PCB Keyswitches

4

RAFI
SOLUTIONS WITH PASSION

Examples for Applications   Standards

MICON 5

RF 15

4

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 V
F. ex. Short-Travel Main Switch KN 19, for this product the Low-Voltage Directive 73/23/EWG applies.

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

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

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

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

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

UL-approval

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

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

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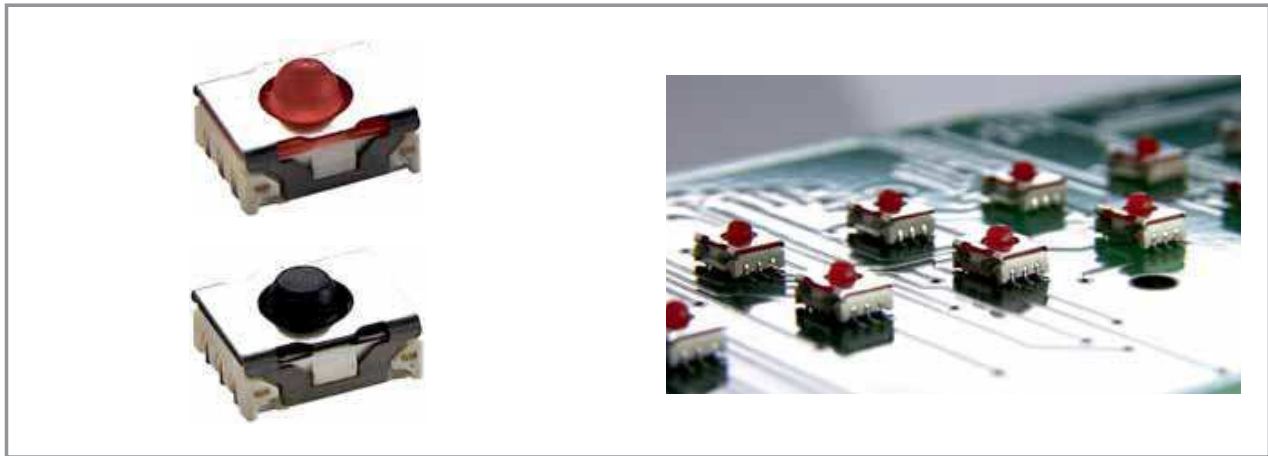
General Data

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.

Content

4

MICON

RAFI
SOLUTIONS WITH PASSION

NEW

MICON 5 - Short-travel keyswitches

General Data

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

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

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

4

MICON

Technical Data

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

4 - 4

PCB Keyswitches

RAFI
SOLUTIONS WITH PASSION

MICON 5 Circuit Diagram

MICON 5 Force-Travel Diagram

Operating force F_1: see order block
Switching travel S_2: see order block
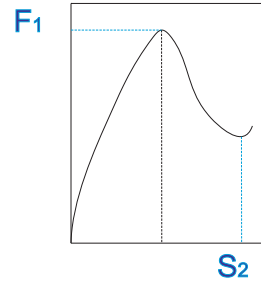
MICON 5 Product Code acc. to DIN EN ISO 9001 (EN ISO 8402)
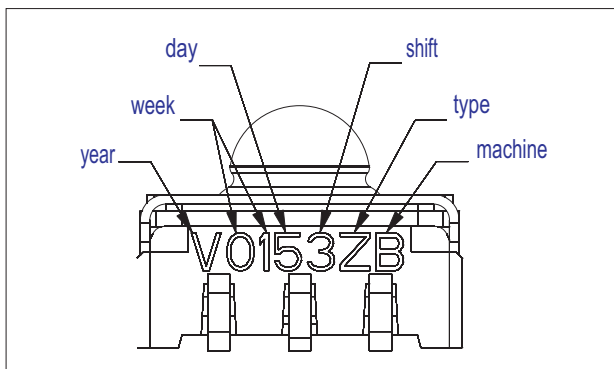
Traceability acc. to (EN ISO 8402) DIN EN ISO 9001, 2000, 7.5.3
A 7-digit code is printed on the housing of the keyswitch. This code informs about production date, production shift and type of product.

MICON 5 SMT Version, Tape and Reel Drawing

4

MICON

SOLUTIONS WITH PASSION

NEW
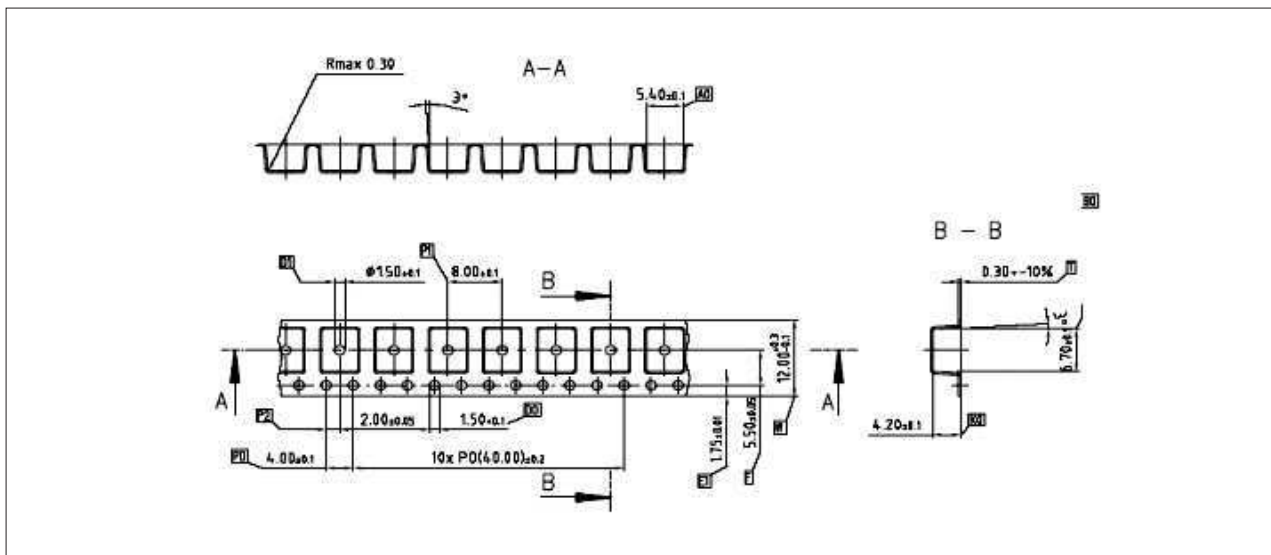
MICON 5 - Short-travel keyswitch, SMT Standard
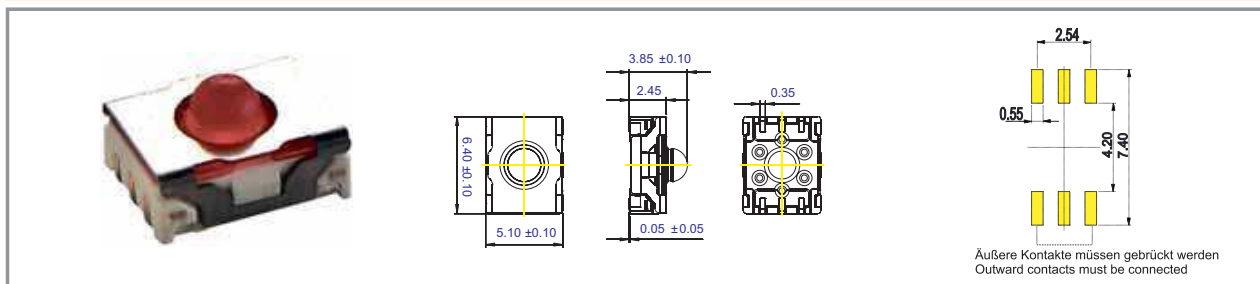
3.85 ±0.10
2.45
0.35
2.54
0.55
4.20
7.40
6.40 ±0.10
5.10 ±0.10
0.05 ±0.05

Äußere Kontakte müssen gebrückt werden
Outward contacts must be connected

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

Technical data see page 4 - 4

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

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

4

MICON

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

PCB Keyswitches

MICON 5 - Short-travel keyswitch, SMT low

NEW
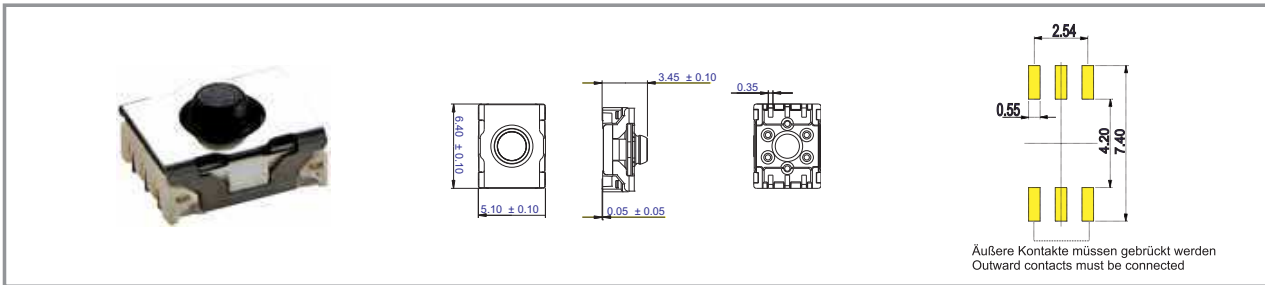
Äußere Kontakte müssen gebrückt werden
Outward contacts must be connected

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

Technical data see page 4 - 4

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

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

MICON 5 - Short-travel keyswitch, THT Standard
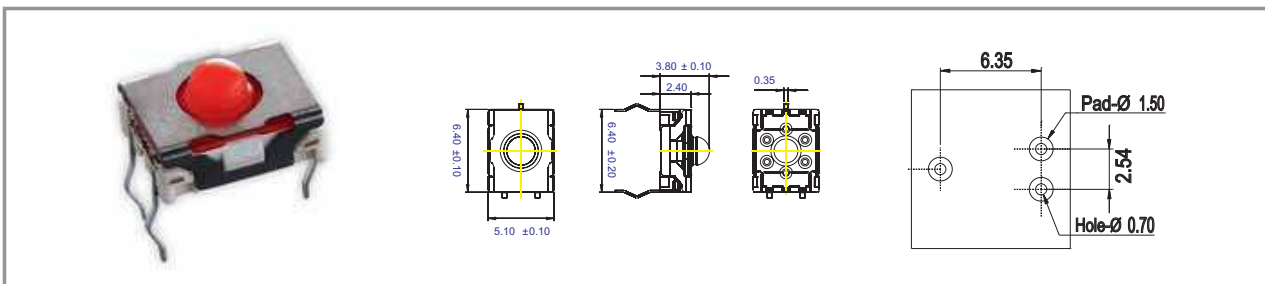
4

MICON

NEW

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

Technical data see page 4 - 4

Packing: in tubes with 102 pieces
Keycaps see RK 90

NEW

MICON 5 - Plungers round, not illuminable
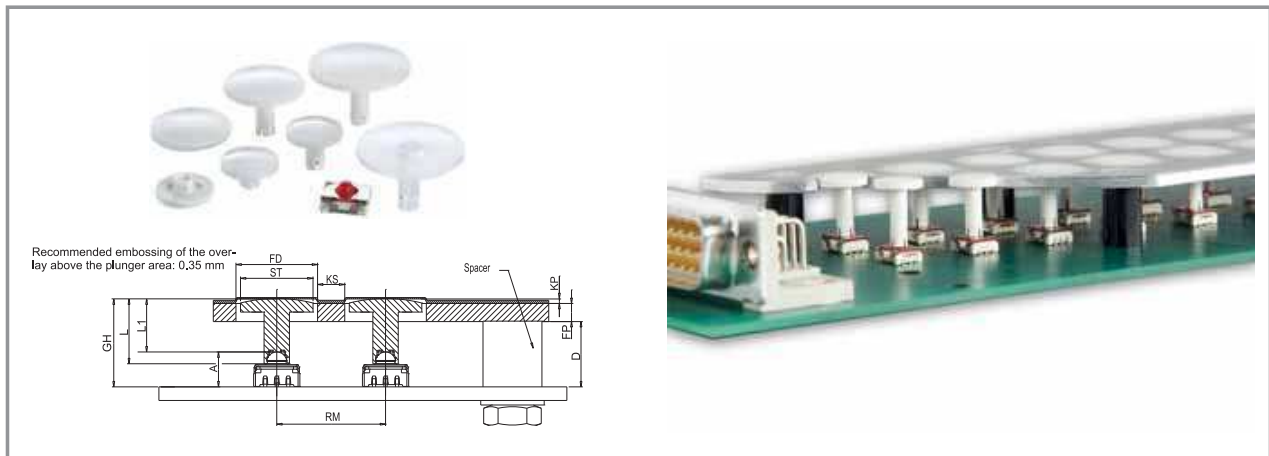
General Data

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

4

Technical Data

General information

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

MICON

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MICON 5 - Plunger opaque, round, not illuminable

NEW

Beispiel: Gesamthöhe GH = 9,70 mm, L = 7,15 mm, ST = 14,5 mm
Example: Overall height GH = 9.7 mm, L = 7.15 mm, ST = 14.5 mm

Ø15.50
Ø14.50
min. 3.00
0.50
2.00
9.70
7.15
5.85
3.85
7.25
18.50
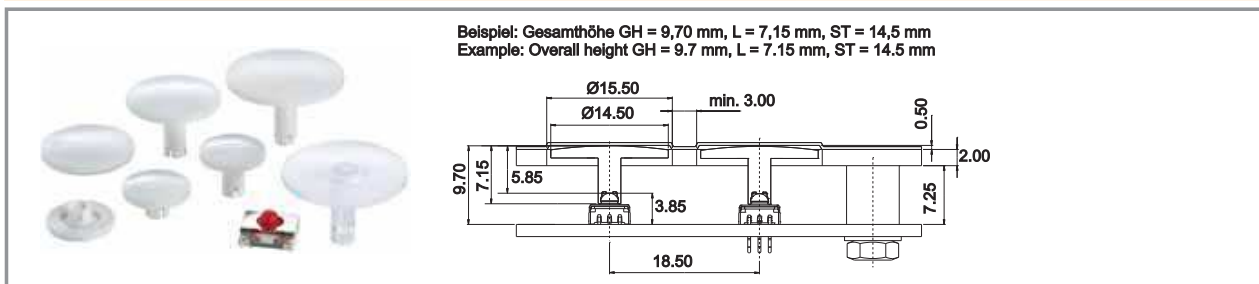
Plunger diameter ST/size	Length of plunger L	Order no.
6.0 mm	3.00 mm	5.46.001.103/0200
6.0 mm	3.45 mm	5.46.001.104/0200
6.0 mm	3.95 mm	5.46.001.105/0200
6.0 mm	4.45 mm	5.46.001.106/0200
6.0 mm	7.15 mm	5.46.001.107/0200
6.0 mm	9.95 mm	5.46.001.108/0200
8.0 mm	3.00 mm	5.46.001.123/0200
8.0 mm	3.45 mm	5.46.001.124/0200
8.0 mm	3.95 mm	5.46.001.125/0200
8.0 mm	4.45 mm	5.46.001.126/0200
8.0 mm	5.50 mm	5.46.001.121/0200
8.0 mm	7.15 mm	5.46.001.127/0200
8.0 mm	9.95 mm	5.46.001.128/0200
8.0 mm	10.30 mm	5.46.001.122/0200
11.5 mm	3.00 mm	5.46.001.143/0200
11.5 mm	3.45 mm	5.46.001.144/0200
11.5 mm	3.95 mm	5.46.001.145/0200
11.5 mm	4.45 mm	5.46.001.146/0200
11.5 mm	5.50 mm	5.46.001.141/0200
11.5 mm	7.15 mm	5.46.001.147/0200
11.5 mm	9.95 mm	5.46.001.148/0200
11.5 mm	10.30 mm	5.46.001.142/0200

4

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

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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

MICON

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

PCB Keyswitches

MICON 5: Just feel it.

AUTOMOTIVE

INSTRUMENTATION-CONTROL-AUTOMATION

MEDICAL TECHNOLOGY

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

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

reliable switching behaviour in demanding applications, including hostile environments. MICON 5 – test it!

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

RAFI GmbH & Co. KG
D-88276 Berg/Ravensburg
Phone: +49 751 89-0, Fax: +49 751 89-13 00
www.rafi.de, info@rafi.de

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MICON 5 - Plungers square, illuminable

Musteraufbau, MICON 5 mit quadratischem Stößel, GH = 9.7 mm
Sample assembly, MICON 5 with square plunger, GH = 9.7 mm
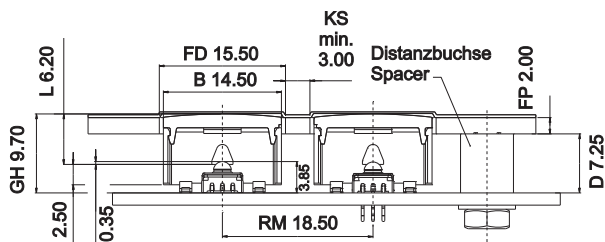
General Data

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).

Technical Data

4

General information

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

MICON

RAFI
SOLUTIONS WITH PASSION

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

NEW

Möglicher Bereich zur LED-Platzierung
Permitted area for LED placement

Lötpad
Solder pad

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

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

Technical data see page 4 - 12

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

4

MICON

PCB Keyswitches

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

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

NEW

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

Möglicher Bereich zur LED-Platzierung
Permitted area for LED placement

Lötpad
Solder pad

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

4

MICON

Technical data see page 4 - 12

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

PCB Keyswitches

RAFI
SOLUTIONS WITH PASSION

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

NEW

Möglicher Bereich zur LED-Platzierung
Permitted area for LED placement

Lötpad
Solder pad

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

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

Technical data see page 4 - 12

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

4

MICON

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

RACON - Short-travel keyswitches
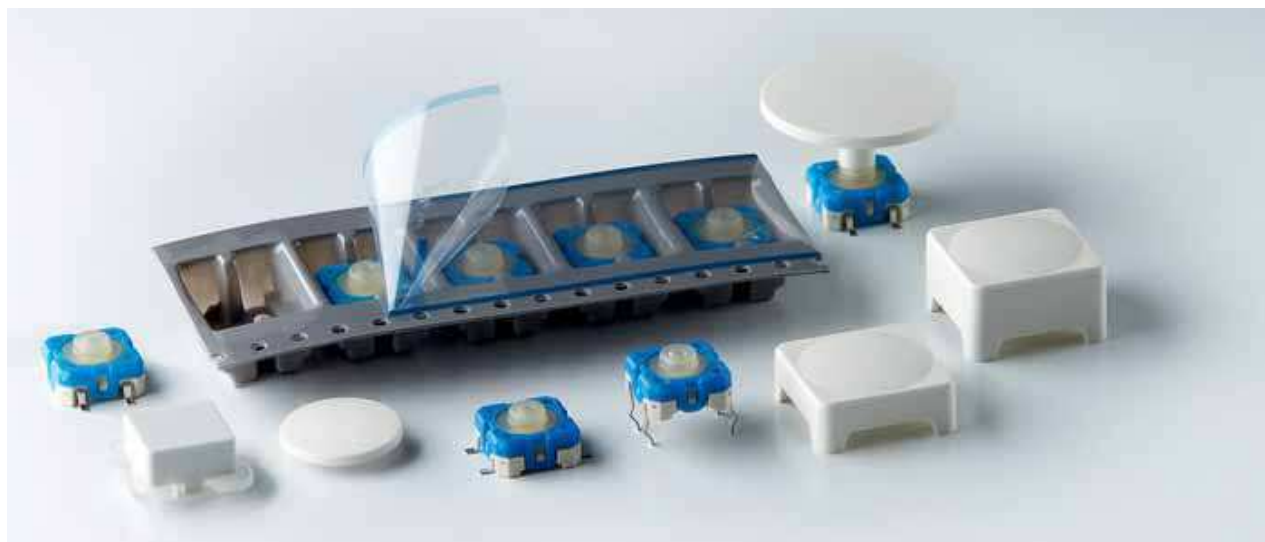
General Data

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

Content

4

RACON

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SOLUTIONS WITH PASSION

RACON 8 - Short-travel keyswitch

product
code (F1)

production
shift (1)

production
year (2002)

production
day (21.)

production
month (03.)

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

4

RACON

Technical Data

Dimensions		**Rated current min.**	0.01 mA
Length of housing	8.4 mm	Rated current max.	100 mA
Width of housing	8.4 mm	Rated power max.	1 W
Height of housing	see order block	(ohmic load)	
		Contact resistance when new	100 mΩ
Mechanical design		max.	
Mounting	soldering	Insulation resistance	10^9 Ω
Terminals	see order block		
Contact system	snap-action contact	**Other specifications**	
Contact arrangement	1 NO	Ambient temp. operating min.	-40 °C
Contact materials	Au	Ambient temp. operating max.	+90 °C
Illumination	no	Resistance to environment	DIN EN 60068-2 -14,
			-30,-33 and -78
Mechanical characteristics		Operating life	1,000,000
Operating force	3.3$^{\pm0.6}$ N	Solderability / Solder heat	see order block
Switching travel	0.34$^{\pm0.1}$ mm	resistance	
		Flammability of materials	UL 94 HB
Electrical characteristics		Packing	see order block
Rated voltage min.	0.02 V	Produkt code	see order block
Rated voltage max.	35 V		

PCB Keyswitches

RACON 8, Typical System Assembly with Plunger under Overlay
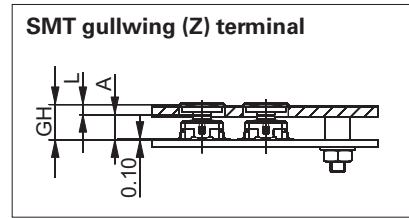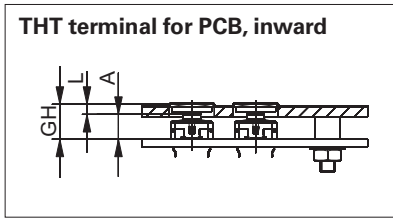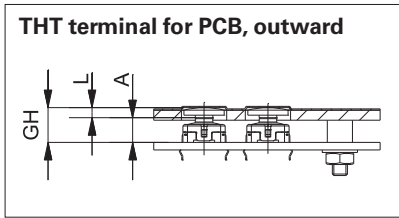
THT terminal for PCB, outward

THT terminal for PCB, inward

SMT gullwing (Z) terminal

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

RACON 8, PCB Hole Pattern, Smallest Grid

THT terminal for PCB, outward

4.50
Ø 1.00
8.50 ± 0.10
RMmin = 11.43
RMmin = 8.90

view on component side

THT terminal for PCB, inward

4.50
Ø 1.00
6.35 ± 0.10
RMmin= 8.90
RMmin = 8.90

view on component side

SMT gullwing (Z) terminal

1.40
4.50
7.60 max
12.00 min
RMmin= 12.70
RMmin = 8.90

view on component side
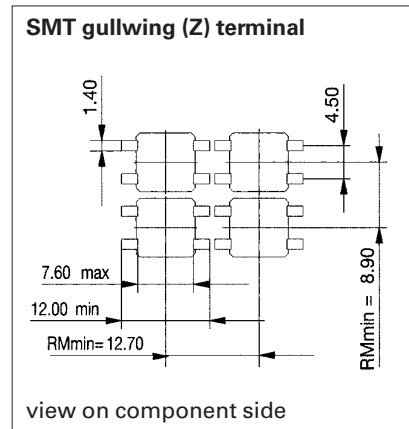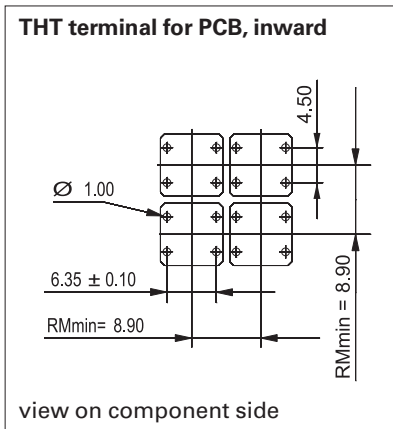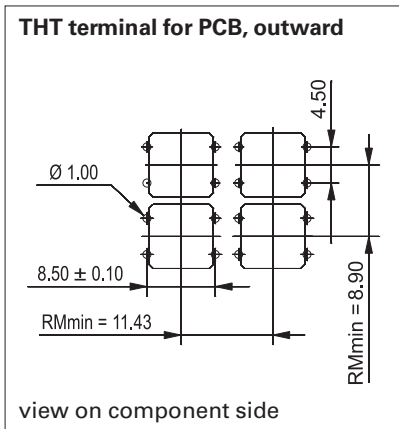
4

RACON 8, SMT Terminal, Tape and Reel Drawing

8.7±0.2 C-D
6,6 ±0,2
1.5 +0.1 12.0±0.1 A
0.4
A–B
8.7±0.2
2.0 +0.1 1.5 +0.1 5.2±0.2
4.0±0.1 24.0±0.3
11.5±0.1
1.75±0.1
(10x4)=40.0±0.2 B
D

Circuit Diagram RACON 8   Typical Force-Travel Diagram

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

RACON

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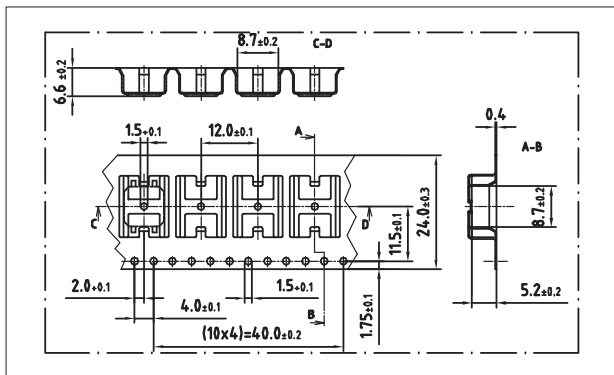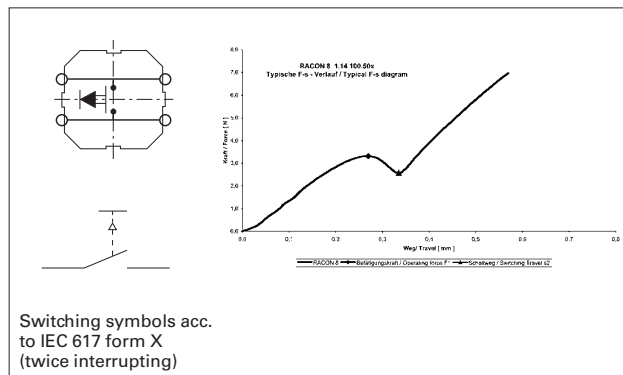
Typical accessories RACON 8 - Short-travel keyswitch

Description	Photo	Order no.	Additional accessories see page
Spacer, round, length 6.25 mm, red		**5.30.759.034/0000**	2 - 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
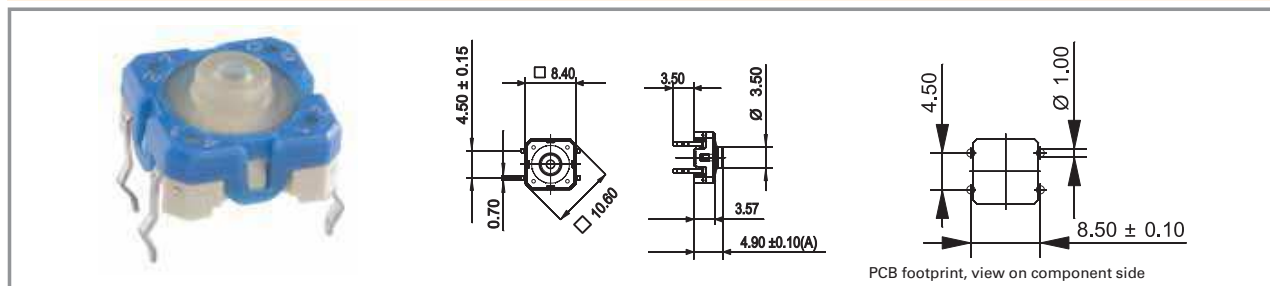
PCB footprint, view on component side

