



# **PCB Keyswitches**

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# **Examples for Applications Standards**





RG 85 III System



#### RF 15 with RK 90 System



#### **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  $U_B > 50 \text{ V}$ 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  $U_B < 50 \text{ V}$ 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: UL file no. for data entry systems: E 202520

4 - 2 PCB 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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4

MICON

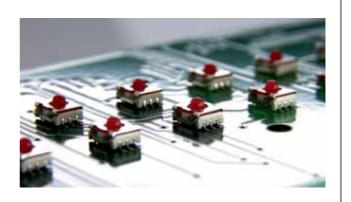
PCB Keyswitches 4 - 3





#### 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

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

#### **Technical Data**

MICON

DimensionsLength of housing6.4 mmWidth of housing5.1 mmOverall heightsee 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 see order block (±0.15 mm)

**Electrical characteristics** 

Rated voltage min. 0.02 V Rated voltage max. 35 V  $\begin{array}{lll} \text{Rated current min.} & 0.01 \text{ mA} \\ \text{Rated current max.} & 100 \text{ mA} \\ \text{Rated power max.} & 1 \text{ W} \\ \text{(ohmic load)} & \\ \text{Contact resistance when new} & 100 \text{ m}\Omega \\ \text{Rated voltage restistance AC} & 250 \text{ V} \\ \end{array}$ 

Other specifications

Insulation resistance

Ambient temp. operating min.
Ambient temp. operating max.
Ambient temp. operating max.
Resistance to environment

Operating life (test force)
Solder heat resistance /
Solderability

-40 °C
+90 °C
IEC 60068-2 -14,
-30,-33, -78
see order block
see order block

10 $^{9}\,\Omega$ 

Flammability of materials

Packing

Produkt code

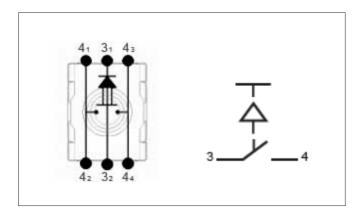
UL 94V1

see order block
see order block

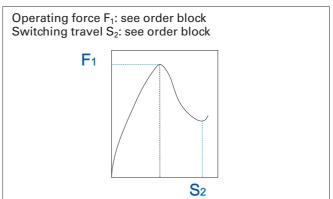
4 - 4 PCB Keyswitches

# SOLUTIONS WITH PASSION

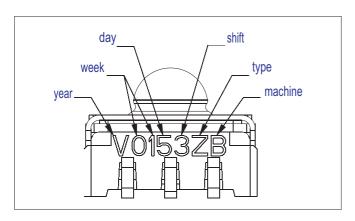
#### **MICON 5 Circuit Diagram**



# **MICON 5 Force-Travel Diagram**



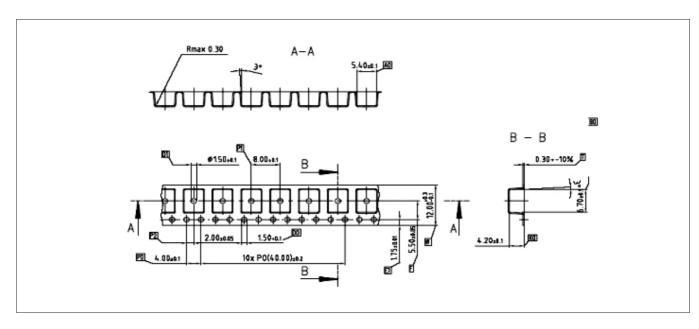
#### MICON 5 Product Code acc. to DIN EN ISO 9001 (EN ISO 8402)



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**



4

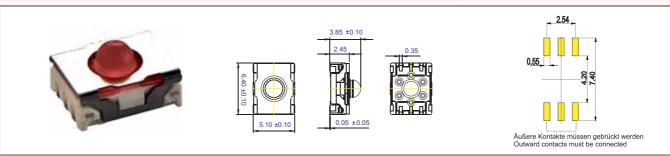
MICON

PCB Keyswitches 4 - 5





# 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)	Υ	1.14.002.011/0000

Technical data see page 4 - 4

Packing: in tape, reel with 2100 pieces

Keycaps see RK 90

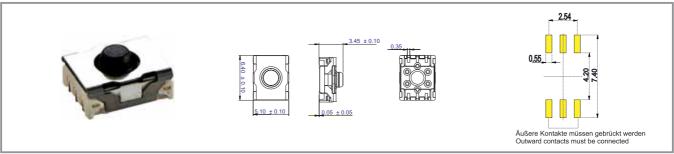
Mounting hints:

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.



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





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)	Т	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

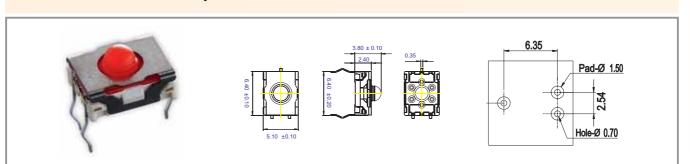
Packing: in tape, reel with 2100 pieces

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.	NE
THT	E DIN IEC 600 68-2-20	3.0 N	0.7 mm	1,000,000 (4 N)	0	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)	Р	1.14.002.016/0000	

Technical data see page 4 - 4

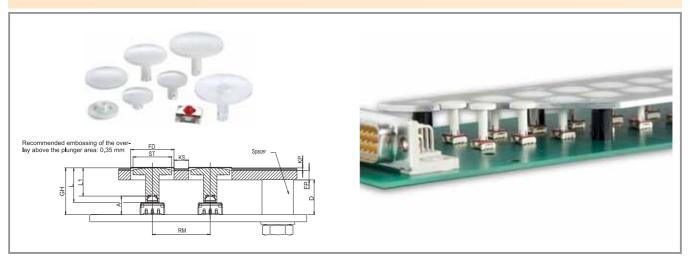
Packing: in tubes with 102 pieces

Keycaps see RK 90





# MICON 5 - Plungers round, not illuminable



#### **General Data**

Height of keyswitch: SMT type: 3.85 mm, THT type: 3.80 mm

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 + L1 (THT type)

KP - Thickness of overlay + embossing KS - Glue webs for overlay, min. 3 mm

L1 - Length of plunger above keyswitch L1 = GH - A

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).

MICON

#### **Technical Data**

**General information** 

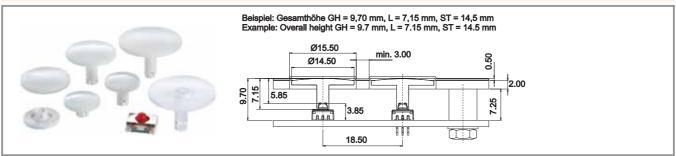
see order block Plunger diameter/size Length of plunger L see order block

4 - 8 **PCB** Keyswitches



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





Plunger diameter ST/size	Length of plunger L	Order no.
6.0 mm	3.00 mm	5.46.001.103/0200
3.0 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
3.0 mm	3.00 mm	5.46.001.123/0200
3.0 mm	3.45 mm	5.46.001.124/0200
8.0 mm	3.95 mm	5.46.001.125/0200
3.0 mm	4.45 mm	5.46.001.126/020
3.0 mm	5.50 mm	5.46.001.121/020
3.0 mm	7.15 mm	5.46.001.127/020
3.0 mm	9.95 mm	5.46.001.128/020
3.0 mm	10.30 mm	5.46.001.122/020
1.5 mm	3.00 mm	5.46.001.143/020
1.5 mm	3.45 mm	5.46.001.144/020
11.5 mm	3.95 mm	5.46.001.145/020
11.5 mm	4.45 mm	5.46.001.146/020
11.5 mm	5.50 mm	5.46.001.141/020
11.5 mm	7.15 mm	5.46.001.147/020
1.5 mm	9.95 mm	5.46.001.148/020
11.5 mm	10.30 mm	5.46.001.142/020

4

# **MICON 5 - Short-travel keyswitches**



Plunger diameter ST/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)

4



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

**AUTOMATION** 

The little one shows its excellence reliable switching behaviour in under keycaps, membrane overlays or elastic seals. Outstanding tactile feedback and absolutely

demanding applications, including hostile environments. MICON 5 test it!

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

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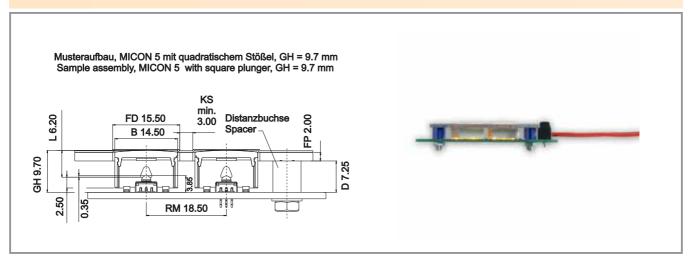
www.rafi.de, info@rafi.de







# MICON 5 - Plungers square, illuminable



#### **General Data**

#### Description

A - Height of keyswitch: SMT = 3.85 mm, THT = 3.80 mm

B - Width of plunger (11 x 11 mm, 14,5 x 14,5 mm or 18 x 18 mm)

D - GH - FP - 0.5 mm (= embossing height 0.35 mm + glue height 0.15 mm)

FD - Front panel cut-out: B + 1 mm

FP -Thickness of front plate

GH - Overall height: A + 5.75 mm

KS - Glue strip min. 3 mm

R - Grid size: FD + KS

The plungers can only be combined with MICON 5 version Standard (red bubble).

4

#### **Technical Data**

#### **General information**

Overall height GH Colour of lens

see order block see order block

MICON

4 - 12 PCB Keyswitches



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





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)





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



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)



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

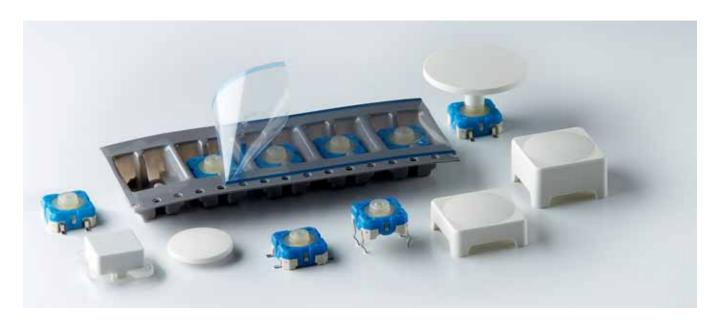




Overall height GH	Colour of lens	Order no.
9.70 mm	red	5.05.511.480/2300
9.70 mm	green	5.05.511.480/2500
9.70 mm	yellow	5.05.511.480/2400
9.70 mm	white	5.05.511.480/2200
9.70 mm	blue	5.05.511.480/2600
12.50 mm	red	5.05.511.481/2300
12.50 mm	green	5.05.511.481/2500
12.50 mm	yellow	5.05.511.481/2400
12.50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



#### **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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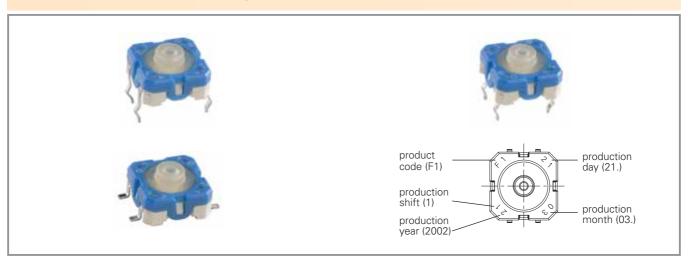
4

RACON

PCB Keyswitches 4 - 17



## **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

#### **Technical Data**

Dimensions	

Length of housing 8.4 mm
Width of housing 8.4 mm
Height of housing see order block

Mechanical design

RACON

Mounting soldering
Terminals see order block
Contact system snap-action contact
Contact arrangement 1 NO
Contact materials Au
Illumination no

**Mechanical characteristics** 

 $\begin{array}{ll} \text{Operating force} & 3.3^{\pm 0.6} \text{ N} \\ \text{Switching travel} & 0.34^{\pm 0.1} \text{ mm} \end{array}$ 

**Electrical characteristics** 

Rated voltage min. 0.02 V Rated voltage max. 35 V

Insulation resistance  $10^9 \, \Omega$ 

Other specifications

Ambient temp. operating min.
Ambient temp. operating max.

Resistance to environment
Operating life
Solderability / Solder heat

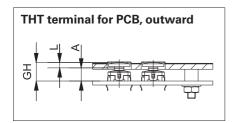
-40 °C
+90 °C
DIN EN 60068-2 -14,
-30,-33 and -78
1,000,000
see order block

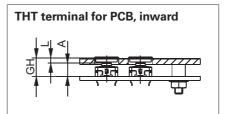
resistance
Flammability of materials
Packing
Produkt code
UL 94 HB
see order block
see order block

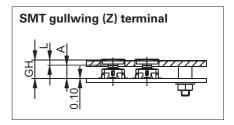
4 - 18 PCB Keyswitches



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

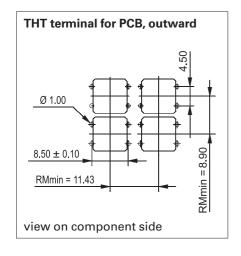


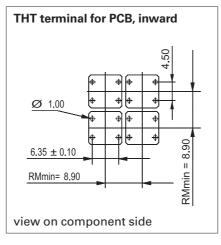


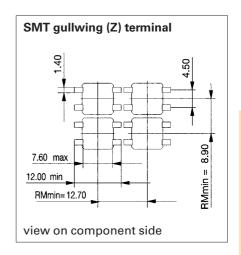


Variabl	e Declaration	THT terminal outward	THT terminal inward	SMT-terminal
Α	Height of keyswitch		A = 4.90 + 0.1  mm	
GH	Overall height	GH = A + L		GH = A + L + 0.1  mm
L	Length of plunger	L = (	SH - A	L = GH - A - 0.1 mm

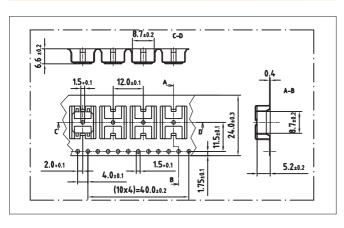
#### **RACON 8, PCB Hole Pattern, Smallest Grid**



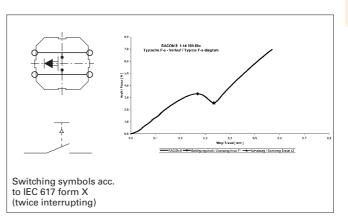




# RACON 8, SMT Terminal, Tape and Reel Drawing



# Circuit Diagram Typical Force-Travel Diagram



PCB Keyswitches 4 - 19

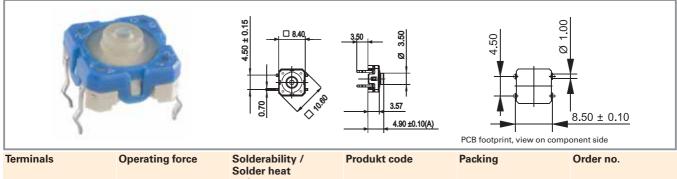


#### Typical accessories RACON 8 - Short-travel keyswitch

Description	Photo	Order no.	Additional accessories see page
Spacer, round, length 6.25 mm, red	450	5.30.759.034/0000	2 - 239, 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**

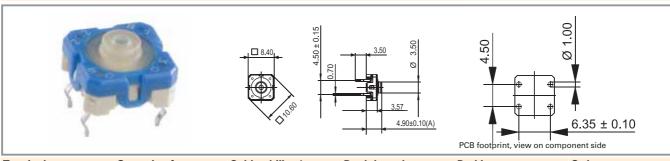


TerminalsOperating forceSolderability / Solder heat resistanceProdukt codePackingOrder no.THT outward3.3±0.6 NE DIN IEC 600 68-2-20A1tubes à 60 piece1.14.100.501/0000

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**



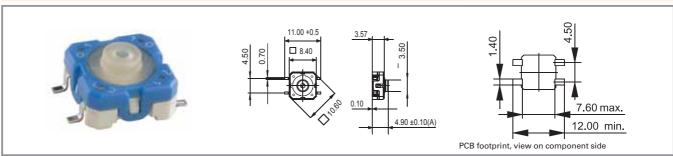
Terminals	Operating force	Solderability / Solder heat resistance	Produkt code	Packing	Order no.
THT inward	3.3 <sup>±0.6</sup> N	E DIN IEC 600 68-2-20	B1	tubes à 60 piece	1.14.100.502/0000

