1 2 3 4 5 6 7 8 9

opaque with nail protection charcoal grey / white

| Size of keycap | Form of lens | Colour of keycap / legending | Symbol | Order no. |
|---|---|---|---|---|
| 1-module | keycap opaque with nail protection | charcoal grey/white | 0-9 | 5.00.999.504/0000 |
| 1-module | keycap opaque with nail protection | light grey/black | 0-9 | 5.00.999.826/0000 |
| 1-module | keycap opaque | charcoal grey/white | 0-9 | **5.00.999.529/0000** |
| 1-module | keycap opaque | light grey/black | 0-9 | **5.00.999.827/0000** |

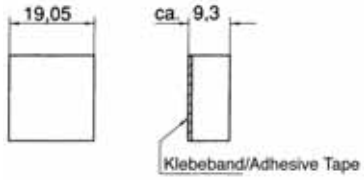
Other symbols and colours on request.

## RS 76 - Accessories

Pict.: light beige

dark grey

## RS 76 - Cover IP40




Pict.: light beige

| Short text | Feature 1 | Feature 2 | Order no. |
|---|---|---|---|
| RS 76 - Cover IP40, 1/4-module, charcoal grey | charcoal grey | ¼-module | 5.04.520.171/0152 |
| RS 76 - Cover IP40, 1/4-module, light grey | light grey | ¼-module | 5.04.520.171/0242 |
| RS 76 - Cover IP40, 1/4-module, light beige | light beige | ¼-module | 5.04.520.171/0710 |
| RS 76 - Cover IP40, 1/4-module, dark grey | dark grey | ¼-module | 5.04.520.171/0801 |
| RS 76 - Cover IP40, 1/2-module, charcoal grey | charcoal grey | ½-module | 5.04.520.172/0152 |
| RS 76 - Cover IP40, 1/2-module, light grey | light grey | ½-module | 5.04.520.172/0242 |
| RS 76 - Cover IP40, 1/2-module, light beige | light beige | ½-module | 5.04.520.172/0710 |
| RS 76 - Cover IP40, 1/2-module, dark grey | dark grey | ½-module | 5.04.520.172/0801 |
| RS 76 - Cover IP40, 3/4-module, charcoal grey | charcoal grey | ¾-module | 5.04.520.173/0152 |
| RS 76 - Cover IP40, 3/4-module, light grey | light grey | ¾-module | 5.04.520.173/0242 |
| RS 76 - Cover IP40, 3/4-module, light beige | light beige | ¾-module | 5.04.520.173/0710 |
| RS 76 - Cover IP40, 3/4-module, dark grey | dark grey | ¾-module | 5.04.520.173/0801 |
| RS 76 - Cover IP40, 1-module, charcoal grey | charcoal grey | 1-module | 5.04.520.174/0152 |
| RS 76 - Cover IP40, 1-module, light grey | light grey | 1-module | 5.04.520.174/0242 |
| RS 76 - Cover IP40, 1-module, light beige | light beige | 1-module | 5.04.520.174/0710 |
| RS 76 - Cover IP40, 1-module, dark grey | dark grey | 1-module | 5.04.520.174/0801 |

Other colours on request.

## General Data

Keylock switches for PCB mounting. Matching with the RS 76 full-travel keyswitches and the RF 15 and RF 19 short-travel keyswitches.

## Content


**MICROMEC - Keylock switch IP54** **4 - 154**
MICROMEC - Keylock switch IP54 4 - 156

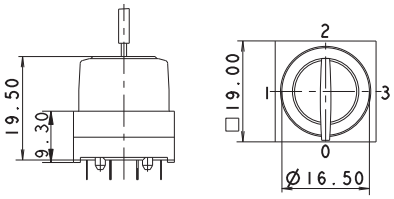
**EUROLOCKS - Keylock switch IP54** **4 - 158**
EUROLOCKS - Keylock switch IP54 4 - 159