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

Technical data see page 4 - 18

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

4

RACON

RACON 8 - Short-travel keyswitch, THT inward
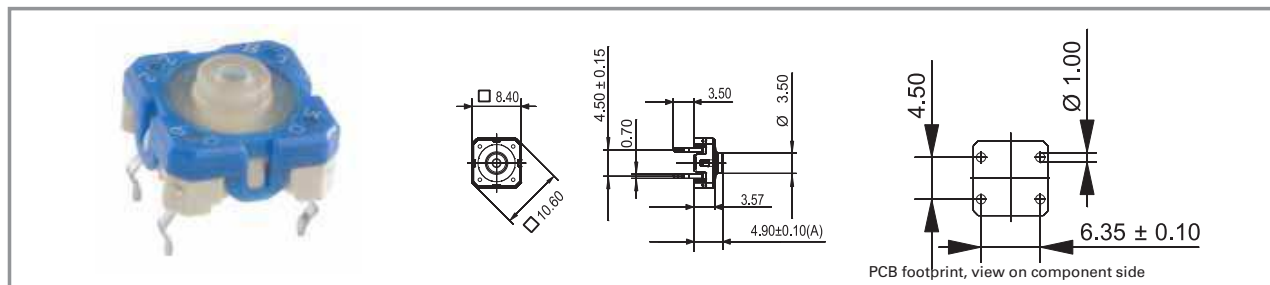
PCB footprint, view on component side

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

Technical data see page 4 - 18

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

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

PCB Keyswitches

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

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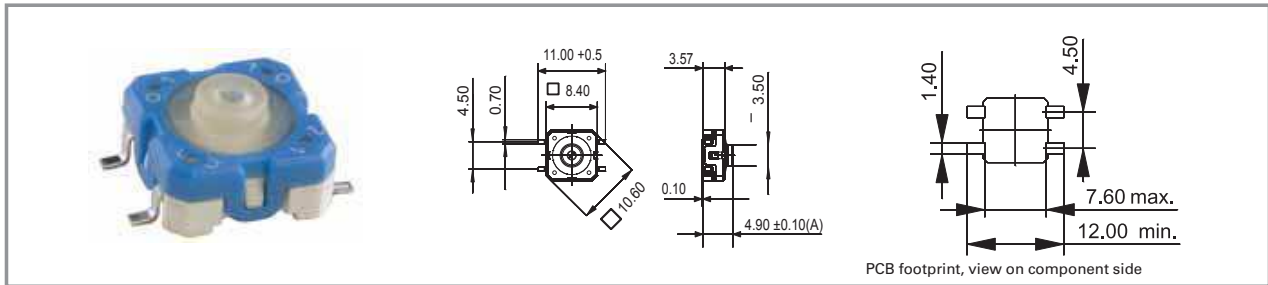
Terminals	Operating force	Solderability / Solder heat resistance	Produkt code	Packing	Order no.
SMT Gullwing (Z) terminals	3.3±0.6 N	E DIN IEC 600 68-2-58	C1	tape and reel à 1000 pieces	**1.14.100.503/0000**

Technical data see page 4 - 18

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

4

RACON

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

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RACON 12 - Short-travel keyswitch

product code (F1)

production shift (1)

production year (2002)

production day (21.)

production month (03.)
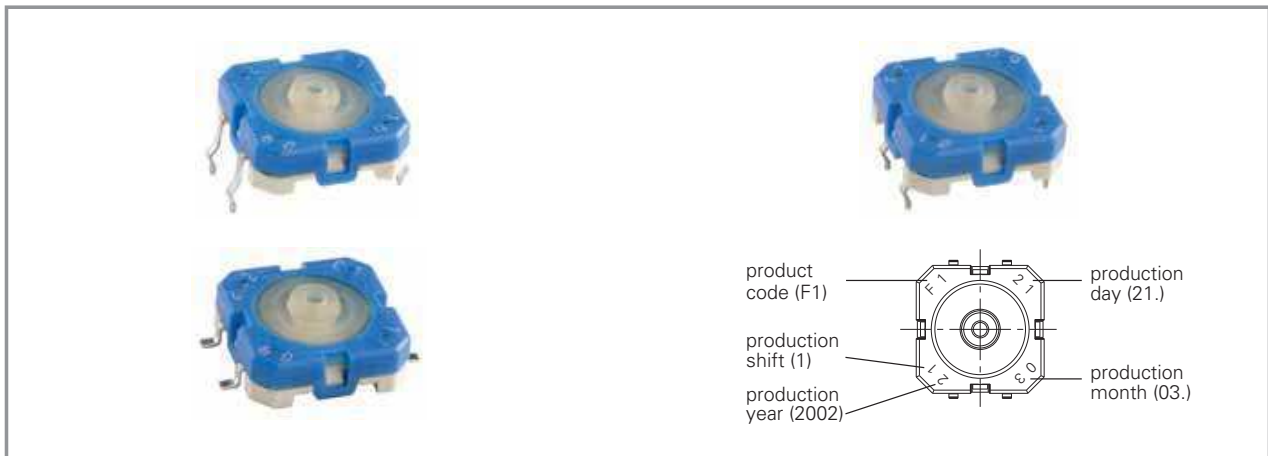
General Data

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

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

4

RACON

Technical Data

Dimensions	
Length of housing	12 mm
Width of housing	12 mm
Overall height	see order block

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

Mechanical characteristics	
Operating force	see order block
Switching travel	see order block

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

Rated current min.	0.01 mA
Rated current max.	100 mA
Rated power max. (ohmic load)	1 W
Contact resistance when new max.	100 mΩ
Insulation resistance	$10^9\ \Omega$

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

RACON - Short-travel keyswitches

RACON 12, Typical System Assembly with Plunger under Overlay
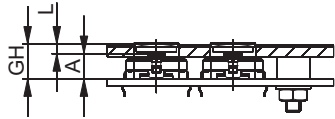
THT terminal for PCB, outward	THT terminal for PCB, inward	SMT gullwing (Z) terminal
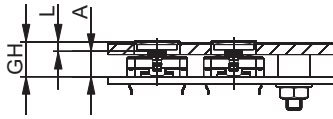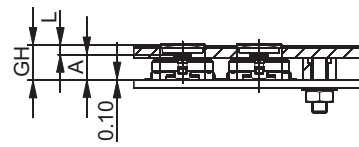
Variable	Declaration	THT terminal outward	THT terminal inward	SMT-terminal
A	Height of keyswitch		$A = 4.95$ $^{+/- 0.1\,mm}$	
GH	Overall height		GH = A + L	GH = A + L + 0.1 mm
L	Length of plunger		L = GH - A	L = GH - A - 0.1 mm

RACON 12, PCB Hole Pattern, Smallest Grid
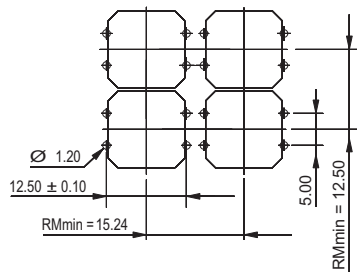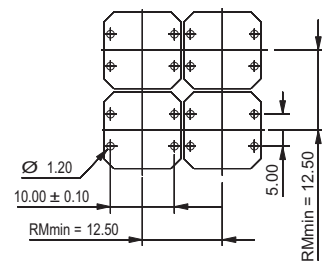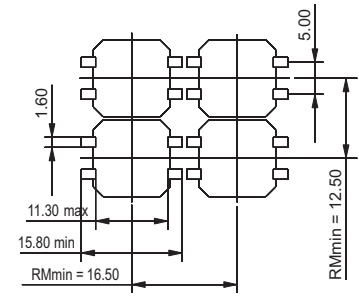
THT terminal for PCB, outward	THT terminal for PCB, inward	SMT gullwing (Z) terminal
Ø 1.20 12.50 ± 0.10 RMmin = 15.24 5.00 RMmin = 12.50 view on component side	Ø 1.20 10.00 ± 0.10 RMmin = 12.50 5.00 RMmin = 12.50 view on component side	5.00 1.60 11.30 max 15.80 min RMmin = 16.50 RMmin = 12.50 view on component side

4

RACON 12, SMT Terminal, Tape and Reel Drawing
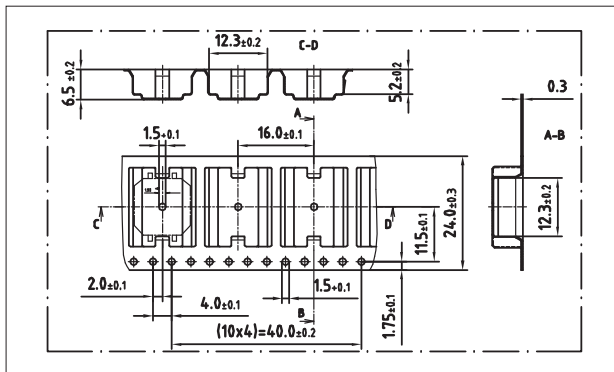
Circuit Diagram RACON 12 **Typical Force-Travel Diagram**
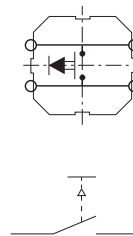
RACON 12 1.14 001.S6x
Typische F-s - Verlauf / Typical F-s diagram

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

RACON

PCB Keyswitches

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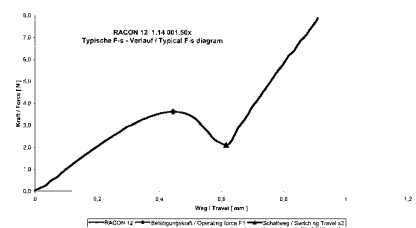
Typical accessories RACON 12 - Short-travel keyswitch

Description	Photo	Order no.	Additional accessories see page
Spacer, round, length 6.25 mm, red		**5.30.759.034/0000**	2 - 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
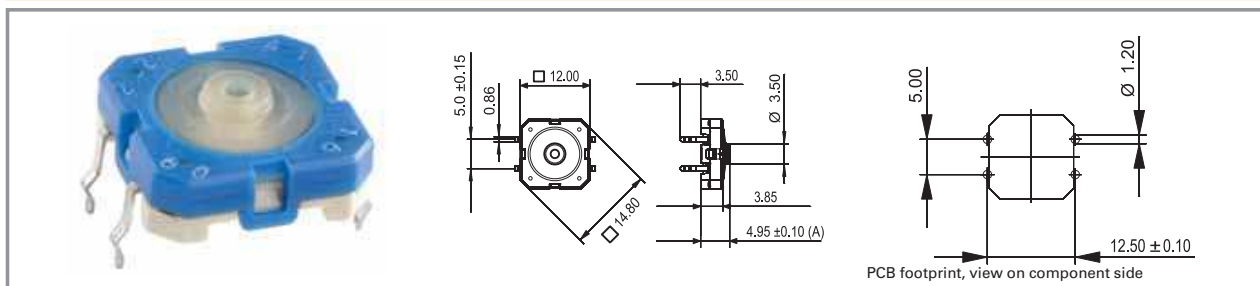
PCB footprint, view on component side

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

Technical data see page 4 - 22

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

4

RACON

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

RACON 12 - Short-travel keyswitch solder terminals for PCB, inward
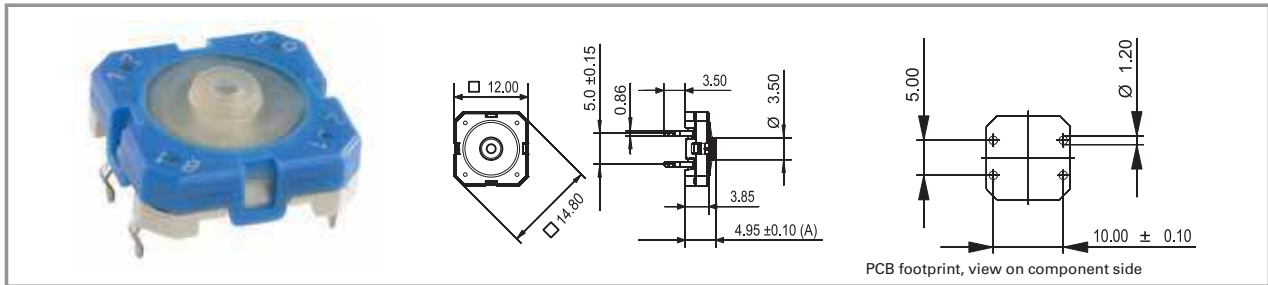
PCB footprint, view on component side

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

Technical data see page 4 - 22

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

RACON 12 - Short-travel keyswitch SMT gullwing (Z) terminals
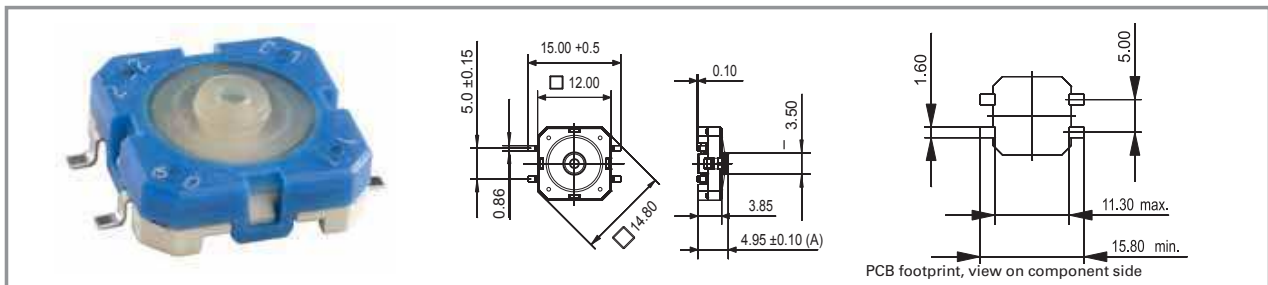
PCB footprint, view on component side

Terminals	Operating force	Switching travel	Solderability / Solder heat resistance	Produkt code	Packing	Order no.
SMT Gullwing (Z)	3.6±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±2.5 N	0.73±0.1 mm	E DIN IEC 600 68-2-58	ZE	tape and reel à 750 pieces	1.14.001.920/0000

Technical data see page 4 - 22

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

4

RACON

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

RACON 12 V - Short-travel keyswitch with vertical adapter

General Data

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

Technical Data

4

RACON

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	$0.61^{\pm0.1}$ mm

Electrical characteristics
Rated voltage min.	0.02 V
Rated voltage max.	35 V
Rated current min.	0.01 mA
Rated current max.	100 mA
Rated power max. (ohmic load)	1 W

Contact resistance when new max.	100 mΩ
Insulation resistance	$10^9\ \Omega$

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

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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

Switching symbols acc. to IEC 617 form X
(twice interrupting)
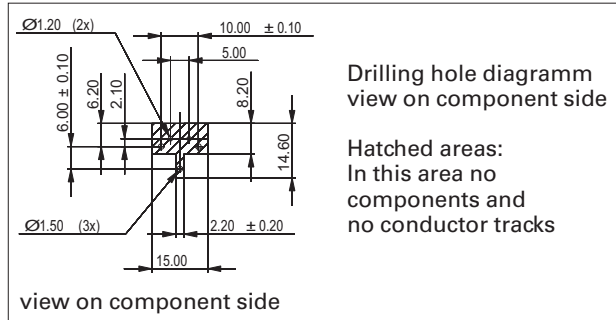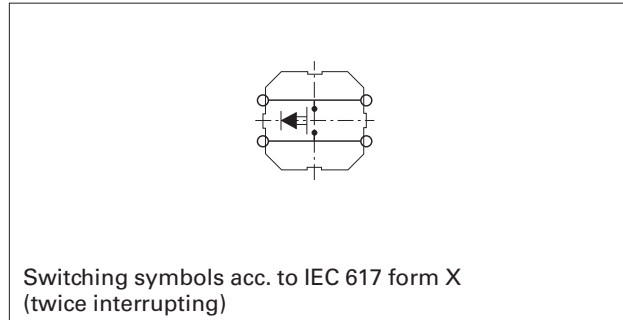
RACON 12 V - Short-travel keyswitch with vertical adapter
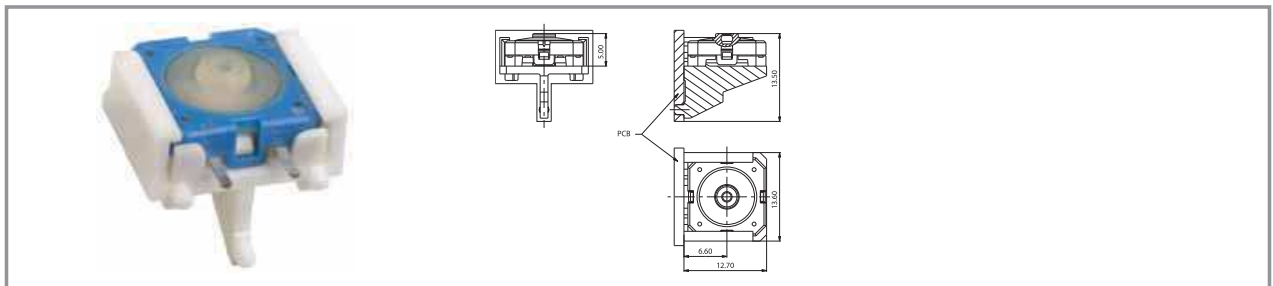
Terminals	Contact arrangement	Produkt code	Packing	Order no.
THT	1 NO	F 1	in boxes à 100 pieces	1.14.001.505/0000

4

Technical data see page 4 - 26

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

RACON

RACON 12 i - Short-travel keyswitch
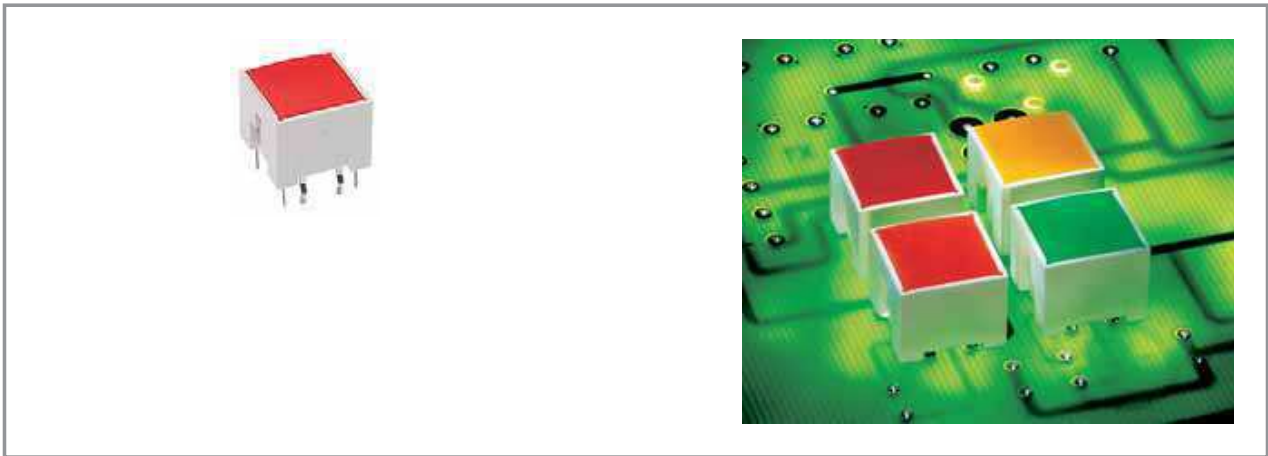
General Data

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

Technical Data

General information
Colour of lens	see order block
Recommended key grid	15.24 x 15.24 mm
Key grid min.	12.5 x 12.5 mm

Dimensions
Length	11.35 mm
Width	11.35 mm
Overall height	9.7 mm

Mechanical design
Mounting	soldering
Terminals	THT
Contact system	snap-action contact
Contact arrangement	1 NO
Contact materials	Au
Illumination	fully illuminated 2 LED
LED colour	see order block
LED type	standard 2 mm

Mechanical characteristics
Operating force	$3.3^{\pm0.6}$ N
Switching travel	$0.34^{\pm0.1}$ mm

Electrical characteristics
Rated voltage min.	0.02 V
Rated voltage max.	35 V
Rated current min.	0.01 mA
Rated current max.	100 mA
Rated power max. (ohmic load)	1 W
Contact resistance when new max.	100 mΩ

Dielectric strength AC min.	750 V
Insulation resistance	$10^9 \Omega$

Electrical characteristics of LED
LED rated current max. I_F at 25 °C	red/green: 30, yellow: 50 mA
LED current reduction beginning with 50 degree C	red: 0.5 mA/degree C, yellow 0.8 mA/ degree C
LED wavelength typ.	red 639, green 510-535, yellow 590
LED forward voltage U_F at 20 mA	red: 1.8 V/20 mA, yellow: 1.9 V/20 mA
LED breakdown voltage U_R at 25 °C	min. 5 V/0.1 mA

Other specifications
Ambient temp. operating min.	-40 °C
Ambient temp. operating max.	+80 °C
Storage temperature min.	see order block
Storage temperature max. (product)	see order block
Storage temperature max. (intube)	see order block
Environmental resistance	acc. to IEC 60068-2 -14, -30, -33 and -78
Operating life	1,000,000
Solderability / solder heat resistance	E DIN IEC 600 68-2-20
Flammability of materials	UL 94 HB
Packing	tubes à 45 pieces

4

RACON

PCB Keyswitches

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RACON 12i
typical system assembly

view on component side
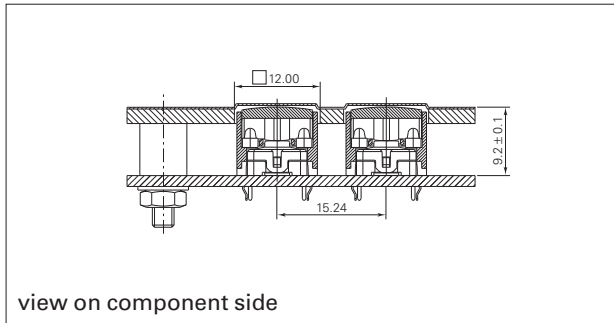
Explanation
Recommended area embossing 0.35 mm at glue spacer
thickness of 0.15 mm

RACON 12i smallest grid
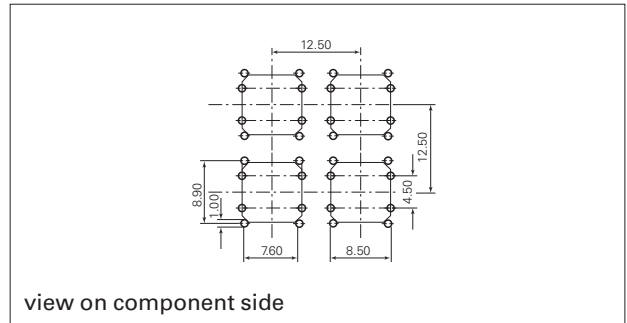
view on component side

LED hole patterns

view on component side

Circuit Diagram RACON 12i

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

4

RACON

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RACON 12 i - Short-travel keyswitch

3,50±0.3

9,70±0,2

☐9,95
☐11,35 — illuminated area
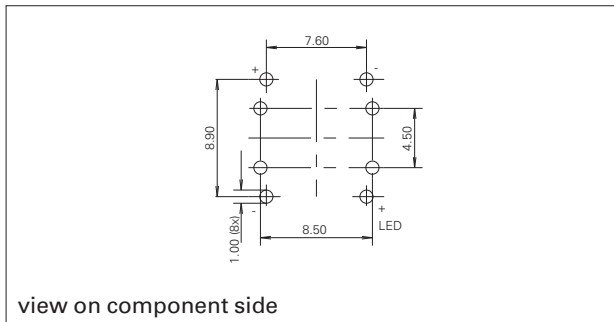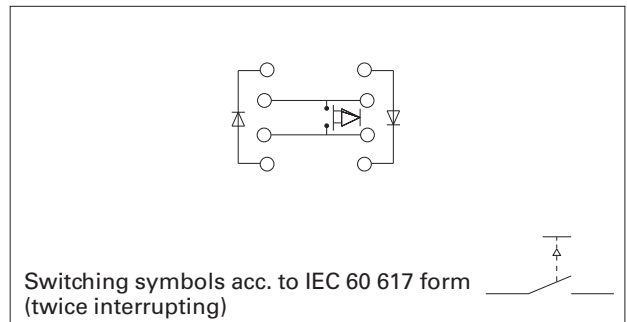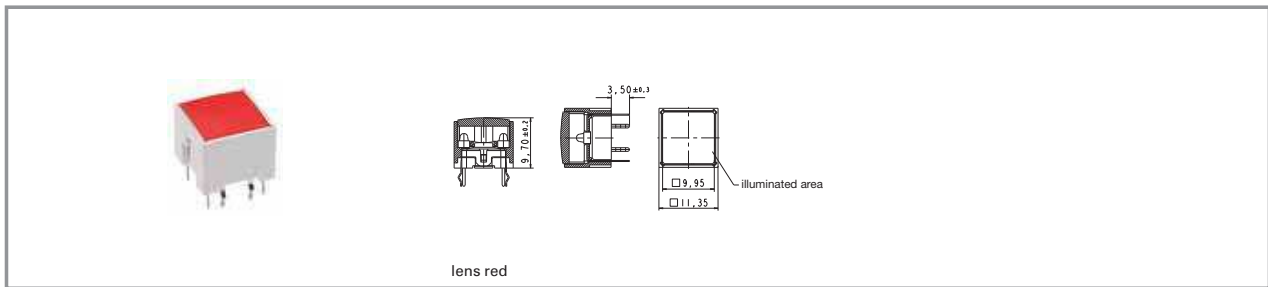
lens red

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

Technical data see page 4 - 28

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

4

RACON

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

RACON - Special accessories

Pict.: 8 mm

General Data

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

Plunger round
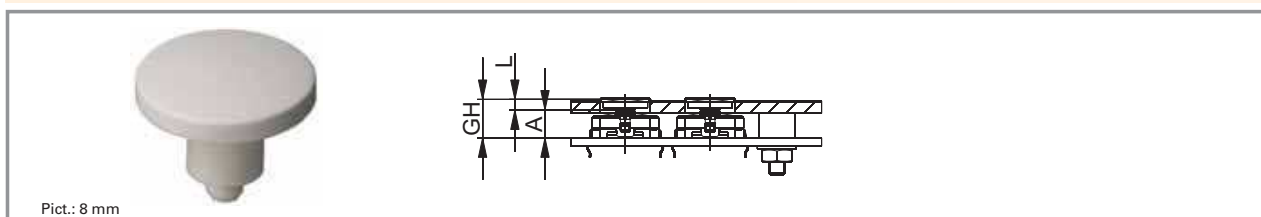
Pict.: 8 mm

4

RACON

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

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

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

4

RACON

PCB Keyswitches

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

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

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

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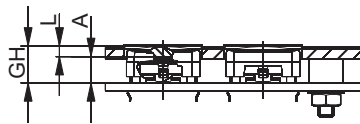
Plunger diameter/size	RACON version	Length of plunger L	Order no.
14 x 14 mm	RACON 12 THT	2.1 mm	5.46.001.064/0209
14 x 14 mm	RACON 12 THT	4.8 mm	5.46.001.060/0209
14 x 14 mm	RACON 12 THT	7.6 mm	5.46.001.063/0209
14 x 14 mm	RACON 12 SMT	2 mm	5.46.001.057/0209
14 x 14 mm	RACON 12 SMT	4.7 mm	**5.46.001.058/0209**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

Front panel cut-out = 15 x 15 mm.

4

RACON

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

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NEW

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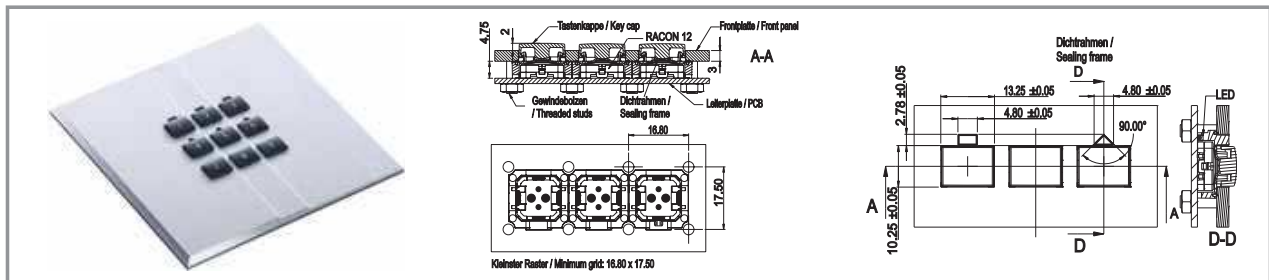
Technical Data

General information

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

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

4

RACON

RAFI
SOLUTIONS WITH PASSION

RK 90 II - Sealing frame

Sealing frame with square light conductor   with snapped-on lens

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

Technical data see page 4 - 36

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

Legended lenses on request.