Technical data see page 4 - 18

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



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



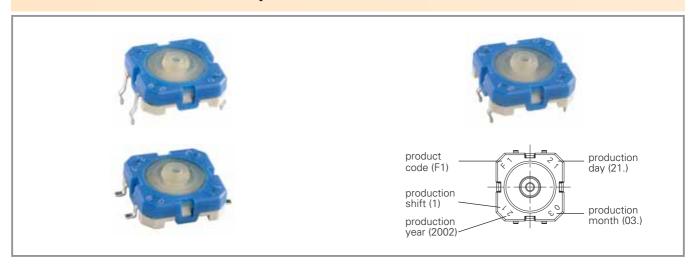
Terminals	Operating force	Solderability / Solder heat resistance	Produkt code	Packing	Order no.
SMT Gullwing (Z) terminals	3.3±0.6 N	E DIN IEC 600 68-2-58	C1	tape and reel à 1000 pieces	1.14.100.503/0000

Technical data see page 4 - 18

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



## **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 SMTversions
- Vapour phase soldering for SMT versions
- Manual soldering
- SMT version suitable for processing with an automatic SMT assembly machine
- IMDS listed

# 4

#### **Technical Data**

RACON

DimensionsLength of housing12 mmWidth of housing12 mmOverall heightsee 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

Other specifications

Produkt code

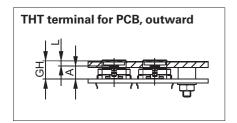
Ambient temp, operating min. -40 °C Ambient temp. operating max. +90 °C Resistance to environment DIN EN 60068-2 -14, -30,-33 and -78 Operating life 1,000,000 Solderability / Solder heat see order block resistance Flammability of materials UL 94 HB see order block **Packing** 

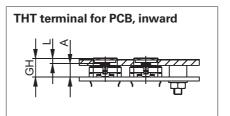
see order block

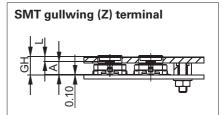
4 - 22 PCB Keyswitches



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

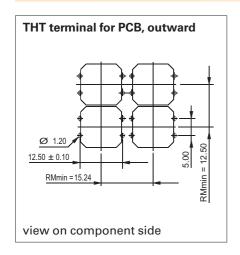


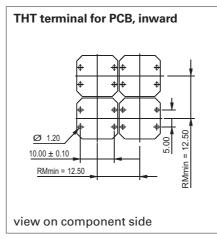


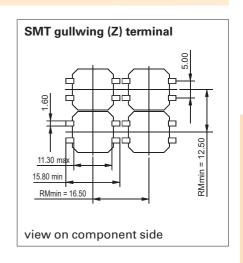


Variabl	e Declaration	THT terminal outward	THT terminal inward	SMT-terminal
Α	Height of keyswitch		A = 4.95 + 0.1  mm	
GH	Overall height	GH = A + L		GH = A + L + 0.1  mm
L	Length of plunger	L = (	SH - A	L = GH - A - 0.1 mm

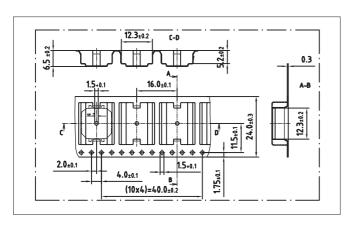
#### **RACON 12, PCB Hole Pattern, Smallest Grid**



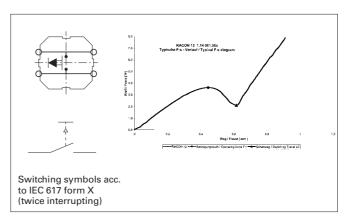




# RACON 12, SMT Terminal, Tape and Reel Drawing



# Circuit Diagram Typical Force-Travel RACON 12 Diagram



PCB Keyswitches 4 - 23

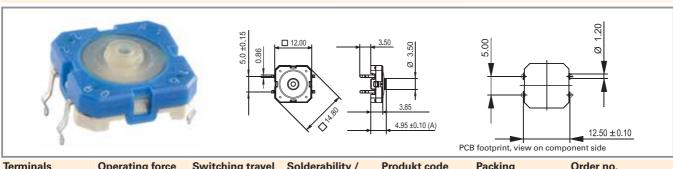


#### Typical accessories RACON 12 - Short-travel keyswitch

Description	Photo	Order no.	Additional accessories see page
Spacer, round, length 6.25 mm, red	, Port	5.30.759.034/0000	2 - 239, 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



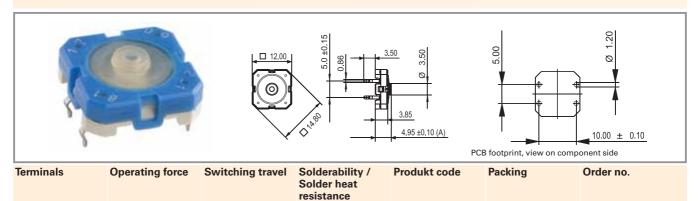
Solderability / **Terminals Operating force Switching travel Produkt code Packing** Order no. Solder heat resistance THT outward  $3.6^{\pm0.7} N$ 0.61±0.1 mm **E DIN IEC** 1.14.001.501/0000 Α1 tubes à 600 68-2-20 45 pieces

Technical data see page 4 - 22

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

1.14.001.502/0000

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



B1

tubes à

45 pieces

E DIN IEC

600 68-2-20

Technical data see page 4 - 22

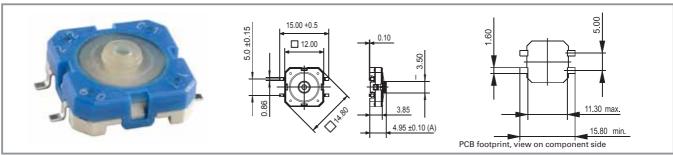
 $3.6^{\pm0.7} N$ 

**THT** outward

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

0.61±0.1 mm

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



Terminals	Operating force	Switching travel	Solderability / Solder heat resistance	Produkt code	Packing	Order no.
SMT Gullwing (Z)	3.6±0.7 N	0.61±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±1.6 N	0.7±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± <sup>2.5</sup> N	0.73 <sup>±0.1</sup> 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".

4



# **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	$3.6^{\pm0.7}$ N
Switching travel	0.61±0.1 mm

**Electrical characteristics** 

**RACON** 

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.	1 W
(ohmic load)	

max.	
Insulation resistance	10 $^{9}$ $\Omega$
Other specifications	
Ambient temp. operating min.	-40 °C
Ambient temp. operating max.	+80 °C
Storage temperature min.	-50 °C
Storage temperature max.	+85 °C
(product)	
Storage temperature max.	+85 °C
(in tube)	
Environmental restistance	acc. to IEC 60068-2
	-14, -30, -33 and -78
Operating life	1,000,000
Solderability / solder heat	E DIN IEC 600 68-2-20
resistance	
Flammability of materials	UL 94 HB
Packing	in boxes à
_	100 pieces

100 m $\Omega$ 

F 1

Contact resistance when new

4 - 26 PCB Keyswitches

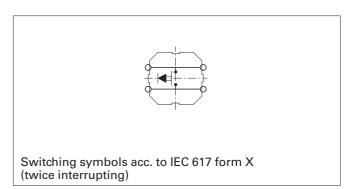
Produkt code



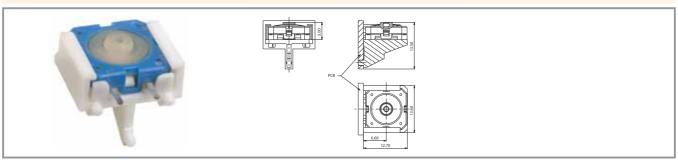
#### **PCB footprint RACON 12V**

# Drilling hole diagramm view on component side Hatched areas: In this area no components and no conductor tracks view on component side

#### **Circuit Diagram RACON 12V**



## 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

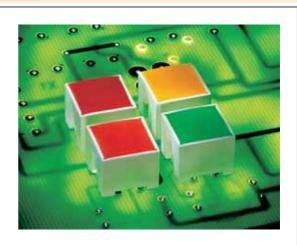
Technical data see page 4 - 26

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



# **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

#### **Technical Data**

Ge	nera	i int	orm	ation
Col	lour	of le	ens	

see order block Recommended key grid 15.24 x 15.24 mm Key grid min. 12.5 x 12.5 mm

#### **Dimensions**

RACON

11.35 mm Length 11.35 mm Width 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 2 LED see order block LED colour standard 2 mm LED type

#### **Mechanical characteristics**

3.3±0.6 N Operating force Switching travel 0.34±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 1 W Rated power max. (ohmic load)

100  $m\Omega$ 

Contact resistance when new

max.

Dielectric strength AC min. Insulation resistance

#### **Electrical characteristics of LED**

LED rated current max. IF at 25°C LED current reduction beginning with 50 degree C LED wavelength typ.

LED forward voltage U<sub>F</sub> at 20 mA

LED breakdown voltage U<sub>R</sub> at 25 °C

#### Other specifications

Ambient temp. operating max. Storage temperature min. Storage temperature max. (product) Storage temperature max. (intube) Environmental restistance

Operating life Solderability / solder heat resistance Flammability of materials Packing

750 V 10<sup>9</sup> Ω

red/green: 30, vellow: 50 mA red: 0.5 mA/degree C, vellow 0.8 mA/ degree C red 639, green 510-535, yellow 590 red: 1.8 V/20 mA, yellow: 1.9 V/20 mA

min. 5 V/0.1 mA

#### -40 °C Ambient temp. operating min.

+80 °C see order block see order block

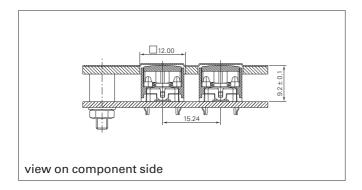
see order block

acc. to IEC 60068-2 -14, -30, -33 and -78 1,000,000 E DIN IEC 600 68-2-20

UL 94 HB tubes à 45 pieces

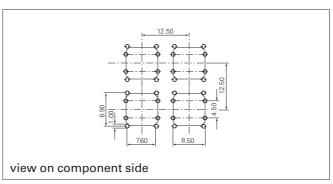
4 - 28 PCB Keyswitches

# RACON 12i typical system assembly

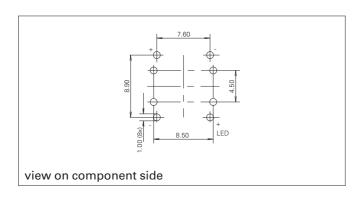


Explanation Recommended area embossing 0.35 mm at glue spacer thickness of 0.15 mm

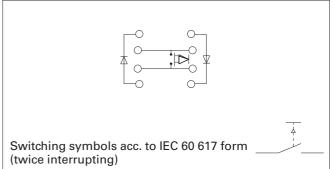
# **RACON 12i smallest grid**



## **LED** hole patterns

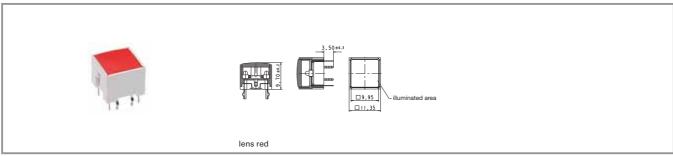


## **Circuit Diagram RACON 12i**





# **RACON 12 i - Short-travel keyswitch**



Terminals	Contact arrangement	Illumination	Colour of lens	LED colour	Order no.
ТНТ	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  $9 \times 9$  mm.

4



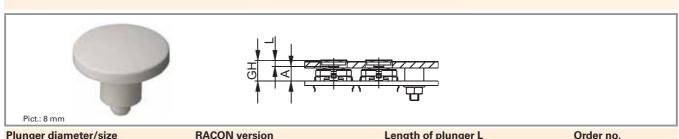
# **RACON - Special accessories**



#### **General Data**

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

#### **Plunger round**



Plunger diameter/size	HACON 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



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

4

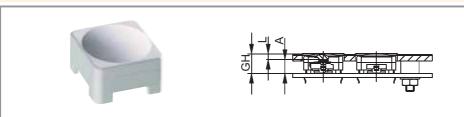
# **RACON - Short-travel keyswitches**



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

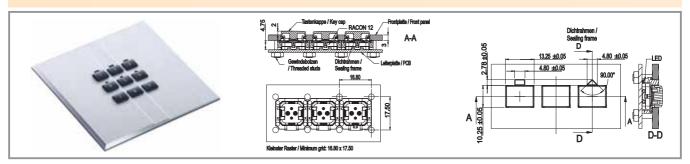
Front panel cut-out =  $15 \times 15 \text{ mm}$ .

4





# 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.

4

**RACON** 

4 - 36 PCB Keyswitches



# RK 90 II - Sealing frame



	Ocaning manne with square in	giit conductor	With shapped official
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.

RACON



### **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	<b>4 - 42</b>
RF 15 - Short-travel keyswitch, non-illuminated	4 - 44
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	<b>4 - 48</b>
RF 15 N - Short-travel keyswitch, non-illuminated	4 - 51
RF 15 R - Short-travel keyswitch RF 15 R - Low short-travel keyswitch, non-illuminated RF 15 R - High short-travel keyswitch, non-illuminated RF 15 R - Low short-travel keyswitch, 1 LED spot-illumination RF 15 R - High short-travel keyswitch, 1 LED spot-illumination	<b>4 - 52</b> 4 - 55 4 - 55 4 - 56 4 - 57
RF 15 H - Short-travel keyswitch	<b>4 - 58</b>
RF 15 H - Short-travel keyswitch, non-illuminated	4 - 60
RF 15 H - Short-travel keyswitch, fully illuminated	4 - 61
RF 15 - Signal indicator	<b>4 - 62</b>
RF 15 - Signal indicator, fully illuminated, 1 LED	4 - 64
RF 19 - Short-travel keyswitch	<b>4 - 66</b>
RF 19 - Short-travel keyswitch, non-illuminated	4 - 69
RF 19 - Short-travel keyswitch, fully illuminated with 2 LED	4 - 70
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# RF - Short-travel keyswitches



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4

4 - 40 PCB Keyswitches

# **Specifications LED**

#### 3 mm LED

(valid for 25 °C)	Red LED	Green LED	Yellow LED
Max. forward current $I_F$ : Current reduction from: $T_0 = 50$ °C: Wavelength typ: Forward voltage $U_F/I_F$ typ: Reverse voltage $U_R/I_F$ typ: Ambient temperature, operating:	30 mA approx 0.5 mA/°C 635 nm 2 V/10 mA 5 V/100 μA min. - 20 °C + 80 °C Blue LED	30 mA approx 0.5 mA/°C 565 nm 2 V/10 mA 5 V/100 μA min. - 20 °C + 80 °C White LED	20 mA approx 0.2 mA/°C 586 nm 2 V/10 mA 5 V/100 μA min. - 20 °C + 80 °C Green LED superbright
Max. forward current $I_F$ : Current reduction from: $T_0 = 50$ °C: Wavelength typ: Forward voltage $U_F/I_F$ typ: Reverse voltage $U_R/I_F$ typ: Ambient temperature, operating:	20 mA approx 0.6 mA/°C 470 nm 2.7 V/10 mA 5V/100 µA min. - 20 °C + 80 °C	25 mA - - 3.6 V/20 mA - - 20 °C + 80 °C	30 mA - 510-545 nm 3.5 V/20 mA - -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 $I_F$ : Current reduction from: $T_0 = 50$ °C: Light current $f_V/I_F$ typ: Wavelength typ: Forward voltage $U_F/I_F$ typ: Reverse voltage $U_R/I_F$ typ: Ambient temperature, operating:	30 mA 0.5 mA/°C - 637 nm 1.8 V/20 mA 5 V/100 µA min. - 55 °C + 100 °C	30 mA 0.5 mA/°C - 569 nm 2.1 V/10 mA 5 V/100 μA min. - 40 °C + 100 °C	50 mA 0.8 mA/°C 250 mIm/20 mA 590 nm 1.9 V/20 mA 5 V/100 μA min. -40 °C + 100 °C
	Blue LED	Multi-colour LED	
Max. forward current $I_F$ : Current reduction from: $T_0 = 50$ °C: Light current $f_V/I_F$ typ: Wavelength typ: Forward voltage $U_F/I_F$ typ: Reverse voltage $U_R/I_F$ typ: Ambient temperature, operating:	30 mA - - 464-485 nm 3.6 V/20 mA - 20 °C + 80 °C	30 mA approx 0.6 mA/°C - 635/565 nm 2 V/10 mA - - 20 °C + 80 °C	

Calculating the Rated power Example for 5 Volt: series resistor: of series:

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

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

$$R_V = \frac{5V - 2.0 \text{ V}}{0.02 \text{ A}} = 150 \text{ }\Omega \text{ (= standard value)}$$

4

PCB Keyswitches 4 - 41



# 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 in	nformation
------------	------------

Colour of lens Recommended key grid

#### **Dimensions**

Length Width Overall height

#### Mechanical design

Mounting
Terminals
Contact system
Contact arrangement
Contact materials
Illumination
LED colour
LED type

#### **Mechanical characteristics**

Operating force max. Switching travel Robustness min. see order block 19.05 mm

15 mm 15 mm 9.7 mm

soldering in PCB THT snap-action contact 1 NO

see order block see order block see order block see order block

2.9±0.6 N 0.5±0.2 mm with through-plated

**PCB 100 N** 

Contact resistant

Contact resistance when new max.