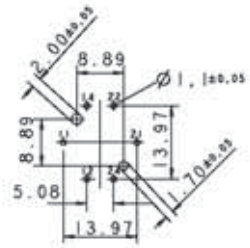
**Priority keylock switch IP54** **4 - 160**
Priority keylock switch IP54 4 - 161

**Rotary switch IP40** **4 - 162**
Rotary switch IP40 4 - 163

# MICROMEC - Keylock switch IP54

Pict.: light grey




PCB hole pattern, component side

## Technical Data

**General information**

| | |
|---|---|
| Colour | see order block |
| Form of collar | square |

**Dimensions**

| | |
|---|---|
| Length of collar | 19 mm |
| Width of collar | 19 mm |
| Overall height | 19.5 mm |

**Mechanical design**

| | |
|---|---|
| Mounting | soldering |
| Terminals | tin-plated |
| Contact system | cross contact self cleaning |
| Contact function | see order block |
| Contact materials | Au alloy |
| Illuminability | no |
| Lock | Micromec |
| Wafers | 5 |
| Lock type | 001 |
| Number of locking positions | 500 |
| Main key | on request |
| Symmetric key | no |
| Group key | on request |
| Key removal position | see order block |
| General key | on request |

**Mechanical characteristics**

| | |
|---|---|
| Switching torque | 0.04 ... 0.10 Nm |
| Robustness max. | 2 Nm |
| Dielectric strength AC min. | 500 V |
| Rated power max. | 1 W |

**Electrical characteristics**

| | |
|---|---|
| Rated voltage | 2 ... 35 V |
| Rated current max. | 100 mA |
| Contact resistance when new max. | 100 mΩ |
| Contact resistance acc. to life max. | 200 mΩ |
| Insulation resistance | $10^9$ Ω |
| ESD strength max. | 8 kV |

**Other specifications**

| | |
|---|---|
| Rotating angle | see order block |
| Operating life | 10,000 |
| Degree of protection from front side | IP54 |
| Ambient temp. operating min. | -25 °C |
| Ambient temp. operating max. | +70 °C |
| Storage temperature min. | -40 °C |
| Storage temperature max. | +80 °C |
| Environmental restistance | acc. to IEC 60068-2 -14, -30, -33 and -78 |
| Flammability of materials | UL 94 HB |

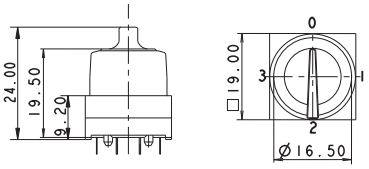
## Typical accessories MICROMEC - Keylock switch IP54

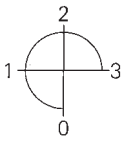
| Description | Photo | Order no. | Additional accessories see page |
|---|---|---|---|
| O-ring for keylock switch |  | 5.30.120.015/0100 | 5 - 25 |
| Spare key, for single action, e.g. 1 x 90° (delivery content 1 key) |  | 5.58.007.001/0000 | |
| Spare key, for double action, e.g. 2 x 90° (delivery content 1 key) |  | 5.58.008.001/0000 | |
| Spare key for 3 angles, f.ex. 3 x 90° degree (content 1 key) |  | 5.58.009.001/0100 | |

## Typical accessories MICROMEC - Keylock switch IP54

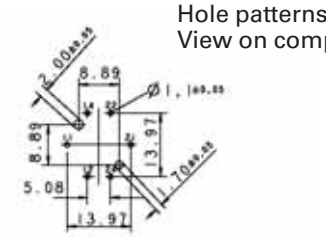
| Description | Photo | Order no. | Additional accessories see page |
|---|---|---|---|
| Spare key for 4 angles, f.ex. 4 x 90 degrees, (content 1 key) |  | 5.58.010.001/0100 | |

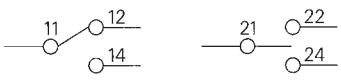
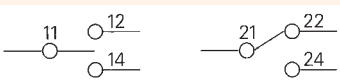
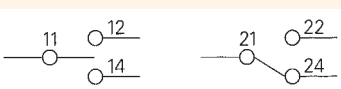
## Configuration Diagram/Dimensional Drawing