4

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

4

RF

4

RF

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	30 mA approx 0.5 mA/°C 565 nm 2 V/10 mA 5 V/100 µA min. - 20 °C . . . + 80 °C	20 mA approx 0.2 mA/°C 586 nm 2 V/10 mA 5 V/100 µA min. - 20 °C . . . + 80 °C
	Blue LED	White LED	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 mlm/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	

4

Calculating the
series resistor:

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

Rated power
of series:

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

Example for 5 Volt:

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

RF

RAFI
SOLUTIONS WITH PASSION

RF 15 - Short-travel keyswitch
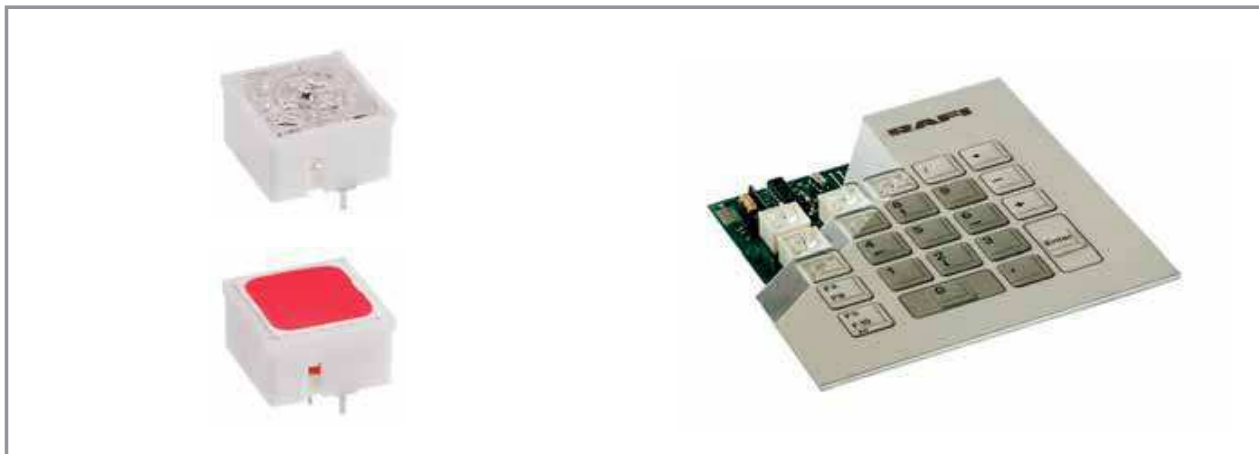
General Data

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

4

RF

General information
Colour of lens	see order block
Recommended key grid	19.05 mm

Dimensions
Length	15 mm
Width	15 mm
Overall height	9.7 mm

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

Mechanical characteristics
Operating force max.	$2.9^{\pm0.6}$ N
Switching travel	$0.5^{+0.2}$ mm
Robustness min.	with through-plated PCB 100 N

Electrical characteristics
Rated voltage min.	Au: 0.02 V, Ag: 3 V
Rated voltage max.	Au: 35 V, Ag: 50 V
Rated current min.	Au: 0.01 mA, Ag: 0.1 mA
Rated current max.	Au: 100 mA, Ag: 250 mA
Rated power max. (ohmic load)	Au: 2 W, Ag: 12.5 W
Contact resistance when new max.	100 mΩ
Insulation resistance	10^9 Ω

Other specifications
Ambient temp. operating min.	-25 °C
Ambient temp. operating max.	+70 °C
Environmental restistance	acc. to IEC 60068-2 -14, -30, -33 and -78
Operating life min. (operations)	1,000,000
Solderability / solder heat resistance	according to E DIN IEC 600 28-2-20
Wave soldering	260 °C max.
Manual soldering	350 °C / 5 sec. max.

RAFI
SOLUTIONS WITH PASSION

Force/Travel Diagram – Keyswitch RF 15

Operation characteristic limits RF
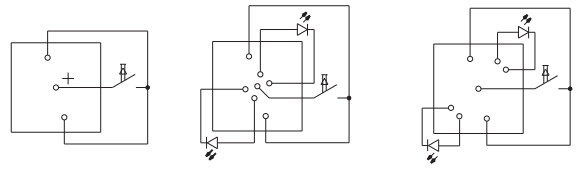
Force

Travel

Circuit Diagram – Keyswitch RF 15

Keyswitch,
non-illuminated

Keyswitch,
fully illuminated

Keyswitch,
spot-illuminated

Dimensional Drawing RF 15

Front mounting   RF 15   Recessed front mounting

1.25 - 1.50 with steel version
2 - 3 with aluminium version

with pressed- in stud M3
min. 5.50

12.00 ±0.10
9.25 ±0.10

19.05   19.05

□16.00
□14.97

Overlay
Front panel
Sealing
Housing

0.50

PCB

Spacer

RF 15 non iluminated

RF 15 iluminated key

Thread stud welded- on with
steel version, pressed-in with
aluminium version

RF 15 with snap- on keycap

RF 15 signal indicator

4

Hole Pattern RF 15

RF15, RF15H

Signal indicator

*Spot-illuminated
5.00

3.21

2.54

2.54

5.00

(19.05)
(15.24min.)

12.70

3.21

Diode

1.27

5.08

3.556 1.27

5.08

19.05   19.05

Non illuminated key

Signal indicator

Fully illuminated key

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

Hole Pattern – Front Panel

□16.00

19.05

19.05
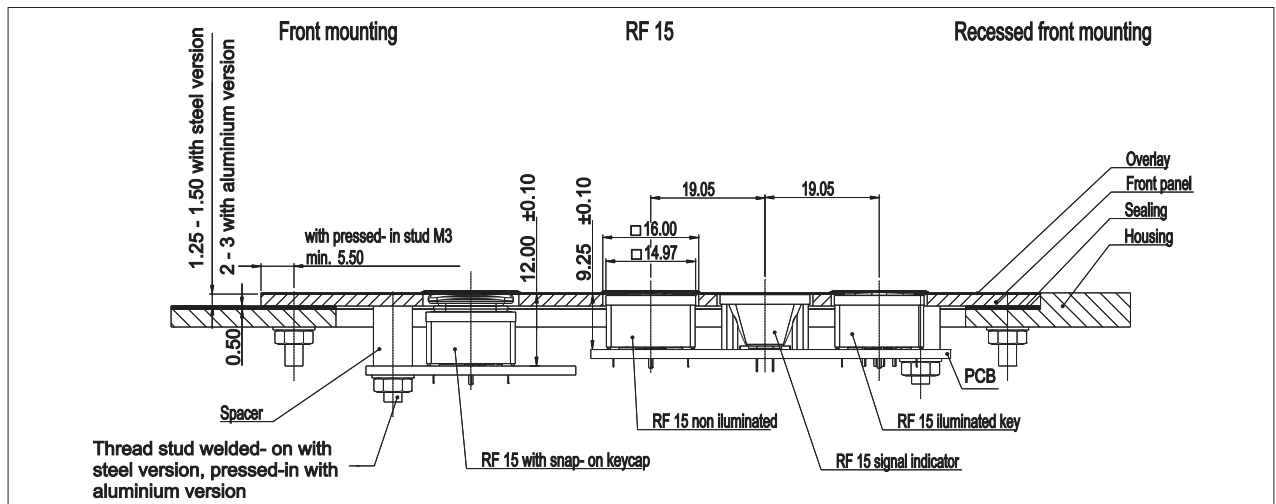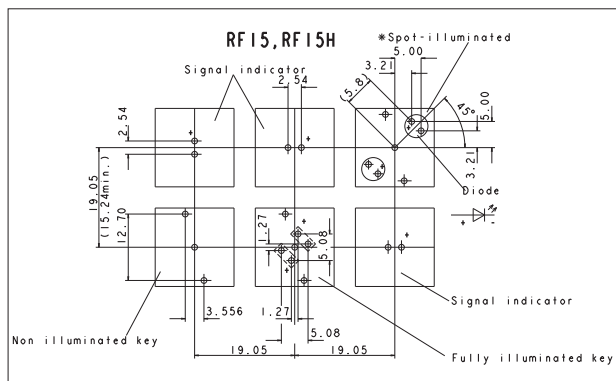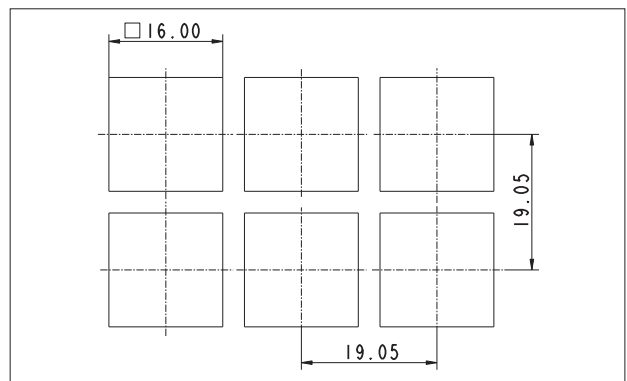
RF

RF 15 - Short-travel keyswitch, non-illuminated
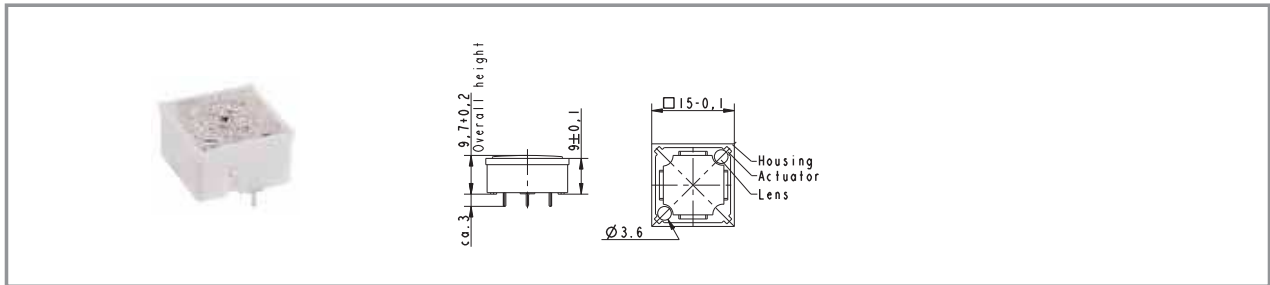
Contact materials	Illumination	Colour of lens	LED colour	LED type	Order no.
Au	not illuminated	transparent	–	–	**3.14.100.001/0000**
Ag	not illuminated	transparent	–	–	**3.14.100.006/0000**

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.
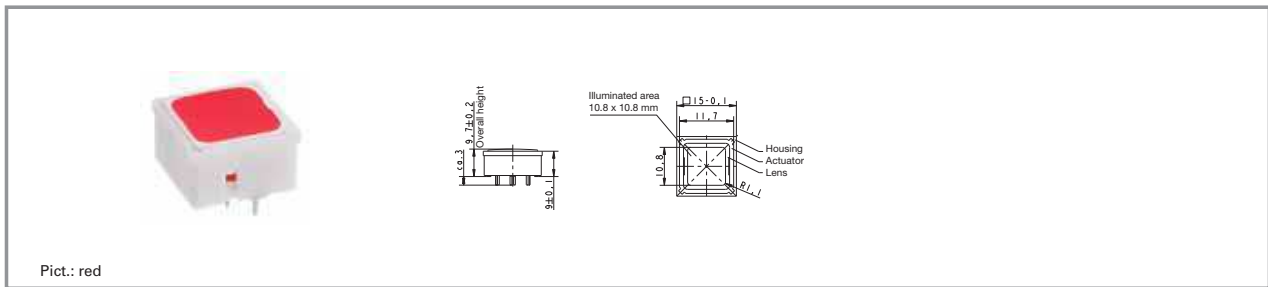
4

RF

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

RAFI
SOLUTIONS WITH PASSION

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

Pict.: red

Illuminated area
10.8 x 10.8 mm

Housing
Actuator
Lens

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.

4

RF

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

RF 15 - Short-travel keyswitch, 1 LED spot-illumination
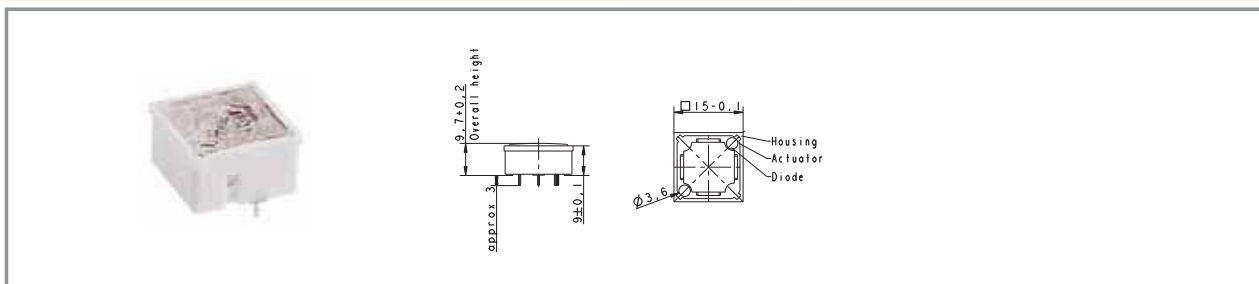
Contact materials	Illumination	Colour of lens	LED colour	LED type	Order no.
Au	spot illumination 1 LED	opaque white	blue	3 mm	3.14.100.030/0000
Au	spot illumination 1 LED	opaque white	red	3 mm	**3.14.100.031/0000**
Au	spot illumination 1 LED	opaque white	green	3 mm	**3.14.100.032/0000**
Au	spot illumination 1 LED	opaque white	yellow	3 mm	**3.14.100.033/0000**
Ag	spot illumination 1 LED	opaque white	blue	3 mm	3.14.100.040/0000
Ag	spot illumination 1 LED	opaque white	red	3 mm	**3.14.100.041/0000**
Ag	spot illumination 1 LED	opaque white	green	3 mm	**3.14.100.042/0000**
Ag	spot illumination 1 LED	opaque white	yellow	3 mm	**3.14.100.043/0000**

Double-spot LED illumination available on request

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

4

RF

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

4

RF

General information

Colour of lens	see order block
Recommended key grid	19.05 mm

Dimensions

Length	15 mm
Width	15 mm
Overall height	6.2 mm

Mechanical design

Mounting	soldering in PCB
Terminals	THT
Contact system	snap-action contact
Contact arrangement	1 NO
Contact materials	see order block
Illumination	external 3 mm LED possible if height more than 12 mm

Mechanical characteristics

Operating force max.	$2.9^{\pm0.6}$ N
Switching travel	$0.5^{+0.2}$ mm
Robustness min.	100 with through-plated PCB N

Electrical characteristics

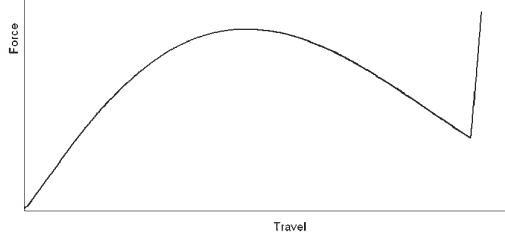|	
Rated voltage min.	Au: 0.02 V, Ag: 3 V
Rated voltage max.	Au: 35 V, Ag: 50 V
Rated current min.	Au: 0.01 mA, Ag: 0.1 mA
Rated current max.	Au: 100 mA, Ag: 250 mA
Rated power max. (ohmic load)	Au: 2 W, Ag: 12.5 W
Contact resistance when new max.	100 mΩ
Insulation resistance	10^9 Ω

Other specifications

|	
Ambient temp. operating min.	-25 °C
Ambient temp. operating max.	+70 °C
Storage temperature max. (in tube)	+50 °C
Environmental restistance	acc. to IEC 60068-2 -14, -30, -33 and -78
Operating life min. (operations)	1,000,000
Solderability / solder heat resistance	according to E DIN IEC 600 28-2-20
Wave soldering	260 °C max.
Manual soldering	350 °C / 5 sec. max.

Force/Travel Diagram – Keyswitch RF 15 N

Operation characteristic limits RF

Force

Travel
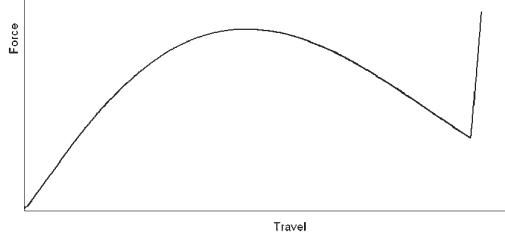
Circuit Diagram – Keyswitch RF 15 N

Keyswitch,
non illuminated

Keyswitch,
spot-illuminated

Dimensional Drawings RF 15 N

□ 15,00 -0,07

□ 15,00 -0,07

Ø 10,00

Ø 15,00

min 1.50

Ø 10.00 (15)

4.80

X

Key overall height X
variable from
8 to 22.5

Distance 5.30109.xxx

From overall height X = 12
illumination is possible
with 3mm LEDs

Front mounting   **RF 15N**   **Recessed front mounting**

1.25-1.50 sith steel version
2-3 with aluminium version

with pressed- in stud M3
min. 5.50

□ 16.00
□ 14.97

0.50

Spacer

19.05   19.05

Thread stud welded- on with
steel version, pressed-in with
aluminium version

Ø 13.00
Ø 10.00

Ø 17.00
Ø 15.00

8...22.5

5.75 ±0.10

PCB

18.00

Overlay
Front panel
Sealing
Housing

Spacer

4

RF

Hole Patterns – Front Panel RF 15 N

RF 15 N without plunger
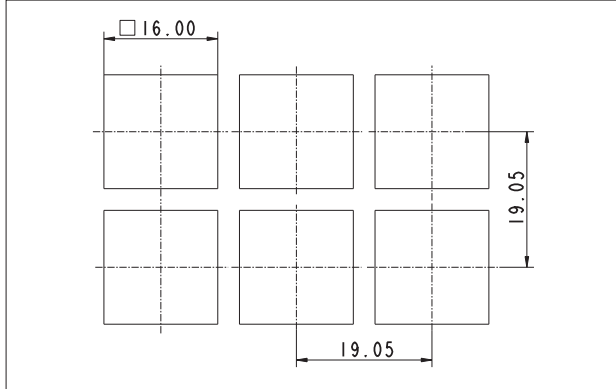
RF 15 N with plunger ø 10 mm, non-illuminated
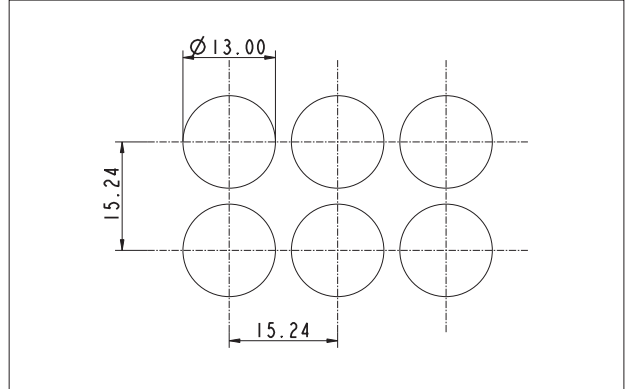
RF 15 N with plunger ø 10 mm, illuminated
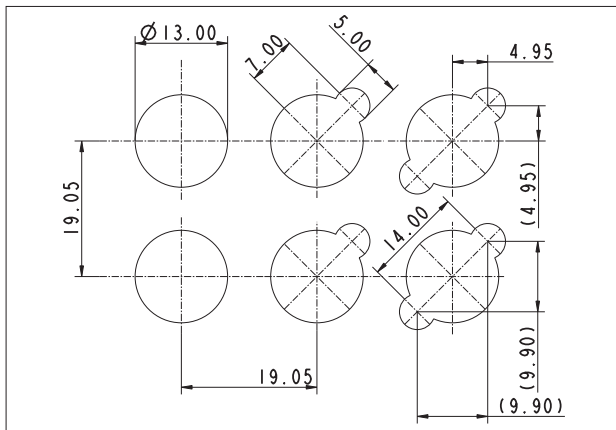
RF 15 N with plunger ø 15 mm, illuminated

4

RF
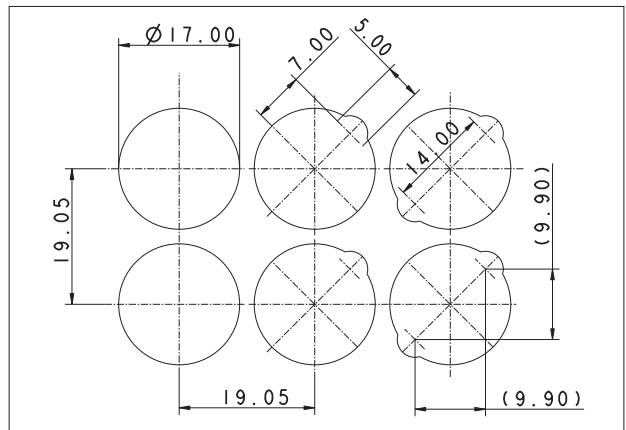
Hole Pattern RF 15 N
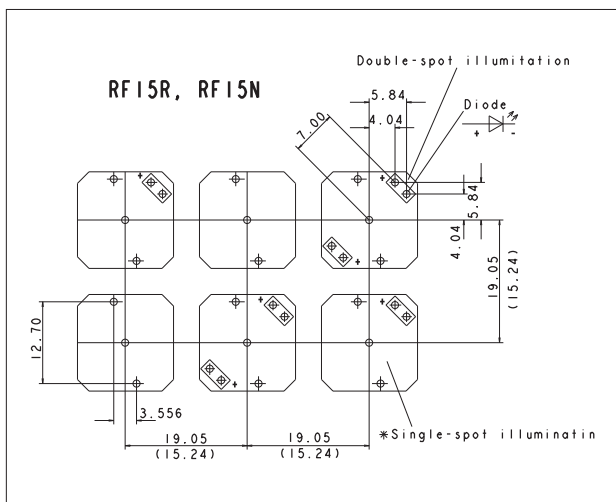
View on component side
All hole diameters 1.1 $^{+/- 0.1}$ mm
PCB layout keyswitch 1/400" grid

RAFI
SOLUTIONS WITH PASSION

Typical accessories RF 15 N - Short-travel keyswitch

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

RF 15 N - Short-travel keyswitch, non-illuminated
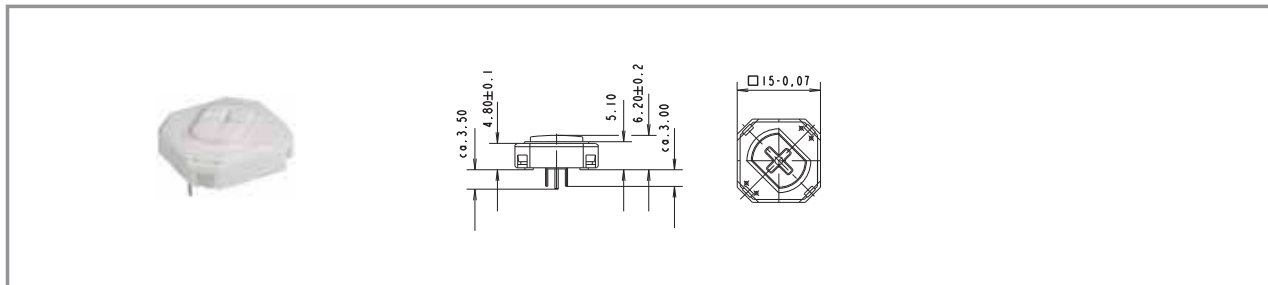
Contact materials	Illumination	Recommended key grid	Overall height	Order no.
Au	external 3 mm LED possible if height more than 12 mm	19.05 mm	6.2 mm	**3.14.100.601/0000**
Ag	external 3 mm LED possible if height more than 12 mm	19.05 mm	6.2 mm	**3.14.100.606/0000**

Technical data see page 4 - 48

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

4

RF

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

RF 15 R - Short-travel keyswitch

Pict.: with 2 mm LED, red

with 3 mm LED, green

General Data

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

Technical Data

4

RF

General information	
Recommended key grid	15.24 mm

Dimensions	
Length	15 mm
Width	15 mm
Overall height	see order block

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

Mechanical characteristics	
Operating force max.	2.9±0.6 N
Switching travel	0.5+0.2 mm
Robustness min.	with through-plated PCB 100 N

Electrical characteristics	
Rated voltage min.	Au: 0.02 V, Ag: 3 V
Rated voltage max.	Au: 35 V, Ag: 50 V
Rated current min.	Au: 0.01 mA, Ag: 0.1 mA
Rated current max.	Au: 100 mA, Ag: 250 mA
Rated power max. (ohmic load)	Au: 2 W, Ag: 12.5 W
Contact resistance when new max.	100 mΩ
Insulation resistance	10^9 Ω

Other specifications	
Ambient temp. operating min.	-25 °C
Ambient temp. operating max.	+70 °C
Environmental restistance	acc. to IEC 60068-2 -14, -30, -33 and -78
Operating life min. (operations)	1,000,000
Solderability / solder heat resistance	according to E DIN IEC 600 28-2-20
Wave soldering	260 °C max.
Manual soldering	350 °C / 5 sec. max.

Force/Travel Diagram – Keyswitch RF 15 R

Operation characteristic limits RF
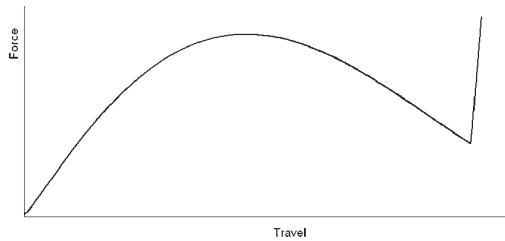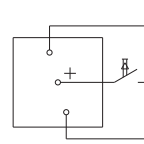
Circuit Diagram – Keyswitch RF 15 R

Keyswitch,
non-illuminated
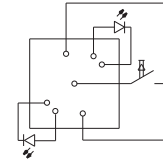
Keyswitch,
spot-illuminated

Dimensional Drawing RF 15 R

Front mounting

RF 15R

Recessed front mounting

1.25 - 1.5 with steel version
2 - 3 with aluminium version

Thread stud welded-on with steel version, pressed- in with aluminium version

with pressed- in stud M3
min. 5.50

9.25 ±0.10

19.05   15.24   19.05

Ø 13.00

Overlay
Front panel
Sealing
Housing

0.50

Spacer

12.00 ±0.10

RF 15R with high actuator

RF 15R
spot - iluminated

RF 15R

RF 15 signal indicator

PCB

4

Hole Pattern RF 15 R

RF15R, RF15N

Double-spot illumitation

5.84
4.04

Diode

7.00

5.84

4.04

19.05
(15.24)

12.70

3.556

19.05
(15.24)

19.05
(15.24)

Single-spot illuminatin

RF

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

RAFI
SOLUTIONS WITH PASSION

Hole Pattern – Front Panel RF 15 R

RF 15 R, non-illuminated

RF 15 R, illuminated

4

RF

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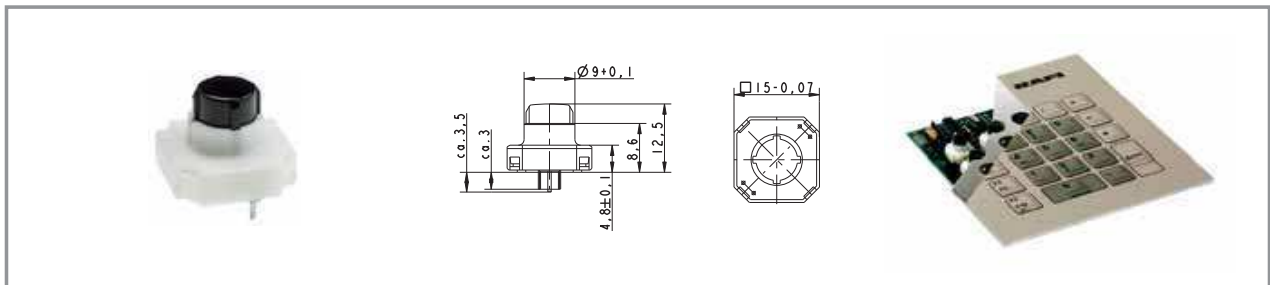
Contact materials	Overall height	Illumination	LED type	LED colour	Order no.
Au	12.5 mm	not illuminated	–	–	**3.14.100.801/0000**
Ag	12.5 mm	not illuminated	–	–	**3.14.100.806/0000**

Technical data see page 4 - 52

4

RF

RF 15 R - Low short-travel keyswitch, 1 LED spot-illumination
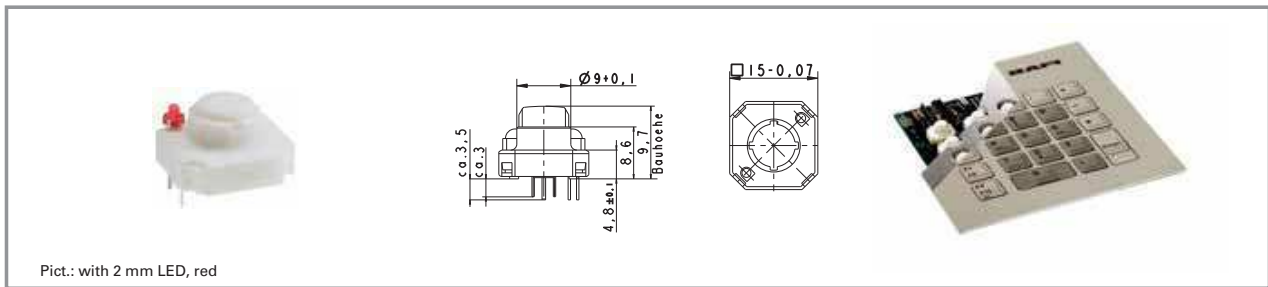
Pict.: with 2 mm LED, red

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

Technical data see page 4 - 52

Versions with 2 LEDs available on request.