Insulation resistance

Rated power max.

(ohmic load)

#### Other specifications

Ambient temp. operating min. Ambient temp. operating max. Environmental restistance

Operating life min. (operations) Solderability / solder heat resistance Wave soldering Manual soldering

Electrical characteristics

Rated voltage min.
Rated voltage max.
Rated current min.
Au: 0.02 V, Ag: 3 V
Au: 35 V, Ag: 50 V
Au: 0.01 mA,
Ag: 0.1 mA
Au: 100 mA,
Ag: 250 mA

Au: 2W, Ag: 12.5W

100 m $\Omega$ 

10 $^{9}\,\Omega$ 

-25 °C +70 °C

acc. to IEC 60068-2 -14, -30, -33 and -78

1,000,000

according to E DIN IEC 600 28-2-20 260 °C max. 350 °C / 5 sec. max.

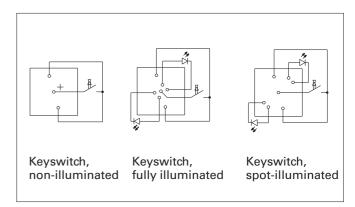
4 - 42 PCB Keyswitches

**D**E

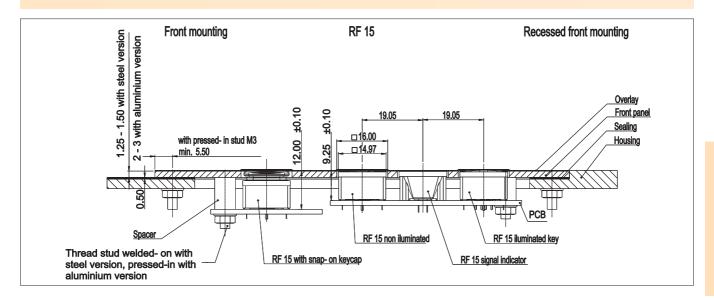
# Force/Travel Diagram – Keyswitch RF 15

# Operation characteristic limits RF

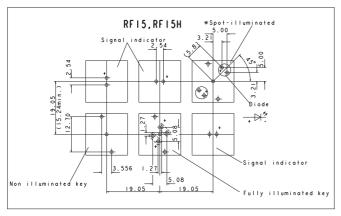
# Circuit Diagram - Keyswitch RF 15



# **Dimensional Drawing RF 15**

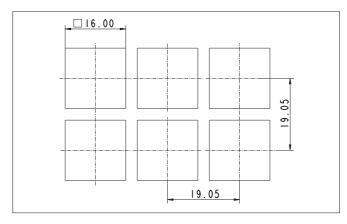


### **Hole Pattern RF 15**



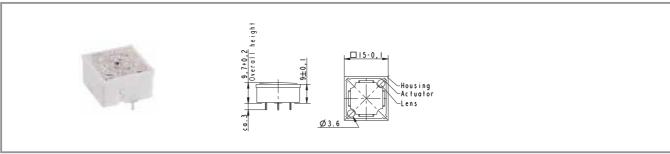
#### View on component side, all hole diameters 1,1 +/- 0,1 mm

#### Hole Pattern - Front Panel



PCB Keyswitches 4 - 43

# 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

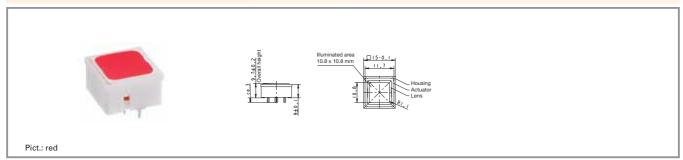
Technical data see page 4 - 42

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.



# RF 15 - 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	3.14.200.011/0000
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

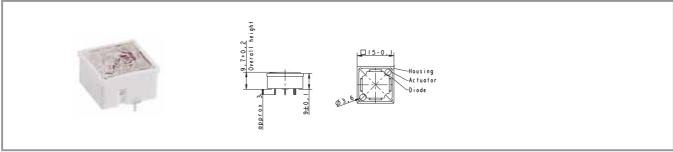
Technical data see page 4 - 42

For keycaps, refer to RK 90 system design.

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



# 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.

4



# 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**

Colour of lens see order block Recommended key grid see order block

**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** 

 $\begin{array}{lll} \text{Operating force max.} & 2.9^{\pm 0.6} \text{ N} \\ \text{Switching travel} & 0.5^{\pm 0.2} \text{ mm} \\ \text{Robustness min.} & 100 \text{ with throughplated PCB N} \end{array}$ 

**Electrical characteristics** 

Rated voltage min.
Rated voltage max.
Rated current min.
Au: 0.02 V, Ag: 3 V
Au: 35 V, Ag: 50 V
Au: 0.01 mA,
Ag: 0.1 mA
Au: 100 mA,
Ag: 250 mA
Rated power max.
(ohmic load)
Au: 2 W, Ag: 12.5 W

Contact resistance when new  $$100\ m\Omega$$  max.

Insulation resistance 10 $^{9}\,\Omega$ 

Other specifications

Ambient temp. operating min.

Ambient temp. operating max.

+70 °C

Storage temperature max.

(in tube)

Environmental restistance acc. to IEC 60068-2
-14, -30, -33 and -78
Operating life min. 1,000,000

(operations)

Solderability / solder heat resistance IEC 600 28-2-20

Wave soldering 260 °C max.

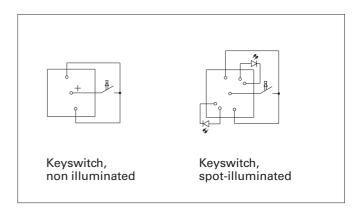
Manual soldering 350 °C / 5 sec. max.

4 - 48 PCB Keyswitches

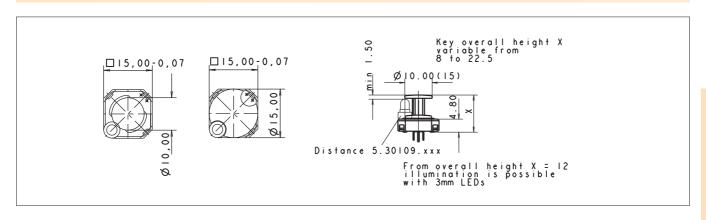
# Force/Travel Diagram – Keyswitch RF 15 N

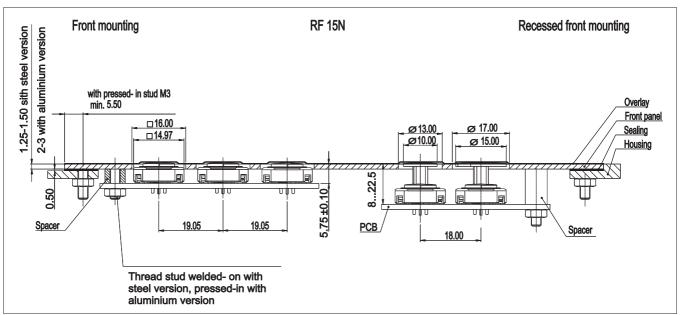
# Operation characteristic limits RF

# Circuit Diagram - Keyswitch RF 15 N



#### **Dimensional Drawings RF 15 N**





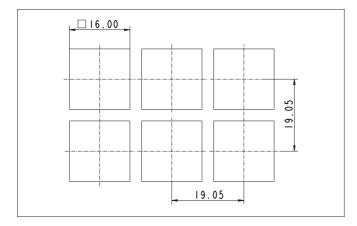
4

RF

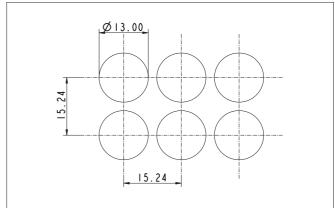
PCB Keyswitches 4 - 49

### **Hole Patterns - Front Panel RF 15 N**

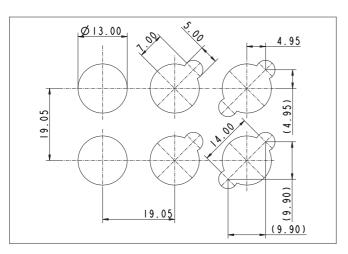
#### RF 15 N without plunger



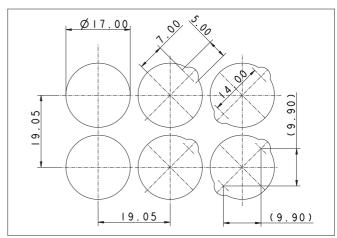
RF 15 N with plunger ø 10 mm, non-illuminated



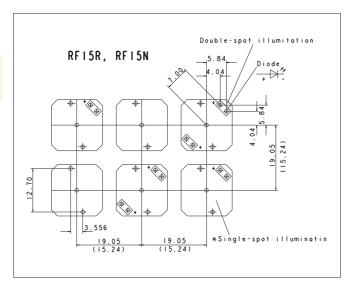
RF 15 N with plunger ø 10 mm, illuminated



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

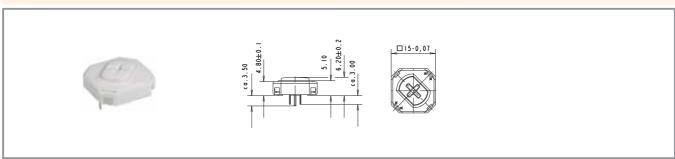
4



# 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	T	5.46.011.028/0710	4 - 80
RF 15 N - Extension plunger, Ø 15 mm, overall height 22.5 mm	Ŧ	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



#### **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.

Switching travel 0.5+0.2 mm

Robustness min. with through-plated PCB 100 N

2.9±0.6 N

**Electrical characteristics** 

Rated voltage min.
Rated voltage max.
Rated voltage max.
Au: 0.02 V, Ag: 3 V
Au: 35 V, Ag: 50 V
Au: 0.01 mA,
Ag: 0.1 mA
Au: 100 mA,
Ag: 250 mA
Rated power max.
Au: 2 W, Ag: 12.5 W

(ohmic load) Contact resistance when new  $$\rm 100~m\Omega$ 

Insulation resistance  $10^9 \Omega$ 

Other specifications

Ambient temp. operating min. Ambient temp. operating max. Environmental restistance

Operating life min. (operations) Solderability / solder heat resistance Wave soldering Manual soldering -25 °C +70 °C

acc. to IEC 60068-2 -14, -30, -33 and -78 1,000,000

according to E DIN IEC 600 28-2-20 260 °C max. 350 °C / 5 sec. max.

RF

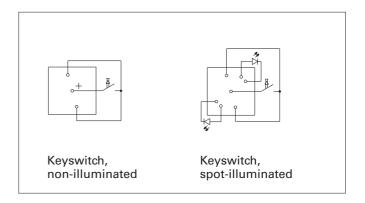
4 - 52 PCB Keyswitches

# SOLUTIONS WITH PASSION

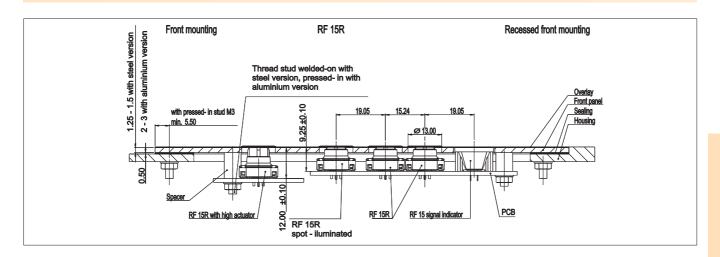
# Force/Travel Diagram - Keyswitch RF 15 R

# Operation characteristic limits RF

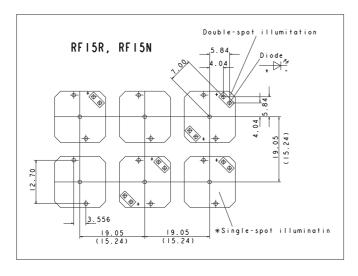
# Circuit Diagram - Keyswitch RF 15 R



### **Dimensional Drawing RF 15 R**



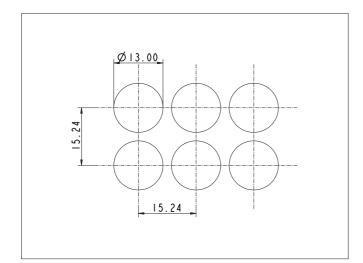
#### Hole Pattern RF 15 R



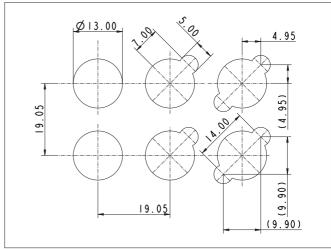
View on component side All hole diameters 1.1 +/- 0.1 mm PCB layout keyswitch 1/400" grid 4

# **Hole Pattern – Front Panel RF 15 R**

#### RF 15 R, non-illuminated



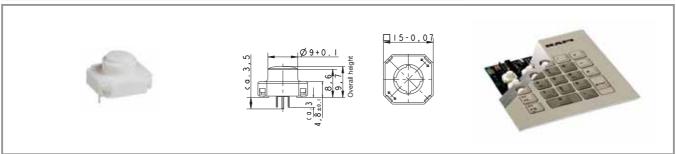
RF 15 R, illuminated



4



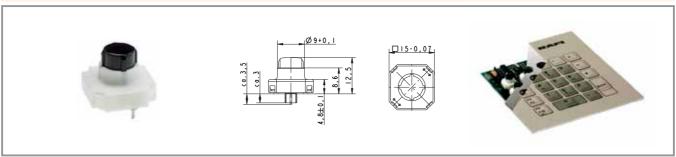
# RF 15 R - Low short-travel keyswitch, non-illuminated



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

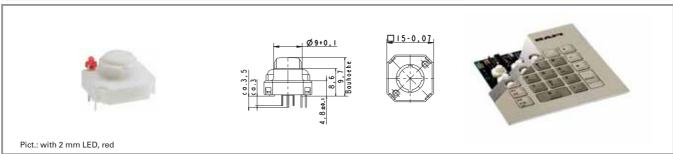


Contact materials	Overall height	Illumination	LED type	LED colour	Order no.
Au	12.5 mm	not illuminated	-	-	3.14.100.801/0000
Ag	12.5 mm	not illuminated	-	-	3.14.100.806/0000

Technical data see page 4 - 52



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



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

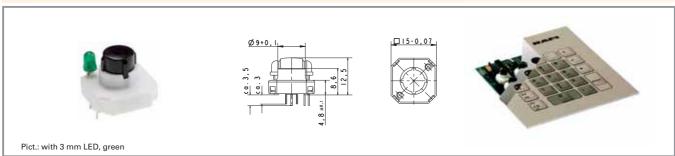
Versions with 2 LEDs available on request.

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

4



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



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

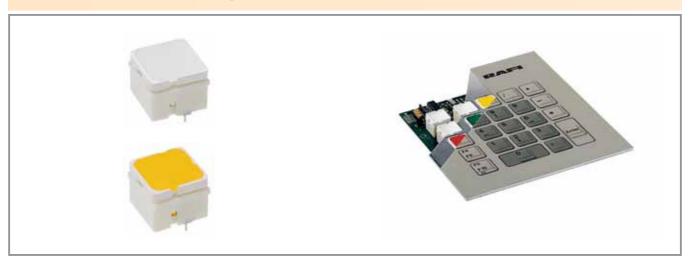
Versions with 2 LEDs available on request.