Hole patterns PCB
View on component side

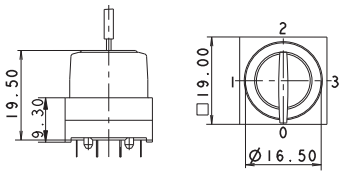


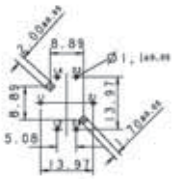

| Switching position | Contact function |
|---|---|
| 0 |   |
| 1 |   |
| 2 |   |
| 3 |   |

4

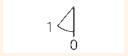
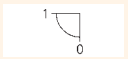
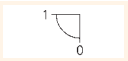
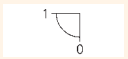
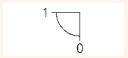
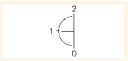
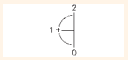
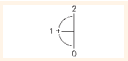
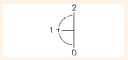
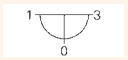
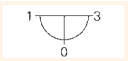
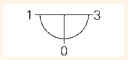
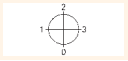
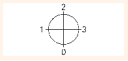
## MICROMEC - Keylock switch IP54

Pict.: charcoal grey



PCB hole pattern, component side

| Contact function | Colour | Rotating angle | | Key removal position | Order no. |
|---|---|---|---|---|---|
| momentary | charcoal grey | 1 x 40° |  | 0 | **3.13.026.041/0000** |
| momentary | light grey | 1 x 40° |  | 0 | 3.13.026.541/0000 |
| latching | charcoal grey | 1 x 90° |  | 0 | **3.13.026.001/0000** |
| latching | light grey | 1 x 90° |  | 0 | **3.13.026.501/0000** |
| latching | charcoal grey | 1 x 90° |  | 0+1 | 3.13.026.006/0000 |
| latching | light grey | 1 x 90° |  | 0+1 | 3.13.026.506/0000 |
| latching | charcoal grey | 2 x 90° |  | 0 | 3.13.026.011/0000 |
| latching | light grey | 2 x 90° |  | 0 | 3.13.026.511/0000 |
| latching | charcoal grey | 2 x 90° |  | 0+1+2 | **3.13.026.016/0000** |
| latching | light grey | 2 x 90° |  | 0+1+2 | 3.13.026.516/0000 |
| latching | charcoal grey | 2 x 90° |  | 0 | 3.13.026.601/0000 |
| latching | light grey | 2 x 90° |  | 0 | 3.13.026.851/0000 |
| latching | charcoal grey | 2 x 90° |  | 0+1+3 | 3.13.026.606/0000 |
| latching | light grey | 2 x 90° |  | 0+1+3 | 3.13.026.856/0000 |
| latching | charcoal grey | 3 x 90° |  | 0 | 3.13.026.021/0000 |
| latching | light grey | 3 x 90° |  | 0 | 3.13.026.521/0000 |
| latching | charcoal grey | 3 x 90° |  | 0+1+2+3 | 3.13.026.026/0000 |
| latching | light grey | 3 x 90° |  | 0+1+2+3 | 3.13.026.526/0000 |
| latching | charcoal grey | 4 x 90° without stop |  | 0 | 3.13.026.031/0000 |
| latching | light grey | 4 x 90° without stop |  | 0 | 3.13.026.531/0000 |
| latching | charcoal grey | 4 x 90° without stop |  | 0+1+2+3 | 3.13.026.036/0000 |
| latching | light grey | 4 x 90° without stop |  | 0+1+2+3 | 3.13.026.536/0000 |

Technical data see page 4 - 154

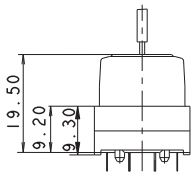
2 keys included.
Other lock variants available on request.