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

4

RF

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

PCB Keyswitches

RF 15 R - High short-travel keyswitch, 1 LED spot-illumination
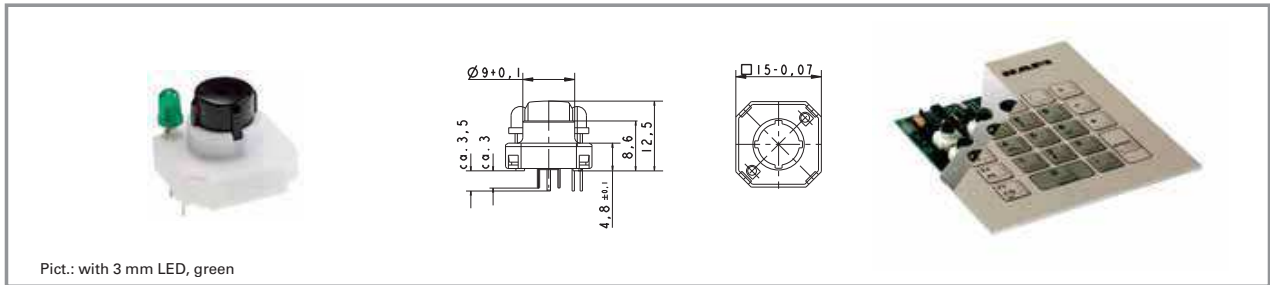
Pict.: with 3 mm LED, green

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

Technical data see page 4 - 52

Versions with 2 LEDs available on request.

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

4

RF

PCB - Keyswitches

RF 15 H - Short-travel keyswitch
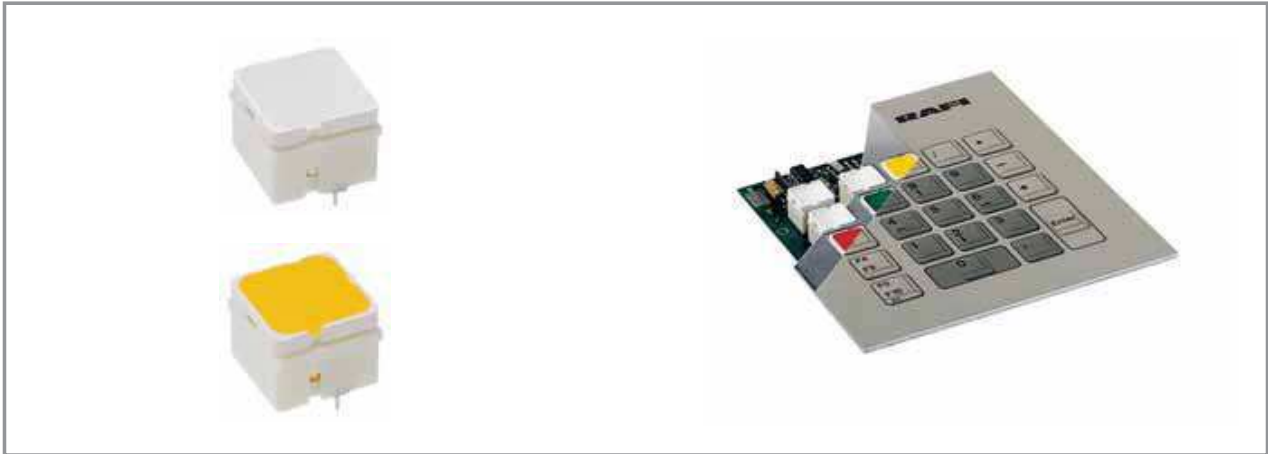
General Data

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

Technical Data

General information
Colour of lens	see order block
Recommended key grid	20 mm

Dimensions
Length	15 mm
Width	15 mm
Overall height	12.5 mm

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

Mechanical characteristics
Operating force max.	$2.9^{\pm0.6}$ N
Switching travel	$0.5^{+0.2}$ mm
Robustness min.	with through-plated PCB 100 N

Electrical characteristics
Rated voltage min.	Au: 0.02 V, Ag: 3 V
Rated voltage max.	Au: 35 V, Ag: 50 V
Rated current min.	Au: 0.01 mA, Ag: 0.1 mA
Rated current max.	Au: 100 mA, Ag: 250 mA
Rated power max. (ohmic load)	Au: 2 W, Ag: 12.5 W
Contact resistance when new max.	100 mΩ
Insulation resistance	10^9 Ω

Other specifications
Ambient temp. operating min.	-25 °C
Ambient temp. operating max.	+70 °C
Environmental restistance	acc. to IEC 60068-2 -14, -30, -33 and -78
Operating life min. (operations)	1,000,000
Solderability / solder heat resistance	according to E DIN IEC 600 28-2-20
Wave soldering	260 °C max.
Manual soldering	350 °C / 5 sec. max.

4

RF

RAFI
SOLUTIONS WITH PASSION

Force/Travel Diagram – Keyswitch RF 15 H

Operation characteristic limits RF
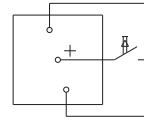
Force

Travel

Circuit Diagram – Keyswitch RF 15 H

Keyswitch,
non-illuminated
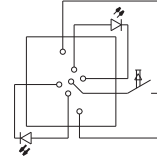
Keyswitch,
fully illuminated

Dimensional Drawing

Hole Pattern

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

Hole Pattern – Front Panel

4
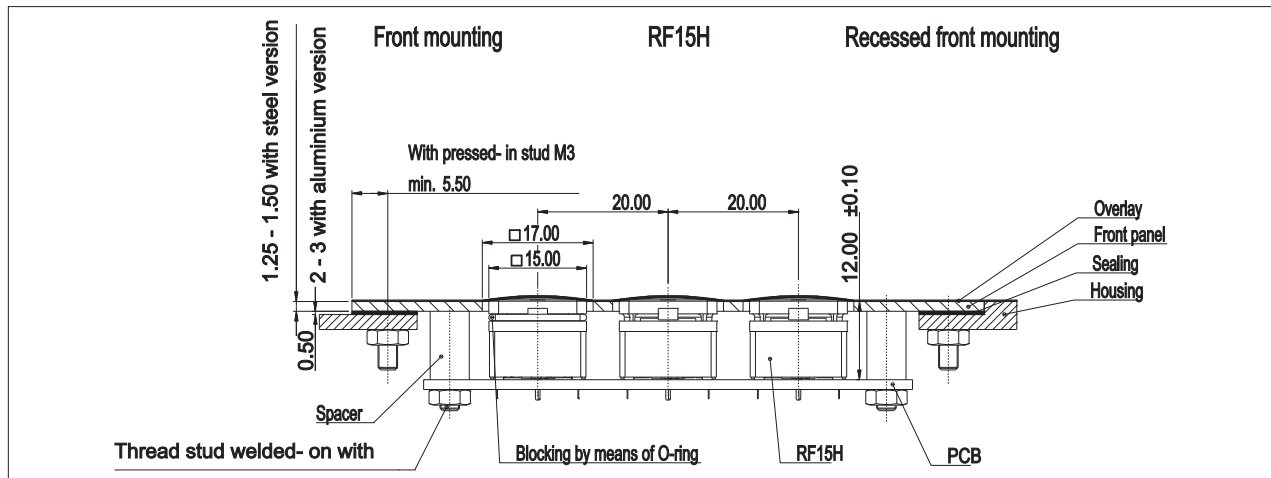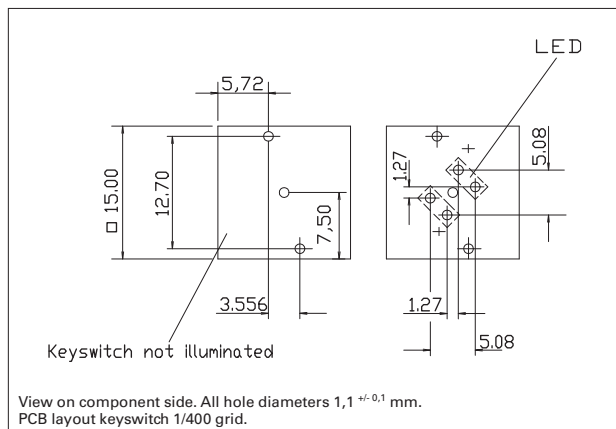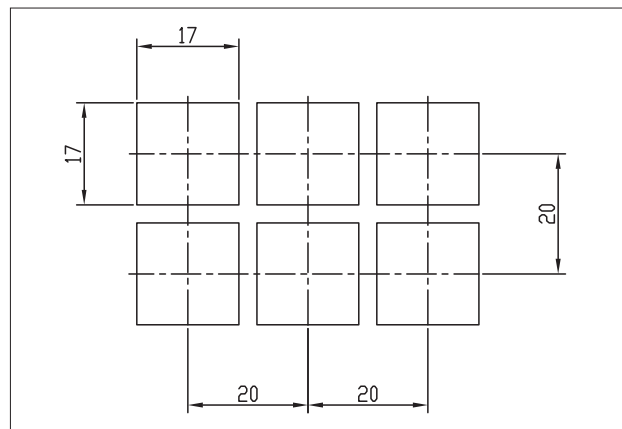
RF

Typical accessories RF 15 H - Short-travel keyswitch

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

RF 15 H - Short-travel keyswitch, non-illuminated
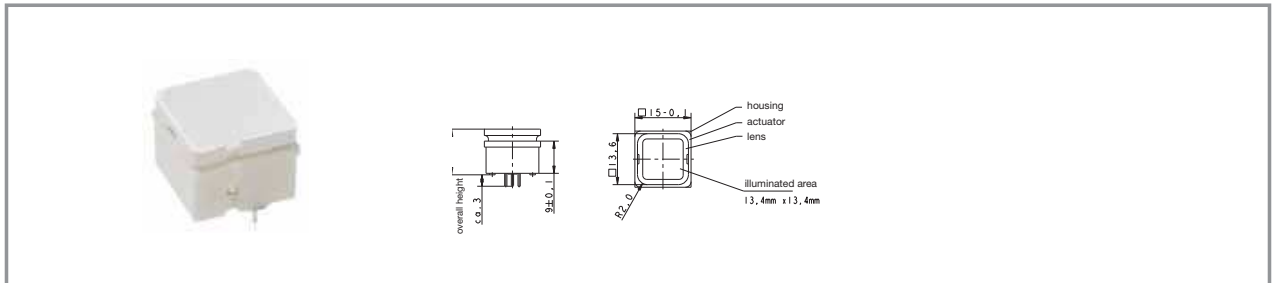
Contact materials	Illumination	Colour of lens	LED colour	LED type	Order no.
Au	not illuminated	white	–	–	3.14.100.702/0000
Ag	not illuminated	white	–	–	3.14.100.707/0000

Technical data see page 4 - 58
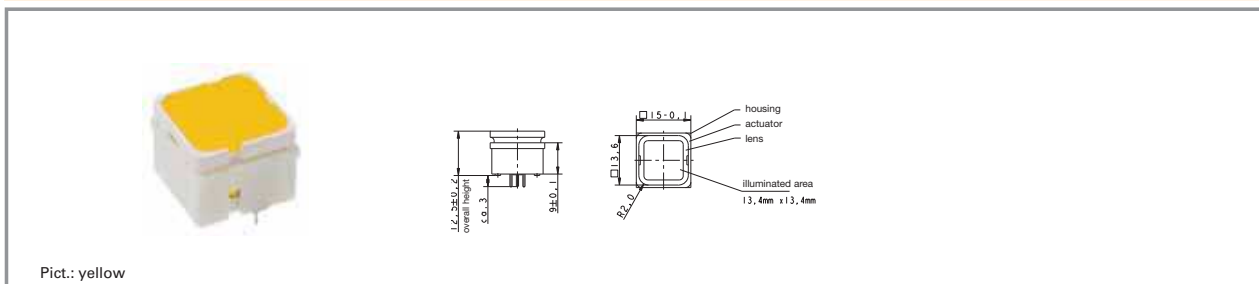
4

RF

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

RF 15 H - Short-travel keyswitch, fully illuminated

Pict.: yellow

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

Technical data see page 4 - 58

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

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

4

RF

RF 15 - Signal indicator

Technical Data

General information
Colour of lens	see order block
Recommended key grid	19.05 mm

Dimensions
Length	15 mm
Width	15 mm
Overall height	9.7 mm

Mechanical design
Mounting	THT soldering in PCB
Illumination	fully illuminated
	1 LED
LED colour	see order block
LED type	2 mm

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

4

RF

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SOLUTIONS WITH PASSION

Dimensional Drawing Signal Indicator RF 15

Front mounting   RF 15   Recessed front mounting

1.25 - 1.50 with steel version
2 - 3 with aluminium version

with pressed- in stud M3
min. 5.50

12.00 ±0.10
9.25 ±0.10

19.05   19.05

Overlay
Front panel
Sealing
Housing

□16.00
□14.97

0.50

PCB

Spacer

Thread stud welded- on with
steel version, pressed-in with
aluminium version

RF 15 with snap- on keycap

RF 15 non iluminated

RF 15 signal indicator

RF 15 iluminated key

Hole Pattern

RF I5, RF I5H

Signal indicator
2.54

*Spot-illuminated
5.00
3.21
(5.8)
45°
5.00
3.21
Diode
2.54

19.05
(15.24min.)
12.70

1.27
5.08

3.556   1.27
5.08
19.05   19.05

Non illuminated key

Signal indicator

Fully illuminated key

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

Hole Pattern – Front Panel

□16.00

19.05

19.05

4

RF

RAFI
SOLUTIONS WITH PASSION

RF 15 - Signal indicator, fully illuminated, 1 LED

Illuminated area
10.8 x 10.8 mm

Housing
Lens

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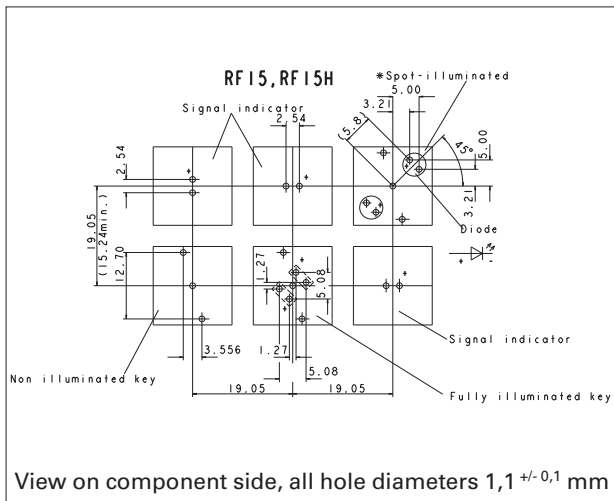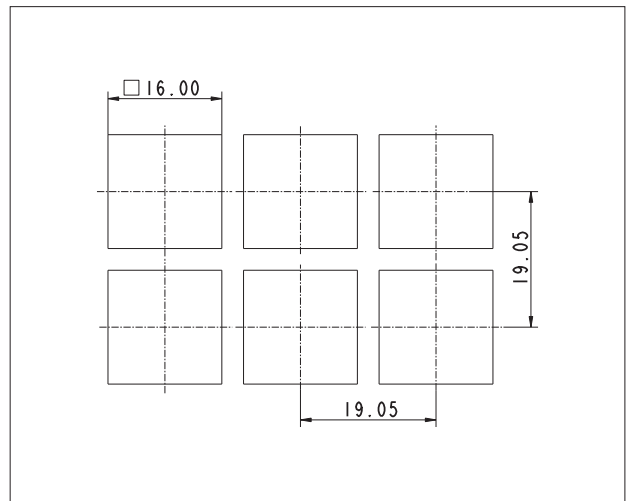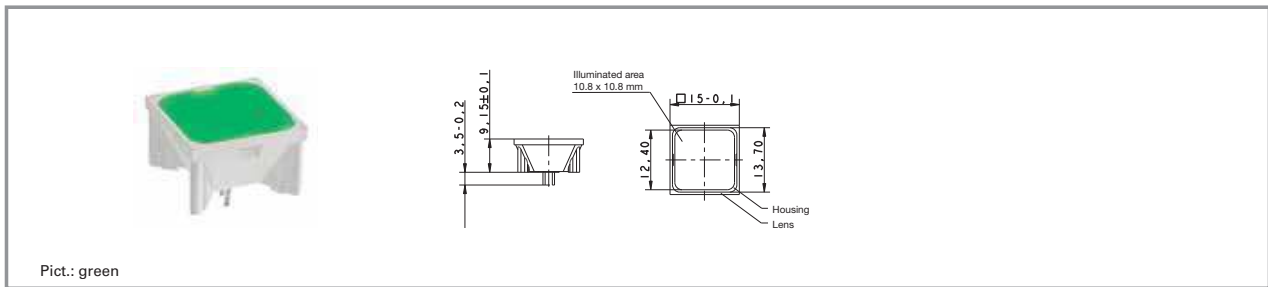
Overall height	Illumination	Colour of lens	LED colour	LED type	Order no.
9.7 mm	fully illuminated 1 LED	red	red	2 mm	**3.14.200.051/0000**
9.7 mm	fully illuminated 1 LED	green	green	2 mm	**3.14.200.052/0000**
9.7 mm	fully illuminated 1 LED	yellow	yellow	2 mm	**3.14.200.053/0000**
9.7 mm	fully illuminated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

Technical data see page 4 - 62

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

4

RF

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

RAFI
SOLUTIONS WITH PASSION

RF 19 - Short-travel keyswitch

General Data

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

Technical Data

General information

Colour of lens	see order block
Recommended key grid	23 mm

Dimensions

Length	19.05 mm
Width	19.05 mm
Overall height	9.7 mm

Mechanical design

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

Mechanical characteristics

Operating force max.	$2.9^{\pm0.6}$ N
Switching travel	$0.5^{+0.2}$ mm
Robustness min.	with through-plated PCB 100 N

Electrical characteristics

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

Other specifications

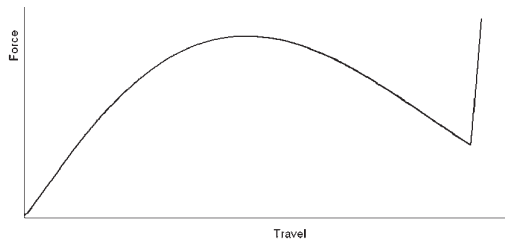|	
Ambient temp. operating min.	-25 °C
Ambient temp. operating max.	+70 °C
Environmental restistance	acc. to IEC 60068-2 -14, -30, -33 and -78
Operating life min. (operations)	1,000,000
Solderability / solder heat resistance	according to E DIN IEC 600 28-2-20
Wave soldering	260 °C max.
Manual soldering	350 °C / 5 sec. max.

4

RF

PCB Keyswitches

RAFI
SOLUTIONS WITH PASSION

Force/Travel Diagram – Keyswitch RF 19

Operation characteristic limits RF
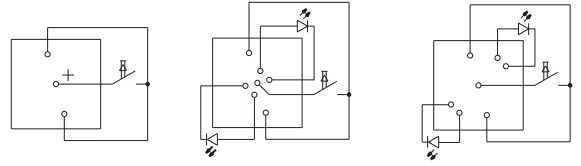
Force

Travel

Circuit Diagram – Keyswitch RF 19

Keyswitch,
non-illuminated

Keyswitch,
fully illuminated

Keyswitch,
spot-illuminated

Dimensional Drawing

Front mounting   RF 19   Recessed front mounting

1.25 - 1.5 with steel version
2 - 3 with aluminium version

Overlay
Front panel
Sealing
Housing

With pressed- in stud M3
min. 5.50

23.00   23.00

□20.00
□18.97

0.50

Spacer

9.25 ±0.10

Thread stud welded- on with
steel version, pressed-in with
aluminium version

RF 19 illuminated key   RF 19 signal indicator   RF 19 non illuminated   PCB
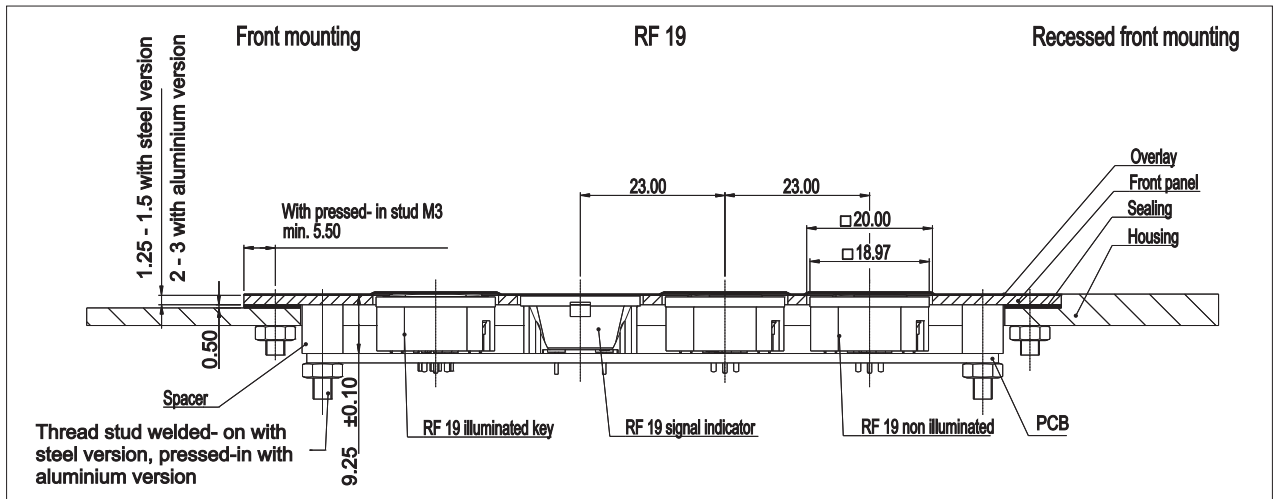
4

RF
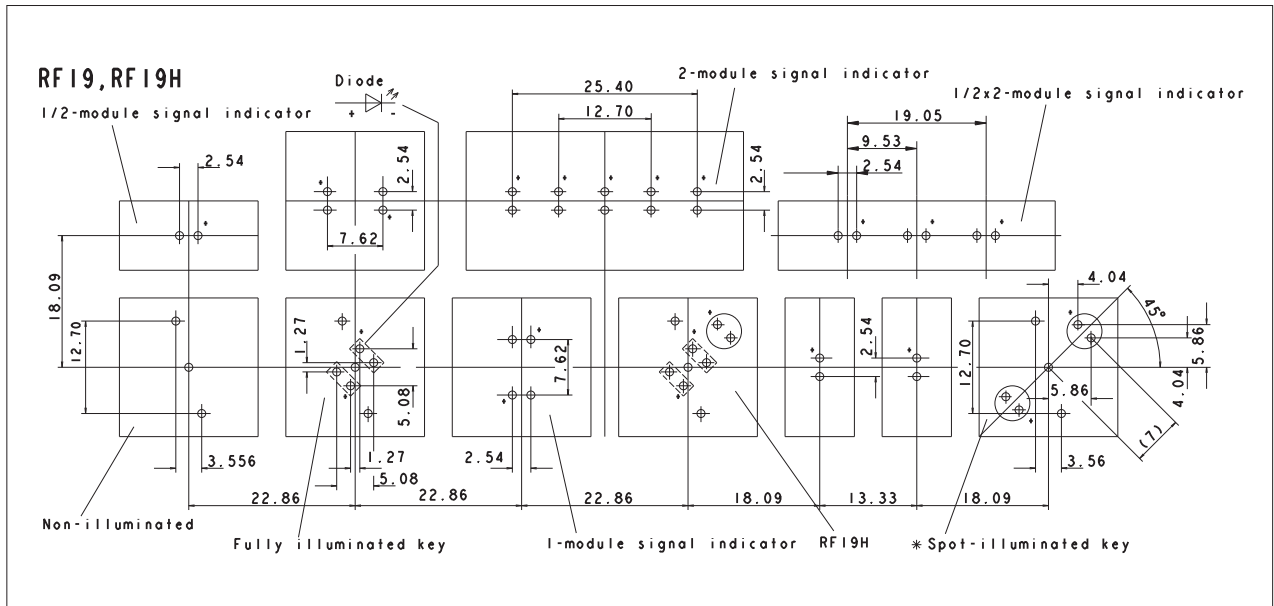
Hole Patterns RF 19

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

Hole Patterns – Front Panel RF 19

4
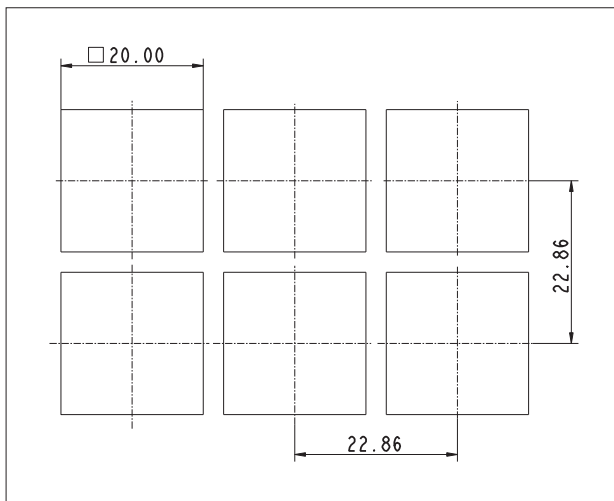
RF

RF 19 - Short-travel keyswitch, non-illuminated
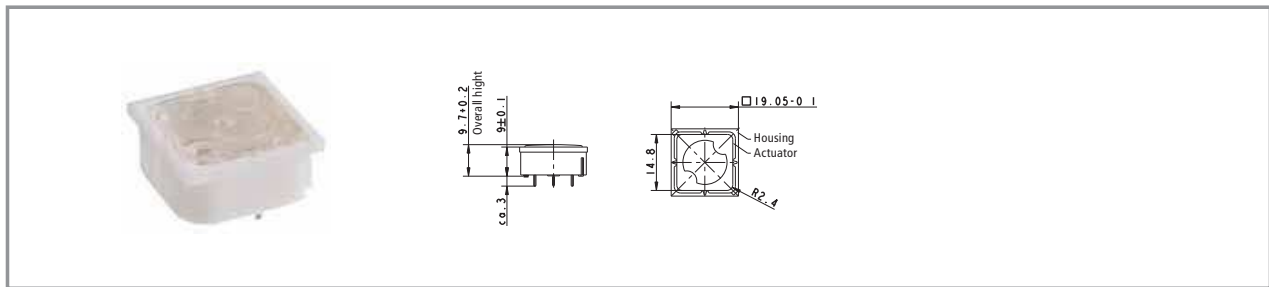
Contact materials	Illumination	Colour of lens	LED colour	LED type	Order no.
Au	not illuminated	transparent	–	–	**3.14.001.001/0000**
Ag	not illuminated	transparent	–	–	**3.14.001.006/0000**