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

4



# 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**

Colour of lens see order block Recommended key grid 20 mm

#### **Dimensions**

Length15 mmWidth15 mmOverall height12.5 mm

#### Mechanical design

Mounting soldering in PCB **Terminals** THT Contact system snap-action contact Contact arrangement 1 NO Contact materials see order block see order block Illumination LED colour see order block LED type see order block

#### **Mechanical characteristics**

 $\begin{array}{lll} \text{Operating force max.} & 2.9^{\pm0.6} \text{ N} \\ \text{Switching travel} & 0.5^{\pm0.2} \text{ mm} \\ \text{Robustness min.} & \text{with through-plated} \\ & \text{PCB 100 N} \end{array}$ 

#### **Electrical characteristics**

Rated voltage min. Au: 0.02 V, Ag: 3 V Rated voltage max. Au: 35 V, Ag: 50 V Au: 0.01 mA, Rated current min. Ag: 0.1 mA Rated current max. Au: 100 mA, Ag: 250 mA Rated power max. (ohmic Au: 2W, Ag: 12.5W load) Contact resistance when new 100 m $\Omega$ max. Insulation resistance 10 $^{9}\,\Omega$ 

#### Other specifications

 $\begin{array}{lll} \mbox{Ambient temp. operating min.} & -25\ ^{\circ}\mbox{C} \\ \mbox{Ambient temp. operating max.} & +70\ ^{\circ}\mbox{C} \\ \mbox{Environmental restistance} & acc. to IEC 60068-2 \\ \mbox{-14, -30, -33 and -78} \\ \mbox{Operating life min.} & 1,000,000 \end{array}$ 

(operations)

Solderability / solder heat according to E DIN resistance IEC 600 28-2-20

Wave soldering 260 °C max.

Manual soldering 350 °C / 5 sec. max.

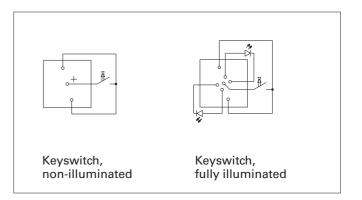
4 - 58 PCB Keyswitches

# SOLUTIONS WITH PASSION

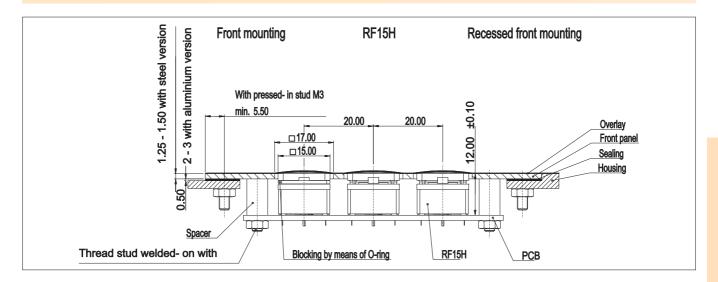
# Force/Travel Diagram - Keyswitch RF 15 H

# Operation characteristic limits RF

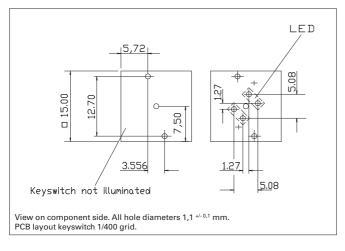
# Circuit Diagram - Keyswitch RF 15 H



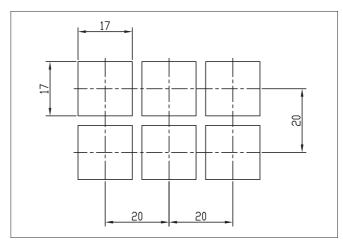
### **Dimensional Drawing**



#### **Hole Pattern**



#### Hole Pattern - Front Panel

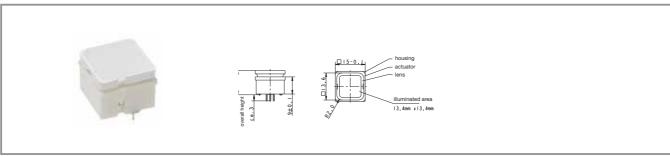


PCB Keyswitches 4 - 59

# Typical accessories RF 15 H - Short-travel keyswitch

Description	Photo		Additional accessories see page
O-ring, black, for blocking the operating stroke	0	5.30.120.009/0100	5 - 25

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



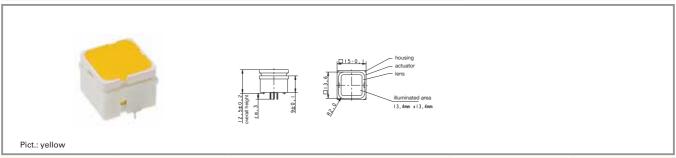
Contact materials	Illumination	Colour of lens	LED colour	LED type	Order no.
Au	not illuminated	white	-	-	3.14.100.702/0000
•		1.25			0.4.4.400.707/0000
Ag	not illuminated	white	-	-	3.14.100.707/0000

Technical data see page 4 - 58

4



### RF 15 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	3.14.200.731/0000
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.

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# RF 15 - Signal indicator



#### **Technical Data**

#### **General information**

Colour of lens Recommended key grid

#### **Dimensions**

Length Width Overall height

#### Mechanical design

Mounting Illumination

LED colour LED type see order block 19.05 mm

15 mm 15 mm 9.7 mm

THT soldering in PCB fully illuminated 1 LED see order block 2 mm

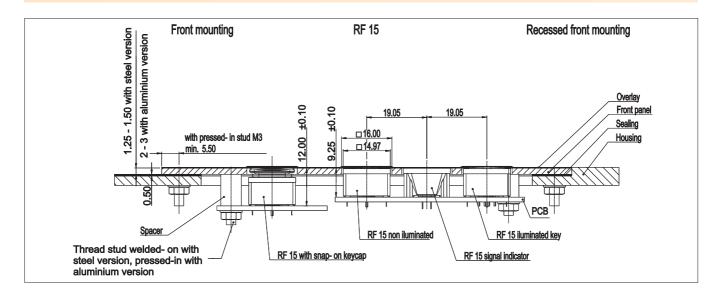
#### Other specifications

Ambient temp. operating min. Ambient temp. operating max. Environmental restistance

Solderability / solder heat resistance Wave soldering Manual soldering -25 °C +70 °C acc. to IEC 60068-2

-14, -30, -33 and -78 according to E DIN IEC 600 28-2-20 260 °C max. 350 °C / 5 sec. max.

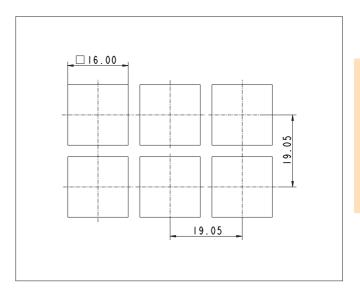
# **Dimensional Drawing Signal Indicator RF 15**



#### **Hole Pattern**

# RF15, RF15H \*Spot-illuminated 5.00 Signal indicator 3.20 Signal indicator 5.00 Signal indicator 5.00 Signal indicator 5.00 Signal indicator 5.00 Fully illuminated key View on component side, all hole diameters 1,1 +/- 0,1 mm

### **Hole Pattern – Front Panel**

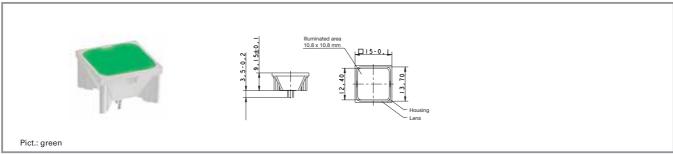


RF

PCB Keyswitches 4 - 63



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



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.

4



# 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**

Ge	nera	ı ıntorn	nation
0 - 1			

see order block Colour of lens 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±0.6 N Switching travel 0.5+0.2 mm Robustness min. with through-plated **PCB 100 N** 

**Electrical characteristics** Rated voltage min.

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 Au: 2W, Ag: 12.5W Rated power max.

(ohmic load) Contact resistance when new 100 m $\Omega$ max.

Insulation resistance 109 $\Omega$ 

Other specifications

Ambient temp. operating min. +70 °C Ambient temp. operating max. Environmental restistance

Operating life min. (operations) Solderability / solder heat resistance Wave soldering Manual soldering

-25 °C

acc. to IEC 60068-2 -14, -30, -33 and -78

Au: 0.02 V, Ag: 3 V

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according to E DIN IEC 600 28-2-20 260 °C max. 350 °C / 5 sec. max.

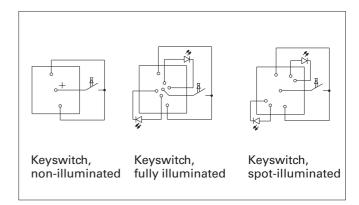
4 - 66 PCB Keyswitches



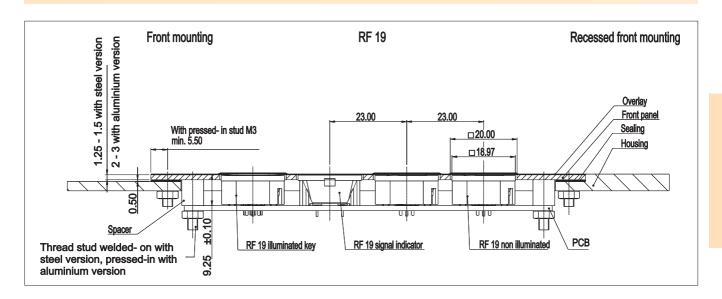
# Force/Travel Diagram – Keyswitch RF 19

# Operation characteristic limits RF

# Circuit Diagram - Keyswitch RF 19



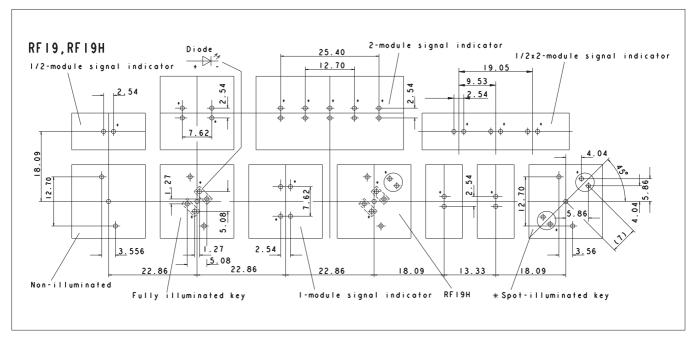
### **Dimensional Drawing**



PCB Keyswitches 4 - 67



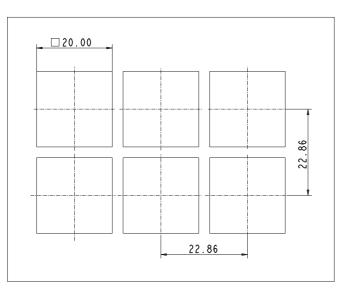
#### **Hole Patterns RF 19**



<sup>\*</sup>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

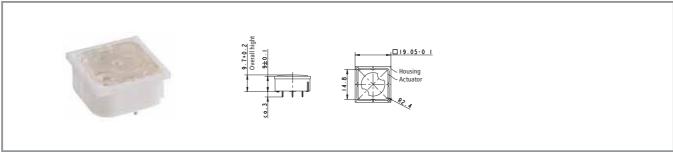
#### **Hole Patterns – Front Panel RF 19**

4





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

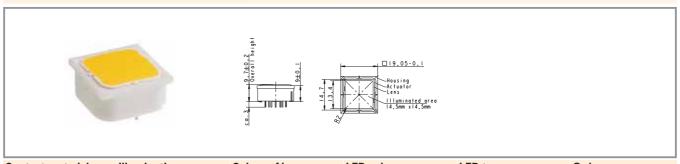


Contact materials	Illumination	Colour of lens	LED colour	LED type	Order no.
Au	not illuminated	transparent	-	-	3.14.001.001/0000
Ag	not illuminated	transparent	-	-	3.14.001.006/0000

Technical data see page 4 - 66



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



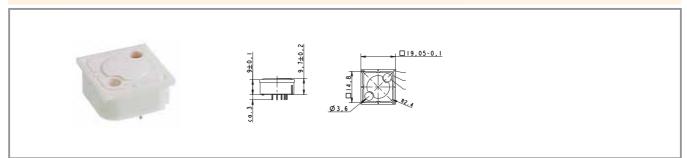
Contact materials	Illumination	Colour of lens	LED colour	LED type	Order no.
Au	fully illuminated 2 LED	red	red	2 mm	3.14.002.011/0000
Au	fully illuminated 2 LED	green	green	2 mm	3.14.002.012/0000
Au	fully illuminated 2 LED	opaque white	green	2 mm	3.14.002.901/0000
Au	fully illuminated 2 LED	yellow	yellow	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.

4

# RF 19 - 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	3.14.001.030/0000
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.

4



# 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	l inform	nation

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 see order block LED colour LED type see order block

**Mechanical characteristics** 

Operating force max. 2.9 $^{\pm0.6}$  N Switching travel 0.5 $^{\pm0.2}$  mm Robustness min. with through-plated PCB 100 N

**Electrical characteristics** Rated voltage min.

Rated voltage max.

Rated current min.

Au: 35 V, Ag: 50 V

Au: 0.01 mA,

Ag: 0.1 mA

Au: 100 mA,

Ag: 250 mA

Rated power max. (ohmic

Au: 2W, Ag: 12.5 W

load) Contact resistance when new  $$100\ m\Omega$$ 

max.
Insulation resistance

nsulation resistance  $10^9 \, \Omega$ 

Other specifications

Ambient temp. operating min.

Ambient temp. operating max.

Environmental restistance

Operating life min. (operations) Solderability / solder heat resistance

Wave soldering Manual soldering -25 °C +70 °C

acc. to IEC 60068-2 -14, -30, -33 and -78

Au: 0.02 V, Ag: 3 V

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according to E DIN IEC 600 28-2-20 260 °C max. 350 °C / 5 sec. max.

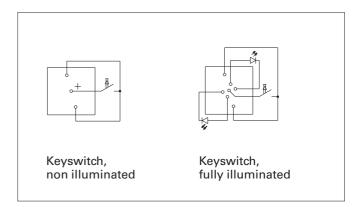
4 - 72 PCB Keyswitches

### Force/Travel Diagram – Keyswitch RF 19 H

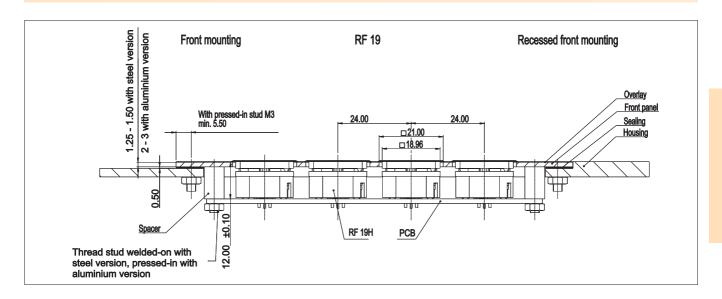
### Operation characteristic limits RF

Travel

### Circuit Diagram - Keyswitch RF 19 H



### **Dimensional Drawing**



RF

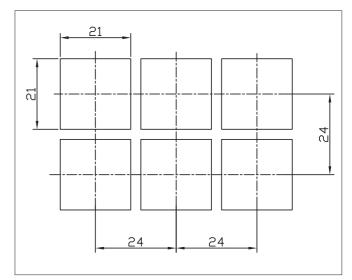
PCB Keyswitches 4 - 73



### Hole Pattern RF 19 H

# Z4,00 LED 7,75 90'61 3,55 Xeyswitch not illuminated

### Hole Pattern - Front Panel RF 19 H



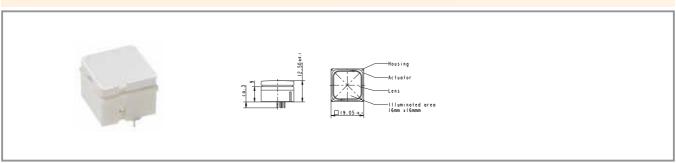
The LED may be positioned either on the left-hand or right-hand side.