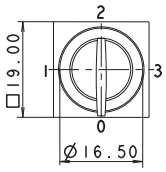


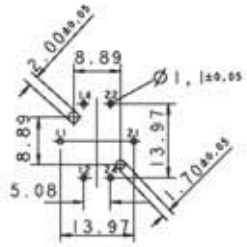
**Stock items** are marked by **bold printed order numbers.**

# EUROLOCKS - Keylock switch IP54

Pict.: light grey




PCB hole pattern, component side

## Technical Data

**General information**

| | |
|---|---|
| Colour | see order block |
| Form of collar | square |

**Dimensions**

| | |
|---|---|
| Length of collar | 19 mm |
| Width of collar | 19 mm |
| Overall height | 19.5 mm |

**Mechanical design**

| | |
|---|---|
| Mounting | soldering |
| Terminals | tin-plated |
| Contact system | cross contact self cleaning |
| Contact function | latching |
| Contact materials | Au alloy |
| Illuminability | no |
| Lock | Eurolocks |
| Wafers | 5 |
| Lock type | 801 |
| Number of locking positions | 50 |
| Main key | no |
| Symmetric key | yes |
| Group key | no |
| Key removal position | see order block |
| General key | no |

**Mechanical characteristics**

| | |
|---|---|
| Switching torque | 0.04 ... 0.10 Nm |
| Robustness max. | 2 Nm |
| Dielectric strength AC min. | 500 V |
| Rated power max. | 1 W |

**Electrical characteristics**

| | |
|---|---|
| Rated voltage | 2 ... 35 V |
| Rated current max. | 100 mA |
| Contact resistance when new max. | 100 mΩ |
| Contact resistance acc. to life max. | 200 mΩ |
| Insulation resistance | $10^9$ Ω |
| ESD strength max. | 8 kV |

**Other specifications**

| | |
|---|---|
| Rotating angle | see order block |
| Operating life | 10,000 |
| Degree of protection from front side | IP54 |
| Ambient temp. operating min. | -25 °C |
| Ambient temp. operating max. | +70 °C |
| Storage temperature min. | -40 °C |
| Storage temperature max. | +80 °C |
| Environmental restistance | acc. to IEC 60068-2 -14, -30, -33 and -78 |
| Flammability of materials | UL 94 HB |

## Typical accessories EUROLOCKS - Keylock switch IP54

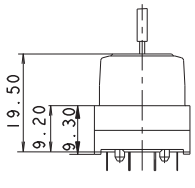
| Description | Photo | Order no. | Additional accessories see page |
|---|---|---|---|
| O-ring for keylock switch |  | 5.30.120.015/0100 | 5 - 25 |
| Spare key (delivery content 1 key) |  | 5.58.006.801/0000 | |

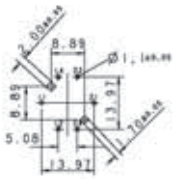


**Stock items** are marked by **bold printed order numbers.**

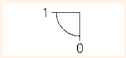
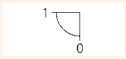
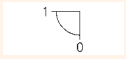
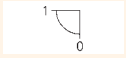
## EUROLOCKS - Keylock switch IP54

Pict.: light grey



PCB hole pattern, component side

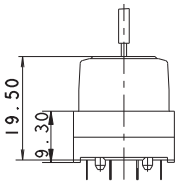
| Contact function | Colour | Rotating angle | | Key removal position | Order no. |
|---|---|---|---|---|---|
| latching | charcoal grey | 1 x 90° |  | 0 | 3.13.009.001/0000 |
| latching | light grey | 1 x 90° |  | 0 | 3.13.009.006/0000 |
| latching | charcoal grey | 1 x 90° |  | 0+1 | 3.13.009.031/0000 |
| latching | light grey | 1 x 90° |  | 0+1 | 3.13.009.036/0000 |

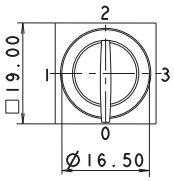
Technical data see page 4 - 158

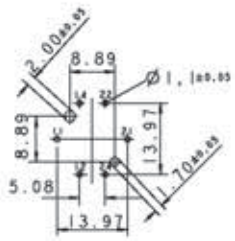
2 keys included.
Other lock variants available on request.
For the switching arrangement, refer to Micromec keylock switch IP54.