Technical data see page 4 - 66

4

RF

RAFI
SOLUTIONS WITH PASSION

RF 19 - Short-travel keyswitch, fully illuminated with 2 LED
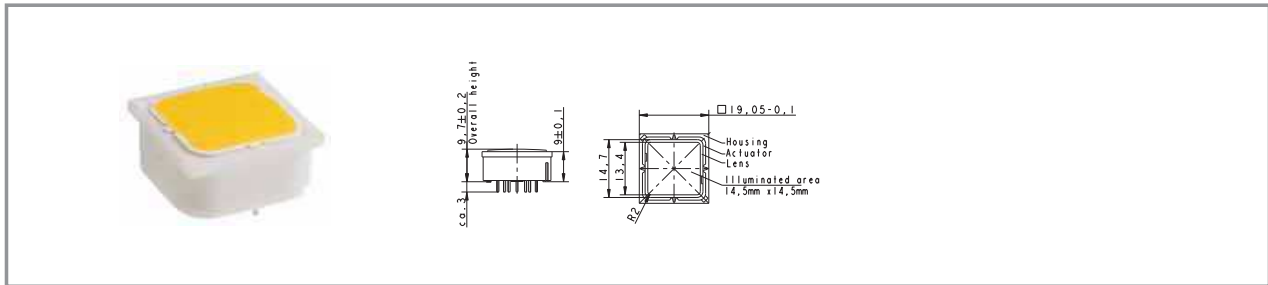
Contact materials	Illumination	Colour of lens	LED colour	LED type	Order no.
Au	fully illuminated 2 LED	red	red	2 mm	**3.14.002.011/0000**
Au	fully illuminated 2 LED	green	green	2 mm	**3.14.002.012/0000**
Au	fully illuminated 2 LED	opaque white	green	2 mm	3.14.002.901/0000
Au	fully illuminated 2 LED	yellow	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

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

PCB Keyswitches

RF 19 - Short-travel keyswitch, 1 LED spot-illumination
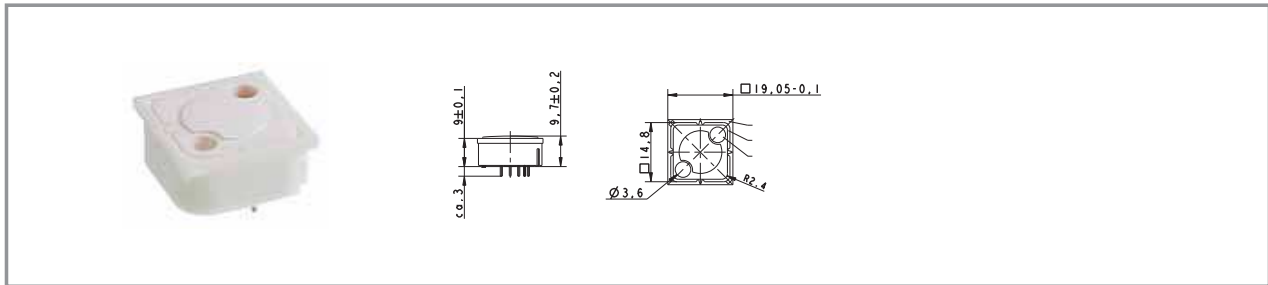
Contact materials	Illumination	Colour of lens	LED colour	LED type	Order no.
Au	spot illumination 1 LED	opaque white	blue	3 mm	3.14.001.030/0000
Au	spot illumination 1 LED	opaque white	red	3 mm	**3.14.001.031/0000**
Au	spot illumination 1 LED	opaque white	green	3 mm	**3.14.001.032/0000**
Au	spot illumination 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

RAFI
SOLUTIONS WITH PASSION

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

4

RF

General information
Colour of lens	see order block
Recommended key grid	24 mm

Dimensions
Length	19.05 mm
Width	19.05 mm
Overall height	12.5 mm

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

Mechanical characteristics
Operating force max.	$2.9^{\pm0.6}$ N
Switching travel	$0.5^{+0.2}$ mm
Robustness min.	with through-plated PCB 100 N

Electrical characteristics
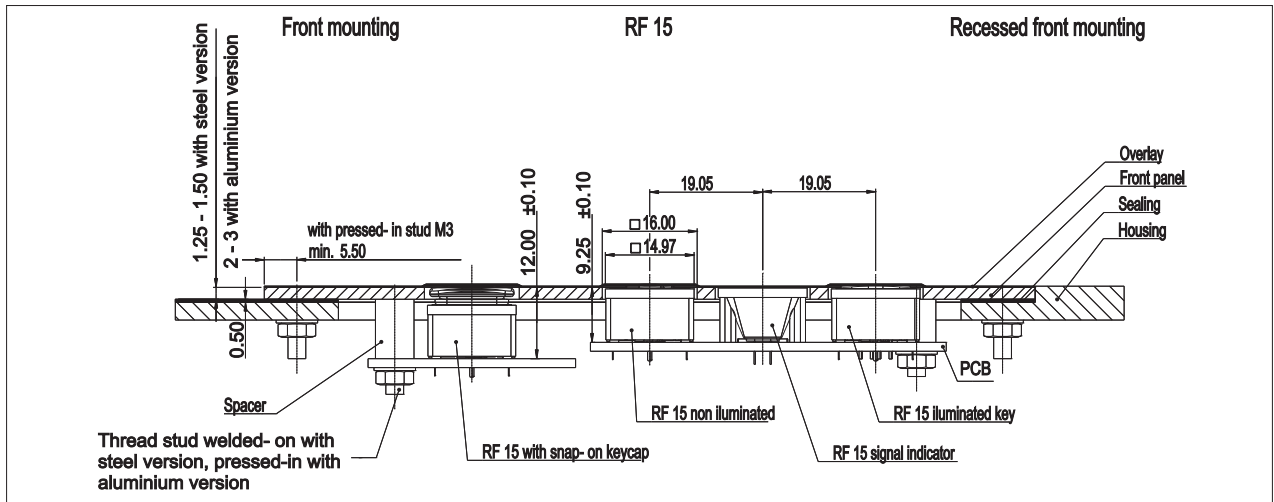|	
Rated voltage min.	Au: 0.02 V, Ag: 3 V
Rated voltage max.	Au: 35 V, Ag: 50 V
Rated current min.	Au: 0.01 mA, Ag: 0.1 mA
Rated current max.	Au: 100 mA, Ag: 250 mA
Rated power max. (ohmic load)	Au: 2 W, Ag: 12.5 W
Contact resistance when new max.	100 mΩ
Insulation resistance	10^9 Ω

Other specifications
Ambient temp. operating min.	-25 °C
Ambient temp. operating max.	+70 °C
Environmental restistance	acc. to IEC 60068-2 -14, -30, -33 and -78
Operating life min. (operations)	1,000,000
Solderability / solder heat resistance	according to E DIN IEC 600 28-2-20
Wave soldering	260 °C max.
Manual soldering	350 °C / 5 sec. max.

Force/Travel Diagram – Keyswitch RF 19 H

Operation characteristic limits RF
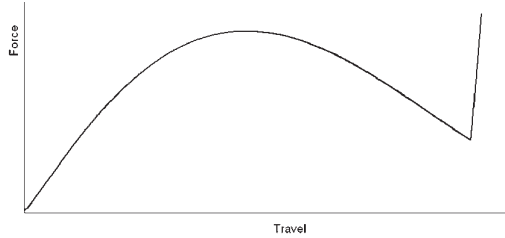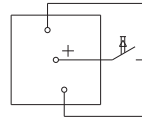
Circuit Diagram – Keyswitch RF 19 H

Keyswitch,
non illuminated
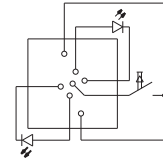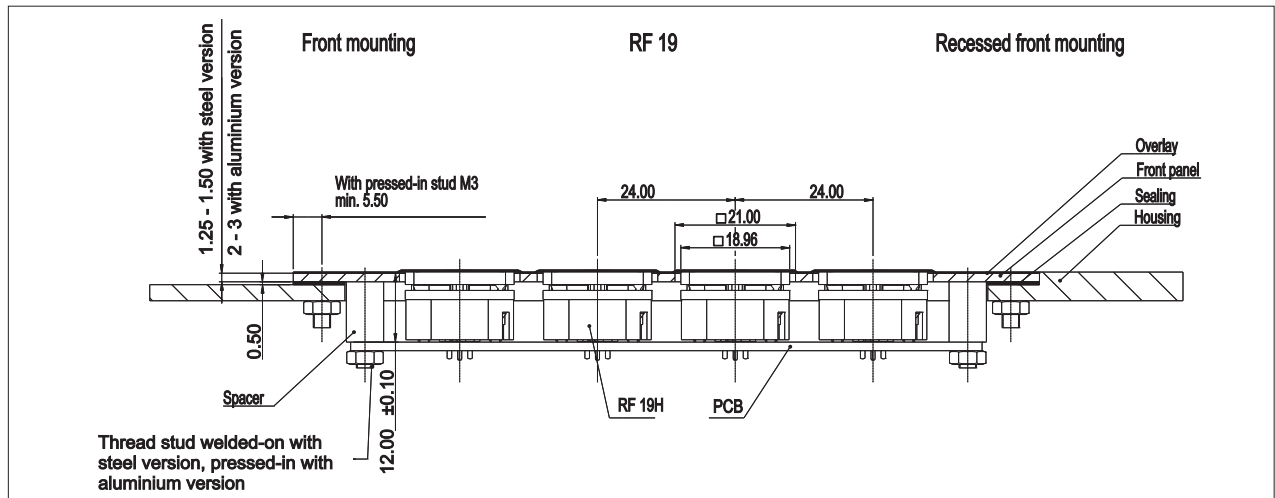
Keyswitch,
fully illuminated

Dimensional Drawing

4

RF
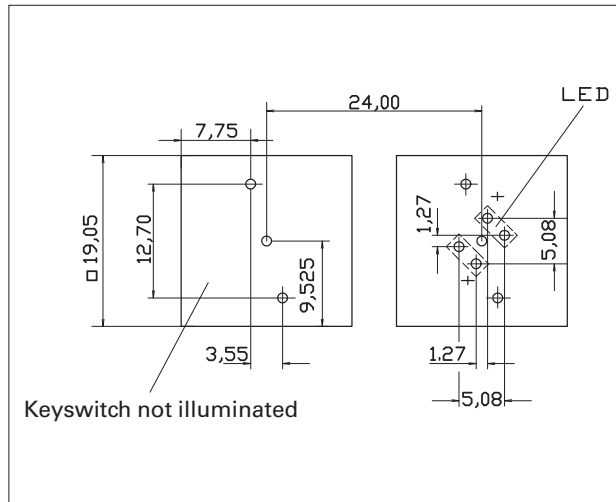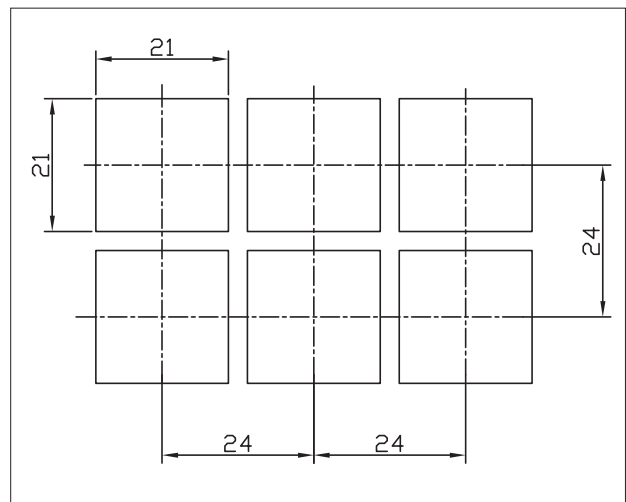
RAFI
SOLUTIONS WITH PASSION

Hole Pattern RF 19 H

24,00
7,75
19,05
12,70
9,525
3,55
LED
1,27
5,08
1,27
5,08
Keyswitch not illuminated

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 Pattern – Front Panel RF 19 H

21
21
24
24
24

4

Typical accessories RF 19 H - Short-travel keyswitch

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

RF
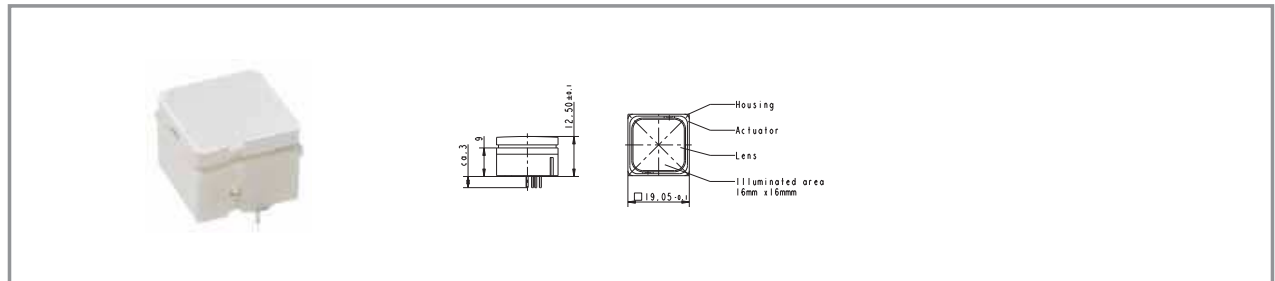
RF 19 H - Keyswitch, non-illuminated

Housing
Actuator
Lens
Illuminated area 16mm x 16mm
□ 19.05

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

Technical data see page 4 - 72
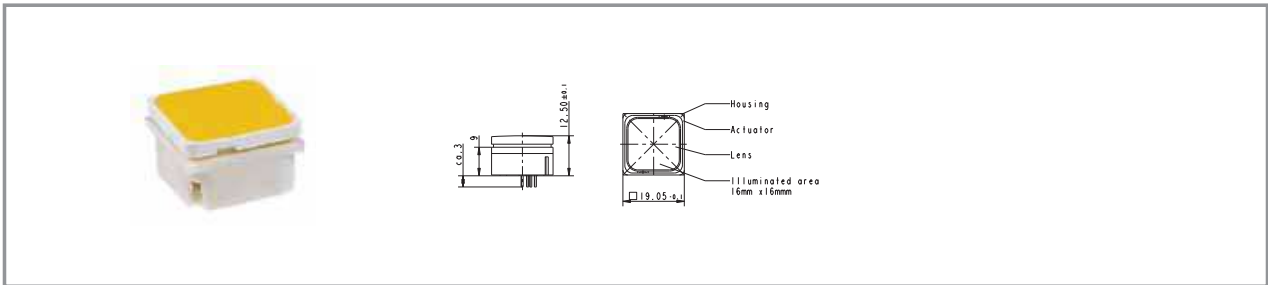
Stock items are marked
by **bold printed order numbers**.

PCB Keyswitches

RF - Short-travel keyswitches

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.

PCB Keyswitches

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

4 - 75

Downloaded from Datasheet.su

RF 19 - Signal indicator

Pict.: 0.5 x 1-module

0,5 x 2-module

1 x 1-module

1 x 2-module
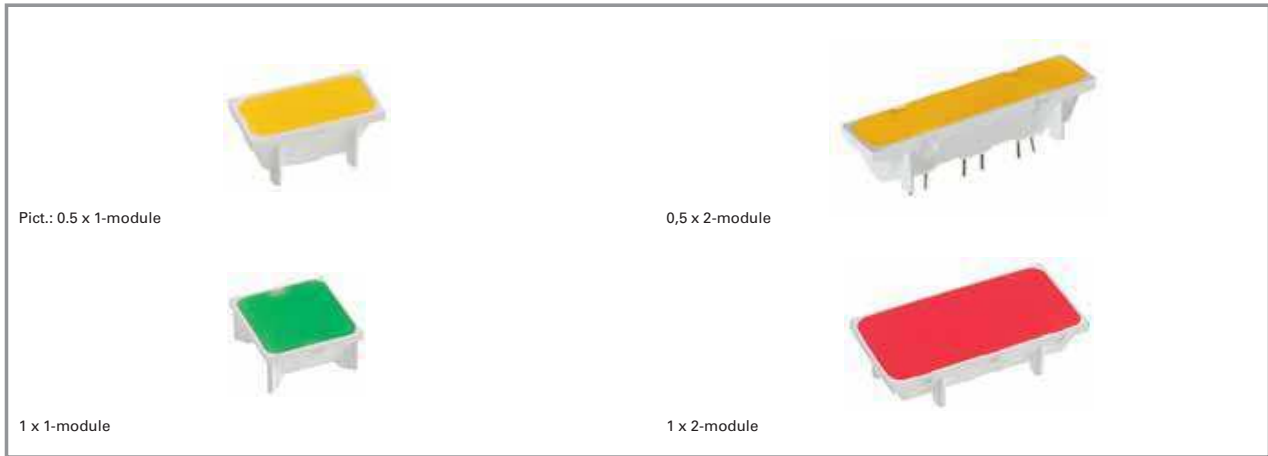
Technical Data

General information
Colour of lens	see order block
Recommended key grid	23/x mm

Dimensions
Length	see order block
Width	see order block
Overall height	9.15 mm

Mechanical design
Mounting	THT soldering in PCB
Illumination	see order block
LED colour	see order block
LED type	see order block

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

4

RF

Dimensional Drawing Signal Indicator RF 19
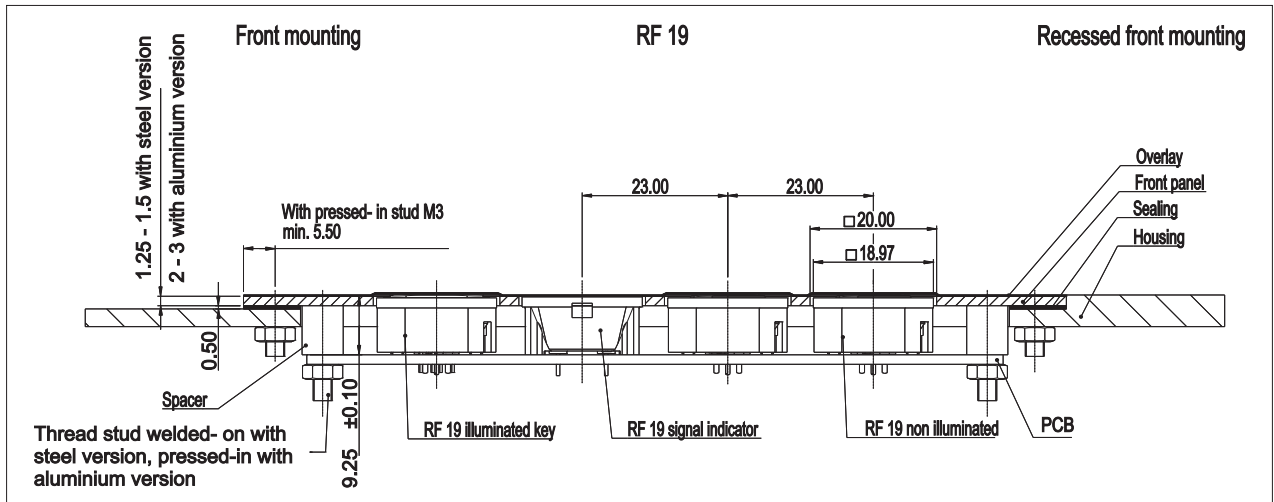
Hole Pattern RF 19
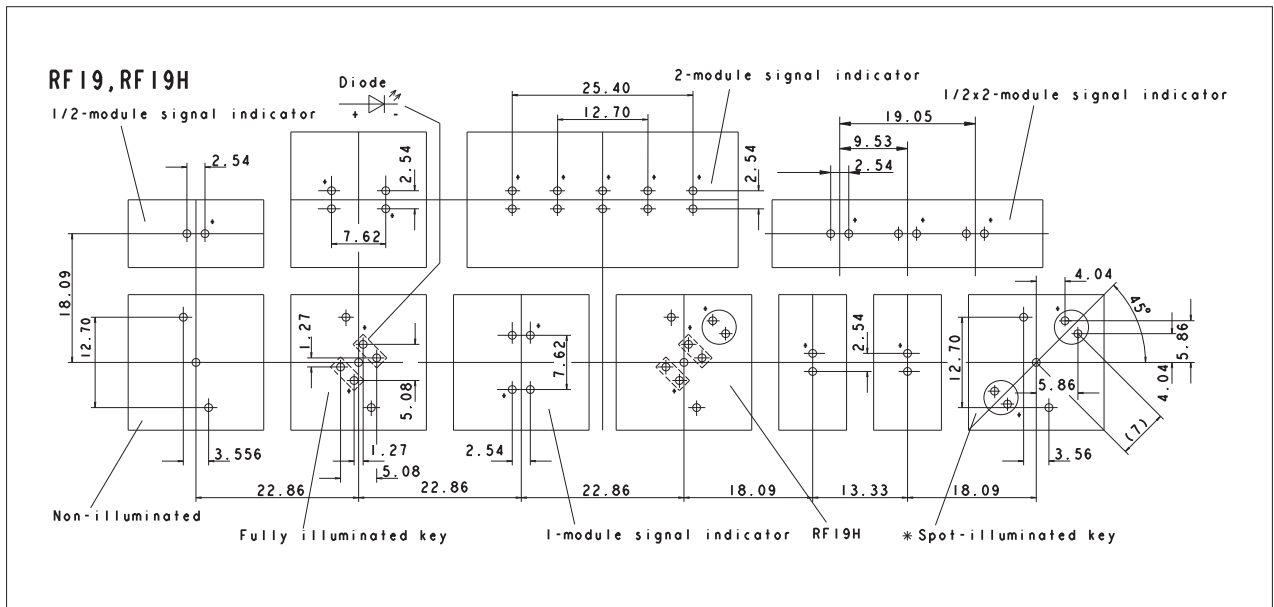
*The LED may be positioned either on the left-hand or right-hand side.
  Standard version: LED on left-hand side
 View on component side, all hole diameters 1.1 +/- 0.1 mm

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

RAFI
SOLUTIONS WITH PASSION

RF 19 - Signal indicator, ½ x 1-module
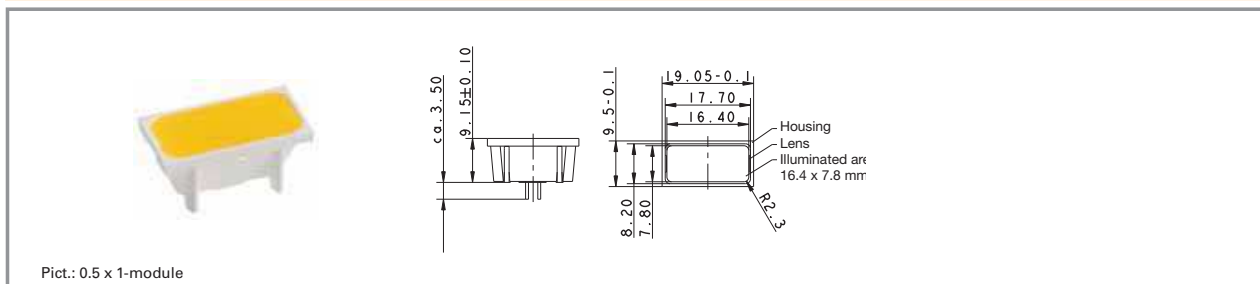
Pict.: 0.5 x 1-module

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

Technical data see page 4 - 76

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

RF 19 - Signal indicator, ½ x 2-module
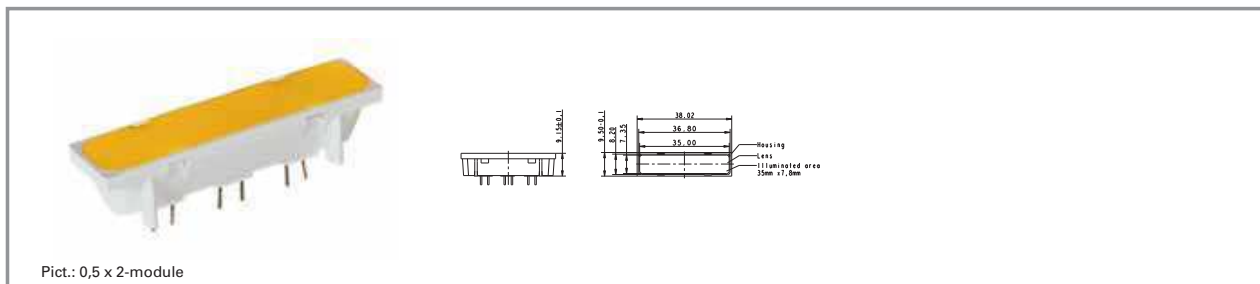
Pict.: 0,5 x 2-module

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

Technical data see page 4 - 76

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

4

RF

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

RAFI
SOLUTIONS WITH PASSION

RF 19 - Signal indicator, 1 x 1-module

Pict.: 1 x 1-module
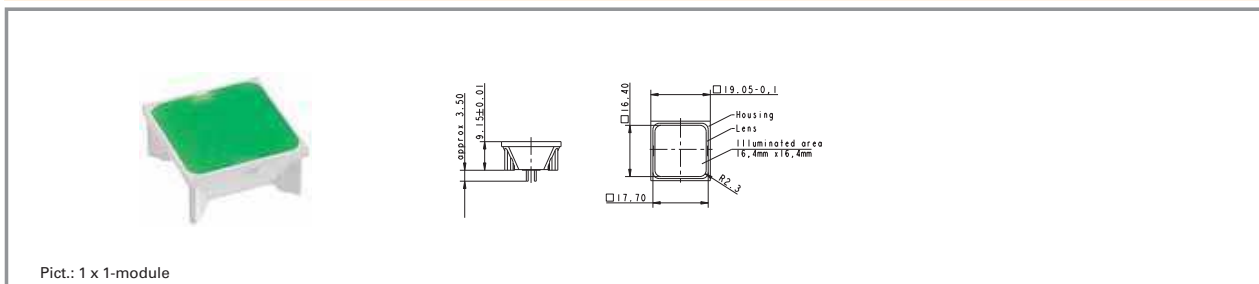
Illumination	Colour of lens	LED colour	LED type	Order no.
fully illuminated 2 LED	red	red	2 mm	**3.14.002.051/0000**
fully illuminated 2 LED	green	green	2 mm	**3.14.002.052/0000**
fully illuminated 2 LED	yellow	yellow	2 mm	**3.14.002.053/0000**
fully illuminated 2 LED	orange	yellow	2 mm	3.14.002.054/0000
fully illuminated 2 LED	blue	blue	2 mm	3.14.001.659/0000

Technical data see page 4 - 76

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

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

RF 19 - Signal indicator, 1 x 2-module

Pict.: 1 x 2-module
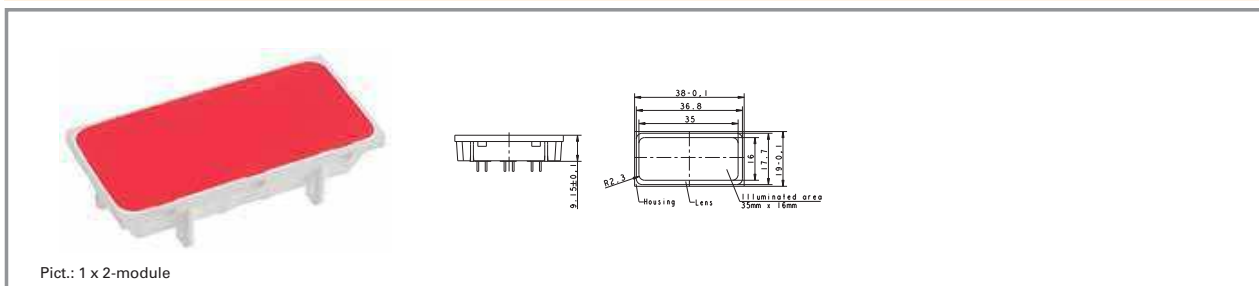
Illumination	Colour of lens	LED colour	LED type	Order no.
fully illuminated 5 LED	red	red	2 mm	3.14.002.071/0000
fully illuminated 5 LED	green	green	2 mm	3.14.002.072/0000
fully illuminated 5 LED	yellow	yellow	2 mm	3.14.002.073/0000
fully illuminated 5 LED	orange	yellow	2 mm	3.14.002.074/0000

Technical data see page 4 - 76

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

4

RF

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

RAFI
SOLUTIONS WITH PASSION

RF 15/19 - Special accessories

Pict.: opaque light grey   round and triangular versions

Technical Data

Dimensions
Length	see order block	
Width	see order block	

Overall height	see order block
Diameter	see order block
Colour	see order block

RF 15 N - Extension plunger, round head

□15,00-0,07
Ø10,00

Key overall height X variable from 8 to 22.5
min 1.50
Ø10.00(15)
4.80
X
Distance 5.30109.xxx
From overall height X = 12 illumination is possible with 3mm LEDs

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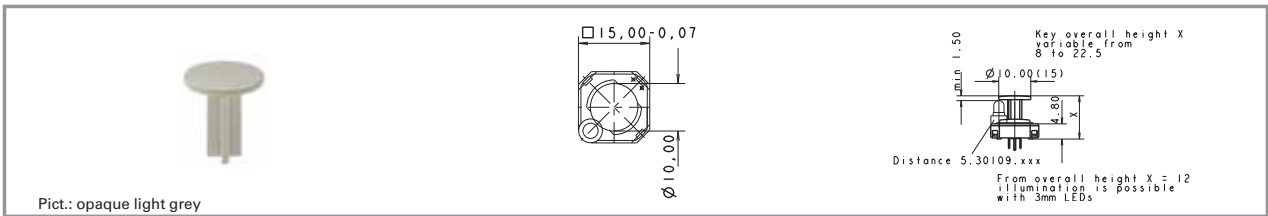
Length	Width	Overall height	Diameter	Colour	Order no.
-	-	9 mm	10 mm	-	5.46.011.036/0710
-	-	9.7 mm	10 mm	-	5.46.011.030/0710
-	-	12.5 mm	10 mm	-	5.46.011.037/0710
-	-	13 mm	10 mm	-	5.46.011.038/0710
-	-	22.5 mm	10 mm	-	**5.46.011.028/0710**

Length of plunger = Overall height - 4.25 mm.