Standard version: LED on left-hand side View on component side, all hole diameters 1.1 +/- 0.1 mm

### 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 19 H - Keyswitch, non-illuminated



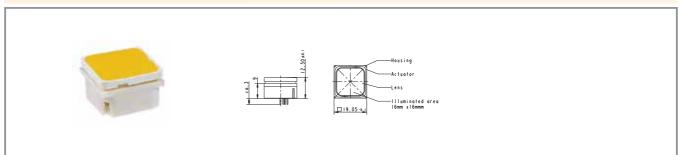
Contact materials	Illumination	Colour of lens	LED colour	LED type	Order no.
Au	not illuminated	white	-	-	3.14.001.501/0000
Ag	not illuminated	white	-	-	3.14.001.506/0000

Technical data see page 4 - 72

RF



### 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

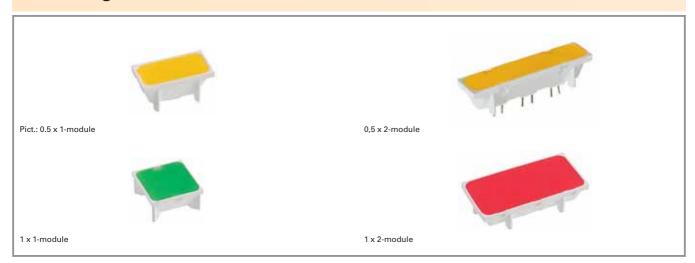
Technical data see page 4 - 72

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.

RF

### RF 19 - Signal indicator



### **Technical Data**

### **General information**

Colour of lens Recommended key grid

### **Dimensions**

Length Width Overall height

### Mechanical design

Mounting Illumination LED colour LED type see order block 23/x mm

see order block see order block 9.15 mm

THT soldering in PCB see order block see order block see order block

### Other specifications

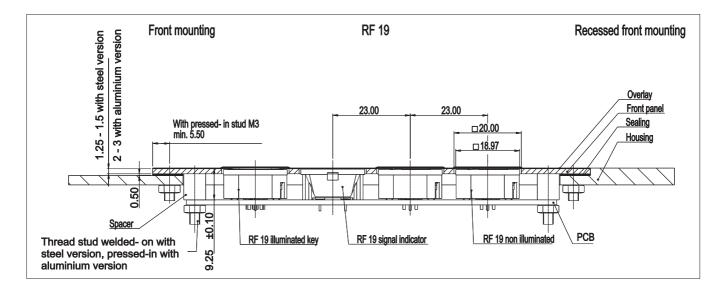
Ambient temp. operating min. Ambient temp. operating max. Environmental restistance

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

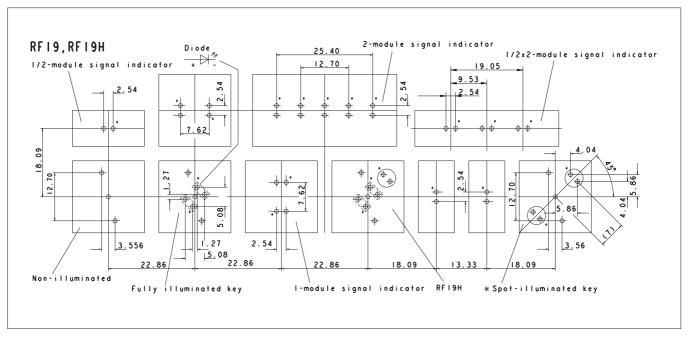
RF

4 - 76 PCB Keyswitches

### **Dimensional Drawing Signal Indicator RF 19**



### **Hole Pattern RF 19**



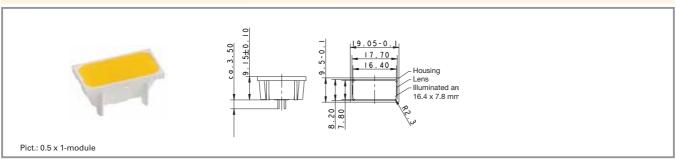
\*The LED may be positioned either on the left-hand or right-hand side. Standard version: LED on left-hand side View on component side, all hole diameters 1.1 +/- 0.1 mm

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

PCB Keyswitches 4 - 77

RF

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

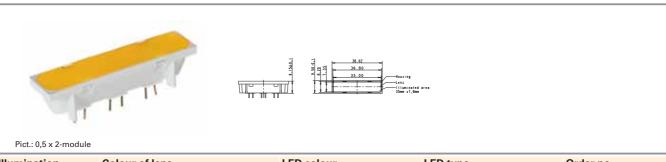


Illumination	Colour of lens	LED colour	LED type	Order no.
fully illuminated 1 LED	red	red	2 mm	3.14.002.061/0000
fully illuminated 1 LED	green	green	2 mm	3.14.002.062/0000
fully illuminated 1 LED	yellow	yellow	2 mm	3.14.002.063/0000
fully illuminated 1 LED	orange	yellow	2 mm	3.14.002.064/0000

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



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

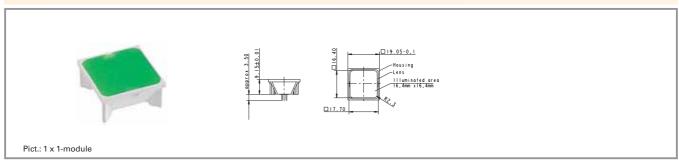
Technical data of LED see separate page at the beginning of chapter 4 PCB Keyswitches.

4

RF



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

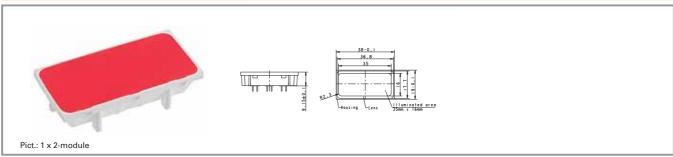


Illumination	Colour of lens	LED colour	LED type	Order no.
fully illuminated 2 LED	red	red	2 mm	3.14.002.051/0000
fully illuminated 2 LED	green	green	2 mm	3.14.002.052/0000
fully illuminated 2 LED	yellow	yellow	2 mm	3.14.002.053/0000
fully illuminated 2 LED	orange	yellow	2 mm	3.14.002.054/0000
fully illuminated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



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"



### RF 15/19 - Special accessories

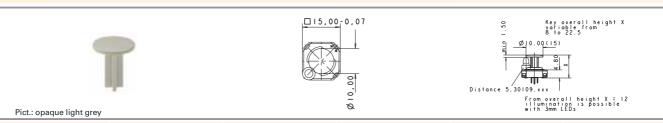


### **Technical Data**

**Dimensions** 

Length Width see order block see order block Overall height Diameter Colour see order block see order block see order block

### RF 15 N - Extension plunger, round head



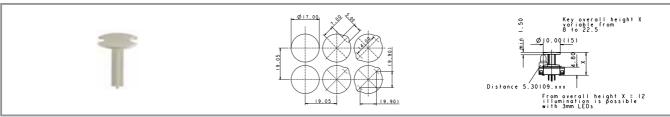
Length	Width	Overall height	Diameter	Colour	Order no.
-	-	9 mm	10 mm	-	5.46.011.036/0710
-	-	9.7 mm	10 mm	-	5.46.011.030/0710
-	-	12.5 mm	10 mm	-	5.46.011.037/0710
-	-	13 mm	10 mm	-	5.46.011.038/0710
-	-	22.5 mm	10 mm	-	5.46.011.028/0710

 $\label{eq:Length} Length\ of\ plunger = Overall\ height\ -\ 4.25\ mm.$ 

4



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

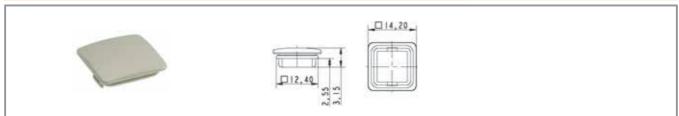


Length	Width	Overall height	Diameter	Colour	Order no.
-	-	9 mm	15 mm	-	5.46.017.036/0710
-	-	9.7 mm	15 mm	-	5.46.017.030/0710
-	-	12.5 mm	15 mm	-	5.46.017.037/0710
-	-	22.5 mm	15 mm	-	5.46.017.028/0710
-	-	13 mm	15 mm	-	5.46.017.038/0710

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

RF

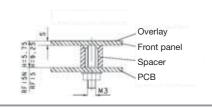


### Spacers, round









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

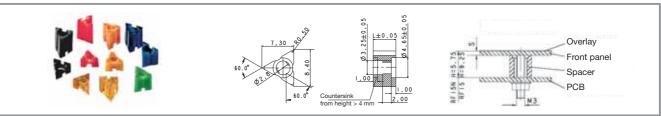
Required spacer length = Overall height of key - front panel thickness - 0.5 mm (area embossing).

4

RF



### 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



### **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	
KN 19 - Short-travel main switch	

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> KN 19



### KN 19 - Short-travel main switch



### **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.

**Electrical characteristics** 

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** 

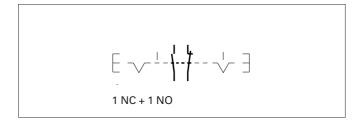
KN

General information		Electrical characteristics	
Recommended key grid	19.05 x 38.1 mm	Rated voltage AC min.	12 V
		Rated voltage DC min.	12 V
Dimensions		Rated voltage AC max.	250 V
Length	37.8 mm	Rated voltage DC max.	50 V
Width	18.8 mm	Ohmic load AC	6 A
Overall height	9.7 mm	Ohmic load DC min.	0.1 A
		Ohmic load DC max.	10 A
Mechanical design		Contact resistance when new	50 m $\Omega$
Mounting	on PCB	max.	
Terminals	THT solder terminals	Capacity input current AC max.	100 A
Contact system	snap-action bridge	Rated motor current AC	4 A
	contact	Rated filament lamp current AC	2.4 A
Contact arrangement	see order block	Bouncing time max.	10 ms
Contact materials	Ag		
Illumination	1 LED (max. 3 mm)	Other specifications	
	possible	Ambient temp. operating min.	-25 °C
Degree of protection	IP40	Ambient temp. operating max.	+70 °C
Hot wire ignition acc. to	850 °C	Environmental restistance	acc. to IEC 60068-2
IEC 60695-2-1			-14, -30, -33 and -78
		Operating life AC	AC 250 V: 200.000/
Mechanical characteristics			2A; 100.000 /6A
Operating force max.	9±3 N	Operating life DC	50,000(10 A / 50 V=)
Operating travel	0.55 <sup>±0.15</sup> mm	Soldering time max.	3 s
Robustness max.	100 N	Soldering temperature max.	350 °C
		Flame class acc. to UL 94	UL 94 VO

4 - 86 PCB Keyswitches



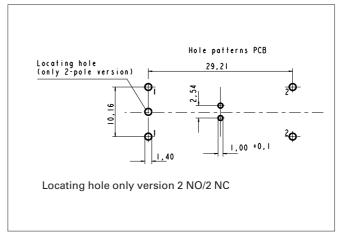
### **Circuit Diagram**



### **Dimensional Drawing**

## 19,05 19,05 10

### **Hole Pattern**



View on component side.







IEC 61058

UL 508,C22.2 No. 14-M91

> KN 19

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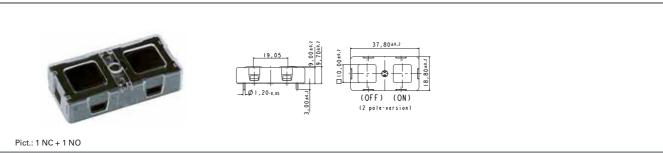
IEC 61058

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



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

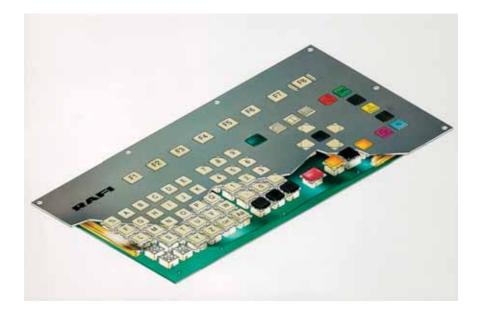
Technical data see page 4 - 86

### 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.

KN 19



### **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

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PCB Keyswitches

### 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 Steel stud welded-on with steel version Keycap Sealing Pressed-in with aluminium version Front panel Housing 19,05 Fixing rail Spacer M4 Key RFI5N Sealing foil PCB Spacer

**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.

4

RK 90



### 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.

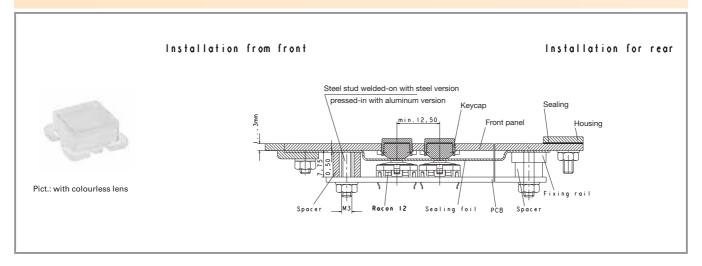
### **Cleaning liquids**

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

90



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



### **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 Size Degree of protection (with silicon seal) Illuminability see order block 1-module IP65

see order block

**Dimensions** 

Dimension keycap in front of front panel
Dimension keycap behind front panel
Dimension (c) hole patterns
Final size
Dimension hole patterns

8.85 x 8.85 mm
11.5 x 11.5 mm
9.00 x 9.00 mm
9.00 x 9.00 mm

punched size

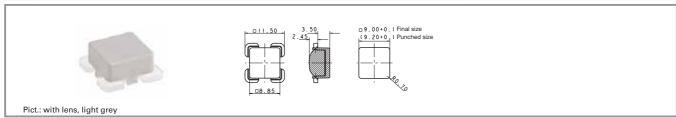
Please order lens separately.

RK

4 - 92 PCB Keyswitches



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



Size	Illuminability	Dimension keycap behind front panel	Dimension keycap in front of front panel		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.

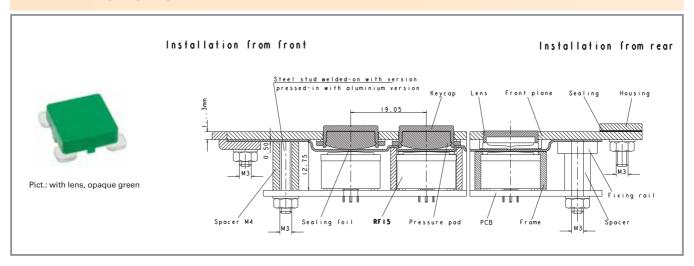
Technical data see page 4 - 92

### 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,  $9 \times 9$  mm, opaque light grey: 5.46.651.015/0700RK 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



### RK 90 - Keycaps, plastic, 14 mm



### **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 Size Degree of protection (with silicon seal) Illuminability see order block see order block IP65

yes

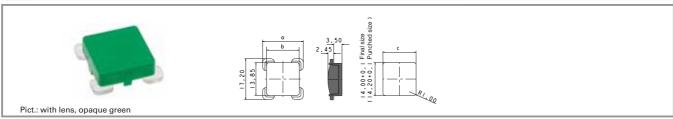
### **Dimensions**

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

RK 90



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



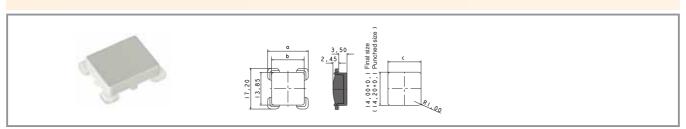
Size	Illuminability	Dimension (a) behind front panel	Dimension (b) in front of front panel		Order no. without lens	Note
1-module	yes	17.20 x 17.20 mm	13.85 x 13.85 mm	14.00 x 14.00 mm	5.55.103.030/1013	Please order lenses separately.

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, 1.5-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 11/4-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 11/4-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.

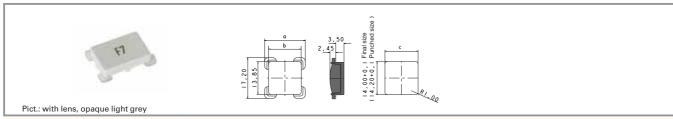
Technical data see page 4 - 94

### 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

> RK 90

### RK 90 - Keycap body plastic, for lenses 14 mm, 11/2-module



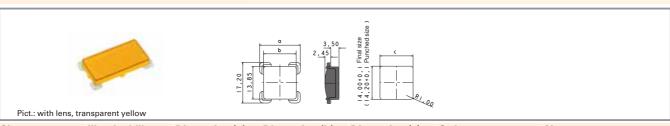
Size	Illuminability	Dimension (a) behind front panel	Dimension (b) in front of front panel	Dimension (c) hole patterns final size	Order no. without lens	Note
1½-module	yes	17.20 x 24.20 mm	13.85 x 20.85 mm	14.00 x 21.00 mm	5.55.103.032/1013	Please order lenses separately.