# Priority keylock switch IP54

Pict.: light grey




PCB hole pattern, component side

## General Data

Either 2 or 3 different keys are required, depending on the angle between positions. Key 1 can switch to position 1, key 2 can switch to position 1 and 2, etc.

## Technical Data

| | |
|---|---|
| **General information** | |
| Colour | see order block |
| Form of collar | square |
| **Dimensions** | |
| Length of collar | 19 mm |
| Width of collar | 19 mm |
| Overall height | 19.5 mm |
| **Mechanical design** | |
| Mounting | soldering |
| Terminals | tin-plated |
| Contact system | cross contact self cleaning |
| Contact function | see order block |
| Contact materials | Au alloy |
| Illuminability | no |
| Lock | Micromec |
| Wafers | 5 |
| Lock type | 001 |
| Number of locking positions | 500 |
| Main key | yes |
| Symmetric key | no |
| Group key | yes |
| Key removal position | see order block |
| General key | yes |

| | |
|---|---|
| **Mechanical characteristics** | |
| Switching torque | 0.04 ... 0.10 Nm |
| Robustness max. | 2 Nm |
| Dielectric strength AC min. | 500 V |
| Rated power max. | 1 W |
| **Electrical characteristics** | |
| Rated voltage | 2 ... 35 V |
| Rated current max. | 100 mA |
| Contact resistance when new max. | 100 mΩ |
| Contact resistance acc. to life max. | 200 mΩ |
| Insulation resistance | $10^9$ Ω |
| ESD strength max. | 8 kV |
| **Other specifications** | |
| Rotating angle | see order block |
| Operating life | 10,000 |
| Degree of protection from front side | IP54 |
| Ambient temp. operating min. | -25 °C |
| Ambient temp. operating max. | +70 °C |
| Storage temperature min. | -40 °C |
| Storage temperature max. | +80 °C |
| Environmental restistance | acc. to IEC 60068-2 -14, -30, -33 and -78 |
| Flammability of materials | UL 94 HB |

## Typical accessories Priority keylock switch IP54

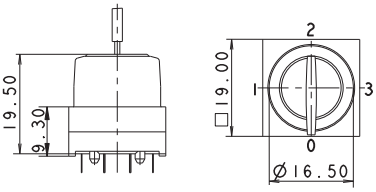
| Description | Photo | Order no. | Additional accessories see page |
|---|---|---|---|
| O-ring for keylock switch |  | 5.30.120.015/0100 | 5 - 25 |

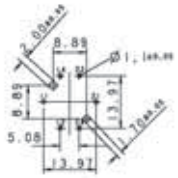
## Typical accessories Priority keylock switch IP54

| Description | Photo | Order no. | Additional accessories see page |
|---|---|---|---|
| Set of keys for 2 x 90° type (2 keys) |  | 5.58.099.012/0000 | |
| Set of keys for 3 x 90° type (3 keys) |  | 5.58.099.013/0000 | |

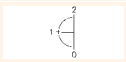
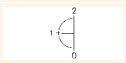
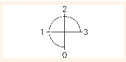
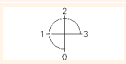
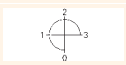
## Priority keylock switch IP54