4

RF

RF 15 N - Extension plunger, round head, with recess for LED
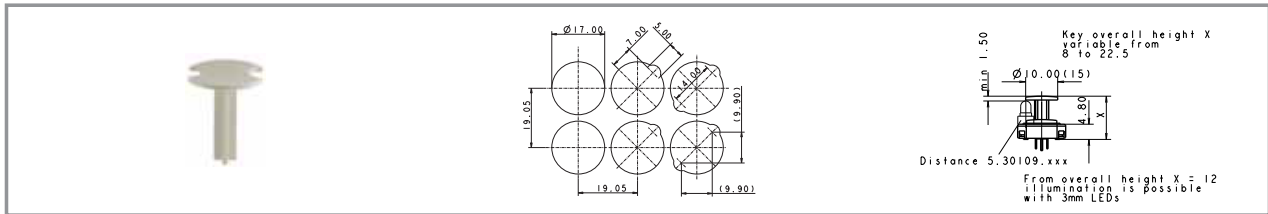
Length	Width	Overall height	Diameter	Colour	Order no.
-	-	9 mm	15 mm	-	5.46.017.036/0710
-	-	9.7 mm	15 mm	-	5.46.017.030/0710
-	-	12.5 mm	15 mm	-	5.46.017.037/0710
-	-	22.5 mm	15 mm	-	5.46.017.028/0710
-	-	13 mm	15 mm	-	5.46.017.038/0710

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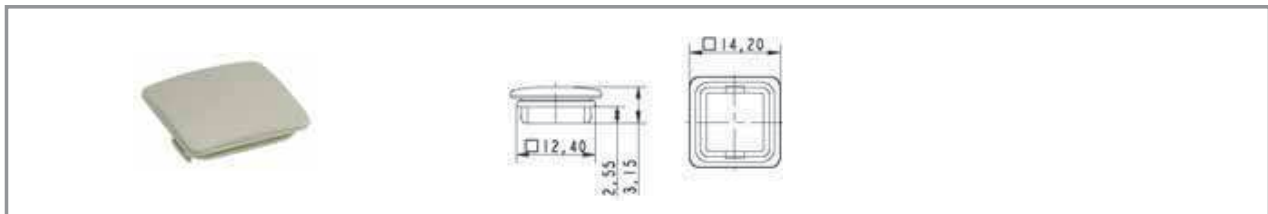
Length	Width	Overall height	Diameter	Colour	Order no.
14.2 mm	14.2 mm	12.5 mm	-	beige	5.46.654.059/0227

Technical data see page 4 - 80

RAFI
SOLUTIONS WITH PASSION

Spacers, round
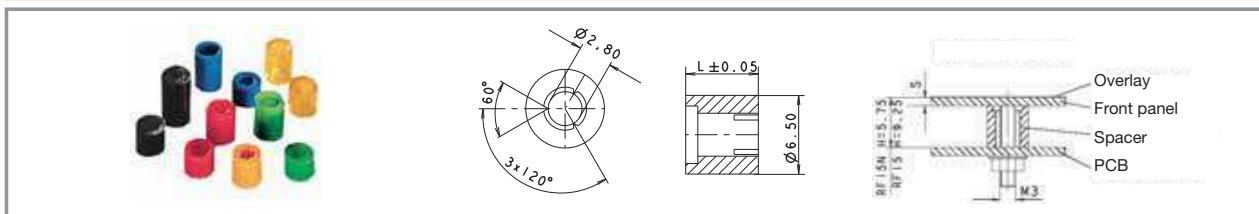
Length	Width	Overall height	Diameter	Colour	Order no.
3.50 mm	-	-	-	blue transparent	5.30.759.023/0000
4 mm	-	-	-	green	5.30.759.025/0000
4.25 mm	-	-	-	blue	5.30.759.026/0000
4.50 mm	-	-	-	red	5.30.759.027/0000
4.75 mm	-	-	-	blue transparent	5.30.759.028/0000
5 mm	-	-	-	black	5.30.759.029/0000
5.25 mm	-	-	-	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

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

PCB Keyswitches

Spacers, triangular
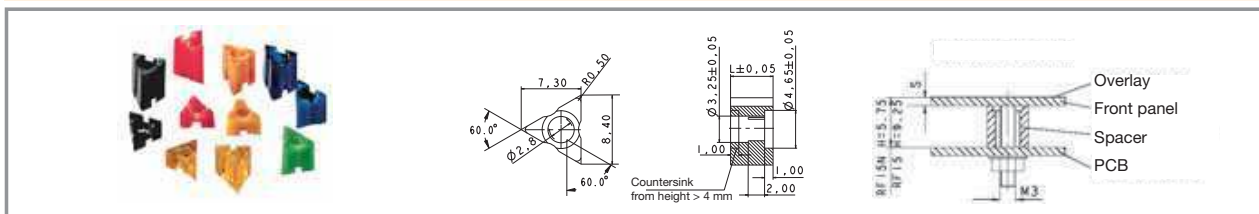
Length	Width	Overall height	Diameter	Colour	Order no.
2.50 mm	-	-	-	blue	5.30.759.094/0000
2.75 mm	-	-	-	red	5.30.759.095/0000
3 mm	-	-	-	blue transparent	5.30.759.096/0000
3.25 mm	-	-	-	black	5.30.759.097/0000
3.50 mm	-	-	-	yellow orange transparent	5.30.759.098/0000
3.75 mm	-	-	-	yellow	5.30.759.099/0000
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

4

RF

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

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

4

RF

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

PCB Keyswitches

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

4

KN
19

RAFI
SOLUTIONS WITH PASSION

KN 19 - Short-travel main switch

Pict.: 1 NC + 1 NO

2 NC / 2 NO

General Data

The KN 19 makes it possible to implement a power switch directly in a low-profile data entry system. This eliminates the need for extra switches on the device and additional openings in the overlay. In this way, you can achieve an optimum of safety and a consistent design.

The contact opening widths comply with the VDE standards. The KN 19 can also be employed underneath RK 90 keycaps. Other actuation functions (momentary, latching/momentary) available on request.

Technical Data

4

KN 19

General information

Recommended key grid	19.05 x 38.1 mm

Dimensions

Length	37.8 mm
Width	18.8 mm
Overall height	9.7 mm

Mechanical design

Mounting	on PCB
Terminals	THT solder terminals
Contact system	snap-action bridge contact
Contact arrangement	see order block
Contact materials	Ag
Illumination	1 LED (max. 3 mm) possible
Degree of protection	IP40
Hot wire ignition acc. to IEC 60695-2-1	850 °C

Mechanical characteristics

Operating force max.	$9^{\pm3}$ N
Operating travel	$0.55^{\pm0.15}$ mm
Robustness max.	100 N

Electrical characteristics

Rated voltage AC min.	12 V
Rated voltage DC min.	12 V
Rated voltage AC max.	250 V
Rated voltage DC max.	50 V
Ohmic load AC	6 A
Ohmic load DC min.	0.1 A
Ohmic load DC max.	10 A
Contact resistance when new max.	50 mΩ
Capacity input current AC max.	100 A
Rated motor current AC	4 A
Rated filament lamp current AC	2.4 A
Bouncing time max.	10 ms

Other specifications

Ambient temp. operating min.	-25 °C
Ambient temp. operating max.	+70 °C
Environmental restistance	acc. to IEC 60068-2 -14, -30, -33 and -78
Operating life AC	AC 250 V: 200.000/ 2A; 100.000 /6A
Operating life DC	50,000(10 A / 50 V=)
Soldering time max.	3 s
Soldering temperature max.	350 °C
Flame class acc. to UL 94	UL 94 VO

RAFI
SOLUTIONS WITH PASSION

Circuit Diagram

1 NC + 1 NO

2 NC/2 NO

Dimensional Drawing

19,05
9,00±0,2
9,70±0,2
Ø1,20 -0,05
3,00±0,2

37,80±0,2
□10,00±0,2
18,80±0,2
(OFF) (ON)

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

Hole Pattern

Hole patterns PCB
Locating hole
(only 2-pole version)
29,21
10,16
2,54
1,40
1,00 +0,1

Locating hole only version 2 NO/2 NC
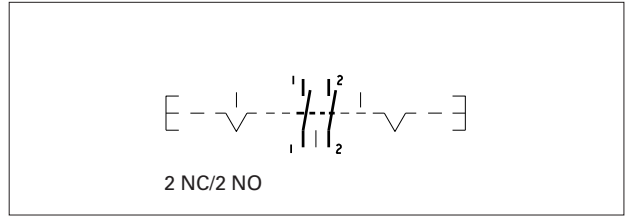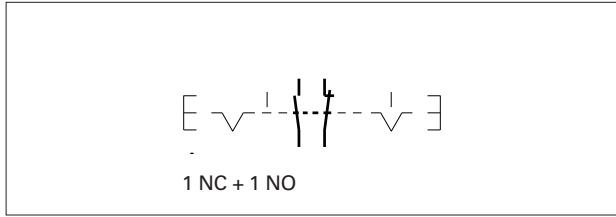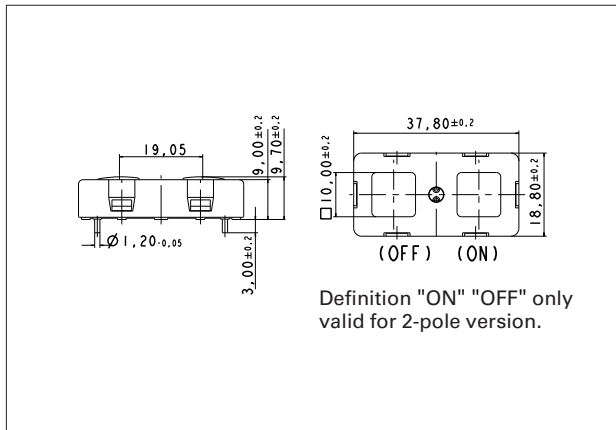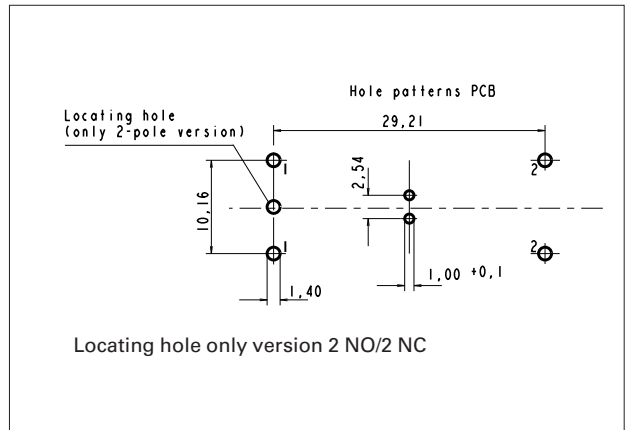
View on component side.

Approvals

IEC 61058
UL 508,C22.2 No.
14-M91

4

RAFI
SOLUTIONS WITH PASSION

Approvals

IEC 61058	UL 508,C22.2 No. 14-M91

Typical accessories KN 19 - Short-travel main switch

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

KN 19 - Short-travel main switch

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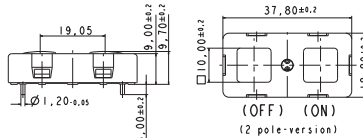
Contact arrangement	Rated voltage AC max.	Order no.
1 NC + 1 NO	250 V	**1.12.000.001/0000**
2 NC / 2 NO	250 V	**1.12.000.501/0000**

Technical data see page 4 - 86

Accessoires:
KN19 - Absorption rubber: 5.30.729.009/0000

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

4

KN
19

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

PCB Keyswitches

RAFI
SOLUTIONS WITH PASSION
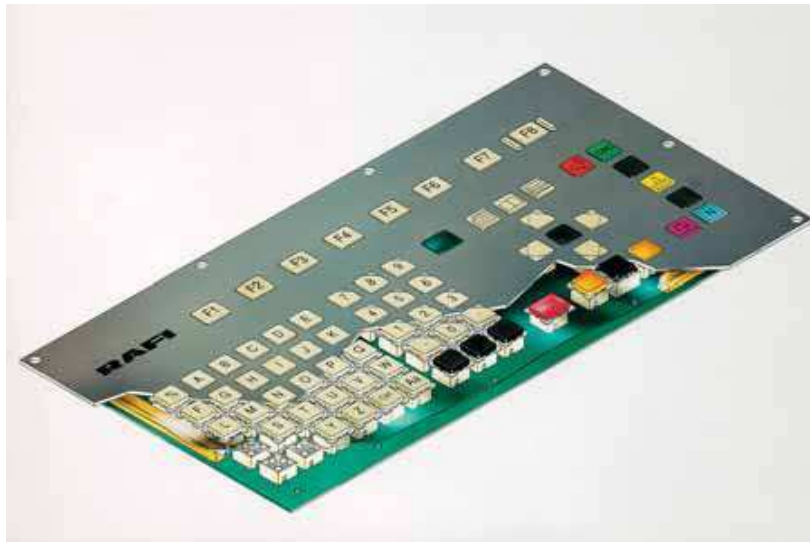
General Data

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

4

RK
90

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
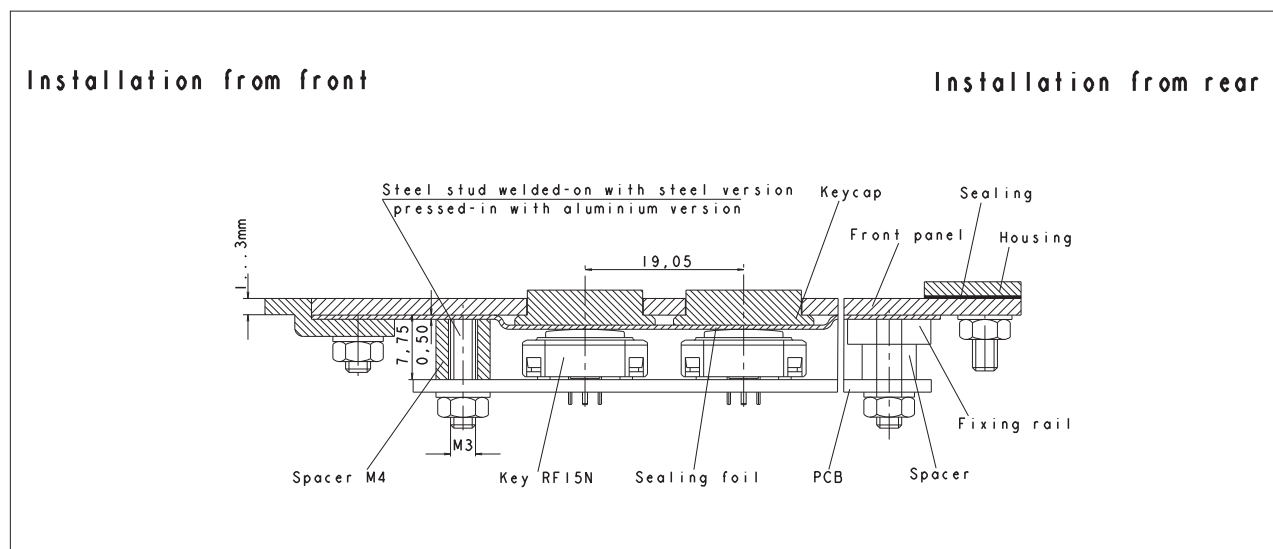
4

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.

RK 90

RAFI
SOLUTIONS WITH PASSION

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.

4

RK
90

RK 90 - Keycaps, plastic, 9 x 9 mm

Installation from front   Installation for rear

Steel stud welded-on with steel version
pressed-in with aluminum version   Keycap   Sealing
                                                          Housing
min.12,50   Front panel

...3mm
7.75 0.50

Pict.: with colourless lens

Spacer   M3   Racon 12   Sealing foil   PCB   Spacer   Fixing rail
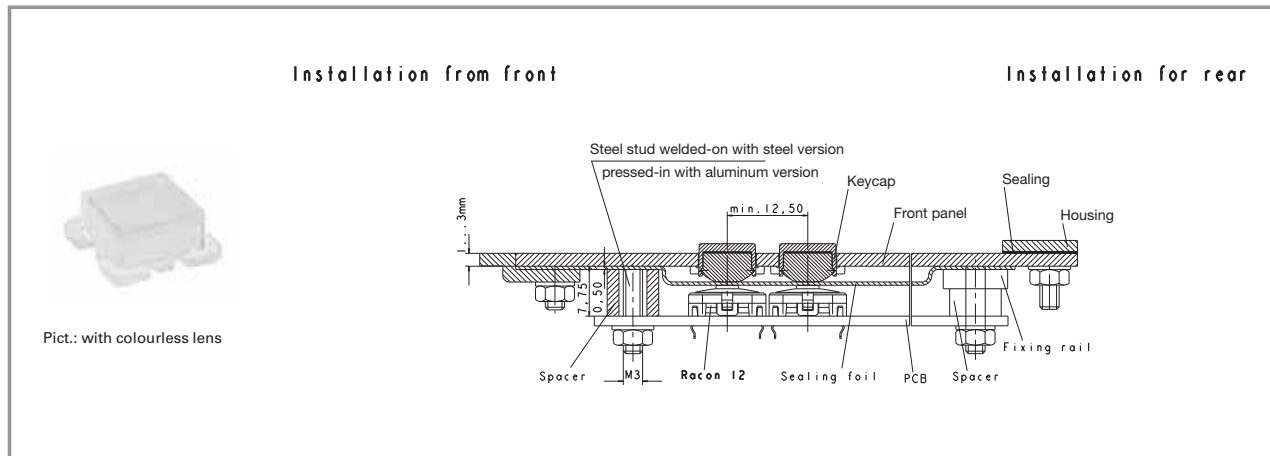
General Data

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

4

General information

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

Dimensions

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

Please order lens separately.

RK
90

SOLUTIONS WITH PASSION

RK 90 - Keycap body plastic, for lenses 9 x 9 mm
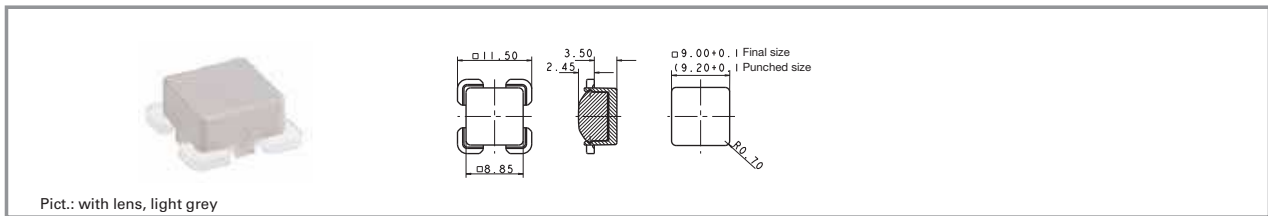
Pict.: with lens, light grey

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

Technical data see page 4 - 92

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

4

RK 90

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

RK 90 - Keycaps, plastic, 14 mm

Installation from front   Installation from rear

Steel stud welded-on with version
pressed-in with aluminium version

Keycap   Lens   Front plane   Sealing   Housing

19.05

Spacer M4   Sealing foil   **RF 15**   Pressure pad   PCB   Frame   Spacer

Fixing rail

M3   M3

Pict.: with lens, opaque green
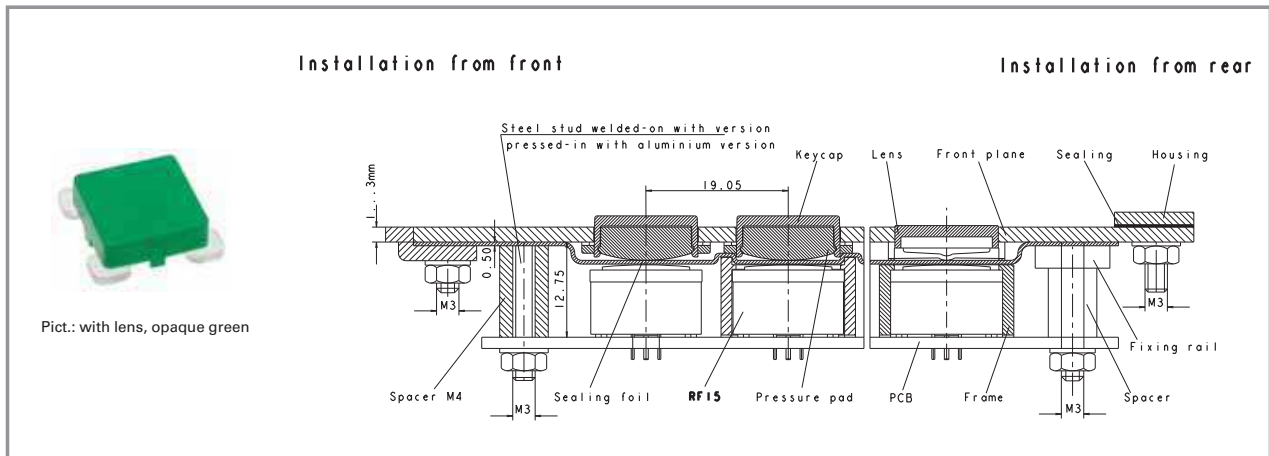
General Data

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

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

4

Technical Data

General information

Colour of lens	see order block
Size	see order block
Degree of protection (with silicon seal)	IP65
Illuminability	yes

Dimensions

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

RAFI
SOLUTIONS WITH PASSION

RK 90 - Keycap body plastic, for lenses 14 mm, 1-module
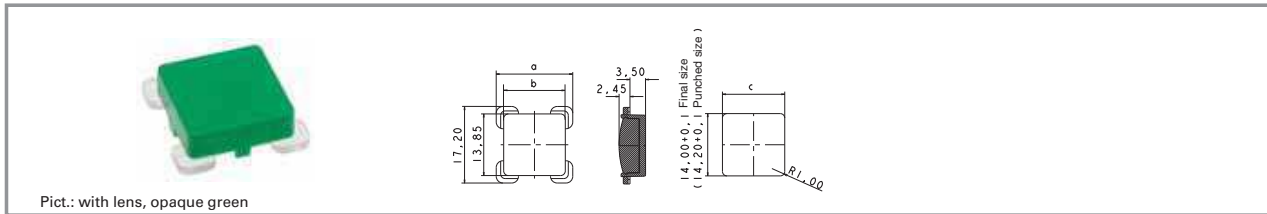
Pict.: with lens, opaque green

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

Technical data see page 4 - 94

Lenses:
RK 90 - Lens, 14 mm, 1-module, opaque red: 5.46.681.001/0309
RK 90 - Lens, 14 mm, 1-module, opaque yellow: 5.46.681.001/0409
RK 90 - Lens, 14 mm, 1-module, opaque green: 5.46.681.001/0514
RK 90 - Lens, 14 mm, 1-module, opaque blue: 5.46.681.001/0611
RK 90 - Lens, 14 mm, 1-module, opaque light grey: 5.46.681.001/0700
RK 90 - Lens, 14 mm, 1-module, transparent colourless: 5.46.681.021/1002
RK 90 - Lens, 14 mm, 1-module, transparent red: 5.46.681.021/1307
RK 90 - Lens, 14 mm, 1.5-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 1¼-module

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

Technical data see page 4 - 94

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

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RK
90

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

RK 90 - Keycap body plastic, for lenses 14 mm, 1½-module
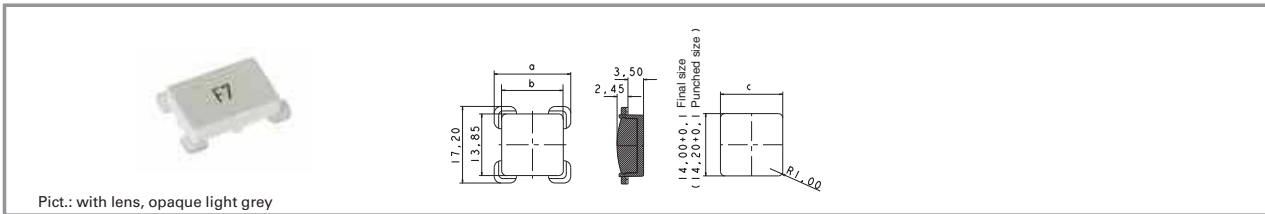
Pict.: with lens, opaque light grey

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

Technical data see page 4 - 94

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

RK 90 - Keycap body plastic, for lenses 2-module
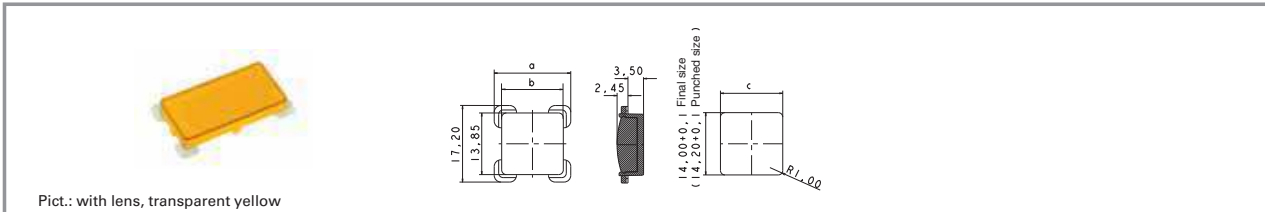
Pict.: with lens, transparent yellow

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

Technical data see page 4 - 94

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

RK
90

RK 90 - Keycaps, aluminum, 14 x 14 mm
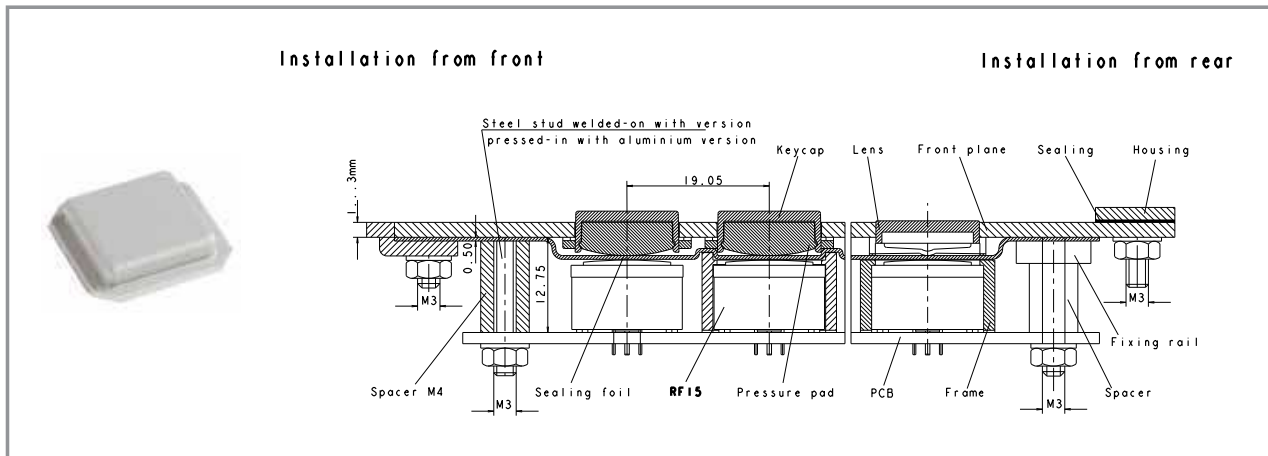
General Data

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.