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 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



Size	Illuminability	Dimension (a) behind front panel	Dimension (b) in front of front panel		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

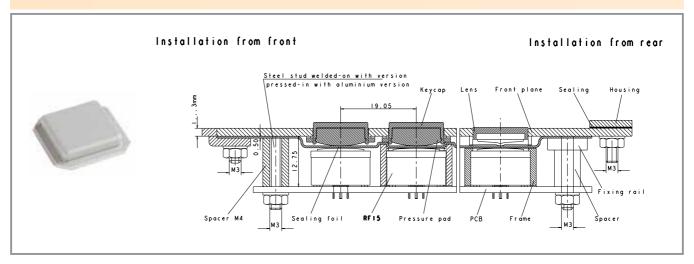
### Lenses:

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 yellow: 5.46.681.024/1403
RK 90 - Lens, 14 mm, 2-module, transparent green: 5.46.681.024/1510

4



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



### **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.

### **Technical Data**

### **General information**

Colour of lens

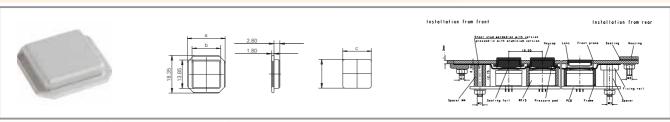
Degree of protection (with silicon seal)

aluminum colourless anodized see order block IP65

### **Dimensions**

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

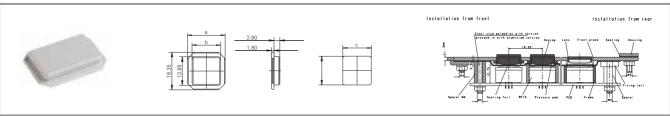
### RK 90 - Keycaps, aluminum, 14 mm, 1-module



Size		Dimension (a) behind front panel		Dimension (c) hole patterns final size	Order no.
	aluminum co- lourless anodized	18.35 x 18.35 mm	13.85 x 13.85 mm	14.00 x 14.00 mm	5.46.500.001/4010



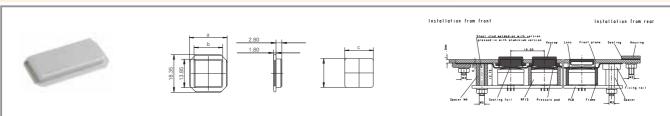
### RK 90 - Keycaps, aluminum, 14 mm, 11/2-module



Size	Colour of lens	Dimension (a) behind front panel	Dimension (b) in front of front panel	Dimension (c) hole patterns final size	Order no.
1½-module	aluminum co- lourless 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 co- lourless 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

### **RK 90 - Special accessories**



### **Technical Data**

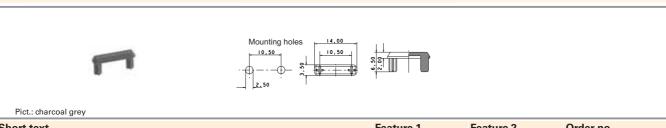
**General information** Colour

see order block

**Dimensions** Dimensions

see order block

### RK 90 - Fin, to avoid inadvertent operation



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

4



### **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

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### **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).

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•

RG 85 III

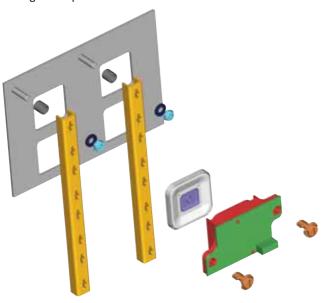
PCB Keyswitches 4 - 103



### **System Features**

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

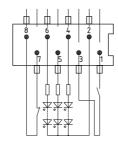
- Vandal proof construction
- Modular fixing system with quick fasteners or single fixing method using thread studs
- Connection with keyed 8-pin micro-match connector
- Degree of protection: IP40/65



### **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 OV-LED
  - 4 Edge illuminat./signal indicator 1st colour + 24 V DC +/- 20%
  - 5 Symbol illumination + 24 V DC +/- 20%
  - 6 Edge illuminat./signal indicator 2<sup>nd</sup> 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

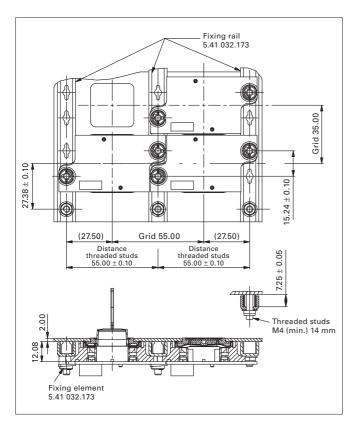
RG 85 III

4 - 104 PCB Keyswitches

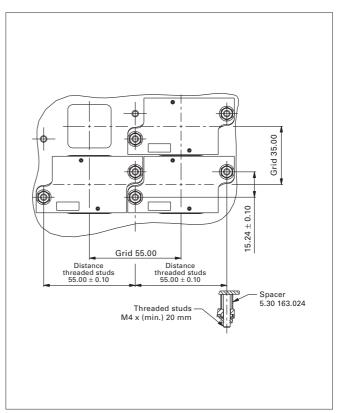


### Installation plan

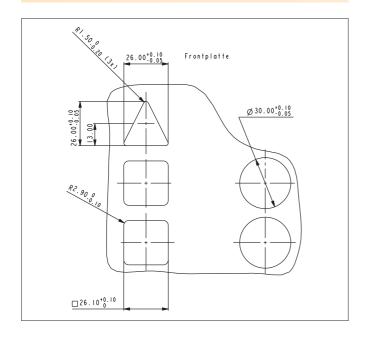
### Rail fixing method



### Single fixing method



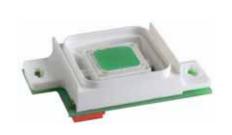
### **Front panel**

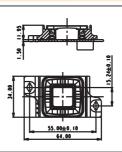


RG 85 III

PCB Keyswitches 4 - 105







### **Technical Data**

**Dimensions** 

 $\begin{array}{lll} \mbox{Mounting grid min.} & 55 \times 35 \mbox{ mm} \\ \mbox{Length} & 64 \mbox{ mm} \\ \mbox{Width} & 34 \mbox{ mm} \\ \end{array}$ 

Mechanical design

Version see order block
Mounting on U-rails or single
mounting
Terminals 8-pin MicroMatch® female
connector
Contact system snap-action (1 NO )
or bridge contact
(1 NC + 1 NO )
Contact arrangement see order block

see order block

see order block

Contact arrangement Contact materials Symbol illumination Edge illumination

**Mechanical characteristics** 

Operating force 3.5 N
Operating travel 1 mm
Switching travel NO 1 mm
Switching travel NC 0.6 mm

**Electrical characteristics** 

 $\begin{array}{lll} \mbox{Rated voltage min.} & 3 \mbox{ V} \\ \mbox{Rated voltage max.} & 50 \mbox{ V} \\ \mbox{Rated current min.} & 0.1 \mbox{ mA} \\ \mbox{Rated current max.} & 250 \mbox{ mA} \\ \mbox{Rated power max.} & 12.5 \mbox{ W} \\ \mbox{Contact resistance when new} & 100 \mbox{ m}\Omega \\ \mbox{max.} & \end{array}$ 

max. Contact resistance acc. to

life max.

Bouncing time max. 10 ms
Operating voltage for LED  $24^{\pm20\%}V$ Input current LED per colour/LED row

Other specifications

Ambient temp. operating min.
Ambient temp. operating max.
Storage temperature min.
-25 °C
+70 °C
-40 °C
-40 °C
+80 °C

Environmental restistance 480 °C acc. to IEC 60068-2 -14, -30, -33 and -78

Operating life min. (operations)

Degree of protection rail

mounting Degree of protection single

mounting

Flammability of materials

1,000,000

 $3\Omega$ 

9 - 16 mA

IP40

IP65

according to UL 94 HB

### Typical accessories RG 85 III - Keyswitch

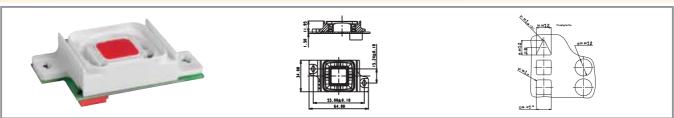
Description	Photo	Order no.	Additional accessories see page
Cable, 8 wires, with socket connectors on both ends, length 1 m	Ţ	5.03.772.261/0000	4 - 122
RG 85 III - Lenses for keyswitches, round, stainless steel	•	5.04.914.000/2000	4 - 117
RG 85 III - Lenses for keyswitches, square, aluminum	[151]	5.04.915.100/2000	4 - 118

4

RG 85 III



### 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

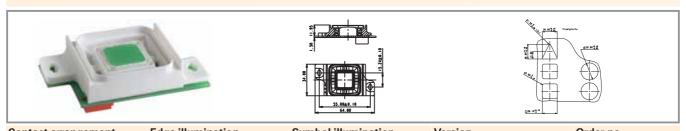
Please order lenses (round shape) separately.

RG 85 III





### 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

RG 85 III

Technical data see page 4 - 106

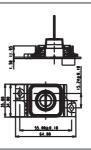
Please order lenses (square shape) separately.



# **RG 85 III - Keylock switch**







### **Technical Data**

**Dimensions** 

Mounting grid min. Length Width

Mounting depth

Mechanical design

Version Mounting

**Terminals** 

Contact system Contact arrangement Contact materials Symbol illumination Edge illumination

Lock

Key removal position

**Mechanical characteristics** 

Rotating angle Switching travel NO

Switching travel NC

55 x 35 mm 64 mm

34 mm (35 mm with sealing)

see order block

see order block

on U-rails or single mounting

8-pin Micro-Match®

female connector

cross contact 1 NO Au alloy

none see order block cylinder lock, lock

type 5201 Pos. 0 + 1

1 x 90° 1 mm

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 100 m $\Omega$ 

Contact resistance acc. to

life max.

Bouncing time max. Operating voltage for LED

Input current LED

 $3\Omega$ 

24±20% V

per colour/LED row 9 - 16 mA

Other specifications

-25 °C Ambient temp. operating min. Ambient temp. operating max. +70 °C Storage temperature min. -40 °C +80 °C Storage temperature max.

Environmental restistance acc. to IEC 60068-2 -14, -30, -33 and -78

Operating life min. (operations)

Degree of protection rail

mounting Degree of protection single

mounting

Flammability of materials

50,000 IP40

IP65

according to UL 94 HB

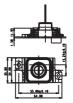
### Typical accessories RG 85 III - Keylock switch

Description	Photo	Order no.	Additional accessories see page
RG 85 III - Lenses for keylock switches, round, stainless steel	9	5.04.914.200/2000	4 - 121
RG 85 III - Lenses for keylock switches, square, aluminum	0	5.04.915.201/2000	4 - 121



# 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

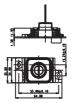
Accessoires: RG 85 III - Lenses for keylock switches, round, stainless steel: 5.04.914.200/2000

Please order lenses (round shape) separately.



# 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.

# 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  $24^{\pm20\%}\,\mathrm{V}$  Input current LED depending on LED

colour 20 - 30 mA

Other specifications

Ambient temp. operating min.
Ambient temp. operating max.
Storage temperature min.
-25 °C
+70 °C
-40 °C
-40 °C
+80 °C

Environmental restistance acc. to IEC 60068-2
-14, -30, -33 and -78
Degree of protection rail IP40

mounting
Degree of protection single IP65

mounting

Flammability of materials

11 03

according to UL 94 HB

# 4

### 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	Ţ	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



# 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.



# **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

4



Version	Form of lens	Legending colour	Legending	Order no.
aluminum	round	opaque black	К	5.04.915.022/0100
aluminum	round	translucent white	К	5.04.915.022/2000
aluminum	round	opaque black	Е	5.04.915.023/0100
aluminum	round	translucent white	Е	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



Version	Form of lens	Legending colour	Legending	Order no.
stainless steel	round	opaque black	К	5.04.914.022/0100
stainless steel	round	translucent white	K	5.04.914.022/2000
stainless steel	round	opaque black	Е	5.04.914.023/0100
stainless steel	round	translucent white	Е	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



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	К	5.04.915.122/0100
aluminum	square	translucent white	К	5.04.915.122/2000
aluminum	square	opaque black	Е	5.04.915.123/0100
aluminum	square	translucent white	Е	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



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	Е	5.04.914.123/0100
stainless steel	square	translucent white	Е	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.



# 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

RG



# 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

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RS 76

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## **RS 76 - Full-travel keyswitches**



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

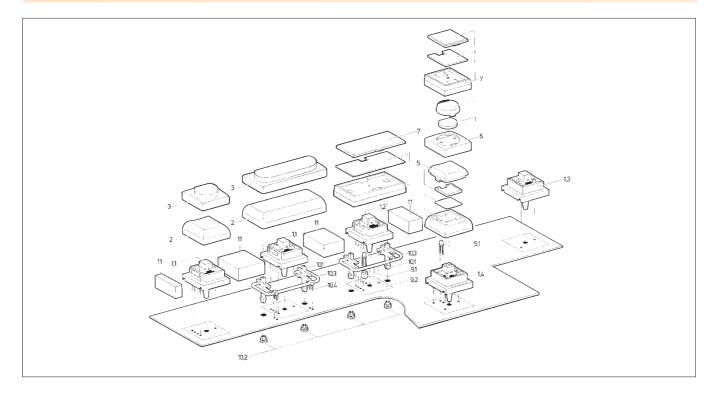
This method of legending can be recommended when complete keyboards are required in different keyboard layouts for which RAFI will develop the respective software. The keyboards can then be legended within a short time. This method of legending ist particularly recommended for average to large volumes.

#### 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
- Keycap, 1- resp. multi-module Keycap with nail protection, 1- resp. multi-module
- Keycap, illuminated
- Keycap, illuminated
- Keycap, illuminated
- 9.1 LED

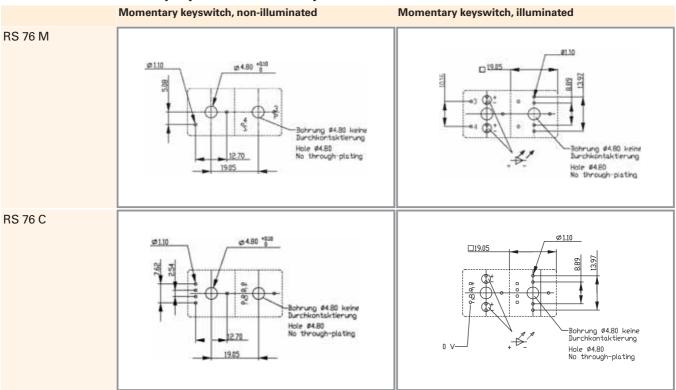
- 9.2 Spacer for LED (for RS 76 C only) 10.1 Plunger for mult-moduel keycaps\*
- 10.2 Sleeve for multi-moduel keycaps\*
- 10.3 Metal lever for multi-module keycaps\*
- 10.4 Bearing bracket for multi-module keycaps\*
- Covers

<sup>\*</sup>These parts are included as a complete packet in the delivery of keycaps ≥ 2-module.

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

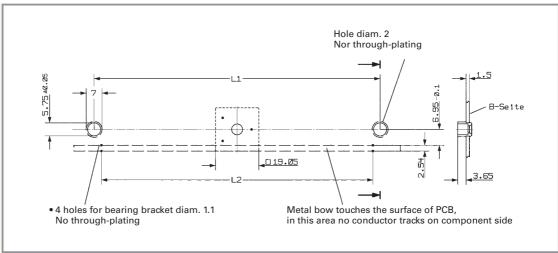
The hole patterns apply to the horizontal position of the keycaps only. Should they be in a vertical position, the momentary keyswitch must be mounted accordingly, i. e. rotated by 90°.

For 1 – 1<sup>3</sup>/<sub>4</sub>-module keycaps (view on component side)



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

RS 76 M/C



Кеусар	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.