Pict.: charcoal grey



PCB hole pattern, component side

| Contact function | Colour | Rotating angle | Key removal position | Order no. |
|---|---|---|---|---|
| latching | charcoal grey | 2 x 90°  | 0 | 3.13.027.001/0000 |
| latching | light grey | 2 x 90°  | 0 | 3.13.027.501/0000 |
| latching | charcoal grey | 2 x 90°  | 0+1+2 | 3.13.027.006/0000 |
| latching | light grey | 2 x 90°  | 0+1+2 | 3.13.027.506/0000 |
| latching | charcoal grey | 3 x 90°  | 0 | 3.13.027.011/0000 |
| latching | light grey | 3 x 90°  | 0 | 3.13.027.511/0000 |
| latching | charcoal grey | 3 x 90°  | 0+1+2+3 | **3.13.027.016/0000** |
| latching | light grey | 3 x 90°  | 0+1+2+3 | 3.13.027.516/0000 |

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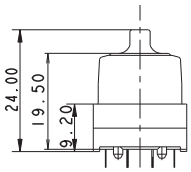
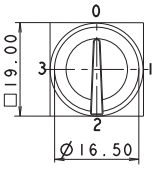
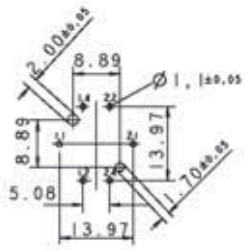
2 sets of keys included.
Other lock variants available on request.
For the switching arrangement, see IP54 Micromec keylock switch.
Either 2 or 3 different keys are required, depending on the angle between positions. Key 1 can switch to position 1, key 2 can switch to position 1 and 2, etc.

# Rotary switch IP40

Pict.: charcoal grey




PCB hole pattern, component side

## Technical Data

**General information**

| | |
|---|---|
| Colour | see order block |
| Form of collar | square |

**Dimensions**

| | |
|---|---|
| Length of collar | 19 mm |
| Width of collar | 19 mm |
| Overall height | 24 mm |

**Mechanical design**

| | |
|---|---|
| Mounting | soldering |
| Terminals | tin-plated |
| Contact system | cross contact self cleaning |
| Contact function | see order block |
| Contact materials | Au alloy |
| Illuminability | no |

**Mechanical characteristics**

| | |
|---|---|
| Torque against stop min. | 0.45 Nm |
| Dielectric strength AC min. | see order block |
| Rated power max. | 1 W |

**Electrical characteristics**

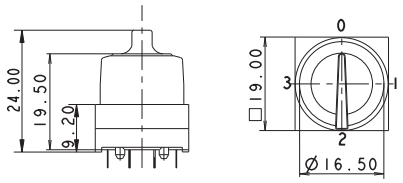
| | |
|---|---|
| Rated voltage max. | 35 V |
| Rated current max. | 100 mA |
| Contact resistance when new max. | 100 mΩ |
| Contact resistance acc. to life max. | 200 mΩ |
| Insulation resistance | $10^9$ Ω |
| ESD strength max. | 8 kV |

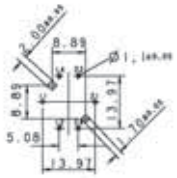
**Other specifications**

| | |
|---|---|
| Rotating angle | see order block |
| Operating life | 50,000 |
| Degree of protection from front side | IP40 |
| Ambient temp. operating min. | -25 °C |
| Ambient temp. operating max. | +70 °C |
| Storage temperature min. | -40 °C |
| Storage temperature max. | +80 °C |
| Environmental restistance | acc. to IEC 60068-2 -14, -30, -33 and -78 |
| Flammability of materials | UL 94 HB |

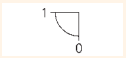
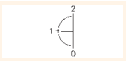
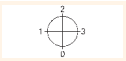
## Rotary switch IP40

Pict.: charcoal grey



PCB hole pattern, component side

| Contact function | Colour | Rotating angle | | Order no. |
|---|---|---|---|---|
| latching | charcoal grey | 1 x 90° |  | 3.13.007.001/0152 |
| latching | charcoal grey | 2 x 90° |  | 3.13.007.011/0152 |
| latching | charcoal grey | 3 x 90° |  | 3.13.007.021/0152 |
| latching | charcoal grey | 4 x 90° |  | 3.13.007.031/0152 |

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Other colour variants available on request

4



**Stock items** are marked by **bold printed order numbers.**