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Technical Data

General information

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

Dimensions

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

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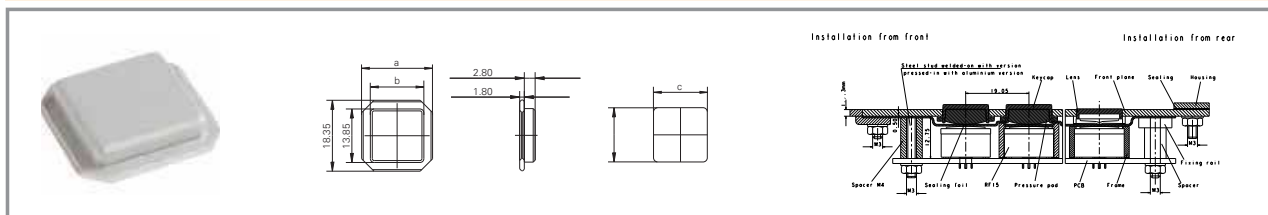
RK 90

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

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

PCB Keyswitches

RK 90 - Keycaps, aluminum, 14 mm, 1½-module
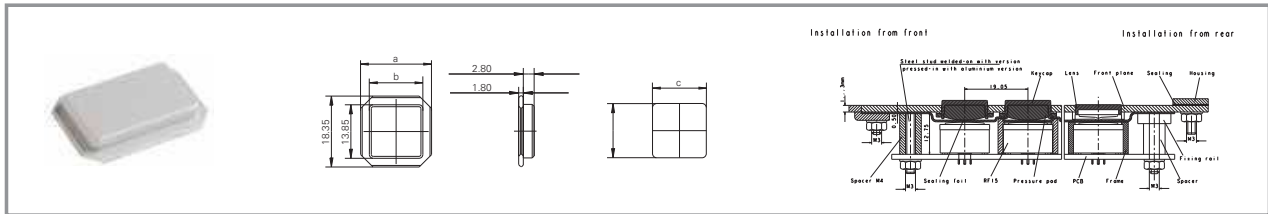
Size	Colour of lens	Dimension (a) behind front panel	Dimension (b) in front of front panel	Dimension (c) hole patterns final size	Order no.
1½-module	aluminum co-lourless anodized	18.35 x 25.35 mm	13.85 x 20.85 mm	14.00 x 21.00 mm	5.46.500.003/4010

Technical data see page 4 - 98

RK 90 - Keycaps, aluminum, 14 mm, 2-module
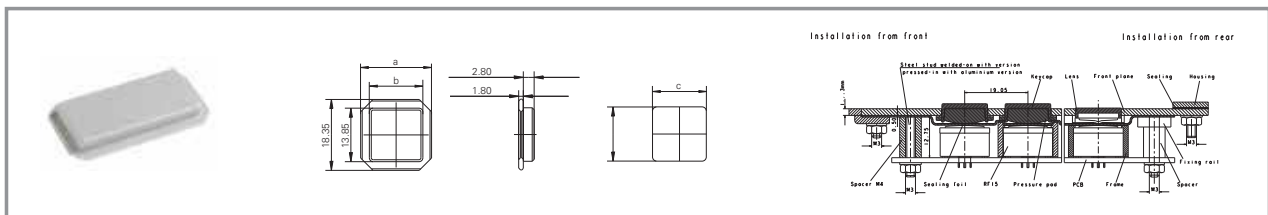
Size	Colour of lens	Dimension (a) behind front panel	Dimension (b) in front of front panel	Dimension (c) hole patterns final size	Order no.
2-module	aluminum co-lourless anodized	18.35 x 32.35 mm	13.85 x 27.85 mm	14.00 x 28.00 mm	5.46.500.004/4010

Technical data see page 4 - 98

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RK
90

PCB Keyswitches

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

RAFI
SOLUTIONS WITH PASSION

RK 90 - Special accessories

Pict.: charcoal grey

Technical Data

General information
Colour   see order block

Dimensions
Dimensions   see order block

RK 90 - Fin, to avoid inadvertent operation

Mounting holes   14,00
10,50   10,50   6,50
3,50   2,00
2,50
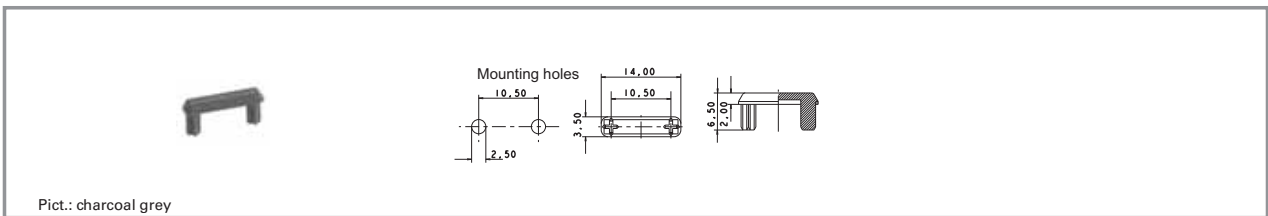
Pict.: charcoal grey

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

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RK
90

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

PCB Keyswitches

RAFI
SOLUTIONS WITH PASSION

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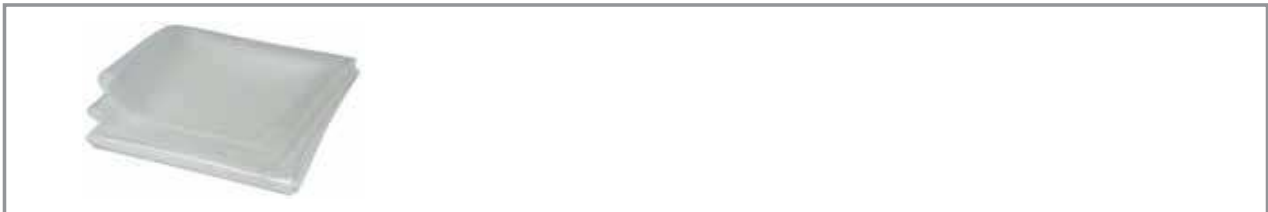
Short text	Feature 1	Feature 2	Order no.
RK 90 - Silicone foil 600 x 590 x 0.45 mm	transparent	600 x 590 x 0.45 mm	7.16.102.006/0000

Technical data see page 4 - 100

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RK
90

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

General Data

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

Content

4

RG
85 III

System Features

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

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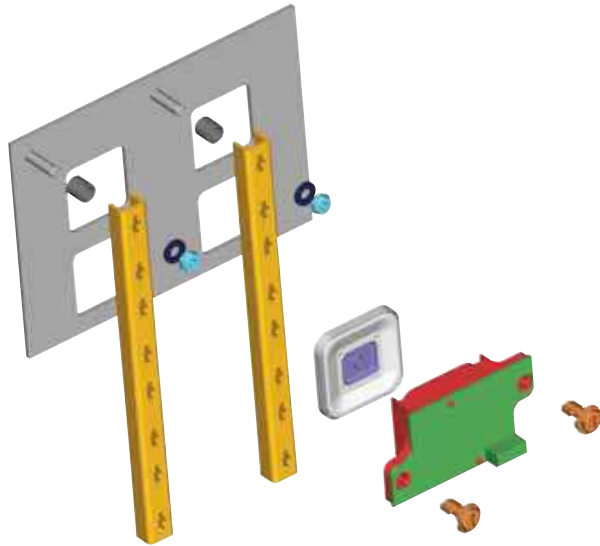
Keylock Switch Features

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

Micro-Match Connector Pin Assignment
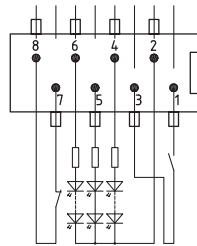
1/3	NO contact
2	0 V – LED
4	Edge illuminat./signal indicator 1st colour + 24 V DC +/- 20%
5	Symbol illumination + 24 V DC +/- 20%
6	Edge illuminat./signal indicator 2nd colour + 24 V DC +/- 20%
7/8	NC contact

4

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

Installation plan

Rail fixing method

Fixing rail
5.41 032.173

Grid 35.00

27.38 ± 0.10

15.24 ± 0.10

(27.50)   Grid 55.00   (27.50)

Distance
threaded studs
55.00 ± 0.10

Distance
threaded studs
55.00 ± 0.10

7.25 ± 0.05

2.00

12.08

Threaded studs
M4 (min.) 14 mm

Fixing element
5.41 032.173

Single fixing method

Grid 35.00

15.24 ± 0.10

Grid 55.00

Distance
threaded studs
55.00 ± 0.10

Distance
threaded studs
55.00 ± 0.10

Spacer
5.30 163.024

Threaded studs
M4 x (min.) 20 mm

Front panel

R1.50-0.20 (3x)

$26.00^{+0.10}_{-0.05}$

Frontplatte

$26.00^{+0.10}_{-0.05}$

13.00

$\varnothing 30.00^{+0.10}_{-0.05}$

R2.90-0.10

$\square 26.10^{+0.10}_{0}$

4

**RG
85 III**

RAFI
SOLUTIONS WITH PASSION

RG 85 III - Keyswitch

Technical Data

Dimensions

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

Mechanical design

Version	see order block
Mounting	on U-rails or single mounting
Terminals	8-pin Micro-Match® female connector
Contact system	snap-action (1 NO) or bridge contact (1 NC + 1 NO)
Contact arrangement	see order block
Contact materials	Ag
Symbol illumination	see order block
Edge illumination	see order block

Mechanical characteristics

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

Electrical characteristics

Rated voltage min.	3 V
Rated voltage max.	50 V
Rated current min.	0.1 mA
Rated current max.	250 mA
Rated power max.	12.5 W
Contact resistance when new max.	100 mΩ
Contact resistance acc. to life max.	3 Ω
Bouncing time max.	10 ms
Operating voltage for LED	$24\pm20\%$ V
Input current LED	per colour/LED row 9 - 16 mA

Other specifications

Ambient temp. operating min.	-25 °C
Ambient temp. operating max.	+70 °C
Storage temperature min.	-40 °C
Storage temperature max.	+80 °C
Environmental restistance	acc. to IEC 60068-2 -14, -30, -33 and -78
Operating life min. (operations)	1,000,000
Degree of protection rail mounting	IP40
Degree of protection single mounting	IP65
Flammability of materials	according to UL 94 HB

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Typical accessories RG 85 III - Keyswitch

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

RG 85 III

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

RAFI
SOLUTIONS WITH PASSION

RG 85 III - Keyswitch, round design, without lens
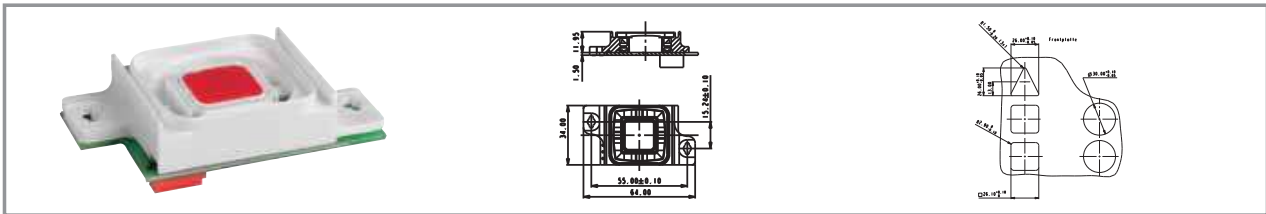
Contact arrangement	Edge illumination	Symbol illumination	Version	Order no.
1 NO	4 LED white	-	round	3.99.400.111/2000
1 NO	4 LED red	-	round	3.99.400.111/3000
1 NO	4 LED yellow	-	round	3.99.400.111/4000
1 NO	4 LED green	-	round	3.99.400.111/5000
1 NO	4 LED blue	-	round	3.99.400.111/6000
1 NO	4 LED white, 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.

4

RG
85 III

PCB Keyswitches

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

RG 85 III - Keyswitch, square design, without lens
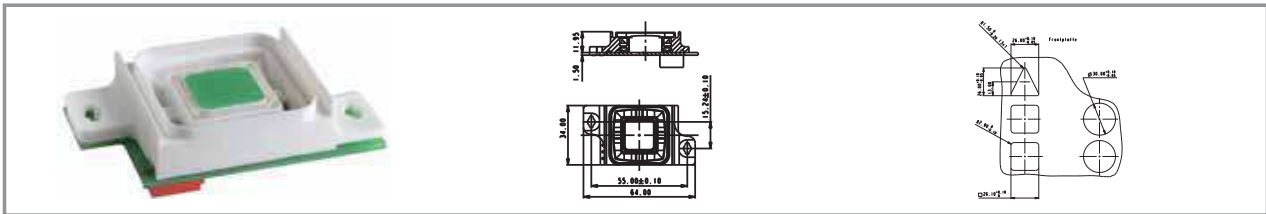
Contact arrangement	Edge illumination	Symbol illumination	Version	Order no.
1 NO	4 LED white	-	square	3.99.400.112/2000
1 NO	4 LED red	-	square	3.99.400.112/3000
1 NO	4 LED yellow	-	square	3.99.400.112/4000
1 NO	4 LED green	-	square	3.99.400.112/5000
1 NO	4 LED blue	-	square	3.99.400.112/6000
1 NO	4 LED white, 4 LED blue	-	square	3.99.400.112/7000
1 NO	4 LED green, 4 LED red	-	square	3.99.400.112/8000
1 NO	4 LED white	2 LED yellow	square	3.99.400.112/2400
1 NO	4 LED red	2 LED red	square	3.99.400.112/3300
1 NO	4 LED yellow	2 LED green	square	3.99.400.112/4500
1 NO	4 LED green	2 LED green	square	3.99.400.112/5500
1 NO	4 LED blue	2 LED blue	square	3.99.400.112/6600
1 NO	4 LED white, 4 LED blue	2 LED blue	square	3.99.400.112/7600
1 NO	4 LED green, 4 LED red	2 LED red	square	3.99.400.112/8300
1 NC + 1 NO	4 LED white	-	square	3.99.400.132/2000
1 NC + 1 NO	4 LED red	-	square	3.99.400.132/3000
1 NC + 1 NO	4 LED yellow	-	square	3.99.400.132/4000
1 NC + 1 NO	4 LED green	-	square	3.99.400.132/5000
1 NC + 1 NO	4 LED blue	-	square	3.99.400.132/6000
1 NC + 1 NO	4 LED white, 4 LED blue	-	square	3.99.400.132/7000
1 NC + 1 NO	4 LED green, 4 LED red	-	square	3.99.400.132/8000

Technical data see page 4 - 106

Please order lenses (square shape) separately.

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

RG
85 III

RAFI
SOLUTIONS WITH PASSION

RG 85 III - Keylock switch

Technical Data

Dimensions

Mounting grid min.	55 x 35 mm
Length	64 mm
Width	34 mm (35 mm with sealing)
Mounting depth	see order block

Mechanical design

Version	see order block
Mounting	on U-rails or single mounting
Terminals	8-pin Micro-Match® female connector
Contact system	cross contact
Contact arrangement	1 NO
Contact materials	Au alloy
Symbol illumination	none
Edge illumination	see order block
Lock	cylinder lock, lock type 5201
Key removal position	Pos. 0 + 1

Mechanical characteristics

Rotating angle	1 x 90°
Switching travel NO	1 mm
Switching travel NC	see order block

Electrical characteristics

Rated voltage min.	3 V
Rated voltage max.	35 V
Rated current min.	0.1 mA
Rated current max.	100 mA
Rated power max.	1 W
Contact resistance when new max.	100 mΩ
Contact resistance acc. to life max.	3 Ω
Bouncing time max.	10 ms
Operating voltage for LED	24±20% V
Input current LED	per colour/LED row 9 - 16 mA

Other specifications

Ambient temp. operating min.	-25 °C
Ambient temp. operating max.	+70 °C
Storage temperature min.	-40 °C
Storage temperature max.	+80 °C
Environmental restistance	acc. to IEC 60068-2 -14, -30, -33 and -78
Operating life min. (operations)	50,000
Degree of protection rail mounting	IP40
Degree of protection single mounting	IP65
Flammability of materials	according to UL 94 HB

Typical accessories RG 85 III - Keylock switch

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

4

RG 85 III

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

RAFI
SOLUTIONS WITH PASSION

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.

4

RG 85 III

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

RAFI
SOLUTIONS WITH PASSION

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.

4

**RG
85 III**

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

RG 85 III - Signal indicator, without lens

Technical Data

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

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

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

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

Typical accessories RG 85 III - Signal indicator, without lens

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

RG 85 III

PCB Keyswitches

RAFI
SOLUTIONS WITH PASSION

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.

4

RG
85 III

PCB Keyswitches

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

RAFI
SOLUTIONS WITH PASSION

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

RG
85 III

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

PCB Keyswitches

RAFI
SOLUTIONS WITH PASSION

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

4

RG 85 III

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

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

Technical data see page 4 - 114

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

RG 85 III - Lenses for keyswitches, square

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

4

RG
85 III

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

RG 85 III - Short-travel system

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

4

RG
85 III

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

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

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

4

RG
85 III

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

RG 85 III - Lenses for keylock switches, round

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

RG 85 III - Lenses for keylock switches, square

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

4

RG 85 III - Lens, round, for signal indicators
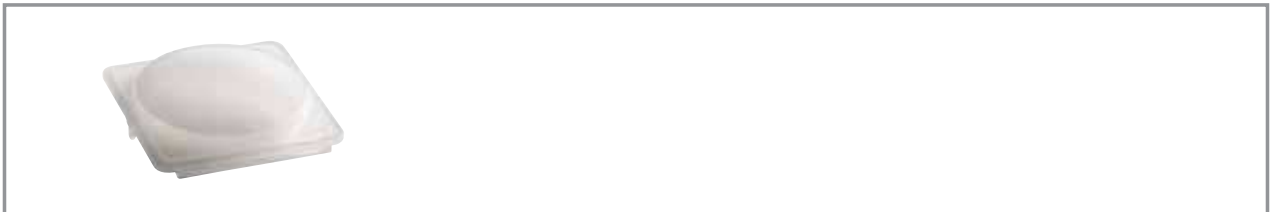
Version	Form of lens	Legending colour	Legending	Order no.
plastic translucent	round	-	-	5.04.903.010/0000

RG
85 III

SOLUTIONS WITH PASSION

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**

4

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 85 III

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

PCB Keyswitches

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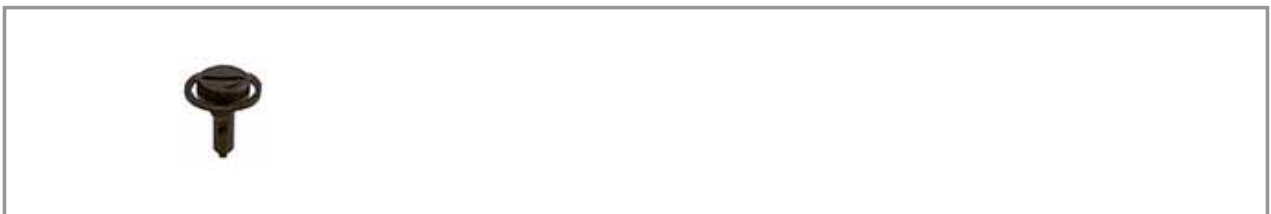
Version	Form of lens	Legending colour	Legending	Order no.
-	-	-	-	5.55.104.208/0459

4

RG
85 III

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

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

4

RS 76

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.

4

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.

RS 76

RAFI
SOLUTIONS WITH PASSION

Design
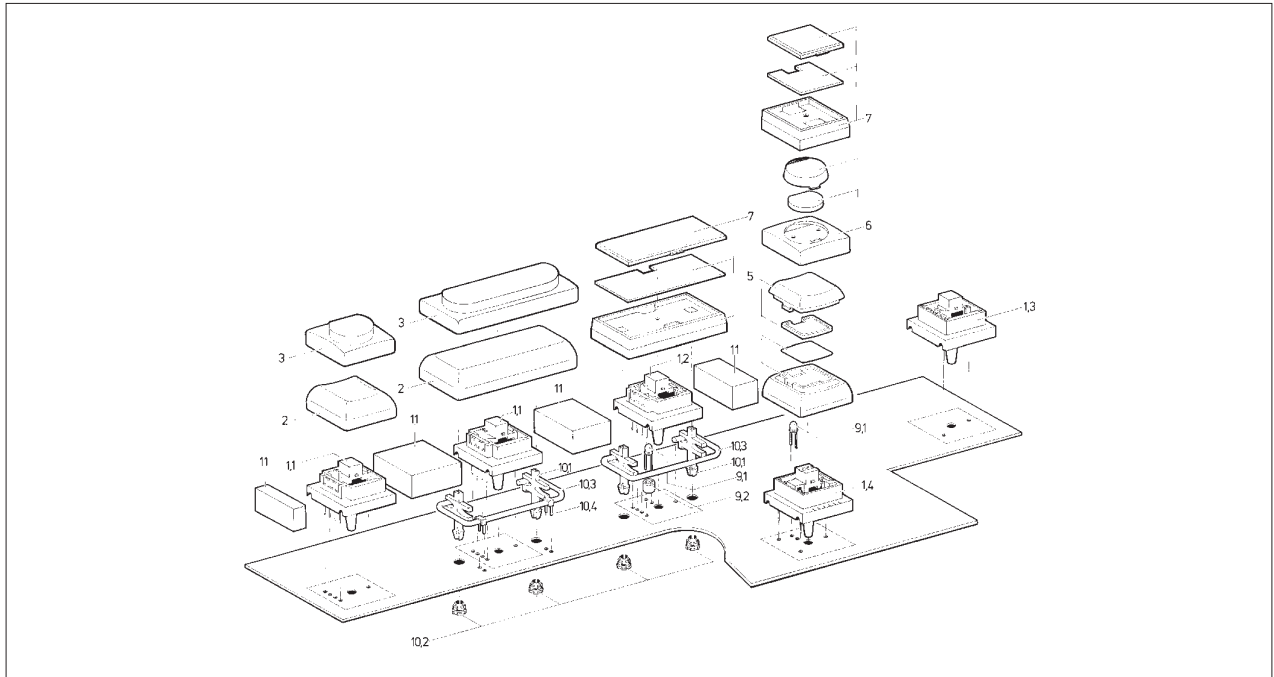
No. Description

1.1 Keyswitch RS 76 C
1.2 Keyswitch RS 76 C with LED
1.3 Keyswitch RS 76 M
1.4 Keyswitch R 76 M with LED
2   Keycap, 1- resp. multi-module
3   Keycap with nail protection, 1- resp. multi-module
5   Keycap, illuminated
6   Keycap, illuminated
7   Keycap, illuminated
9.1 LED

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

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

4

Hole Pattern PCB RS 76 M/RS 76 C

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

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

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

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

RS 76 M/C

• 4 holes for bearing bracket diam. 1.1
No through-plating
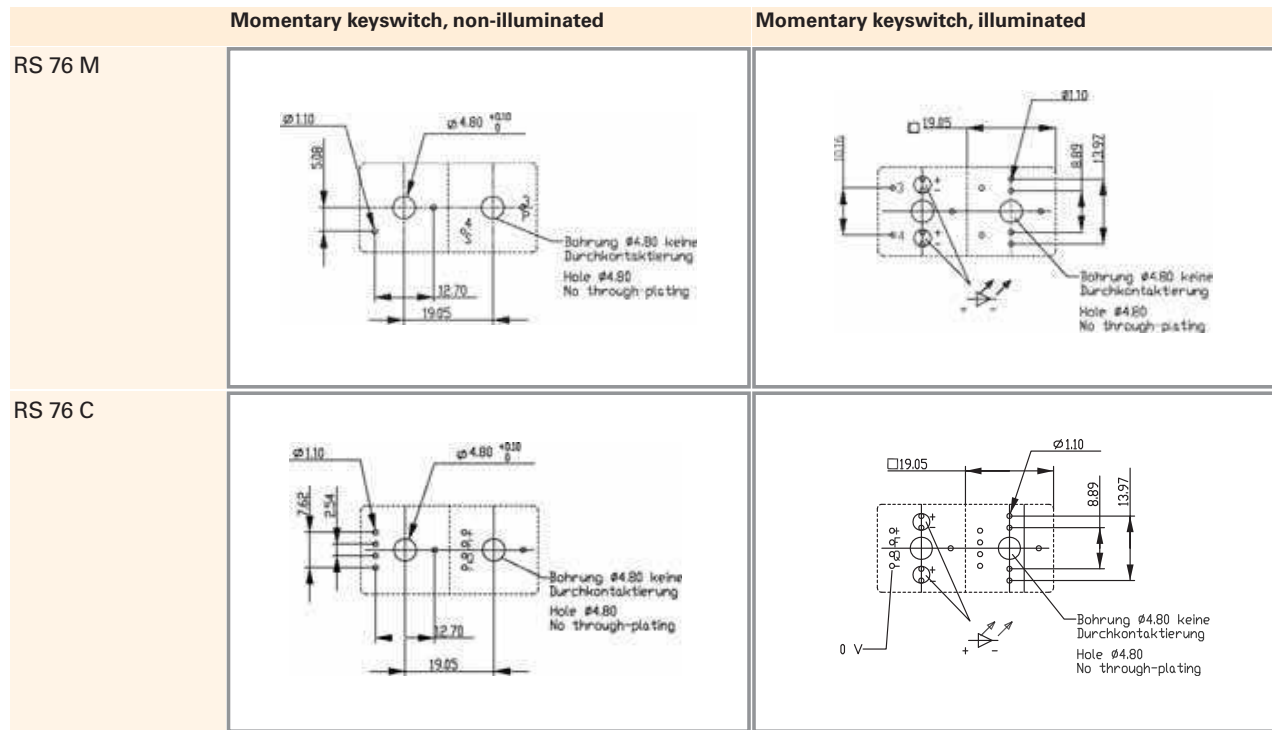
Metal bow touches the surface of PCB,
in this area no conductor tracks on component side
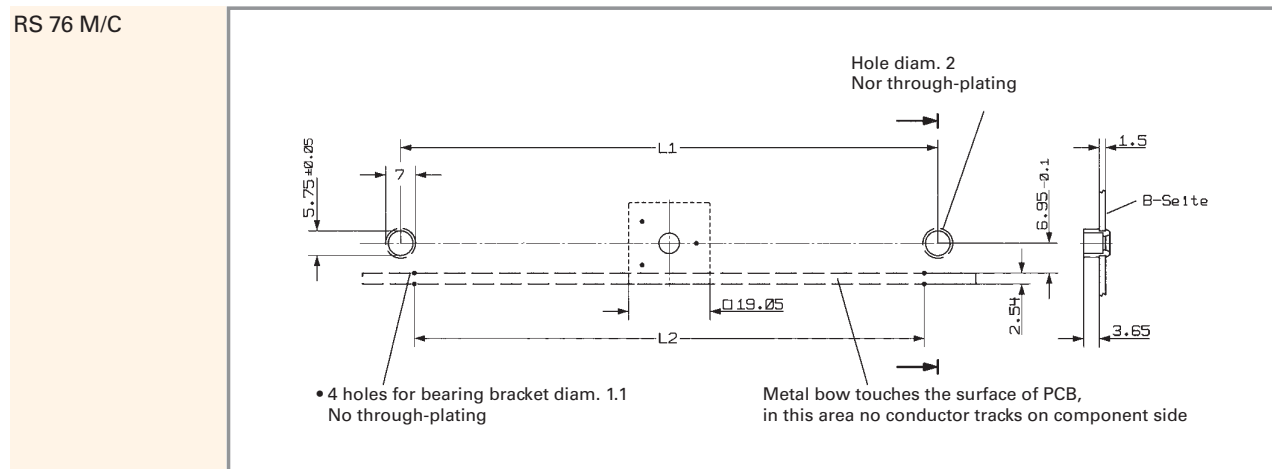
Keycap	L 1 mm	L 2 mm
2-module	25,40	22,86
3-module	30,48	24,13
5-module	68,58	68,58

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

4

SOLUTIONS WITH PASSION

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_{PHL}	3 µs	7 µs	10 µs
Turn-off delay time	t_{PHL}	4 µs	5 µs	6 µs
Fall/rise time	t_{PHL}	2 µs	2,5 µs	3 µs
	t_{PHL}	1 µs	1,5 µs	2,5 µs