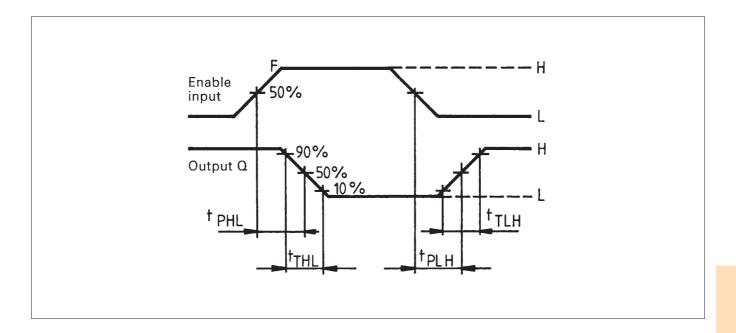
4

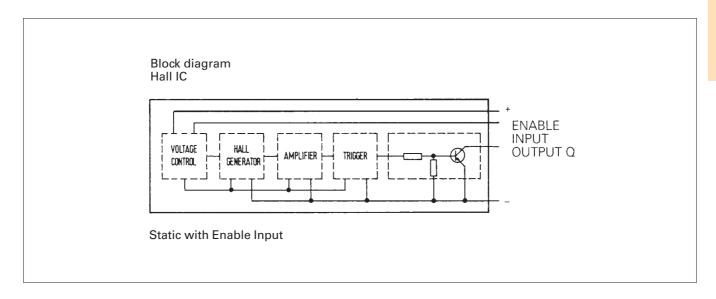
RS 76



## Specific Technical Data RS 76 C

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

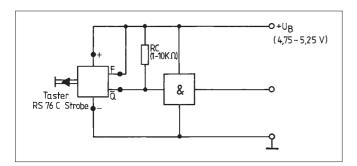


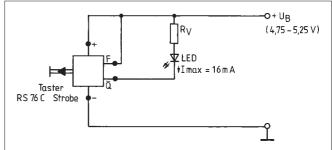


RS 76

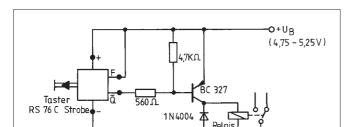


## **Examples for Application RS 76 C**

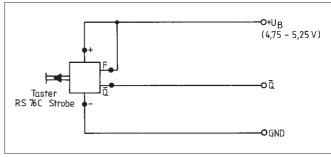




Driving of logic components

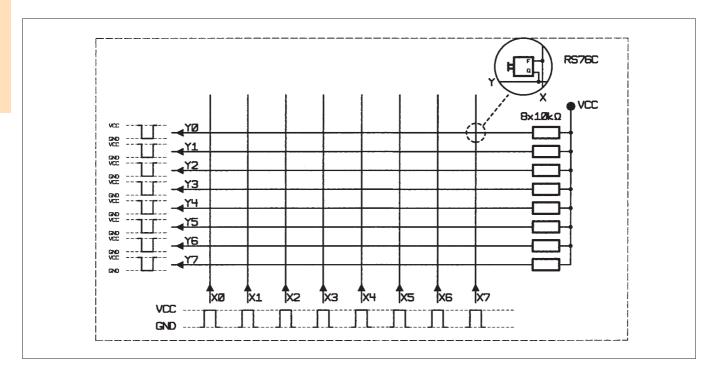


Indication of logical states



Driving of a PNP transistor

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



Use in keyboards

4

RS 76

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





### **Technical Data**

General	information
Dagama	nandad kay arid

Recommended key grid

19.05 mm

Mechanical design

Contact function Mounting **Terminals** 

momentary soldering solder terminals, tin-plated

Contact system Contact arrangement Contact materials Illumination

cross contact 1 NO Au alloy no

**Mechanical characteristics** 

Operating force max. Operating travel Switching travel

Robustness min.

see order block 4 mm 1.5 - 2.8 mm 100 N

**Electrical characteristics** 

Rated voltage min. Rated voltage max. Rated current min. Rated current max.

2 V (with Diode 3 V) 35 V 0.01 mA 100 mA

Rated power max.

Contact resistance when new max.

Contact resistance acc. to life max.

Insulation resistance ESD strength max.

Bouncing time max.

Other specifications

Ambient temp. operating min. Ambient temp. operating max. Storage temperature min. Storage temperature max.

(product) Storage temperature max.

(rail)

Environmental restistance

Operating life min. (operations)

Degree of protection Flammability of materials 1 W 100 m $\Omega$ 

(without diode)

 $3 \Omega$ 

(without diode)

 $10^9\,\Omega$ 8 kV 5 ms

-25 °C +70 °C -40 °C +80 °C

+50 °C

acc. to IEC 60068-2 -14, -30, -33 and -78

107

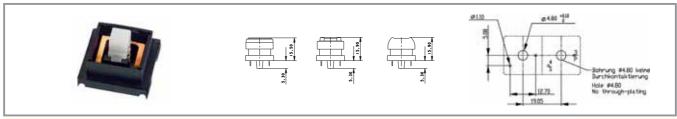
IP40 UL 94 HB

### 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



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



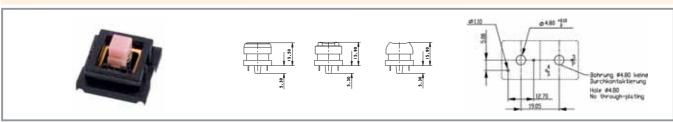
Contact function	Illumination	Contact arrangement	Contact materials	Operating travel	Operating force max.	Bestell-Nr.
momentary	no	1 NO	Au alloy	4 mm	0.9 N	3.13.002.502/0000
momentary	no	1 NO	Au alloy	4 mm	1.4 N	3.13.002.512/0000

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.



# 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** 2 V Rated voltage min. Rated voltage max. 35 V Rated current min. 0.01 mA 100 mA Rated current max.

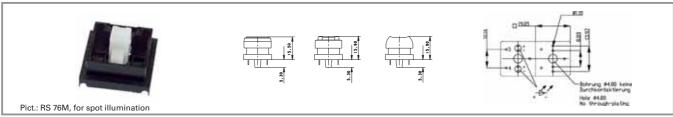
1 W Rated power max. Contact resistance when new  $\rm 200~m\Omega$ max. Contact resistance acc. to  $3 \Omega$ life max.  $10^9 \Omega$ Insulation resistance ESD strength max. 8 kV Bouncing time max. 10 ms Other specifications Ambient temp. operating min. -25 °C +70 °C Ambient temp. operating max. -40 °C Storage temperature min. +80 °C Storage temperature max. (product) +50 °C Storage temperature max. (rail) Environmental restistance acc. to IEC 60068-2 -14, -30, -33 and -78 Operating life min. 107 momentary, 105 (operations) 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	9	5.04.665.911/5520	4 - 145
RS 76 C - Keycap with light bar		5.82.110.000/0242	4 - 144



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

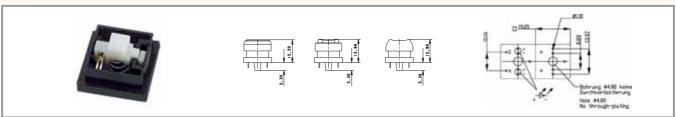


Contact function	Contact system	Illumination	Recommended key grid	Order no.
momentary	bridge contact	spot illumination possible with 3 LED	19.05 mm	3.13.002.102/0000

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

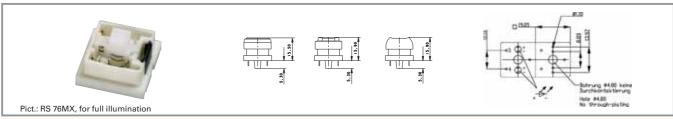


Contact function	Contact system	Illumination	Recommended key grid	Order no.
latching	bridge contact	spot illumination possible with 3 LED	19.05 mm	3.13.002.022/0000

Technical data see page 4 - 134

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

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



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:

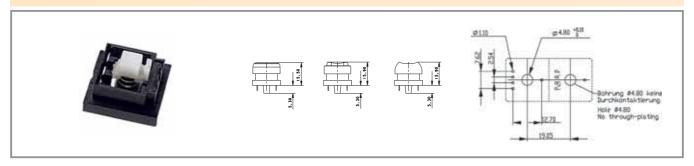
RS 76 MX - Keycap, fully illuminated: 5.05.511.168/0209 RS 76 MX - Keycap, fully illuminated: 5.05.511.168/0754

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**

Output residual current (Q) max. 10 µA

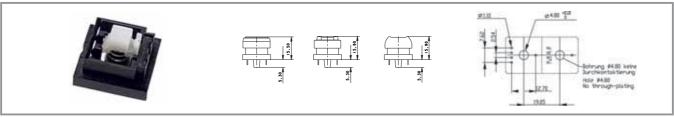
General information		Output saturation voltage	0.4 V
Recommended key grid	19.05 mm	(Q) max. bei 16 mA	
		ESD strength max.	8 kV
Mechanical design		Output switching times (Q)	3 µs
Contact function	momentary	at 25 °C, t <sub>PHL</sub>	
Mounting	soldering	Output switching times (Q)	4 μs
Terminals	solder terminals,	at 25 °C, t <sub>PLH</sub>	
	tin-plated	Output switching times (Q)	1 μs
Contact system	contactless with	at 25 °C, t⊤н∟	
·	Hall-IC	Output switching times (Q)	2 μs
Illumination	no	at 25 °C, t <sub>TLH</sub>	
Mechanical characteristics		Other specifications	
Wiceffallical characteristics		Other specimentions	
Switching travel off	08 21mm	Reliability of Hall-IC at 25 °C	$\lambda = 2.5 \times 10^{-7} \text{ h}^{-1}$
Switching travel off	0.8 2.4 mm	Reliability of Hall-IC at 25 °C	$\lambda = 2.5 \times 10^{-7}  h^{-1}$
Operating force max.	see order block	Ambient temp. operating min.	0 °C
Operating force max. Operating travel	see order block 4 mm	Ambient temp. operating min. Ambient temp. operating max.	0 °C +70 °C
Operating force max. Operating travel Switching travel on	see order block 4 mm 1.5 - 2.8 mm	Ambient temp. operating min. Ambient temp. operating max. Storage temperature min.	0 °C +70 °C -40 °C
Operating force max. Operating travel	see order block 4 mm	Ambient temp. operating min. Ambient temp. operating max.	0 °C +70 °C
Operating force max. Operating travel Switching travel on	see order block 4 mm 1.5 - 2.8 mm	Ambient temp. operating min. Ambient temp. operating max. Storage temperature min. Storage temperature max.	0 °C +70 °C -40 °C
Operating force max. Operating travel Switching travel on Robustness min.	see order block 4 mm 1.5 - 2.8 mm	Ambient temp. operating min. Ambient temp. operating max. Storage temperature min. Storage temperature max. (product)	0 °C +70 °C -40 °C +80 °C
Operating force max. Operating travel Switching travel on Robustness min.  Electrical characteristics Operating voltage DC	see order block 4 mm 1.5 - 2.8 mm 100 N	Ambient temp. operating min. Ambient temp. operating max. Storage temperature min. Storage temperature max. (product) Storage temperature max. (rail)	0 °C +70 °C -40 °C +80 °C +50 °C
Operating force max. Operating travel Switching travel on Robustness min.  Electrical characteristics Operating voltage DC Supply current max. at U <sub>IL</sub> = 0 V	see order block 4 mm 1.5 - 2.8 mm 100 N	Ambient temp. operating min. Ambient temp. operating max. Storage temperature min. Storage temperature max. (product) Storage temperature max. (rail)	0 °C +70 °C -40 °C +80 °C +50 °C acc. to IEC 60068-2
Operating force max. Operating travel Switching travel on Robustness min.  Electrical characteristics Operating voltage DC Supply current max. at U <sub>IL</sub> = 0 V Supply current max. at U <sub>IH</sub> = 5 V	see order block 4 mm 1.5 - 2.8 mm 100 N 4.75 5.25 V 0.5 mA 5 mA	Ambient temp. operating min. Ambient temp. operating max. Storage temperature min. Storage temperature max. (product) Storage temperature max. (rail) Environmental restistance Operating life min.	0 °C +70 °C -40 °C +80 °C +50 °C acc. to IEC 60068-2 -14, -30, -33 and -78
Operating force max. Operating travel Switching travel on Robustness min.  Electrical characteristics Operating voltage DC Supply current max. at U <sub>IL</sub> = 0 V Supply current max. at U <sub>IH</sub> = 5 V Input voltage (F) at U <sub>IL</sub> = 0 V	see order block 4 mm 1.5 - 2.8 mm 100 N 4.75 5.25 V 0.5 mA 5 mA 0.4 V	Ambient temp. operating min. Ambient temp. operating max. Storage temperature min. Storage temperature max. (product) Storage temperature max. (rail) Environmental restistance	0 °C +70 °C -40 °C +80 °C +50 °C acc. to IEC 60068-2 -14, -30, -33 and -78
Operating force max. Operating travel Switching travel on Robustness min.  Electrical characteristics Operating voltage DC Supply current max. at U <sub>IL</sub> = 0 V Supply current max. at U <sub>IH</sub> = 5 V	see order block 4 mm 1.5 - 2.8 mm 100 N 4.75 5.25 V 0.5 mA 5 mA	Ambient temp. operating min. Ambient temp. operating max. Storage temperature min. Storage temperature max. (product) Storage temperature max. (rail) Environmental restistance  Operating life min. (operations)	0 °C +70 °C -40 °C +80 °C +50 °C acc. to IEC 60068-2 -14, -30, -33 and -78 see order block

# 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



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

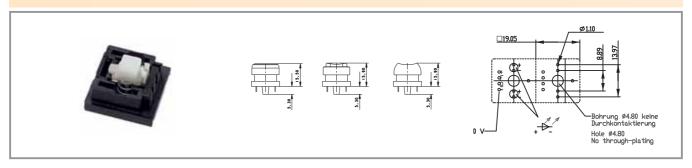


Contact function	Operating life min. (operations)	Illumination	Operating force max.	Operating travel	Order no.
momentary	108	no	0.7 N	4 mm	3.13.001.010/0000
momentary	108	no	1 N	4 mm	3.13.001.210/0000

Technical data see page 4 - 138

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

# RS 76 C - Full-travel keyswitch, illuminable



### **Technical Data**

General information		Output residual current (Q) max.	10 μΑ
Recommended key grid	19.05 mm	Output saturation voltage	0.4 V
		(Q) max. bei 16 mA	
Mechanical design		ESD strength max.	8 kV
Contact function	see order block	Output switching times (Q)	3 µs
Mounting	soldering	at 25 °C, t <sub>PHL</sub>	
Terminals	solder terminals,	Output switching times (Q)	4 µs
	tin-plated	at 25 °C, t <sub>PLH</sub>	
Contact system	contactless with	Output switching times (Q)	1 μs
	Hall-IC	at 25 °C, t <sub>THL</sub>	
Illumination	with LED	Output switching times (Q)	2 µs
LED colour	see order block	at 25 °C, t⊤∟н	
Mechanical characteristics		Other specifications	
	1.5 - 2.8 mm	Reliability of Hall-IC at 25 °C	$\lambda = 2.5 \times 10^{-7} h^{-1}$
Switching traveron	1.3 - 2.0 111111	neliability of nail-10 at 25 C	V - 2.3 X 10 11
Switching travel on Switching travel off			0 °C
Switching travel off	0.8 2.4 mm 0.7 N	Ambient temp. operating min.	
Switching travel off Operating force max.	0.8 2.4 mm	Ambient temp. operating min. Ambient temp. operating max.	0 °C
Switching travel off	0.8 2.4 mm 0.7 N	Ambient temp. operating min. Ambient temp. operating max. Storage temperature min. Storage temperature max.	0 °C +70 °C
Switching travel off Operating force max. Operating travel	0.8 2.4 mm 0.7 N 4 mm	Ambient temp. operating min. Ambient temp. operating max. Storage temperature min.	0 °C +70 °C -40 °C +80 °C
Switching travel off Operating force max. Operating travel	0.8 2.4 mm 0.7 N 4 mm	Ambient temp. operating min. Ambient temp. operating max. Storage temperature min. Storage temperature max.	0 °C +70 °C -40 °C
Switching travel off Operating force max. Operating travel Robustness min.	0.8 2.4 mm 0.7 N 4 mm	Ambient temp. operating min. Ambient temp. operating max. Storage temperature min. Storage temperature max. (product)	0 °C +70 °C -40 °C +80 °C
Switching travel off Operating force max. Operating travel Robustness min.  Electrical characteristics	0.8 2.4 mm 0.7 N 4 mm 100 N	Ambient temp. operating min. Ambient temp. operating max. Storage temperature min. Storage temperature max. (product) Storage temperature max.	0 °C +70 °C -40 °C +80 °C +50 °C acc. to IEC 60068-2
Switching travel off Operating force max. Operating travel Robustness min.  Electrical characteristics Number of LED	0.8 2.4 mm 0.7 N 4 mm 100 N see order block	Ambient temp. operating min. Ambient temp. operating max. Storage temperature min. Storage temperature max. (product) Storage temperature max. (rail) Environmental restistance	0 °C +70 °C -40 °C +80 °C +50 °C acc. to IEC 60068-2 -14, -30, -33 and -78
Switching travel off Operating force max. Operating travel Robustness min.  Electrical characteristics Number of LED Operating voltage DC Supply current max. at U <sub>IL</sub> = 0 V Supply current max. at U <sub>IH</sub> = 5 V	0.8 2.4 mm 0.7 N 4 mm 100 N see order block 4.75 5.25 V	Ambient temp. operating min. Ambient temp. operating max. Storage temperature min. Storage temperature max. (product) Storage temperature max. (rail) Environmental restistance Operating life min.	0 °C +70 °C -40 °C +80 °C +50 °C acc. to IEC 60068-2
Switching travel off Operating force max. Operating travel Robustness min.  Electrical characteristics Number of LED Operating voltage DC Supply current max. at U <sub>IL</sub> = 0 V Supply current max. at U <sub>IH</sub> = 5 V Input voltage (F) at U <sub>IL</sub> = 0 V	0.8 2.4 mm 0.7 N 4 mm 100 N see order block 4.75 5.25 V 0.5 mA	Ambient temp. operating min. Ambient temp. operating max. Storage temperature min. Storage temperature max. (product) Storage temperature max. (rail) Environmental restistance  Operating life min. (operations)	0 °C +70 °C -40 °C +80 °C +50 °C acc. to IEC 60068-2 -14, -30, -33 and -78 see order block
Switching travel off Operating force max. Operating travel Robustness min.  Electrical characteristics Number of LED Operating voltage DC Supply current max. at U <sub>IL</sub> = 0 V Supply current max. at U <sub>IH</sub> = 5 V	0.8 2.4 mm 0.7 N 4 mm 100 N see order block 4.75 5.25 V 0.5 mA 5 mA	Ambient temp. operating min. Ambient temp. operating max. Storage temperature min. Storage temperature max. (product) Storage temperature max. (rail) Environmental restistance  Operating life min. (operations) Degree of protection	0 °C +70 °C -40 °C +80 °C +50 °C acc. to IEC 60068-2 -14, -30, -33 and -78 see order block
Switching travel off Operating force max. Operating travel Robustness min.  Electrical characteristics Number of LED Operating voltage DC Supply current max. at U <sub>IL</sub> = 0 V Supply current max. at U <sub>IH</sub> = 5 V Input voltage (F) at U <sub>IL</sub> = 0 V	0.8 2.4 mm 0.7 N 4 mm 100 N see order block 4.75 5.25 V 0.5 mA 5 mA 0.4 V	Ambient temp. operating min. Ambient temp. operating max. Storage temperature min. Storage temperature max. (product) Storage temperature max. (rail) Environmental restistance  Operating life min. (operations)	0 °C +70 °C -40 °C +80 °C +50 °C acc. to IEC 60068-2 -14, -30, -33 and -78 see order block

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

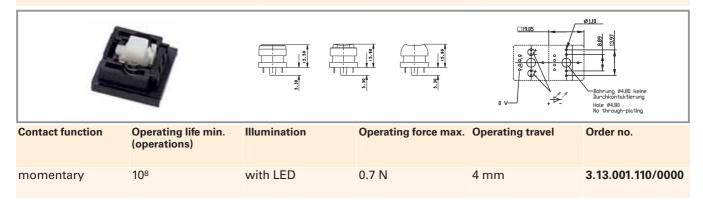
Description	Photo	Order no.	Additional accessories see page
RS 76 - Cover IP40, 1-module, light grey		5.04.520.174/0242	4 - 151
RS 76 C - Keycap, illuminated, with legend insert		5.04.665.521/5520	4 - 144
RS 76 C - Keycap, illuminated, with nail protection and legend insert	9	5.04.665.911/5520	4 - 145



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

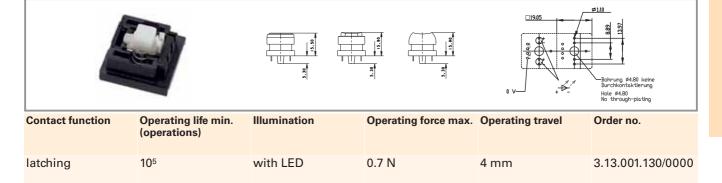
DescriptionPhotoOrder no.Additional accessories see pageRS 76 C - Keycap with light bar5.82.110.000/02424 - 144

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



Technical data see page 4 - 140

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



Technical data see page 4 - 140



# RS 76 - Keycaps, not illuminable



### RS 76 - Keycap, opaque



Tict charcoar grey		light grey			
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



1 Total right groy	opaquo mi	man protoction charocal groy / winto	110		
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.



# 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 - Keycap with light bar



Pict.: light grey

3 3 4 3 4 7				
Size of keycap	Illumination		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



Pict.: charcoal grey

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.



## 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.: light grey, red lens

0 0 7				
Size of keycap	Illumination		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



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.

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



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



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.

4



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



0 1 2 3 4 5 6 7 8 9



Pict.: opaque light beige / brown

opaque with nail protection charcoal grey / white

riotii opaqao iigiit bolgo, brotiii			an protoction anarood groy / winto	
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.

4 - 150



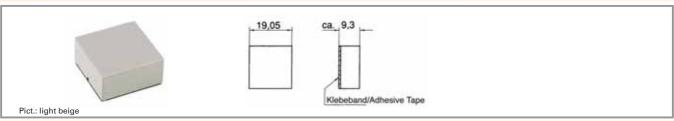
# **RS 76 - Accessories**



RS 76



### **RS 76 - Cover IP40**



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	1/4-module	5.04.520.171/0242
RS 76 - Cover IP40, 1/4-module, light beige	light beige	1/4-module	5.04.520.171/0710
RS 76 - Cover IP40, 1/4-module, dark grey	dark grey	1/4-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

WICROMEC - Keylock switch IP54	<b>4 - 154</b>
WICROMEC - Keylock switch IP54	4 - 156
EUROLOCKS - Keylock switch IP54	<b>4 - 158</b>
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Priority keylock switch IP54	<b>4 - 160</b>
Priority keylock switch IP54	4 - 161
Rotary switch IP40	<b>4 - 162</b>
Rotary switch IP40	4 - 163

4

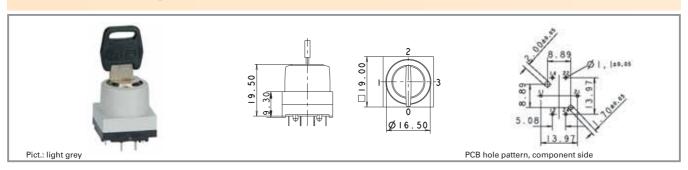
Main key

Key removal position

Rated power max.



# **MICROMEC - Keylock switch IP54**



#### **Technical Data**

<b>General information</b> Colour	see order block
Form of collar	square
<b>Dimensions</b> Length of collar Width of collar Overall height	19 mm 19 mm 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

Mechanical characteristics	
Switching torque	0.04 0.10 Nm
Robustness max.	2 Nm
Dielectric strength AC min.	500 V

Electrical characteristics	
Rated voltage	2 35 V
Rated current max.	100 mA
Contact resistance when new	100 m $\Omega$
max.	
Contact resistance acc. to	200 m $\Omega$
life max.	
Insulation resistance	10 $^{9}$ $\Omega$
ESD strength max.	8 kV
Other specifications	
Other specifications Rotating angle	see order block
Rotating angle Operating life	see order block 10,000
Rotating angle	
Rotating angle Operating life	10,000
Rotating angle Operating life Degree of protection from	10,000 IP54 -25 °C
Rotating angle Operating life Degree of protection from front side	10,000 IP54

+80 °C

UL 94 HB

acc. to IEC 60068-2

-14, -30, -33 and -78

Storage temperature max.

Environmental restistance

Flammability of materials

## Typical accessories MICROMEC - Keylock switch IP54

1 W

on request

see order block

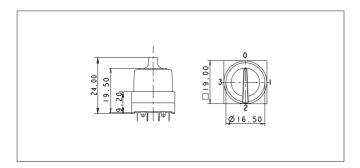
Description	Photo	Order no.	Additional accessories see page
O-ring for keylock switch	0	5.30.120.015/0100	5 - 25
Spare key, for single action, e.g. 1 x 90° (delivery content 1 key)		5.58.007.001/0000	
Spare key, for double action, e.g. 2 x 90° (delivery content 1 key)		5.58.008.001/0000	
Spare key for 3 angles, f.ex. 3 x 90° degree (content 1 key)		5.58.009.001/0100	

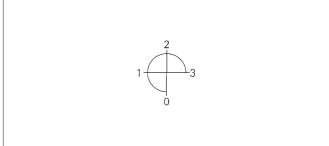
Additional accessories see page

Spare key for 4 angles, f.ex. 4 x 90 degrees, (content 1 key)

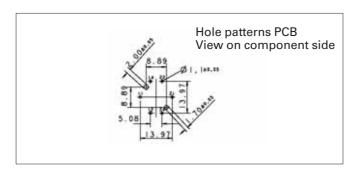


## **Configuration Diagram/Dimensional Drawing**





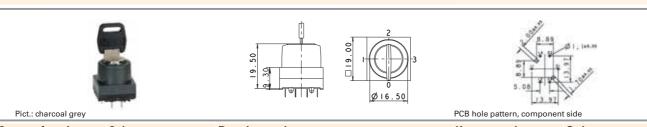
5.58.010.001/0100



Switching position	Contact function
0	$ \begin{array}{cccccccccccccccccccccccccccccccccccc$
1	$ \begin{array}{cccccccccccccccccccccccccccccccccccc$
2	$ \begin{array}{cccccccccccccccccccccccccccccccccccc$
3	$ \begin{array}{cccccccccccccccccccccccccccccccccccc$



## **MICROMEC - Keylock switch IP54**



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

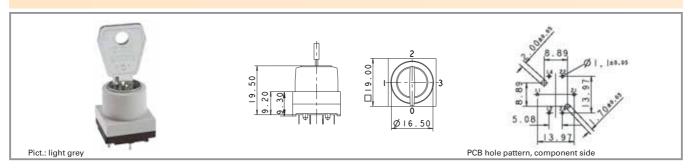
Technical data see page 4 - 154

2 keys included.

Other lock variants available on request.



## **EUROLOCKS - Keylock switch IP54**



#### **Technical Data**

_			
Gener	al ın	torm	ation

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 Lock Eurolocks Wafers Lock type 801

Wafers 5
Lock type 801
Number of locking positions 50
Main key no
Symmetric key yes
Key removal position see order block

#### 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**

#### Other specifications

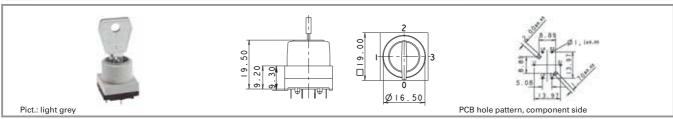
Rotating angle see order block Operating life 10,000 Degree of protection from IP54 front side -25 °C Ambient temp. operating min. +70 °C Ambient temp. operating max. Storage temperature min. -40 °C Storage temperature max. +80 °C Environmental restistance acc. to IEC 60068-2 -14, -30, -33 and -78 Flammability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

### Typical accessories EUROLOCKS - Keylock switch IP54

Description	Photo	Order no.	Additional accessories see page
O-ring for keylock switch	0	5.30.120.015/0100	5 - 25
Spare key (delivery content 1 key)		5.58.006.801/0000	



## **EUROLOCKS - Keylock switch IP54**



1 oz note patern, component otac					
Contact function	Colour	Rotating angle		Key removal position	Order no.
latching	charcoal grey	1 x 90°	1 0	0	3.13.009.001/0000
latching	light grey	1 x 90°	1 0	0	3.13.009.006/0000
latching	charcoal grey	1 x 90°	1 0	0+1	3.13.009.031/0000
latching	light grey	1 x 90°	1 0	0+1	3.13.009.036/0000

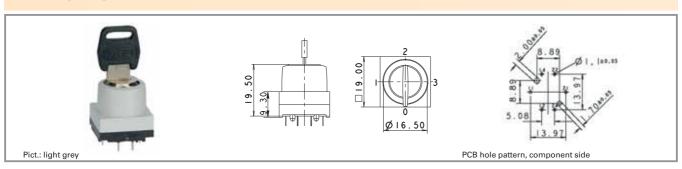
Technical data see page 4 - 158

2 keys included. Other lock variants available on request.

For the switching arrangement, refer to Micromec keylock switch IP54.



# **Priority keylock switch IP54**



#### **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**

**Mechanical characteristics** 

Dielectric strength AC min.

Switching torque

Robustness max.

Rated power max.

<b>General information</b> Colour	see order block	Electrical characteristics Rated voltage	2 35 V
Form of collar	square	Rated current max.	100 mA
Dimensions		Contact resistance when new max.	100 m $\Omega$
Length of collar	19 mm	Contact resistance acc. to	200 m $\Omega$
Width of collar	19 mm	life max.	
Overall height	19.5 mm	Insulation resistance	10 $^{9}$ $\Omega$
		ESD strength max.	8 kV
Mechanical design			
Mounting	soldering	Other specifications	
Terminals	tin-plated	Rotating angle	see order block
Contact system	cross contact self	Operating life	10,000
	cleaning	Degree of protection from	IP54
Contact function	see order block	front side	
Contact materials	Au alloy	Ambient temp. operating min.	-25 °C
Illuminability	no	Ambient temp. operating max.	+70 °C
Lock	Micromec	Storage temperature min.	-40 °C
Wafers	5	Storage temperature max.	+80 °C
Lock type	001	Environmental restistance	acc. to IEC 60068-2
Number of locking positions	500		-14, -30, -33 and -78
Main key	on request	Flammability of materials	UL 94 HB
Key removal position	see order block		

### Typical accessories Priority keylock switch IP54

0.04 ... 0.10 Nm

2 Nm

500 V

1 W

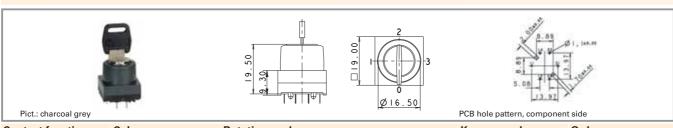
Description	Photo	Order no.	Additional accessories see page
O-ring for keylock switch	0	5.30.120.015/0100	5 - 25



## 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**



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

Technical data see page 4 - 160

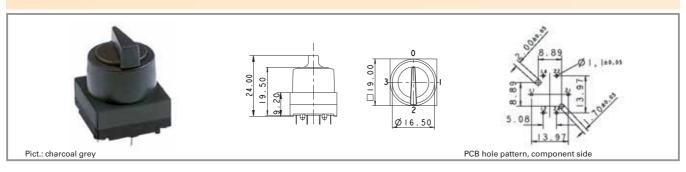
2 sets of keys included.

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**



#### **Technical Data**

Ge	eneral	information
$\sim$		

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

Illuminability

Mounting soldering **Terminals** tin-plated Contact system cross contact self cleaning Contact function see order block Au alloy Contact materials

**Mechanical characteristics** 

Torque against stop min. Dielectric strength AC min. Rated power max. 1 W

0.45 Nm see order block **Electrical characteristics** 

35 V Rated voltage max. Rated current max. 100 mA 100 m $\Omega$ Contact resistance when new 200  $m\Omega$ Contact resistance acc. to life max. 109  $\Omega$ Insulation resistance ESD strength max. 8 kV

Other specifications

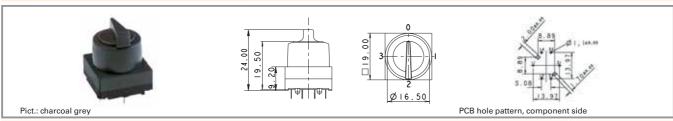
see order block Rotating angle Operating life 50,000 Degree of protection from IP40 front side Ambient temp. operating min. -25 °C +70 °C Ambient temp. operating max. Storage temperature min. -40 °C Storage temperature max. +80 °C acc. to IEC 60068-2 Environmental restistance

-14, -30, -33 and -78

Flammability of materials UL 94 HB



## **Rotary switch IP40**



Contact function	Colour	Rotating angle		Order no.
latching	charcoal grey	1 x 90°	1 0	3.13.007.001/0152
latching	charcoal grey	2 x 90°	1 - 2	3.13.007.011/0152
latching	charcoal grey	3 x 90°	1 3	3.13.007.021/0152
latching	charcoal grey	4 x 90°	1 2 3	3.13.007.031/0152

Technical data see page 4 - 162

Other colour variants available on request

# AMEYA360 Components Supply Platform

## **Authorized Distribution Brand:**

























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