Output pulse diagram

Block diagram
Hall IC

Static with Enable Input

4

RS 76

RAFI
SOLUTIONS WITH PASSION
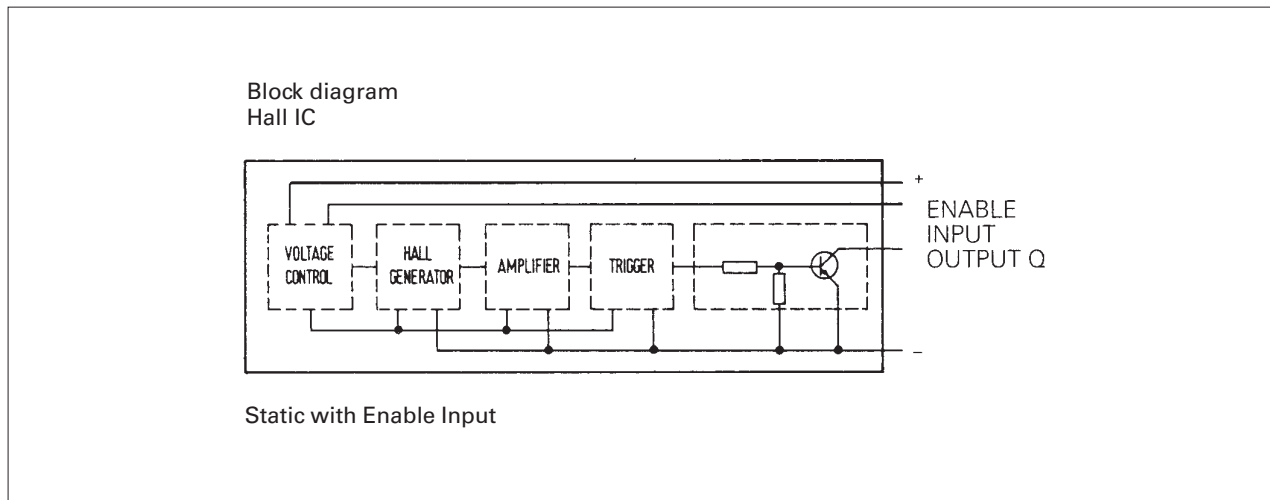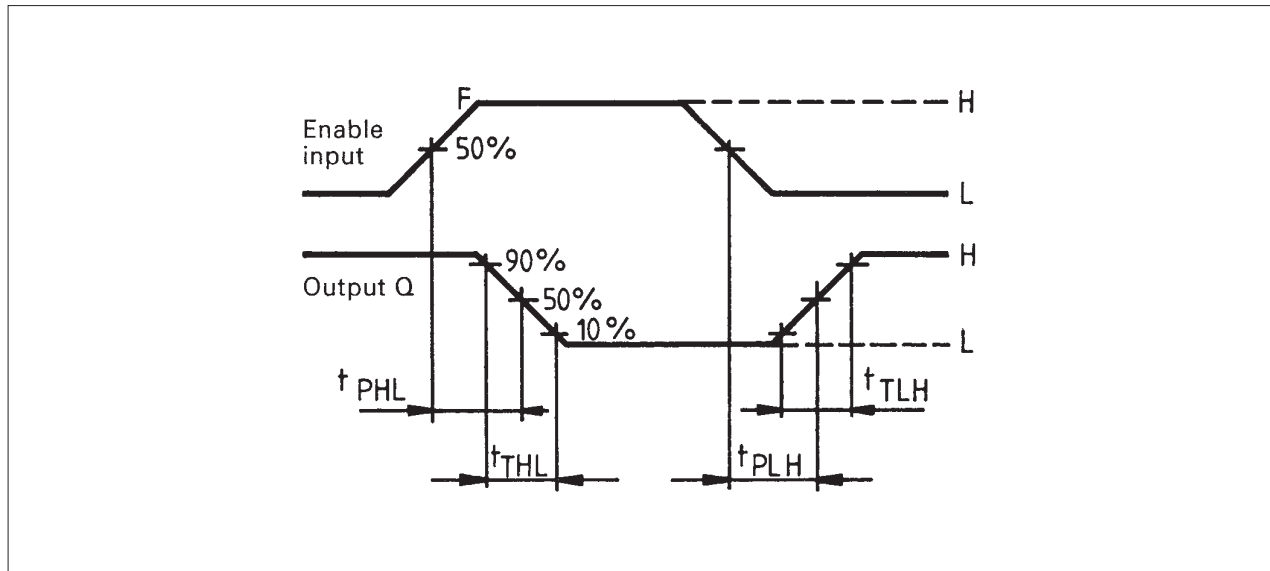
Examples for Application RS 76 C
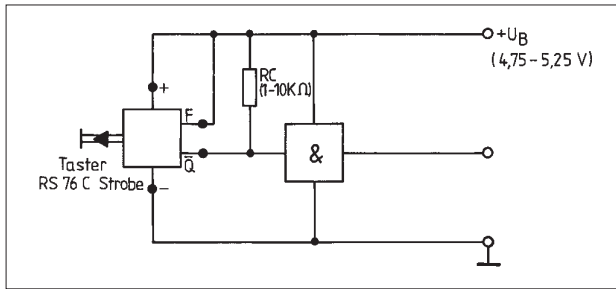
Driving of logic components
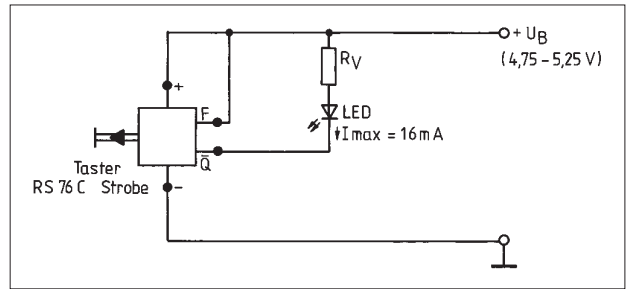
Indication of logical states
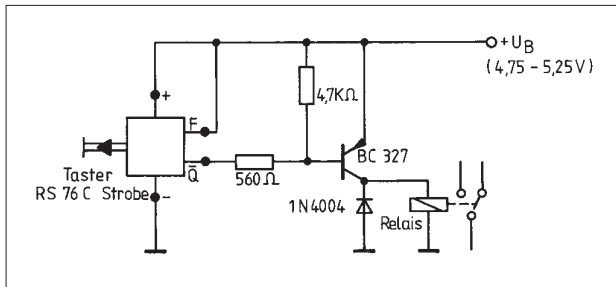
Driving of a PNP transistor
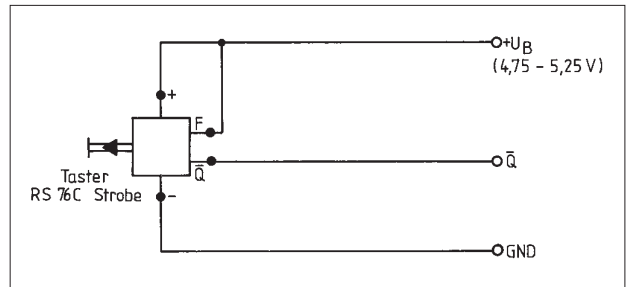
Use as static key with open collector output.
Output transistor (NPN) is conductive when actuated.

Use in keyboards

RS 76

PCB Keyswitches

RAFI
SOLUTIONS WITH PASSION

RS 76 M - Full-travel keyswitch, not illuminable

Technical Data

General information
Recommended key grid   19.05 mm

Mechanical design
Contact function   momentary
Mounting   soldering
Terminals   solder terminals,
                              tin-plated

Contact system   cross contact
Contact arrangement   1 NO
Contact materials   Au alloy
Illumination   no

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

Electrical characteristics
Rated voltage min.   2 V (with Diode 3 V)
Rated voltage max.   35 V
Rated current min.   0.01 mA
Rated current max.   100 mA

Rated power max.   1 W
Contact resistance when new   100 mΩ
max.   (without diode)
Contact resistance acc. to   3 Ω
life max.   (without diode)
Insulation resistance $10^9 \, \Omega$
ESD strength max.   8 kV
Bouncing time max.   5 ms

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

4

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

Description	Photo	Order no.	Additional acces-sories 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

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

PCB Keyswitches

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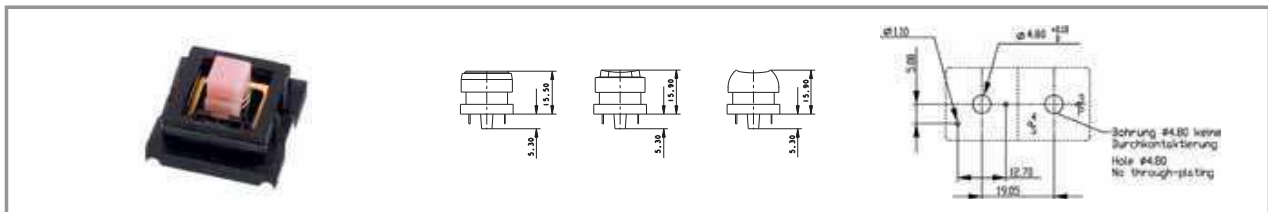
Contact function	Illumination	Contact arrangement	Contact materials	Operating travel	Operating force max.	Bestell-Nr.
momentary	no	1 NO	Au alloy	4 mm	0.9 N	**3.13.005.001/0000**
momentary	no	1 NO	Au alloy	4 mm	1.4 N	3.13.005.011/0000

Technical data see page 4 - 132

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

4

RS
76

RAFI
SOLUTIONS WITH PASSION

RS 76 M - Full-travel keyswitch, illuminable

Pict.: RS 76M, for spot illumination

RS 76MX, for full illumination

RS 76MX, keyboard fully illuminated

Technical Data

General information

Recommended key grid	19.05 mm

Mechanical design

Contact function	see order block
Mounting	soldering
Terminals	solder terminals, tin-plated
Contact system	bridge contact
Contact arrangement	1 NO
Contact materials	Au alloy
Illumination	see order block

Mechanical characteristics

Operating force max.	1 N
Operating travel	4 mm
Switching travel	1.5 - 2.8 mm
Robustness min.	100 N

Electrical characteristics

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

Rated power max.	1 W
Contact resistance when new max.	200 mΩ
Contact resistance acc. to life max.	3 Ω
Insulation resistance	$10^9 \Omega$
ESD strength max.	8 kV
Bouncing time max.	10 ms

Other specifications

Ambient temp. operating min.	-25 °C
Ambient temp. operating max.	+70 °C
Storage temperature min.	-40 °C
Storage temperature max. (product)	+80 °C
Storage temperature max. (rail)	+50 °C
Environmental restistance	acc. to IEC 60068-2 -14, -30, -33 and -78
Operating life min. (operations)	10^7 momentary, 10^5 latching
Degree of protection	IP40
Flammability of materials	UL 94 HB

4

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

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

RS
76

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

PCB Keyswitches

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

Pict.: RS 76M, for spot illumination

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

Technical data see page 4 - 134

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

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

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

Technical data see page 4 - 134

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

4

RS
76

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

RAFI
SOLUTIONS WITH PASSION

RS 76 MX - Full-travel keyswitch, fully illuminable
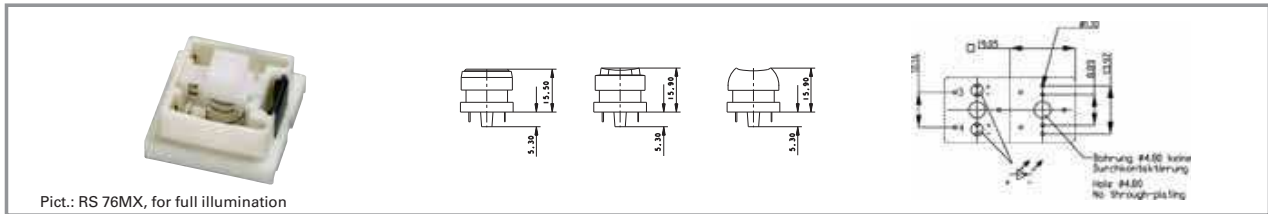
Pict.: RS 76MX, for full illumination

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

Technical data see page 4 - 134

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

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

4

RS
76

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

PCB Keyswitches

RAFI
SOLUTIONS WITH PASSION

RS 76 C - Full-travel keyswitch, not illuminable

Technical Data

General information
Recommended key grid   19.05 mm

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

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

Electrical characteristics
Operating voltage DC   4.75 ... 5.25 V
Supply current max. at U_{IL} = 0 V   0.5 mA
Supply current max. at U_{IH} = 5 V   5 mA
Input voltage (F) at U_{IL} = 0 V   0.4 V
Input voltage (F) at U_{IH} = 2.4V   5.25 V
Output load current (Q) max. 16 mA
Output residual current (Q) max. 10 µA

Output saturation voltage   0.4 V
(Q) max. bei 16 mA
ESD strength max.   8 kV
Output switching times (Q)   3 µs
at 25 °C, t_{PHL}
Output switching times (Q)   4 µs
at 25 °C, t_{PLH}
Output switching times (Q)   1 µs
at 25 °C, t_{THL}
Output switching times (Q)   2 µs
at 25 °C, t_{TLH}

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

4

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

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

PCB Keyswitches

RAFI
SOLUTIONS WITH PASSION

RS 76 C - Full-travel keyswitch, not illuminable

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

Technical data see page 4 - 138

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

4

RS
76

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

RAFI
SOLUTIONS WITH PASSION

RS 76 C - Full-travel keyswitch, illuminable

Technical Data

General information
Recommended key grid   19.05 mm

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

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

Electrical characteristics
Number of LED	see order block
Operating voltage DC	4.75 ... 5.25 V
Supply current max. at U_{IL} = 0 V	0.5 mA
Supply current max. at U_{IH} = 5 V	5 mA
Input voltage (F) at U_{IL} = 0 V	0.4 V
Input voltage (F) at U_{IH} = 2.4V	5.25 V
Output load current (Q) max.	16 mA

Output residual current (Q) max.	10 µA
Output saturation voltage (Q) max. bei 16 mA	0.4 V
ESD strength max.	8 kV
Output switching times (Q) at 25 °C, t_{PHL}	3 µs
Output switching times (Q) at 25 °C, t_{PLH}	4 µs
Output switching times (Q) at 25 °C, t_{THL}	1 µs
Output switching times (Q) at 25 °C, t_{TLH}	2 µs

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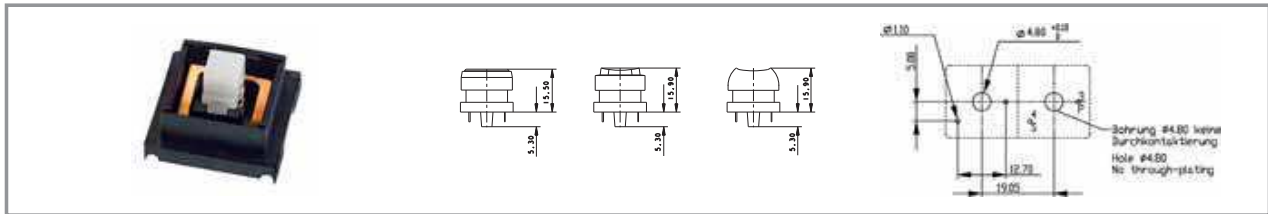|	
Reliability of Hall-IC at 25 °C	$\lambda = 2.5 \times 10^{-7} \, h^{-1}$
Ambient temp. operating min.	0 °C
Ambient temp. operating max.	+70 °C
Storage temperature min.	-40 °C
Storage temperature max. (product)	+80 °C
Storage temperature max. (rail)	+50 °C
Environmental resistance	acc. to IEC 60068-2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

4

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

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

RS
76

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

PCB Keyswitches

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

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

RS 76 C - Full-travel keyswitch, illuminable, momentary
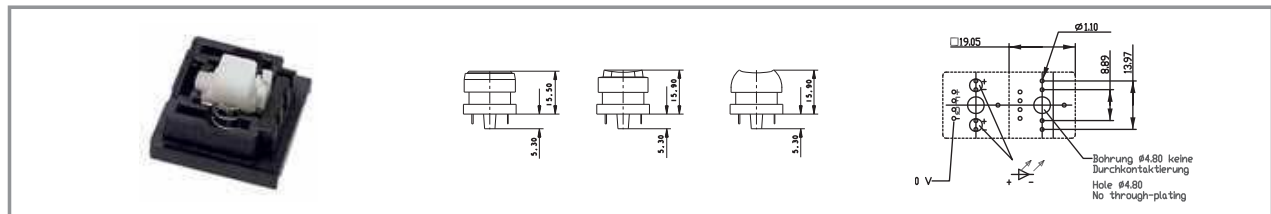
Contact function	Operating life min. (operations)	Illumination	Operating force max.	Operating travel	Order no.
momentary	10^8	with LED	0.7 N	4 mm	**3.13.001.110/0000**

Technical data see page 4 - 140

RS 76 C - Full-travel keyswitch, illuminable, latching
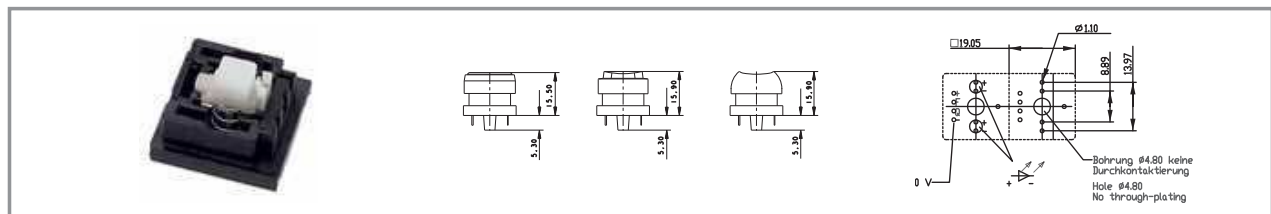
Contact function	Operating life min. (operations)	Illumination	Operating force max.	Operating travel	Order no.
latching	10^5	with LED	0.7 N	4 mm	3.13.001.130/0000

Technical data see page 4 - 140

4

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

RS 76 - Keycaps, not illuminable

Pict.: light grey   opaque with nail protection charcoal grey / white   transparent colourless

RS 76 - Keycap, opaque

Pict.: charcoal 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.

4

RS 76 - Keycap, opaque, with nail protection

Pict.: light grey   opaque with nail protection charcoal grey / white

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

Keycap sets available in two-shot moulded design.

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

RS
76

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

PCB Keyswitches

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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.

4

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

RS 76 - Keycaps, illuminable

RS 76 - Keycap with light bar

Pict.: light grey

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

Other colours on request.

4

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

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

PCB Keyswitches

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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

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

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

4

RS
76

PCB Keyswitches

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

RAFI
SOLUTIONS WITH PASSION

RS 76 MX - Keycap, fully illuminable

RS 76MX, keyboard fully illuminated

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

Laser-printed versions available on request.

4

RS
76

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

PCB Keyswitches

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RS 76 - Keycaps, with legend, two-shot moulded/keycap sets
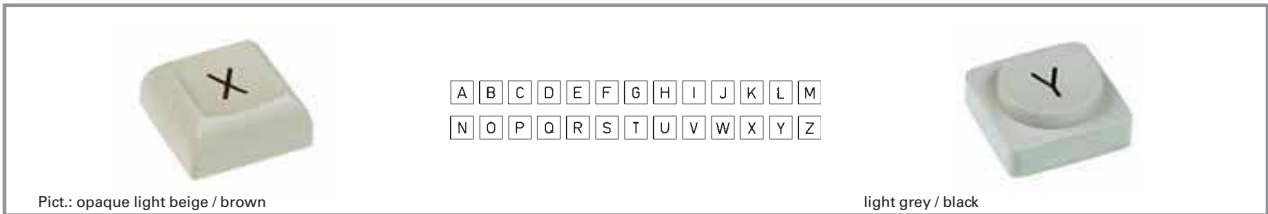
Pict.: opaque light beige / brown   opaque light beige / brown

RS 76 - Keycap set, symbols A-Z

Pict.: opaque light beige / brown   light grey / black

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

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

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

PCB Keyswitches

RS 76 - Keycap set, symbols 0-9

Pict.: opaque light beige / brown

`0 1 2 3 4 5 6 7 8 9`

opaque with nail protection charcoal grey / white

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

Other symbols and colours on request.

4

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RS 76 - Accessories

Pict.: light beige   dark grey

4

SOLUTIONS WITH PASSION

RS 76 - Cover IP40

19,05   ca. 9,3

Klebeband/Adhesive Tape
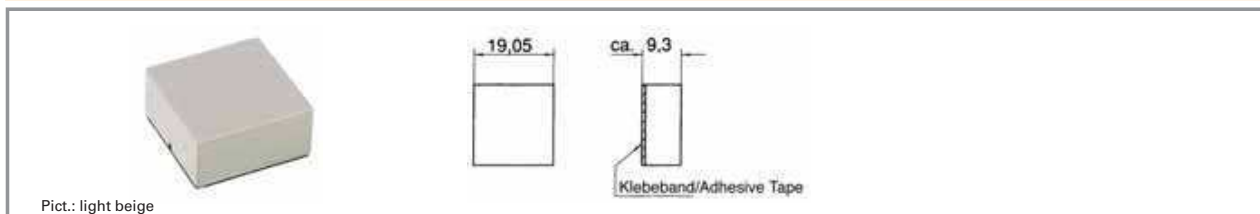
Pict.: light beige

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

Other colours on request.

4

RS
76

PCB Keyswitches

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

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

4

MICROMEC - Keylock switch IP54

Pict.: light grey   PCB hole pattern, component side

Technical Data

General information

Colour	see order block
Form of collar	square

Dimensions

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

Mechanical design

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

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

Other specifications

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

4

Typical accessories MICROMEC - Keylock switch IP54

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

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

PCB Keyswitches

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Typical accessories MICROMEC - Keylock switch IP54

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

Configuration Diagram/Dimensional Drawing

Hole patterns PCB
View on component side

Switching position	Contact function
0	
1	
2	
3	

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

4

Key
Swit-
ches

RAFI
SOLUTIONS WITH PASSION

MICROMEC - Keylock switch IP54

Pict.: charcoal grey

PCB hole pattern, component side

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

Technical data see page 4 - 154

2 keys included.
Other lock variants available on request.

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

PCB Keyswitches

RAFI
SOLUTIONS WITH PASSION

EUROLOCKS - Keylock switch IP54

Pict.: light grey

PCB hole pattern, component side

Technical Data

General information
Colour	see order block
Form of collar	square

Dimensions
Length of collar	19 mm
Width of collar	19 mm
Overall height	19.5 mm

Mechanical design
Mounting	soldering
Terminals	tin-plated
Contact system	cross contact self cleaning
Contact function	latching
Contact materials	Au alloy
Illuminability	no
Lock	Eurolocks
Wafers	5
Lock type	801
Number of locking positions	50
Main key	no
Symmetric key	yes
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
Rated voltage	2 ... 35 V
Rated current max.	100 mA
Contact resistance when new max.	100 mΩ
Contact resistance acc. to life max.	200 mΩ
Insulation resistance	10^9 Ω
ESD strength max.	8 kV

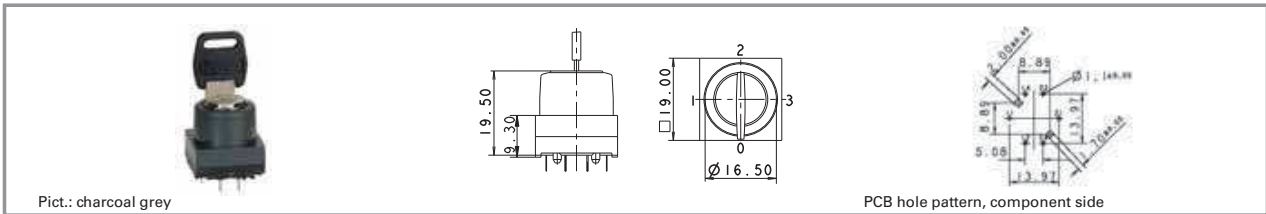### Other specifications
Rotating angle	see order block
Operating life	10,000
Degree of protection from front side	IP54
Ambient temp. operating min.	-25 °C
Ambient temp. operating max.	+70 °C
Storage temperature min.	-40 °C
Storage temperature max.	+80 °C
Environmental restistance	acc. to IEC 60068-2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

4

Typical accessories EUROLOCKS - Keylock switch IP54

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

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

PCB Keyswitches

RAFI
SOLUTIONS WITH PASSION

EUROLOCKS - Keylock switch IP54

Pict.: light grey

PCB hole pattern, component side

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

Technical data see page 4 - 158

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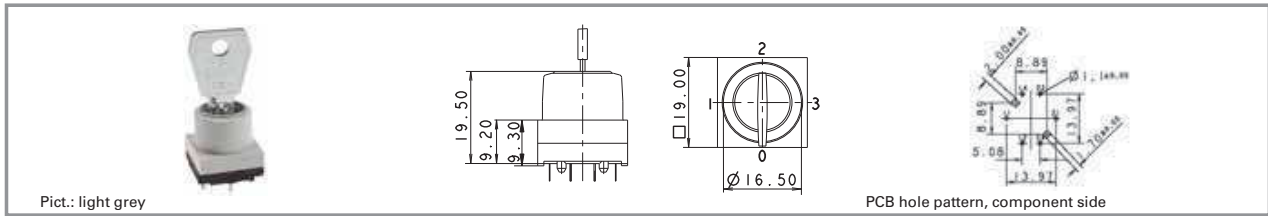For the switching arrangement, refer to Micromec keylock switch IP54.

4

Priority keylock switch IP54

Pict.: light grey | PCB hole pattern, component side
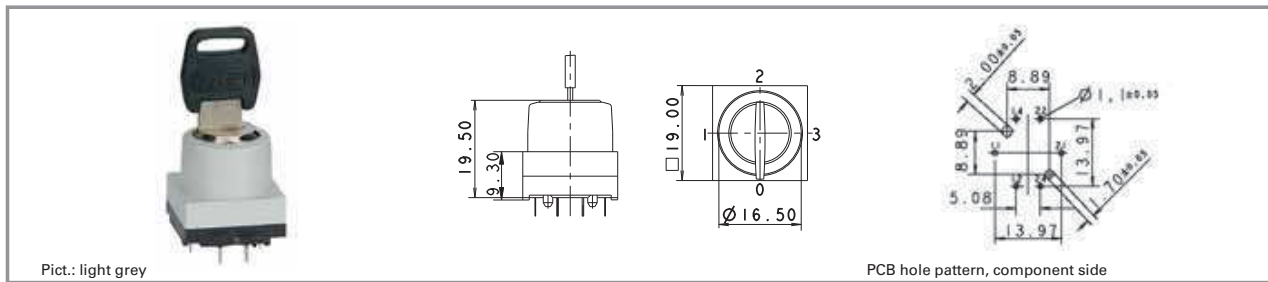
General Data

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

Technical Data

General information

Colour	see order block
Form of collar	square

Dimensions

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

Mechanical design

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

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

Other specifications

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

Typical accessories Priority keylock switch IP54

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

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

Typical accessories Priority keylock switch IP54

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

Priority keylock switch IP54

Pict.: charcoal grey				PCB hole pattern, component side	

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

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.

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PCB Keyswitches

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

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Key
Switches

Rotary switch IP40

Pict.: charcoal grey

PCB hole pattern, component side

Technical Data

General information
Colour	see order block
Form of collar	square

Dimensions
Length of collar	19 mm
Width of collar	19 mm
Overall height	24 mm

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

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

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

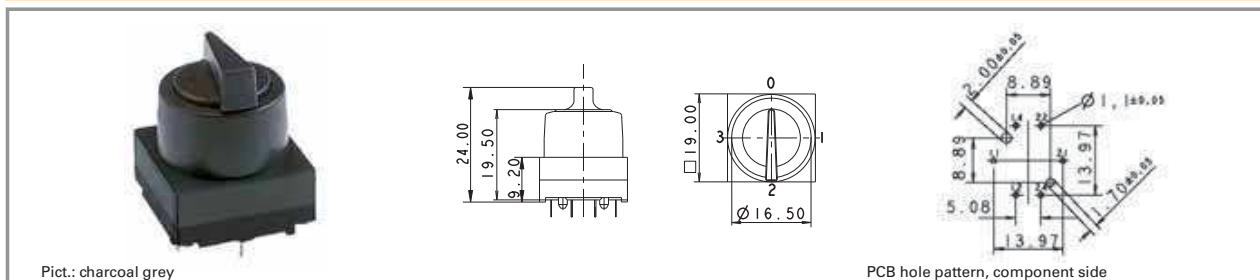### Other specifications
Rotating angle	see order block
Operating life	50,000
Degree of protection from front side	IP40
Ambient temp. operating min.	-25 °C
Ambient temp. operating max.	+70 °C
Storage temperature min.	-40 °C
Storage temperature max.	+80 °C
Environmental restistance	acc. to IEC 60068-2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

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Rotary switch IP40

Pict.: charcoal grey

24.00
19.50
9.20

0
19.00
3
2
Ø16.50

PCB hole pattern, component side

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

Technical data see page 4 - 162

Other colour variants available on request

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

Key
Swit-
ches